MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT	**SOCIALIST REPUBLIC OF VIETNAM**
No .76 / 2017 / TT-BTNMT	**Independence - Freedom - Happiness**
	Hanoi, dated December 29 2018

CIRCULAR

Regulating assessment of wastewater receiving capacity and loading capacity of rivers and lakes

Pursuant to the Law on Water Resources 2012;

Pursuant to the Law on Environmental Protection 2014;

Pursuant to Decree No.38/2015/ND-CP dated April 24 2015 by the Government on waste and scrap management;

Pursuant to Decree No. 36/2017 / ND-CP of April 4,2017 of the Government regulating the functions, tasks, powers and organizational structure of Ministry of Natural Resources and Environment ng;

At the proposal of General Director of the Vietnam Environment Administration, Director of Department for Water Resource Management and Director of Legislation Department;

The Minister of Natural Resources and Environment issues a circular regulating the assessment of wastewater receiving capacity, loading capacity of rivers and lakes.

Chapter I

GENERAL PROVISION

Article 1. Scope of regulation

This Circular provides assessment of wastewater receiving capacity, loading capacity of water source in rivers, streams, canals,

lagoons, lakes, ponds (hereinafter referred to as assessment of wastewater receiving capacity, loading capacity of rivers, lakes).

Article 2. Subjects of application

This Circular applies to state management agencies in areas of water resources and environment, organizations, and individuals engaged in activities related to the assessment of the wastewater receiving capacity and loading capacity of rivers, lakes.

Article 3. Principles for the assessment of wastewater receiving capacity, loading capacity of rivers, lakes

1. The assessment of wastewater receiving capacity, loading capacity of water sources must ensure the unification at river basin level, and for water sources.

2. With water sources are rivers, streams, canals (hereinafter referred to as rivers), under wastewater receiving capacity, loading capacity assessment process, it is obligated to divide and assess by each river section.

3. The division of river into river sections, determination of water use purposes, selection of flow rate, selection of surface water quality parameters, selection of target parameters in wastewater sources for assessing wastewater receiving capacity, loading capacity of each river section shall ensure the unification in each river, river system.

4. Assessment of the wastewater receiving capacity, loading capacity of water sources in rivers, lakes shall be conducted for each pollutant parameter.

5. Assessment of the wastewater receiving capacity, loading capacity of water sources in rivers, lakes shall be conducted based on characteristics of water use purposes, self-purification capacity of water source, scope and

characteristics of current wastewater sources and socio-economic development planning.

Chapter II

ASSESSMENT OF WASTEWATER RECEIVING CAPACITY, LOADING CAPACITY OF WATER SOURCES IN RIVERS, LAKES

Article 4. Water sources subjects to wastewater receiving capacity, loading capacity assessment

1. The rivers are in the List of inter-provincial and intra-provincial river basins, List of international, inter-provincial, and intra provincial water sources, provided by competent agencies.

2. Lakes are in the List of inter-provincial, intra-provincial water sources, provided by competent agencies.

3. For water sources which are not defined at Clause 1 and Clause 2 of this Article, agencies which are competent for approving wastewater receiving capacity, loading capacity as specified at Clause 1 Article 15 of this Circular shall consider, and decide the assessment of wastewater receiving capacity, loading capacity in consideration of importance of water sources for socio-economic development, requirements for water resources and environmental protection, biodiversity conservation, preservation of cultural values concerning water sources.

Article 5. River division for assessing wastewater receiving capacity, loading capacity of rivers

1. The river division for assessing the wastewater receiving capacity, loading capacity of river must be implemented based on the following criteria:

a) Position of confluent points, division points on rivers;

b) The water use purposes, functions of the river sections, locations of water exploitation, use and wastewater discharge works; location of reservoirs, water-regulating works on rivers;

c)The salinity intrusion section with highest salinity of 4.0 ‰,for tidal-affected river sections;

d) Requirements on conservation and development of aquatic ecosystems, historical, cultural, tourist and belief values relating to water sources.

e) With international, inter-provincial rivers, apart from regulations specified at Point a, b, c, and d of this Clause, it is required to consider national boundaries, provincial administrative boundaries.

2. River section is determined as the followings:

a) One (01) river section is determined by two (02) consecutive cross-section, with length of 10 km or above, except cases specified at Point b and Point c of this Clause.

If there are nearby river sections with length of less than 10 km, based on flow variations, water use purposes, water source protection requirements, it can be considered to merged these sections into one section.

b) For tidal affected river section with highest salinity of 4.0 ‰, it can be considered as one river section.

c) For river running across urban areas, biodiversity reserves, cultural value conservation areas which relating to water sources, it can be considered as one river section.

Article 6. Determining water use purposes for assessing wastewater receiving capacity, loading capacity of rivers, lakes

1. Water use purpose of river sections, lakes shall be determined in accordance to water resources planning, environmental protection planning approved by competent state agencies. If river sections, lakes serve different water use purposes, it is required to select purpose with the highest water quality requirement.

2. For cases are not specified in Clause 1 of this Article, based on current status of water use and exploitation in river sections, lakes, agencies which are competent for approving wastewater receiving capacity, loading capacity as stipulated at Clause 1 Article 15 of this Circular shall consider, decide water use purpose of river section for assessment.

Article 7. Parameters for assessing wastewater receiving capacity and loading capacity of water sources in rivers, lakes

1. Wastewater receiving capacity, loading capacity of each river section, lake shall be assessed for the following parameters: COD, $BOD_{5,}$ ammonium, nitrate, phosphate and other parameters regulated in Clause 2 of this Article.

2. According to technical regulations (QCVNs) on surface water quality, wastewater quality, water use purpose, scope, characteristics, type of wastewater, requirements for water sources protection, environmental protection for each river section, lake, agencies which are competent for approving wastewater receiving capacity, loading capacity as stipulated at Clause 1 Article 15 of this Circular shall consider and decide specifically other parameters to be assessed.

Article 8. Method for assessing wastewater receiving capacity, loading capacity of rivers, lakes

1. Methods to be used for assessing wastewater receiving capacity, loading capacity of river are as bellows:

a) Direct assessment method: determining wastewater receiving capacity, loading capacity of river based on the maximum allowable value of each parameter as specified at QCVNs for surface water quality, flow and water quality analysis results in this river section;

Direct assessment method is applied for river sections where there are no direct wastewater discharge sources as confirmed by survey.

b) Indirect assessment method: determining wastewater receiving capacity, loading capacity of river based on the maximum allowable value of each parameter as specified at QCVNs for surface water quality, flow and water quality analysis results of river water, flow, and water quality analysis results obtained in wastewater discharge sources in this river section;

c) Assessment by simulation model: determining wastewater receiving capacity, loading capacity of river based on the maximum allowable value of each parameter as specified at QCVNs for surface water quality, flow and water quality analysis results of river water, flow, and water quality analysis results obtained in wastewater discharge sources in this river section, and the confluence process, changes of pollutants;

d) The assessment of wastewater receiving capacity, loading capacity of river shall be implemented as stipulated at Article 9 of this Circular.

2. The assessment of wastewater receiving capacity, loading capacity of lakes shall apply methods specified at Clause 1 of this Article and implement as specified at Article 13 of this Circular.

3. Given principles for wastewater receiving capacity, loading capacity assessment stipulated at Article 3 of this Circular, and information, data concerning river's flow and quality, wastewater sources' flow and quality, agencies which are competent for approving wastewater receiving capacity, loading capacity as stipulated at Clause 1 Article 15 of this Circular shall consider, and decide to use appropriate assessment methods for each river section, river system, except cases regulated in Clause 4 of this Article.

4. For tidal-affected river section as specified at Point b Clause 2 Article 5 of this Circular, it is obligated to use simulation model.

Article 9. Assessment of wastewater receiving capacity, loading capacity of rivers

1. Direct assessment method:

Assessment formula:

$$L_{tn} = (L_{td} - L_{nn)} \times F_S$$

Of which:

a) $L_{tn:}$ wastewater receiving capacity, loading capacity for each parameter, unit is kg/day;

b) $L_{td:}$ The maximum pollutant load of surface water quality parameter in river section, and is defined as regulated in Article 10 of this Circular, unit is kg/day

c) $L_{nn:}$ the pollution load of water quality parameter existing in the water source of the river sections, and is determined as specified in Article 11 of this Circular, unit is kg/day.

d) $F_{S:}$ Safety factor, which is consider and select within the range from 0.3 to 0.7. Given the reliability level, accuracy and adequateness of information and data used for assessment, agencies which are competent for

approving wastewater receiving capacity, loading capacity as stipulated at Clause 1 Article 15 of this Circular shall consider and decide.

2. Indirect assessment method:

Assessment formula:

$$L_{tn} = (L_{td} - L_{nn-} L_t) \times F_S$$

Of which:

a) $L_{tn:}$ wastewater receiving capacity, loading capacity for each parameter, unit is kg/day;

b) L_{td}, F_S are defined at Point b, Point d, Clause 1 of this Article;

c) L_{nn}: the pollution load existing in the water source of the river sections, and is determined as specified in Article 11 of this Circular, unit is kg/day.

d) L_t: pollution load existing in wastewater sources and is determined as specified at Article 12 of this Circular, unit is kg/day.

3. Assessment by modelling method

Given flow characteristics in river section, river, or in the whole river system, information and data about flow, water quality, and discharge sources, agencies which are competent for approving wastewater receiving capacity, loading capacity as stipulated at Clause 1 Article 15 of this Circular shall consider and select appropriate model for assessment. Model shall be calibrated before usage.

4. Assessment result shall meet requirements regulated at Clause 1, Clause 2 Article 14 of this Circular.

Article 10. Determining the maximum pollution load of surface water quality parameters

1. Formula:

$$L_{td} = C_{qc} \times Q_S \times 86.4$$

In which:

a) C_{qc}: maximum permissible value of the surface water quality parameter according to the national technical regulation on surface water quality applying to water use purpose in river section, unit is: mg/l;

b) Q_S: flow rate of the assessed river section, and is determined according to Clause 2 of this Circular, unit is m^3/s;

c) 86.4 is dimensional conversion factor (converted from unit mg/l, m^3/s to kg/day).

2. Flow rate of the assessed river section is determined by agencies which are competent for approving wastewater receiving capacity, loading capacity as stipulated at Clause 1 Article 15 of this Circular through considering minimum flow approved by competent agencies; in case the minimum flow is not available, the flow rate with be selected within the scope of the lowest flow rate to average value of three (03) lowest flow rates measured by month.

Article 11. Determination of existing pollution load of water quality parameters in water source

1. Determination formula:

$$L_{nn} = C_{nn} \times Q_S \times 86.4$$

In which:

a) C_{nn}: analytical results of surface water quality parameter and is determined as regulated at Clause 2 of this Article, unit is mg/l

b) Q_S: flow rate of the assessed river section, and is determined by regulations at Clause 2 Article 10 of this Circular unit is m^3/s;

c) 86.4 is dimensional conversion factor.

2. Analytical results of surface water quality parameter is determined at cross-sections in assessed river sections, and are determined by the average analytical results of at least 10 river samples, with frequency of three (03) days/sample during the three (03) driest months; If in the river section, there are water quality monitoring data from hydrological observation stations, water resources monitoring stations, environmental monitoring stations, these data can be considered for utilization. Water sampling locations at cross sections are as follows:

a / At the last cross-section of the assessed river section, when direct method is applied;

b) At the first section of the assessed river section, when indirect method is applied.

Article 12. Determination of pollution load of parameter in the wastewater source

1. Determination formula:

$$L_t = C_t \times Q_t \times 86.4$$

In which:

a) $C_{t:}$ Analytical results of parameter in the wastewater source to be discharged into the assessed river section, and is determined based on Clause 2 of this Article, unit is mg/l;

b) Q_t: The maximum wastewater volume to be discharged into the river section, and is determined based on Clause 3 of this Article, unit is m^3/s;

c) 86.4 is dimensional conversion factor.

2. Analytical result of pollutants in wastewater source is determined by an average value of analytical results of at least 10 wastewater samples, with frequency of 3 days/sample. If pollution sources conducted monitoring as stipulated in legal regulation, monitoring data can be considered for utilization.

3. The maximum wastewater volume is determined based on flow monitoring results at pollution sources according to legal regulations or the maximum wastewater volume specified at the License for wastewater discharge into water sources issued by competent agencies.

4. If many wastewater sources discharge into the river section, the calculation of pollution load for each parameter shall be conducted at each wastewater source.

5. If socio-economic development planning identified wastewater sources, flows and pollutants to be discharged into the assessed river section, pollution load of each parameter should be considered and calculated. The value of each pollutant parameter is determined based on limits specified at technical regulation on wastewater.

Article 13. Assessment of wastewater receiving capacity, loading capacity of lakes

1. For reservoirs constructed on rivers

a) If reservoirs operated by daily scheme, the wastewater receiving capacity, loading capacity of the reservoir is determined based on assessing wastewater receiving capacity, loading capacity of river section with reservoir as specified at Article 9 of this Circular.

b) If reservoirs are not operated by daily scheme, wastewater receiving capacity, loading capacity of reservoir shall be assessed as follows:

$$M_{tn} = (C_{qc} - C_{nn}) \times V_h \times 10^{-3} \times F_S$$

Of which:

- M_{tn}: Wastewater receiving capacity, loading capacity for each parameter in reservoir, unit is kg;

- C_{qc}: Maximum permissible value of the surface water quality parameter according to the national technical regulation on surface water quality corresponding to the water use purpose, unit is mg/l;

C_{nn}: analytical result of lake water quality parameter, and is determined as regulated at Clause 2 of this Article, unit is mg/l;

- V_h: volume of the lake, and is determined by the volume variations during dry season, unit is m^3;

- F_S: Safety factor, applied as 0.7.

2. Analytical result of lake water quality parameters are determined by an average value of the analysis results of at least 10 water samples of the lake with the sampling frequency of 03 days/sample; The sampling period is three (03) months in dry season; If water quality has been monitored according to the provisions of law, the use of such data for evaluation shall be considered.

3. For lakes are not prescribed in Clause 1 of this Article, the evaluation of the wastewater receiving capacity and loading capacity of the lakes shall comply with the provisions at Point b, Clause 1 of this Article, The F_S is 0.3.

4. For lakes specified at Point b Clause 1 and Clause 3 of this Article, given characteristics of the lake, information and data concerning water quality and pollution sources, agencies which are competent for approving wastewater receiving capacity, loading capacity as stipulated at Clause 1

Article 15 of this Circular shall consider and decide to apply modelling method for assessment. Model shall be calibrated before use.

5. Assessment result shall meet requirements specified at Clause 3 Article 14 of this Circular.

Article 14. Requirements for assessment results of wastewater receiving capacity, loading capacity in rivers, lakes

1. Assessment result of wastewater receiving capacity and loading capacity in each river section must be clearly demonstrated and explained on river segmentation, determination of water use purposes, determination of flow of water, evaluation parameters, safety factors and the selection of assessment methods prescribed in this Circular; Assessment results must show that the river section is capable of receiving or is not capable of receiving each parameter.

2. River's wastewater receiving capacity, loading capacity assessment result shall be collected and reflected to river system map, list of assessed river sections. For each river section, the main information shall be described are as bellows:

a) Name of the river section, name of river, name of river basin;

b) Length, administrative scale of river section;

c) The wastewater receiving capacity, loading capacity of river section, for each assessed parameter.

3. Lake's wastewater receiving capacity, loading capacity assessment result shall be explained clearly regarding the determination of water use purpose, determination of lake's volume, assessed parameters, safety factors, and applied method in accordance to regulations in this Circular; Assessment

results must show that the lake is capable of receiving or is not capable of receiving each parameter

Article 15. Approving wastewater receiving capacity, loading capacity of rivers and lakes

1. The Ministry of Natural Resources and Environment shall approve waste water receiving capacity and loading capacity of rivers and lakes of inter-provincial and international water sources. The People's Committees of the provinces and centrally-run cities (hereafter collectively referred to as the provincial-level People's Committees) shall approve wastewater receiving capacity and loading capacity of rivers and lakes at intra-provincial level.

2. Department of Water Resources Management shall assume the prime responsibility for, and coordinate with Vietnam Environment Administration in consulting, supporting Ministry of Natural Resources and Environment in organizing the survey, evaluating wastewater receiving capacity, loading capacity of interprovincial, international rivers, lakes, collecting opinions from the following ministries: Ministry of Industry and Trade, Ministry of Agriculture and Rural Development, Ministry of Transports, Ministry of Construction, Ministry of Culture, Sports, and Tourism, Provincial People’s Committee, agencies and units relating to wastewater receiving capacity, loading capacity assessment results of rivers and lakes; summarizing opinions, finalizing dossiers, and submitting to MONRE for considering and approving wastewater receiving capacity, loading capacity of lakes, rivers.

3. Department of Natural Resources and Environment shall consult, support Provincial People’s Committee in organizing the survey, evaluating wastewater receiving capacity, loading capacity of lakes, rivers of intra-provincial water sources, collecting opinions from the following

departments: Department of Industry and Trade, Department of Agriculture and Rural Development, Department of Transports, Department of Construction, Department of Culture, Sports, and Tourism, District level PPC, agencies and units relating to wastewater receiving capacity, loading capacity assessment results of intra-provincial rivers and lakes; summarizing opinions and sending to MONRE for comment, then finalizing dossiers, and submitting to PPC for considering and approving wastewater receiving capacity, loading capacity of lakes, rivers.

4. The dossier for opinion collection as specified at Clause 2 and Clause 3 of this Article shall include: draft approval decision, List of wastewater receiving capacity, loading capacity of assessed rivers and lakes, a report explaining wastewater receiving capacity, loading capacity assessment result of rivers and lakes.

5. The announcement that rivers, river sections are unable to receive wastewater for each parameters will be considered, decided, and delivered by agencies which are competent for approving wastewater receiving capacity, loading capacity as stipulated at Clause 1 of this Article, in accordance to legal provisions on water resources, environmental protection, and state secrecy protection regulations in the field of natural resources and environment.

Chapter III

ORGANIZATION OF IMPLEMENTATION AND IMPLEMENTATION PROVISIONS

Article 16. Organization of implementation

1. Department of Water Resources Management shall take prime responsibility and cooperate with Vietnam Environment Administration,

Department of Natural Resources and Environment, Provincial People's Committee to consider and decide, based on their competence as stipulated in Article 15 of this Circular for the contents specified in Clause 3 of Article 4; Clause 2 of Article 6; Clause 2 of Article 7; Clause 3 of Article 8; Point d of Item 1, Clause 3 of Article 9; Clause 2 of Article 10; Clause 4 of Article 13 of this Circular and the contents specified in Clause 2 of this Article.

2. Every five (05) years, organizing wastewater receiving capacity and loading capacity assessment in water sources of rivers and lakes before the socio-economic development planning period or agencies which are competent for approving wastewater receiving capacity, loading capacity as stipulated at Clause 1 Article 15 of this Circular shall consider and decide the re-assessment of wastewater receiving capacity and loading capacity of water sources in one of the following cases:

a) In socio-economic development planning, there are adjustments relating to water use purposes and activities of discharge of wastewater into water sources;

b) There are projects or water exploitation and utilization works, or wastewater discharge activities in new water sources, which greatly alter the flow regime and quality of rivers and lakes;

c) At the request of competent state agencies.

3. The Department of Water Resources Management shall assume the prime responsibility for, and coordinate with VEA in guiding and supervising the implementation of this Circular.

4. Vietnam Environment Administration (VEA) coordinates with Department of Water Resources Management to conduct surveys, statistics

and to build a wastewater discharge source database for inter-provincial and international rivers.

5. Ministries, ministerial agencies, provincial People's Committee, DONRE, and concerned organizations, individuals are responsible for implementing this Circular.

6. If wastewater receiving capacity, loading capacity of some rivers and lakes have not been approved, competent agencies can base on wastewater receiving capacity assessment results at receiving sources conducted by organizations, individuals would like to discharge into the water sources, in accordance to this Circular to consider to agree, approve, and grant license as prescribed. The number of each river, lake water sample at receiving wastewater sources and wastewater (if any) is 1 to 3 samples and are determined by considering characteristics of receiving sources, characteristic and scope of wastewater sources.

Article 17. Implementation Provisions

1. This Circular takes effect from March 01 2018. and replaces Circular No.02/2009/TT-BTNMT on March 19, 2009 by MONRE, stipulating the assessment of the wastewater receiving capacity of water sources.

2. Any difficulties or problems arising in the course of implementation of this Circular should be reported by concerned organizations and individuals to the Ministry of Natural Resources and Environment for consideration and appropriate amendment and supplement.

ON BEHALF OF MINISTER
DEPUTY MINISTER

To:
- Prime Minister;
- Deputy Prime Ministers;

- Ministries, ministerial-level agencies, governmental agencies;
- Office of National Assembly;
- Office of the President;
- Office of Central Party;
- People's Supreme People's Procuracy
- People's Procuratorate of the Supreme
- Ministries, ministerial agencies, governmental agencies
- Department of Legal Document Inspection, Ministry of Justice
- People's Committees of provinces and cities under central authority;
- Departments of Natural Resources and Environment of provinces and cities under central authority;

- Gazette; Government’s Portal
- MONRE’s Portal;
- Save: Office, PC, VEA, WR.

Vo Tuan Nhan

DRAFT DOCUMENT

(As of December 13 2017)

CIRCULAR

REGULATING THE ASSESSMENT OF RIVER LOADING CAPACITY AND DISCHARGE QUOTA ALLOCATION TO RIVER

Hà Nội, 11/2017

MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT	**SOCIALIST REPUBLIC OF VIETNAM** **Independence - Freedom – Happiness**
No: xxx/2018 / TT-BTNMT	Hanoi, …. 2018

CIRCULAR

REGULATING THE ASSESSMENT OF RIVER LOADING CAPACITY AND DISCHARGE QUOTA ALLOCATION TO RIVER

Pursuant to Law on Environmental Protection No. 55/2014/QH13 dated June 23, 2014

Pursuant to the Decree No. 38/2015/ND-CP of the Government, dated April 24, 2015, on the management of wastes and scrap

Pursuant to Decree no.36/2017/ND-CP dated April 4 2017 by the Government regulating functions, tasks, competences, and organizational structure of MONRE;

Upon request of General Director of Vietnam Environment Administration and Director of Legislation Department;

The Minister of Natural Resources and Environment issues a circular on the assessment of river loading capacity and allocation of discharge quota into the river as follows:

CHAPTER I:

GENERAL PROVISIONS

Article 1. Scope of Regulation

1. This Circular regulates details of the Clause 4, Article 55 of the Law on Environment Protection; the Point b, Clause 1, Article 43 of the Government Decree No. 38/2015/ND-CP on waste and scrap management;

2. This Circular regulates assessment of river loading capacity and allocation of discharge quota to the river, which includes the following contents:

a) Data, information collection and processing;

b) Principles, procedure, and methods of calculation of pollutant load;

c) Principles, procedure, and methods of calculation of river loading capacity;

d) Principles, procedure, and methods of discharge quota calculation and allocation into river;

e) Responsibilities of relevant agencies in assessment of river loading capacity and of discharge quota allocation .

Article 2. Subjects of Application

This Circular applies to authorities, organizations, and individuals which have activities relating to loading capacity assessment and discharge quota allocation in river.

Article 3. Interpretation of Terms

In this Circular, following terms shall be construed as follows:

1. Point source of pollution is interpreted as a pollution source where its discharge location can be attributed to a particular location

2. Non-point source of pollution is interpreted as a pollution source where its discharge location cannot be attributed to a particular location, and therefore shall be interpreted as a discharge source from a certain area.

3. Pollutant load (referring to pollution load of specific pollutants) from a discharge object (production, business, service establishment, area, sub-basin, etc.) shall be the volume of a pollutant from that object entering the environment in a defined unit of time.

4. Pollutant load unit (or PLU) is interpreted as pollutant load from a single unit of a discharge object.

5. Total pollutant load entering river is interpreted as the sum of the pollution loads which exist in the natural environment of river, and from the point sources, and non-point sources entering the river.

6. *River loading capacity* is interpreted as the maximum pollution load that a river can receive, which ensure that the pollutant concentration in river water still sustain appropriate water quality in accordance to the defined water use purpose.

7. *Representative point* is interpreted as a river cross section selected for controlling total pollution load to a river.

8. *Run off coefficient* is an empirical coefficient showing the decreased level of pollutant in it process of transportation from wastewater source to the receiving water source.

9. *Discharge quota allocation to river* is interpreted as the methodology of distributing pollutant load to the river for ensuring the river loading capacity

CHAPTER II:

ASSESSMENT OF POLLUTANT LOADS AND RIVER LOADING CAPACITY AND DISCHARGE QUOTA ALLOCATION TO THE RIVER

Article 4. General procedure for calculation of pollutant load, river loading capacity, and allocation of discharge quota discharge quota to river

Calculation of pollutant load, river loading capacity and allocation of discharge quota to river is implemented in the following main steps:

1) Collecting and processing needed data/information;
2) Calculating pollutant loads into the river;
3) Assessing river loading capacity;
4) Calculating scenarios of allocating discharge quota into river to satisfy the river loading capacity.

SECTION 1

NECESSARY DATA AND INFORMATION

Article 5. Necessary Data and Information on River Basin

1. The data and information on the river/ river system and river basin to be collected, surveyed and processed are of the categories presented in the Appendix 1.
2. Data and information on river basin scale shall be collected as follows:

a) Meteorological, hydrological and river water quality monitoring data in the river basin;

b) Survey data on river cross sections, land use and water use in river basin;

c) GIS data on topography, soil, and vegetation cover in river basin;

d) Socio-economic development and environmental management plans related to the river basin

Article 6. Necessary Data and Information on Pollution Sources

1. The data and information on the pollution sources in the river basin to be collected, surveyed and processed are of the categories presented in the Appendix 2 attached to this Circular.
2. Information and data on wastewater sources are collected from the following sources:

a) Survey and inventory data on wastewater sources in the river basin;

b) Relevant reports on waste water sources of production, business and service establishments in the river basin;

c) Research results on pollutant load and river loading capacity;

d) Statistical yearbooks of provinces, districts, cities in the river basin;

e) Wastewater/water environment management plans related to the river basin.

SECTION 2

CALCULATION OF POLLUTANT LOAD

Article 7. Principles of calculation of pollutant load

1. Select appropriate parameters for calculation basing on:

a) Management needs: the pollutants which are allowed to be discharged into environment, but cause bad effect to the river water quality and need to be reduced;

b) Technical Capacity: the data/information availability and the technical capability of the relevant agencies in calculating pollutant loads and water quality.

2. Take into consideration all significant pollution sources into the river.
3. Calculate pollutant loads for both point and non-point sources by each sub-basin.

Article 8. Procedure and method of pollutant load calculation

1. Procedure of pollutant load calculation consists of following steps:

a) Determine scope of the river;

b) Determine, classify point sources and non-point sources of pollution in the river basin;

c) Calculate pollutant loads from the point sources and non-point sources of pollution;

d) Identify the positions where the point sources and non-point sources discharging into river;

e) Calculate the pollutant loads from point sources and non-point sources of pollution entering the river;

f) Aggregate pollutant sources by each sub-basin.

2. Method of pollutant load calculation is regulated in Appendix 3 attached to this Circular.

SECTION 3

CALCULATION OF RIVER LOADING CAPACITY

Article 9. Principles of calculation of river loading capacity

1. River loading capacity shall be calculated based on calculation results and monitoring results of river flow and river water quality for the concerned parameters.

2. River loading capacity shall be calculated by using popular and reliable methods and tools, from simple (explicit empirical formula with simplifying assumptions) to complex (sophisticated models with many influencing factors) depending on the characteristics of the river, river basin, concerned pollution sources and parameters, availability of data and information, financial resources, and the capacity of the parties involved.
3. Loading capacity of river is calculated based on satisfaction of water use purposes in all river sections, sub-river basin, and river system.
4. River loading capacity shall be checked at the representative points.

Article 10. Procedure of Calculation of River loading capacity

1. Select appropriate methods, tools, models for calculating the river flow and water quality as regulated at Appendix 4 attached to this Circular.
2. Process data and information needed for calculation.
3. Setup simulation model on river flow and water quality as regulated at Appendix 5 attached to this Circular.
4. Calculate pollutants loads to river as stipulated in the Section 2 of this Chapter.
5. Conduct of calibration and validation of the models toward the monitoring data.
6. Assess the river loading capacity.

SECTION 4
CALCULATION AND ALLOCATION OF DISCHARGE QUOTA INTO RIVER

Article 11. Principles of discharge quota allocation into river

1. Discharge quota allocation to the river shall be implemented within the respective river regulated at Appendix 6 attached to this Circular.
2. Discharge quota allocation shall be determined each administrative unit, each sub river basin or specific discharge sources.
3. Pollutant sources and level of administrative units being considered for discharge quota allocation depend on the management priority, and relevant data and information availability.

Article 12. Procedures for Discharge quota Calculation and Allocation

1. Developing and calculating scenarios predicting the changes of pollutant loads in the target year, based on relevant national/provincial policies and socio-economic development plans as regulated at the point 1, Appendix 7 attached to this Circular.
2. Developing and calculating scenarios on adjustment of pollutants loads for meeting river loading capacity based on the results of the scenarios mentioned at the Clause 1 of this Article as regulated at the Point 2 and Point 3, Appendix 7 attached to this Circular.
3. Calculating discharge quota allocation to concerned administrative units/ areas/ establishments based on the calculation results of the scenarios mentioned at the Clause 2 of this Article.

CHAPTER III: RESPONSIBILITY OF AGENCIES

Article 13. Responsibilities of Ministry of Natural Resources and Environment

1. To develop detailed technical guidance on how to calculate pollutant load, assess river loading capacity and estimate of discharge quota allocation to the rivers.
2. To develop and implement plan on assessment of river loading capacity and waste water discharge quota allocation for inter-provincial river basins (which includes the list of priority river basins for assessing river loading capacity and time to conduct the assessment).
3. Competent agencies shall appraise loading capacity assessment results and conduct discharge quota allocation for inter-provincial river basins.
4. To propose to competent agencies for approving discharge quota for provinces concerning inter-provincial river basins.
5. To support relevant local agencies in the activities related to pollutant load calculation, river loading capacity assessment and discharge quota allocation estimation at local level.
6. To cooperate with river basin organizations in:

a) Soliciting the participation of local governments and stakeholders to provide necessary data for calculation of river loading capacity and discharge quota allocation in river basin;

b) Appraising the results of calculation on river loading capacity and discharge quota allocation in river basin;

c) Coordinating and providing advice to relevant agencies in making decisions about discharge quota allocation for inter-provincial river basins;

d) Promoting the approach to river water quality management using discharge quota.

Article 14 Responsibilities of people's committees of provinces and centrally run cities

1. To provide relevant data and information, and to participate in calculation of river loading capacity and discharge quota allocation for inter-provincial river basins.
2. To develop plans for, and to carry on the assessment of river loading capacity and discharge quota allocation for intra-provincial river basins (which includes a list of priority river basins for assessment of river loading capacity, and required time steps to conduct the assessment).
3. To organize the appraisal of loading capacity assessment results and discharge quota allocation results in intra-provincial river basins.
4. To approve discharge quota allocation to subordinate administrative units and pollution sources owners which under management of the province.
5. To develop plans for pollutant load reduction, and pollutant load based river water management.
6. To report periodically to MONRE about loading capacity and wastewater discharge quota into river in the province.

CHAPTER IV:

IMPLEMENTATION PROVISIONS

Article 15. Effectiveness

1. This Circular takes effect from the date 2018

2. General Director of VEA is responsible for instructing, checking, supervising, and facilitating the implementation of this Circular.

3. In the course of implementation, if difficultiesoccurs, the authorities, organizations and individuals should promptly report to the Ministry of Natural Resources and Environment for consideration and handling./.

To:
- Ministries, ministerial agencies, governmental bodies;
- State Audit Office of Vietnam;
- Provincial PCs;
- DONRE in provinces; cities under central supervision;
- MOJ (Department of Legal Document Check);
- Gazette;
- Government Portal;
- Agencies, departments under MONRE;
- Save: Office, VEA, PC.

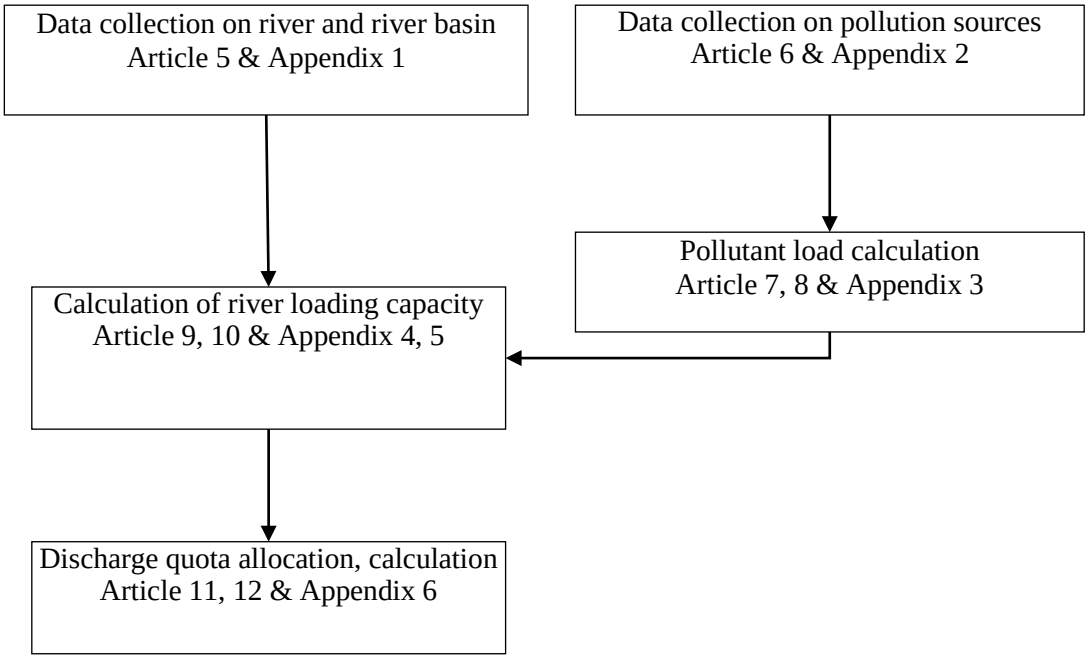
MINISTER

Trần Hồng Hà

APPENDIX

(Attached with Circular no. /TT-BTNMT dated 2018 by MONRE Minister)

Relationship among Articles and Appendices



Appendix 1: Necessary Information and data on river and river basin

1. Types of necessary information and data are as follows;

- River basin topography (GIS data)
- River cross sections
- Land use data (GIS data), Location and area of each land use category (rice, other crops, forest, and urban area)
- Meteorological data (temperature, relative humidity, evaporation, solar radiation, rain, wind speed/ direction, etc.)
- Hydrological data (flow, water level)
- Data on irrigation works on the river (water gates, dams: operating rules, water volumes and locations, etc.)
- Lakes and wetlands connected to river/ river system (location, volume)
- Data on water intake for domestic use, irrigation and production (location, water amount)
- Water quality monitoring data
- Demographic data and relevant economic activities producing wastewater in the basin
- Sewerage system operation information
- Planning for socio-economic development, and water use and wastewater management in river basin
- Legal requirements for wastewater and river water quality management.

2. Collected data type and data source are presented in the Table 1.

Table 1 Collected Data Type and Data Source

No.	Data Type	Data Source	Objective
1.	Basic map	MONRE DONRE	Plot locations of discharge sources, both point and non-point sources.
2.	Location and type of industrial activities (industry data/ profile)	MONRE DONRE General Statistics Office	Plot locations of industrial sources which produce pollutants.
3.	Demography and its distribution	General Statistics Office	Plot pollutant load from domestic source.
4.	Topography	MONRE	Plot sub-basin and pollutant sources distribution in sub basins, understand

No.	Data Type	Data Source	Objective
	Hydrology and climatology	DONRE MARD DARD MOC DOC	hydrological and hydraulic conditions.
	Existing sewerage system		
	Water bodies and sub-river basin borders		
	information/map of existing land use		
5.	Quantity and quality of water source	MONRE DONRE	Identify parameters of dominant pollutants which significantly contribute to high water pollution affecting particular water quality.
6.	Cultivation/ livestock data	General Statistics Office MARD DARD	Plot cultivation/livestock area, land condition, and distribution of fertilizer/pesticide use by plant type.
7.	Socio economic and spatial development plans and other relevant sectoral plans	PPC MONRE DONRE MARD DARD MOC DOC Other relevant ministries and departments	Basic data for Predicting future pollution source and its pollutant load..

Appendix 2: Information and data on wastewater sources to be collected

1. Types of concerned wastewater sources are as follows:

a) Production establishments in the metallurgy, glass making, mechanical engineering, pulp & paper production; production of beverages (beer, wine); manufacture of electronic components, garment ….

b) Industrial parks (IPs) and industrial clusters (ICs);

c) Centralized waste water treatment plants of cities and towns;

d) Mineral exploiting establishments: coal mining, zinc ore, iron ore, titanium, and gold exploitation;

e) Concentrated livestock farms;

f) Hospital and health clinic;

g) Landfills, and waste treatment areas

2. Data and information to be collected for each type of pollution source are presented in Table 2:

Table 2 Data and Information to be collected for Each Type of Pollution Source

Pollution Source	Sector	Data and Information to be collected to Identify Pollution Source
Point Sources	Domestic	Sewage treatment facilities (covered area and population, treated wastewater quality and amount), population(person), household, and availability of domestic wastewater treatment, wastewater quality and quantity
	Livestock	Number of livestock (head), type of animal, turnover, facility area, location, volume of discharged wastewater, effluent water quality, and type of treatment facility
	Industry (including Mining)	Sector/type, products, turnover, number of employees (person), production area, location, volume of discharged wastewater, effluent water quality, and type of treatment facility
	Service (including Hospital)	Location, number of beds, volume of discharged wastewater, effluent water quality, type of wastewater treatment facility
	Cultivation	Location, area, volume of discharged wastewater, effluent water quality, type of wastewater treatment facility
Non-point Sources	Cultivation	Area, amount and type of the product, amount and type of Agricultural chemicals
	Livestock	Area, number of livestock, type of animal
	Forest	Area of forest, type of forest
	Urban run-off	Urbanized area
	Others	It depends on the type of pollution source

Appendix 3: Method of calculation of pollutant load at source

1. There are two methods that can be used to calculate the pollutant load from the point source.

The first method shall be applied when necessary data on the flow of waste water and the concentration of pollutant are available; the pollutant load is calculated according to the following formula:

$$TLs = Cs \times Qs \qquad (1)$$

In which: TLs is the s pollutant load (kg/day), Qs is the discharge of wastewater source (m^3/day) containing pollutants, Cs is the pollutant s concentration (kg/m^3).

The second method is applied where necessary the flow of pollutant effluent and pollutant concentration are inadequate; the pollutant load is calculated according to the formula:

$$TLs = PLU * NUs \qquad (2)$$

In which: TLs is the s pollutant load (kg/day), the PLU is the pollutant load of one unit of discharge (referred to as pollution load unit), NUs is the number of units of the discharging object. Unit load is determined experimentally and is usually referenced (with adjustment to suit actual conditions) from the results of other studies.

2. Pollutant load from nonpoint source is calculated according to formula (2) for each discharging area. Although calculation is the same as for point sources in the absence of required data on the pollutant discharge flow and concentration of wastewater, the difference is that for non-point sources, it needs to assume the location (or locations) where the pollutant enters into the river.

3. Pollutant load from point source is integrated into the load from the sub-basin in which it belongs, when the access point from the source to the river is unidentifiable.

4. For the wastewater source that does not directly discharge to the river (from a distance or through an environment), pollutant load entering the river body is calculated as the product of the pollutant load into the ambient environment multiplied by the run off coefficient Ks. The Ks coefficient depends on how the waste source approaches the river, and is calibrated based on actual data or can be referenced with experience gained from other studies.

Examples of pollutant load calculation using Pollutant load Unit (PLU) and the PLU values for reference are given in the Table 3.

Table 3 Examples of Pollutant Load Calculation, and Available Pollutant Load Unit (PLU)

<table>
<tr><th>Pollution Source</th><th>Sector</th><th>Examples of Pollutant Load Calculation, and Available PLU</th></tr>
<tr><td>Point Sources</td><td>Domestic</td><td>For Untreated Wastewater
Generated PL = Population x Pollutant load Unit (PLU)
Table 3.1 PLU for Domestic Wastewater
<table>
<tr><th>Domestic Wastewater</th><th>Volume of Wastewater (L/person/day)</th><th>BOD (g/person/day)</th><th>COD (g/person/day)</th><th>T-N (kg/person/year)</th><th>T-P (kg/person/year)</th></tr>
<tr><td>Urban</td><td>96 (city, town)
64 (district)</td><td>49.5</td><td>93.5</td><td>3.3</td><td>0.93</td></tr>
<tr><td>Rural</td><td>80 (city, town),
48 (district)</td><td>39.6</td><td>74.8</td><td>2.64</td><td>0.744</td></tr>
</table>
Discharged PL = Generated PL x Runoff Ratio</td></tr>
</table>

<table>
<tr><th>Pollution Source</th><th>Sector</th><th>Examples of Pollutant Load Calculation, and Available PLU</th></tr>
<tr><td></td><td></td><td>
Table 3.2 Pollutant Runoff Ratio for Domestic Wastewater
<table>
<tr><th rowspan="2">Wastewater type</th><th colspan="4">Pollutants Run-Off Coefficient (Depend on Ratio of Urban Area)</th></tr>
<tr><th>Less than 5%</th><th>5% - 10%</th><th>10~15%</th><th>More than 15%</th></tr>
<tr><td>Domestic (untreated)</td><td>0.1</td><td>0.4</td><td>0.7</td><td>0.9</td></tr>
</table>
<u>For Treated Wastewater</u>
a) In urban areas: in case of Sewerage system
Pollutant load (ton/year)
= Rate of urban population (%) x Discharge flow (m3/day) x 365 days/year x Concentration of Pollutant /1000.
b) In rural areas: in case of Septic Tank
Pollutant load (ton/year)
= Pollutant load from untreated wastewater (ton/year) x Rate of rural population (%) x Rate of treated waste water by septic tank
· Rate of urban and rural population collect from Statistical Yearbook
· 40~60 % of pollutant load from domestic wastewater is treated by septic tank.
</td></tr>
<tr><td></td><td>Livestock</td><td>
Generated PL = Number of Livestock ×Pollutant load Unit (PLU) x average feeding time (month) /12
Table 3.3 PLU for Livestock
<table>
<tr><th>Domestic</th><th>Average Feeding Time (month)</th><th>Volume of Wastewater (m3/head/year)</th><th>BOD (kg/head/year)</th><th>COD (kg/head/year)</th><th>T-N (kg/head/year)</th><th>T-P (kg/head/year)</th></tr>
<tr><td>Buffalo</td><td>12</td><td>8</td><td>164</td><td>295</td><td>43,8</td><td>11,3</td></tr>
<tr><td>Cow</td><td>12</td><td>8</td><td>164</td><td>295</td><td>43,8</td><td>11,3</td></tr>
<tr><td>Pig</td><td>6</td><td>14.6</td><td>32,9</td><td>59.2</td><td>7,3</td><td>2,3</td></tr>
<tr><td>Horse</td><td>12</td><td>13.6</td><td>146</td><td>263</td><td>95,3</td><td>16,4</td></tr>
<tr><td>Goat</td><td>6</td><td>4.9</td><td>33,7</td><td>60.7</td><td>13,5</td><td>3,7</td></tr>
<tr><td>Chicken</td><td>3</td><td>3.2</td><td>1.61</td><td>2.90</td><td>3,6</td><td>-</td></tr>
</table>
Discharged PL = Generated PL x Runoff Ratio
Table 3.4 Pollutant Runoff Ratio for Livestock
<table>
<tr><th rowspan="2">Sector</th><th colspan="4">Pollutants Run-Off Coefficient (Depend on Ratio of Urban Area)</th></tr>
<tr><th>Less than 5%</th><th>5% - 10%</th><th>10~15%</th><th>More than 15%</th></tr>
<tr><td>Domestic (untreated)</td><td>0.01</td><td>0.04</td><td>0.07</td><td>0.09</td></tr>
</table>
</td></tr>
<tr><td></td><td>Industry (including Mining)</td><td>
<u>Discharge</u>
Industrial wastewater discharge (m3/year)
= PLU according to their production value (m3/million VND) x Production Value (million VND/year)).
Table 3.5 Wastewater pollution factor of the main sectors according to their production value
<table>
<tr><th>No.</th><th>Sector</th><th>PLU (m^3/million dong)</th></tr>
<tr><td>I</td><td>Mining industry</td><td></td></tr>
<tr><td>01</td><td>Quarrying and other mining</td><td>0,427</td></tr>
<tr><td>II</td><td>Processing industry</td><td></td></tr>
<tr><td>01</td><td>Food and drink</td><td>0,398</td></tr>
<tr><td>02</td><td>Textile products</td><td>0,608</td></tr>
<tr><td>03</td><td>Costume</td><td>0,108</td></tr>
<tr><td>04</td><td>Products made of leather and leatherette</td><td>0,677</td></tr>
<tr><td>05</td><td>Wood products and forestry products</td><td>0,323</td></tr>
<tr><td>06</td><td>Paper and paper products</td><td>2,491</td></tr>
<tr><td>07</td><td>Chemistry</td><td>2,090</td></tr>
<tr><td>08</td><td>Rubber and plastic products</td><td>2,090</td></tr>
</table>
</td></tr>
</table>

Pollution Source	Sector	Examples of Pollutant Load Calculation, and Available PLU

09	Non-metallic mineral products	0,910
10	Metal	0,910
11	Metal products	0,128
12	Devices	0.570
13	Production of office equipment and computers	0,320
14	Electrical equipment, electronic	0,320
15	Radio, television, communication equipment	0,320
16	Medical instruments, precision	0,547
17	Motor vehicles	0,099
18	Other means of transport	0,099
19	Beds, wardrobes, tables, chairs	0,323
III	Industrial production and distribution of electricity, gas and water	
01	Production and distribution of electricity, gas	0,116

The industrial production value of each sector: Collect from Statistical Yearbook.

Pollutant load

PL (tons/year) = (concentration of waste (mg/l) x industrial discharge (m3/year) x 10-6).

Average concentration of industrial wastewater is taken as followed:

Table 3.6 Average concentration of industrial wastewater

Parameter	Concentration (treated) (mg/l)
BOD_5	21
COD	50.5
Total-N	14.75
Total-P	1.32

Service (including Hospital)

Discharge

Wastewater from commercial sector; restaurant, hotel, tourism; transportation and other services (m3/year) = (Wastewater pollution of each sector (m3/million VND) x Production value of each sector (million VND/year)).

Healthcare Wastewater (m3/year)

= healthcare wastewater pollution factor (liter / bed/day) x Number of beds x 365 x10-3.

Table 3.7 Wastewater pollution factor of sectors

Sector	PLU (m^3/million dong)	Sector	PLU (litter/bed/day)
Commercial	0.291	Healthcare	
Restaurants, hotels, travelling	0.785	+ Hospital	473
Transportation	0.323	+ Clinic	280
Other services	0.785		

Pollutant load

a) Pollutant load from untreated health wastewater

PL = waste concentration (mg/l) x service wastewater volume (m^3/day) x 365 x 10^{-6}

Table 3.8 Concentration of medical wastewater

Parameter	Concentration (mg/L)	
	Range	Average
BOD_5	120 - 150	135
COD	200 - 260	220
Total N	75 - 150	112.5
Total P	10 -50	30

b) Pollutant load from treated health wastewater

PL = Concentration of Pollutant (mg/l) x service wastewater volume (m^3/day) x 365 x 10^{-6}

Table 3.9 Value of pollution parameters in QCVN28:2010/BTNMT

<table>
<tr><th>Pollution Source</th><th>Sector</th><th>Examples of Pollutant Load Calculation, and Available PLU</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Parameters</td><td>Unit</td><td colspan="2">C value</td></tr>
<tr><td>Parameters</td><td>Unit</td><td>Column A</td><td>Column B</td></tr>
<tr><td>BOD_5 (20°C)</td><td>mg/l</td><td>30</td><td>50</td></tr>
<tr><td>COD</td><td>mg/l</td><td>50</td><td>100</td></tr>
<tr><td>$NH4^+$ (N)</td><td>mg/l</td><td>5</td><td>10</td></tr>
<tr><td>NO_3^- (N)</td><td>mg/l</td><td>30</td><td>50</td></tr>
<tr><td>PO_4^{3-} (P)</td><td>mg/l</td><td>6</td><td>10</td></tr>
</table>
Source: QCVN 28:2010/BTNMT National Technical Regulation on Health Care Wastewater
</td></tr>
<tr><td></td><td>Others</td><td>It depends on the type of pollution source.</td></tr>
<tr><td rowspan="5">Non-point Sources</td><td>Agriculture</td><td rowspan="5">Generated PL (tons/year) = PLU of land use type (tons/year) x sector area (ha)/1000.
Table 3.10 PLU of land use type
<table>
<tr><th>Land use</th><th>BOD (kg/ha/year)</th><th>COD (kg/ha/year)</th><th>T-N (kg/ha/year)</th><th>T-P (kg/ha/year)</th></tr>
<tr><td>Cultivation</td><td>16.8</td><td>30.2</td><td>17.9</td><td>1.1</td></tr>
<tr><td>Forest</td><td>72.8</td><td>131.0</td><td>4.4</td><td>0.3</td></tr>
<tr><td>Special use</td><td>60.4</td><td>108.7</td><td>10.6</td><td>2.3</td></tr>
<tr><td>Residence (urban runoff)</td><td>56</td><td>100.8</td><td>9</td><td>2.2</td></tr>
<tr><td>Aquaculture</td><td>90</td><td>162.0</td><td>12.6</td><td></td></tr>
</table></td></tr>
<tr><td>Livestock</td></tr>
<tr><td>Natural (Forest)</td></tr>
<tr><td>Urban run-off</td></tr>
<tr><td>Others</td></tr>
<tr><td></td><td>Others</td><td>(it depends on the type of pollution source)</td></tr>
</table>

Appendix 4: Selection of Tool for Calculation of River Loading Capacity

1. Calculation of river loading capacity relies on the methods/ model for calculating river flow and simulation of behavior of pollutants in the river. Depending on the characteristics of river, river basin, the pollutants of interest, the sources of pollutants, the availability of information and data, available resources, and capacities of stakeholders for calculation, assumptions can be made, for a selection of a simple equation, or a sophisticated model. From flow condition and pollutant behavior viewpoints, the following points shall be considered.

Table 4 Way of Selecting a Tool for River Loading Capacity Assessment

Flow Condition	Pollutant Behavior
- If there are not enough reliable river flow data at upstream boundaries and tributaries of the river network, a rainfall-runoff model is used. - If flow condition is quite stable in the calculation period, a steady flow model is used. - If flow is affected by tide, an unsteady flow model is used. - If flow is stratified vertically or horizontally, a two/three dimensional model is used.	- If not considering bio-chemical reactions of pollutants, a simple equation for conservation of mass is used. - If considering simple bio-chemical reactions of pollutants, decay coefficients is used. - If considering physical transport, bio-chemical reactions of pollutants, complex water quality models is used.

2. The selection of suitable model shall be based on characteristics and simulation capacity of each model, as presented from Table 5 to Table 8:

Table 5 Main Characteristics of Models

Model	State of Hydraulics	Cost	Parameters could be Modeled	Popularity in Vietnam
QUAL2K	Steady	Free	Most of pollutants	Popular
WASP5/ WASP6	Steady	Free	Most of pollutants	Less popular
Streeter–Phelps	Steady	Free	Some pollutants	Least popular
HEC-RAS	Steady & Unsteady	Free	Most of pollutants	Less popular
MIKE 11	Unsteady	Required	Almost all pollutants	Popular
SHADM	Unsteady	Free	Some pollutants	Less popular
DELTA	Unsteady	Free	Some pollutants	Less popular
Freshwater Fraction/ Tidal prism	Unsteady	Free	Some pollutants	Least popular

Table 6 Parameters could be Modeled

Model	DO	BOD	COD	T^0	pH	Salinity	TSS	Total P	Organic P	Total N	Organic N
QUAL2K	X	X	X	X	X		X	X	X	X	X
WASP5/ WASP6	X	X	X	O	O		X	X	X	X	X
Streeter–Phelps	X	X	X				X	X		X	
HEC-RAS	X	X	X	X		X	X	X	X	X	X
MIKE 11	X	X	X	X	X	X	X	X	X	X	X
SHADM	X	X	X			X		X		X	
DELTA	X	X	X			X		X		X	
Freshwater Fraction/ Tidal prism	X	X	X			X		X		X	

Note: "X" means that the model can simulate the parameter. "O" means that the model can simulate the parameter by users' setting.

Table 7 Capability of Simulation

Model	Time Scale	Spatial Scale	Water Body	Type of Load	Load Rate	Calibration/ Verification Parameters
QUAL2K	Steady	1D.	Stream network	Multiple point sources and nonpoint sources	Constant	Flow, Velocity, concentration
WASP5/ WASP6	Steady	1D, 2D, 3D	Stream network, lake, reservoirs	Multiple point sources and nonpoint sources	Constant or time variable	Flow, Velocity, concentration
Streeter–Phelps	Steady	1D	Stream network	Multiple point sources	Constant	Flow, concentration
HEC-RAS	Unsteady	1D, 2D	River network	Multiple point sources and nonpoint sources	Constant or time variable	Flow, Velocity, concentration
MIKE 11	Unsteady	1D, 2D	River network	Multiple point sources and nonpoint sources	Constant or time variable	Flow, Velocity, concentration
SHADM	Unsteady	1D	River network	Multiple point sources	Constant or time variable	Flow, concentration
DELTA	Unsteady	1D	River network	Multiple point sources	Constant or time variable	Flow, concentration
Freshwater Fraction/ Tidal prism	Unsteady	1D	Estuaries	Multiple point sources	Constant	Flow, concentration

Note: "D" in the column of "Spatial Scale" means dimension.

Table 8 Main Required Data

Model	Geometric	Meteorology	Hydrology	Hydraulic Condition	Water Quality	Effluent
QUAL2K	Stream length; Connection scheme; Length of computational element	Cloud cover, barometric pressure, dry and wet bulb, T°, wind speed, evaporation coefficient, net solar radiation, dust attenuation coefficient, reach-variable climatology	Headwater and tributary inflow, withdrawals	Bottom friction, bottom width, side and channel slop for trapezoidal cross section	Inflow concentration, initial and boundary conditions	Flow rates and concentration
WASP5/ WASP6	Channel length, width and direction; Connection scheme; Segment surface area and depth	Time series of solar radiation, wind speed and direction, photoperiod, T°	Time series of headwaters and tributary inflows	Coefficients for velocity/flow regression (steady state time, cross section geometry, bottom elevation, bottom friction	Inflow concentration, initial and boundary conditions for all modelled state variables	Flow rates and concentration
Streeter–Phelps	Channel length, width and depth, Connection scheme	Barometric pressure, evaporation coefficient, , reach-variable climatology	Time series of headwaters and tributary inflows	Cross sections, bottom friction	Inflow concentration, initial and boundary conditions for all modelled state variables	Flow rates and concentration
HEC-RAS	Channel length, width and depth, Connection scheme;	Barometric pressure, T°, wind speed, evaporation coefficient, reach-variable climatology	Time series of headwaters and tributary inflows	Cross sections, bottom friction	Inflow concentration, initial and boundary conditions for all modelled state variables	Flow rates and concentration
MIKE 11	Channel length, width and depth, Connection scheme;	Barometric pressure, T°, wind speed, evaporation coefficient, net solar	Time series of headwaters and tributary inflows	Cross sections, bottom friction	Inflow concentration, initial and boundary conditions for all modelled	Flow rates and concentration

Model	Geometric	Meteorology	Hydrology	Hydraulic Condition	Water Quality	Effluent
		radiation, dust attenuation coefficient, reach-variable climatology			state variables	
SHADM	Channel length, width and depth, Connection scheme;	Barometric pressure, evaporation coefficient, , reach-variable climatology	Time series of headwaters and tributary inflows	Cross sections, bottom friction	Inflow concentration, initial and boundary conditions for all modelled state variables	Flow rates and concentration
DELTA	Channel length, width and depth, Connection scheme	Barometric pressure, evaporation coefficient, , reach-variable climatology	Time series of headwaters and tributary inflows	Cross sections, bottom friction	Inflow concentration, initial and boundary conditions for all modelled state variables	Flow rates and concentration
Freshwater Fraction/ Tidal prism	Channel length, width and depth	Reach-variable climatology	Tidal amplitude and inflow	Cross sections, bottom friction	Inflow concentration, boundary conditions	Concentration

Appendix 5: Setting up water quantity and water quality model

Setting up water quantity and water quality model must be in line with the type of tools/ models chosen. The model construction process is as follows:

- Divide the river basin into sub-basins based on DEM; the detail level of of sub-basin delineation depends on the interest of managers and the availability of information and data
- Identify administrative units in sub-basins
- Schematize the river system (river, boundaries, confluence, river-cross section, location of discharge from sources, location of water pumping stations, dams and reservoir areas linking with river
- Identify the sub-basin and area where non-point sources represent, and locate the discharging points on the river
- Identify representative points
- Determine necessary boundary conditions: hydraulic boundary conditions (upstream flow, and downstream water level), and water quality boundary conditions (pollutant concentration, or pollutant load), corresponding to the selected calculation scenarios
- Select the dataset used to calibrate and verify the model
- Identify future scenarios, and scenarios for pollutant load adjustment in order to achieve river loading capacity (including boundary conditions).

Appendix 6: Pollutant Load/Discharge quota Calculation and Allocation to River

Steps to calculate Pollutant Load Allocation to river in the current discharge condition include:

i) Identify pollutant load of each sub river basin in the current situation according to the result of pollutant load calculation from all sources

ii) Calculate loading capacity of whole river basin.

iii) Identify contribution ratio of each sub basin using the result of a simulation model. The contribution ratio is the division of a subtract of pollutant concentration at current condition to the pollutant concentration at a zero discharge condition from the calculated sub-basin, and the pollutant concentration at current condition.

iv) Quantify loading capacity of each sub basin, by multiplying contribution ratio with the loading capacity value of the whole river basin.

v) Increase (or decrease) the loading capacity of sub-basins to reach river water quality standards for the water use purpose of each river section. The total discharge load at this stage is the river's load capacity under the current discharge status.

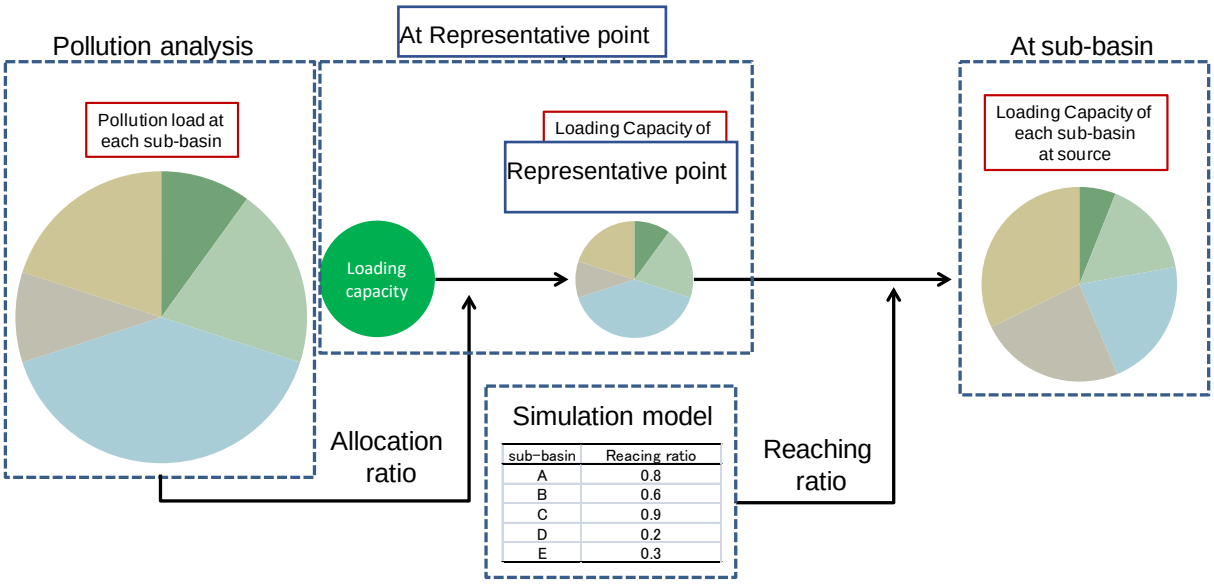


Figure 1 Process of calculation of loading capacity of each river basin

Using this approach, self-purification capacity of the river can be considered through the process of advection, diffusion, and decay, etc. in water quality model. The contribution ratio of each sub river basin is estimated as follows.

i) Using the constructed simulation model representing the current situation. Setting pollutant load in a sub river basin to zero and make a simulation model with the boundary condition.

ii) Comparing the result of the model between the current condition, and the zero input condition. As illustrated in Figure 3, the results are a little different because pollutant load from a sub river basin is different. As a result, the difference shows contribution of the sub river basin to whole concentration. The contribution ratio of others sub river basins is calculated similarly.

iii) After calculating the contribution ratio of each sub river basin, loading capacity of each sub river basin is calculated by multiplying this contribution ratio with the total loading capacity value of the whole river basin.

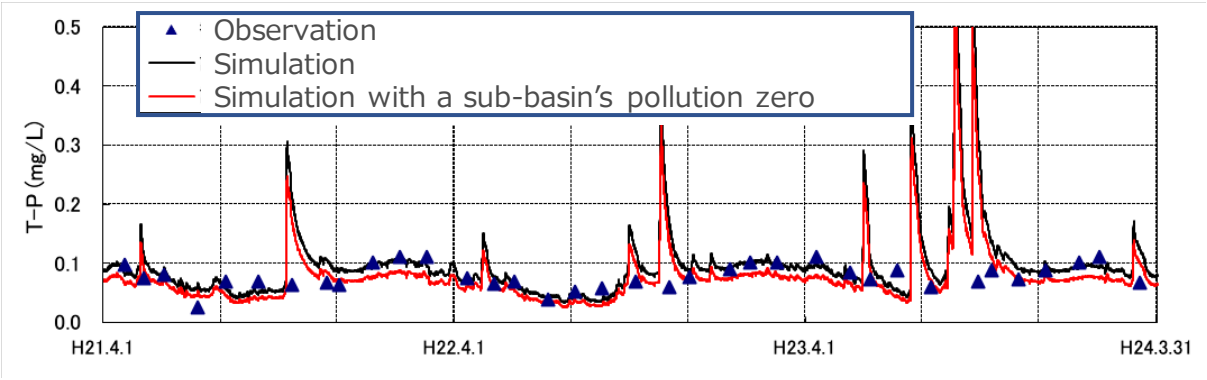


Figure 2 Comparison of an original simulation with that with zero pollutant load from one sub river basin

Appendix 7: Selection of scenarios

1. For future prediction, the following steps are required (Figure 4):

   a) Estimation of future pollutant load

   b) Prediction of the future water quality by the model

   c) Development of scenarios for adjusting pollutant load in the future to ensure that it shall not exceed the loading capacity of the river in the future.

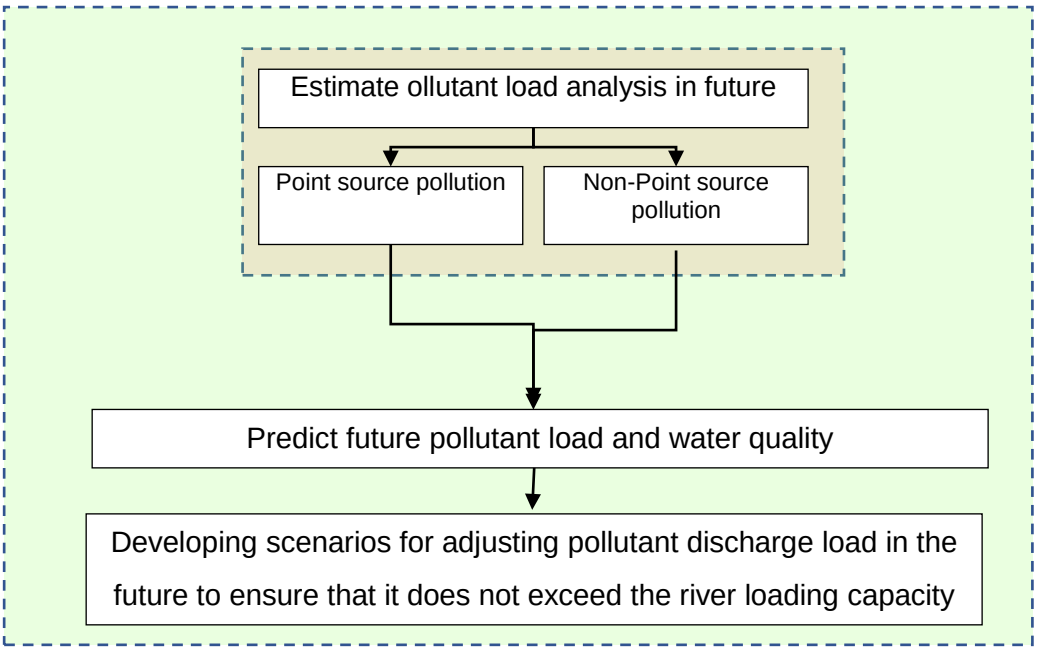


Figure 3 Steps of future prediction

2. Future computational scenarios are developed and calculated by the flow and water quality model based on national and local policies to future year of concern. Key changing factors in the scenarios include:

a) Meteorological data

b) Pollutant loads in the basin

c) Land use data

d) Water use data

e) Population size and economic activity producing wastewater

3. Types of scenarios for calculating, allocating discharge quota include:

a) Reduction of pollutant load to ensure the loading capacity of the river in case of river pollution

b) Increase of the pollutant load, not exceeding the river loading capacity in case the river is capable to receive more pollutants

4. Possible criteria for selecting scenarios for calculating, allocating discharge quota are as follows:

a) Equality for pollutant loads (decrease of pollutant discharge load)

b) Equality for water use purposes at the entry and exit points of the provinces (the same water quality at river sections between provinces in river basins)

c) Priority discharge policy for areas in the river basin (based on GDP, population, nation security, international relation, etc.)

d) Feasibility of implementing measures to reduce pollutant load (agreement of stakeholders, appropriate costs, etc.).

CIRCULAR

REGULATING THE PROCEDRE OF INVENTORY AND SETTING UP DATA SET ON WASTEWATER SOURCES

(Draft)

November 2017

Name of Circular: ***Circular No….. regulating the procedure of inventory and setting up data set on wastewater sources***

Pursuant to the June 23, 2014 Law on-Environmental Protection;

Pursuant to the June 21, 2012 Law on Water resources;

Pursuant to the Government's Decree No. 38/2015/ND-CP of April 24, 2015 on the management of waste and scrap;

Pursuant to the Government's Decree No. 73/2017 / ND-CP of June 14, 2017 on the collection, management, exploitation and use of natural resources and environmental information and data;

Pursuant to the Government's Decree No. 36/2017/NĐ-CP of April 04, 2017, stipulating the functions, tasks, powers and organizational structure of the ministry of natural resources and environment;

At the proposal of the director general of Vietnam Environmental Administration and the director of the Legal Department;

The Minister of Ministry of Natural Resources and Environment promulgates this Circular to regulate the inventory and development of data set on wastewater sources as follows.

Article 1. Scope

This Circular details the contents of provisions of Point d, Clause 1, Article 43 of Decree No. 38/2015 / ND-CP on management of wastes and scrap, including:

1. Procedure of wastewater sources inventory.
2. Establishment of wastewater data set.

Article 2. Subjects of application

This Circular applies to agencies, organizations and individuals involved in wastewater source inventory and development of wastewater source data set.

Article 3. Subjects and levels of wastewater sources inventory

1. Subjects of wastewater sources inventory are those discharged into the environment from the establishments which should have permits for discharge into water sources according to the Law on Water Resources.
2. The wastewater sources inventory shall be conducted at 4 levels:

a) Level 1: Wastewater sources equal to or more than 200 m3/day.

b) Level 2: Wastewater sources equal to or more than 50 m3/day.

c) Level 3: Wastewater sources equal to or more than 20 m3/day.

d) Level 4: Wastewater sources from the establishments which must have permits for discharge of wastewater into water sources according to the provisions of the Law on water resources.

Article 4. Conduct of wastewater sources inventory

1. The wastewater sources inventory shall be conducted in all provinces/centrally run cities at all the levels as follows:

A) Level 1: before January 1st, 2020;

B) Level 2: before January 1st, 2023;

C) Level 3: before January 1st, 2025;

D) Based on local conditions and data needs, local authorities is encouraged to conduct the inventory at level 4.

2. The additional survey for updating the wastewater sources shall be conducted every year.

Article 5. Contents of wastewater sources inventory

1. Contents of wastewater sources inventory include:

a) The type of wastewater generated by facility (belonging to one of the 14 basic types specified in Appendix 1).

b) Wastewater treatment measures and technology

c) Wastewater amount by m^3/day

d) Value of concerned pollutants in wastewater, which include:

- Basic parameters: Temperature, pH, DO, COD, TSS, conductivity.

- Specific parameters according to the type of production of the establishment, defined in the form of inventory sheet of the Appendix 2 attached to this Circular.

e) The coordinate point of discharge into receiving sources.

f) The receiving source.

g) Other information (for the polluting establishment/the establishments causing serious environmental pollution; information on sanctions against administrative violations in the fields of environmental protection and water resource in the recent three years, etc.)

2. Detailled form of inventory sheet is provided in Appendix 2 attached to this Circular.

Article 6. Procedure of wastewater sources inventory

1. Determine the scope and subject of wastewater sources inventory:

a) The inventory spatial cope is defined according to administrative boundaries (province, district and commune levels)

b) The wastewater sources under inventory at different levels are regulated at the Article 3 of this Circular.

2. To prepare and unify on the wastewater inventory sheet.

3. Collect available existing data/information on wastewater sources from relevant central and provincial management agencies and other sources, using the inventory sheet.

4. Conduct additional field survey (if necessary)

5. Digitize and edit the collected data.

6. Report the results of wastewater sources inventory.

Article 7. Method of wastewater sources inventory

1. Direct, indirect interview.

2. Sending questionnaire sheet to establishments for filling information.

3. Collecting and processing data from other sources (online monitoring stations or available information management systems; reports on periodical environmental monitoring or discharge of wastewater into water sources or additional survey (if any) of establishments; inspection/ checks data).

4. Conducting field survey

Article 8. Preparation of Wastewater data set

1. The wastewater data set should be a component of the environmental database and contains the needed information on wastewater sources as follows:

a) Information on the wastewater-generating establishments: coordinate and type of establishment

b) Data on wastewater source: volume, treatment methods; parameters of pollutants in wastewater; wastewater receiving point of water body.

2. Basic information and data on wastewater sources shall be interpreted on the GIS map

3. Structure of wastewater data set is unified at the central and local levels.

4. Wastewater data set preparation composes of the followings:

a) Select appropriate graphic software

b) Setting up appropriate digital data format on wastewater sources;

c) Establishing an appropriate base map for the concerned area;

d) Developing necessary interface

e) Developing wastewater sources map.

5. Technical guidance on the setting up of the wastewater data set is presented in Appendix 5 to this Circular.

Article 9. Management and updating of wastewater database and map

1. Wastewater data set is managed at two levels:

a) National level for the whole country

b) Local level for individual province

2. Wastewater data sets shall be used at the national and local level in the same format with the rights of use in accordance with the regulations on the environmental database.

3. The wastewater data set is updated once a year.

Article 10. Responsibilities of the provincial Department of Natural Resources and Environment

1. To organize the inventory of wastewater sources under its respective management authority in the province on the basis of the establishments' regular environmental monitoring reports, reports on discharge of wastewater into water sources and results of additional survey (if available);

2. To periodically report on the results of wastewater sources inventory under its respective management authority to the Ministry of Natural Resources and Environment before January 15 each year, under the form of separate reports or integrated to annual environmental protection reports in accordance with Circular No. 19/201/TT-BTNMT on environmental protection report. The reporting sheet on the wastewater sources inventory results is presented at Appendix 3 of this Circular.

3. To set up and manage the wastewater data set in the province and update it into the national wastewater data set, according to its management authority.

Article 11. Responsibilities of the Water Resource Management Department

1. To cooperate with the VEA in conducting wastewater sources inventory for establishments under the licensing competence of the Ministry of Natural Resources and Environment.
2. To share information with the VEA on wastewater sources of establishments under the licensing authority of the Ministry of Natural Resources and Environment. The information sharing sheet on wastewater sources is presented at Appendix 4 of this Circular.

Article 12. Responsibilities of the Vietnam Environment Administration

1. To take leading role and cooperate with the Water Resource Management Department in conducting wastewater sources inventory for the establishments falling within the licensing competence of the Ministry of Natural Resources and Environment.
2. To synthesize information and set up, manage and update national wastewater data set and map.
3. To handle over and guide the Department of Natural Resources and Environment of provinces in using map, dataset and management software, uniform throughout the country to manage the provincial wastewater sources data connected to the country data base and map.
4. To conduct additional surveys on wastewater sources nationwide, when so requested.
5. To make reports on wastewater sources nationwide and periodically report to the Government.

Article 13. Funds for the wastewater sources inventory and development of wastewater source data set

Funds for the wastewater sources inventory and development of wastewater source data set shall be taken from the budgetary resources allocated to the environmental archievement for the ministries, sectors, and provinces according to the related law and regulations.

Article 14. Effectiveness

This Circular comes into effect from .....

Article 15. Responsibility for implementation

1. Provincial People's Committees, VEA, Water Resources Management Department, Departments of Natural Resources and Environment of provinces and cities under central authority, and relevant organizations and individuals are

responsible for implementing this circular.

2. The General Director of the VEA shall have to guide, inspect, monitor and urge the implementation of this Circular.
3. In the course of implementation of this Circular, ministries, sectors, provinces, organizations and individuals shall promptly report any problems to the Ministry of Natural Resources and Environment for study and amendment and supplement accordingly.

MINISTRY OF NATURAL RESOURCES
AND ENVIRONMENT

MINISTER

Tran Hong Ha

Recipients:

- Prime Minister;
- Deputy Prime Ministers;
- Party Central Committee Office and the Party Sections;
- Ministries, ministerial-level agencies and agencies belonging to the Government;
- Ethnic Council and Committees of the National Assembly;
- Office of the Secretary General;
- Office of National Assembly
- Office of the President;
- Government office;
- Supreme People's Court;
- Supreme People's Tribunal;
- State Audit;
- The Bank for Social Policies;
- Central body of mass organizations;
- People's Councils, People's Committees of provinces and centrally run cities;
- Department of Document Inspection - Ministry of Justice;
- Gazette, Government Website, Website of Ministry of Natural Resources and

Environment;

- Provincial Departments of Natural Resources and Environment;
- Achieved: Secretariat, VASI,

APPENDIXES TO THE CIRCULAR

APPENDIX 1

LIST OF ESTABLISHMENT TYPES UNDER THE INVENTORY ON WASTEWATER SOURCES

1) Centralized urban sewage treatment facility	8) Natural rubber processing establishment
2) Wastewater treatment facility in industrial park	9) Steel production establishment
3) Petrol storage or station	10) Mining area
4) Textile-dyeing establishment	11) Trade village
5) Paper and paper pulp production establishment	12) Livestock farm
6) Ethanol production establishment	13) Medical center
7) Aquatic products processing establishment	14) Solid waste disposal site

APPENDIX 2

WASTEWATER SOURCE INVENTORY SHEET

Form: P1
Issued together with the Circular No. ..., dated ... by the Minister of Natural Resources and Environment

Inventory sheet on wastewater sources for production/business/service establishments

Reporting agency: …..

Reporting date:

Receiving Agency: DONRE of province …

I. General information

1. Name of establishment: .....
   Tel:.....Fax: .....Website: .....
   Tax Code: .....
2. Address:
   Province/city .....
   District:.....
   Commune/ward:.....
   Street/village: .....
   Geographic coordinate: .....
3. Establishment owner: .....
   Tel:.....Mobile: .....Email:.....
4. Person in charge of environment:.....
   Tel:.....Mobile: .....Email:.....

II. Information about the establishment

1. Year of establishment: .....
2. Type of the establishment:
   ☐1) Centralized urban wastewater treatment facility
   ☐2) Industrial wastewater treatment facility
   ☐3) Petrol stock/station
   ☐4) Textile dyeing establishment

☐5) Paper and paper milk production establishment

☐6) Bioethanol processing establishment

☐7) Aquatic products processing establishment

☐8) Natural rubber production establishment

☐9) Steel production establishment

☐10) Mining area

☐11) Craft village

☐12) Livestock farm

☐13) Hospital

☐14) Solid Waste Disposal Site

3. Size of establishment

Total area:.....m^2

4. Agency receiving regular environmental report: .....

.....

☐ National ☐ Provincial ☐ District level

5. Water consumption (daily average)

Daily water consumption by source (m^3/day)	*Daily water consumption by usage (m^3/day)*
a) Clean water supply network:.....	a) For production/business/service:.....
b) Drilling water:.....	b) Domestic use: .....
c) River/stream/lake water:	c) Other uses .....
d) Other water (rain water):	
e) Total water consumption:.....	

III. Information about environment

1. Wastewater

1.1. Total amount: ..... (m^3/day).....(m^3/month)

1.2. Drainage system separating waste and rain waters: ☐ Yes ☐ No

1.3. Centralized wastewater treatment system: ☐ Yes ☐ No

*If **Yes**, provide information about the wastewater treatment system:*

a. Treatment capacity: ……..(m^3/day)

b. Treatment facility type:

☐ A)Neutralization/regulation ☐ B) Sedimentation ☐ C) Flotation ☐ D) Sand filtration

□ E) Absorption by activated carbon	□ F) Oil separation	□ G) Activated sludge	□ H) Other biological treatment
□ I) Trickling filtration	□ J) Aeration pond	□ K) Anaerobic digestion	□ L) Other treatment

1.4 Conduct of regular monitoring of wastewater (self monitoring):

☐ Yes ☐ No ☐ Sometime

a. Submission of monitoring report to authorized agency?

☐ Yes ☐ No

b. Frequency:☐ 4 times/year, ☐ 2 times/year, ☐ 1 time/year, ☐ Other ( )

c. Name, address, contact information of monitoring/analysis agency: .....

d. Results of last monitoring/analysis of wastewater (within last 6 months): ….

Monitoring date: ……

No.	***Parameter***	***Unit***	***Quantity***	***No.***	***Parameter***	***Unit***	***Quantity***
1	T^0	°C		23	Sulfate (by H_2S)	mg/l	
2	Color	Pt/Co		24	Florine	mg/l	
3	pH			25	Ammonium (by N)	mg/l	
4	BOD_5 (20°C)	mg/l		26	Nitrate (by N)	mg/l	
5	COD	mg/l		27	Total nitrogen	mg/l	
6	TSS	mg/l		28	Phosphate (by P)		
7	TDS	mg/l		29	Total phosphorous (by P)	mg/l	
8	Arsenic	mg/l		30	Chlorine	mg/l	
9	Mercury	mg/l		31	Residual Chlorine	mg/l	
10	Lead	mg/l		32	Total organic chlorine plant protection chemicals	mg/l	
11	Cadimi	mg/l		33	Total organic phosphorous plant protection chemicals	mg/l	
12	Cr(VI)	mg/l		34	Total PCB	mg/l	
13	Cr(III)	mg/l		35	Coliform	MPN or CFU/100 ml	
14	Copper	mg/l		36	Salmonella	Microorganisms/100	

No.	***Parameter***	***Unit***	***Quantity***	***No.***	***Parameter***	***Unit***	***Quantity***
						ml	
15	Zinc	mg/l		37	Shigella	Microorganisms /100ml	
16	Nickel	mg/l		38	Vibrio cholera	Microorganisms /100ml	
17	Manganese	mg/l		39	Total α active radioactivity	Bq/l	
18	Iron	mg/l		40	Total β active radioactivity	Bq/l	
19	Total cyanide	mg/l		41	Total surface active substances	mg/l	
20	Total phenol	mg/l		42	Easy Absorbed Organic Halogen (AOX)	mg/l	
21	Total oil/grease	mg/l		43	Dioxin	pgTEQ/l	
22	Animal/plant oil/grease	mg/l					

Note: It is mandatory to fill in the wastewater quality parameters that the facility has committed to monitor in its environmental protection licenses.

1.5. Wastewater receiving source:

☐ Drainage network	☐ Drainage system in the factory	☐ Drainage system outside the factory
☐ River/stream/pond/lake.	☐ Soil (infiltration)	☐ Other

2. Environmental Protection Fee *(According to Decree No. 154/2016/ND-CP on EP fees for wastewater)*

Fee for wastewater Monthly payment: ..... VND/month

Or annual payment: .....VNĐ/year

3. Environmental licenses

- Environmental Impact Assessment report	☐ Yes	☐ No	☐ Not required
- EIA completion report	☐ Yes	☐ No	☐ Not required
- Environmental Protection commitment	☐ Yes	☐ No	☐ Not required
- Environmental Protection project	☐ Yes	☐ No	☐ Not required
- Registration of waste source owner	☐ Yes	☐ No	☐ Not required
- Hazardous waste management report	☐ Yes	☐ No	☐ Not required
- Permit for water source use/exploitation	☐ Yes	☐ No	☐ Not required
- Permit for discharge of wastewater	☐ Yes	☐ No	☐ Not required
- ISO 14001	☐ Yes	☐ No	☐ Not required
- Other (ISO 9001..……..)	☐ Yes	☐ No	☐ Not required

....., date…

Information provider
(Unit & Name)

(*) Note: Please send the form to: ....Department of Natural Resources and Environment of…

APPENDIX 3

WASTEWATER SOURCE REPORTING SHEET

Sheet P2
Issued together with the Circular No. ..., dated ... of the Minister of Natural Resources and Environment
Reporting date:

Report on wastewater inventory of province/city ….

Year……

Reporting agency: DONRE of… province/city

Report receiving agency:

Table 1. General information

STT	Name of establishment	Operation type	Address	Provincial code	District code	Commune code	Tax code	Location		Water amount used (m^3/year)	Wastewater amount (m^3/year)	Water receiving source	Wastewater receiving location	
								Longitude	Latitude				Longitude	Latitude
1														
2														
3														
4														
5														
6														

Table 2. Wastewater quality

No	Name of establishment	Concentrations of pollutants in the wastewater																								
		T^0	Color	pH	BOD5 (20°C)	COD	...	...																		
1																										
2																										
3																										
4																										
5																										
6																										

Prepared by
(Sign, name)

Checked by
(Sign, name)

Approved by
(Sign, seal, name)

Type of the establishment:

1) Centralized urban sewage treatment facility	8) Natural rubber processing establishment
2) Wastewater treatment facility in industrial park	9) Steel production establishment
3) Petrol storage or station	10) Mining area
4) Textile-dyeing establishment	11) Trade village
5) Paper and paper pulp production establishment	12) Livestock farm
6) Ethanol production establishment	13) Medical center
7) Aquatic products processing establishment	14) Solid waste disposal site

Wastewater quality parameters:

No.	*Parameter*	*Unit*	*Quantity*	*No.*	*Parameter*	*Unit*	*Quantity*
1	T^0	°C		23	Sulfate (by H_2S)	mg/l	
2	Color	Pt/Co		24	Florine	mg/l	
3	pH			25	Ammonium (by N)	mg/l	
4	BOD_5 (20°C)	mg/l		26	Nitrate (by N)	mg/l	
5	COD	mg/l		27	Total nitrogen	mg/l	
6	TSS	mg/l		28	Phosphate (by P)		
7	TDS	mg/l		29	Total phosphorous (by P)	mg/l	
8	Arsenic	mg/l		30	Chlorine	mg/l	
9	Mercury	mg/l		31	Residual Chlorine	mg/l	
10	Lead	mg/l		32	Total organic chlorine plant protection chemicals	mg/l	
11	Cadimi	mg/l		33	Total organic phosphorous plant protection chemicals	mg/l	

No.	*Parameter*	*Unit*	*Quantity*	*No.*	*Parameter*	*Unit*	*Quantity*
12	Cr(VI)	mg/l		34	Total PCB	mg/l	
13	Cr(III)	mg/l		35	Coliform	MPN or CFU/100ml	
14	Copper	mg/l		36	Salmonella	Microorganisms/100ml	
15	Zinc	mg/l		37	Shigella	Microorganisms/100ml	
16	Nickel	mg/l		38	Vibrio cholera	Microorganisms/100ml	
17	Manganese	mg/l		39	Total α active radioactivity	Bq/l	
18	Iron	mg/l		40	Total β active radioactivity	Bq/l	
19	Total cyanide	mg/l		41	Total surface active substances	mg/l	
20	Total phenol	mg/l		42	Easy Absorbed Organic Halogen (AOX)	mg/l	
21	Total oil/grease	mg/l		43	Dioxin	pgTEQ/l	
22	Animal/plant oil/grease	mg/l					

APPENDIX 4

WASTEWATER SOURCE INFORMATION SHARING SHEET

Sheet P3
Issued together with the Circular No. ..., dated ... of the Minister of Natural Resources and Environment

Information on wastewater sources of establishments under the licensing jurisdiction of MONRE

Reporting agency: Water Resources Management Department

Reporting date:

Year……

Report receiving agency: Department of Waste Management and Environmental Improvement, VEA

Table 1. General information

No	Name of establishment	Operation type	Address	Provincial code	District code	Commune code	Tax Code	Location		Person in charge of environment	Tel	Fax	Reporting day	No. of licence	Date of issuance	Wastewater amount licenced to be discharged (m^3/year)	Actual wastewater amount discharged (m^3/year)	Receiving water source	Wastewater receiving location	
								Longitude	Latitude										Longitude	Latitude
1																				
2																				
3																				
4																				

5																				
6																				

Table 2. Wastewater quality

No	Name of establishment	Concentrations of pollutants in the wastewater																								
		T0	Color	pH	BOD5 (20°C)	COD	...	...																		
1																										
2																										
3																										
4																										
5																										
6																										

Prepared by
(Sign, name)

Checked by
(Sign, name)

Approved by
(Sign, seal, name)

Type of the establishment:

1) Centralized urban sewage treatment facility	8) Natural rubber processing establishment
2) Wastewater treatment facility in industrial park	9) Steel production establishment
3) Petrol storage or station	10) Mining area
4) Textile-dyeing establishment	11) Trade village
5) Paper and paper pulp production establishment	12) Livestock farm
6) Ethanol production establishment	13) Medical center
7) Aquatic products processing establishment	14) Solid waste disposal site

Waste watr quality parameters:

No.	*Parameter*	*Unit*	*Quantity*	*No.*	*Parameter*	*Unit*	*Quantity*
1	T^0	°C		23	Sulfate (by H_2S)	mg/l	
2	Color	Pt/Co		24	Florine	mg/l	
3	pH			25	Ammonium (by N)	mg/l	
4	BOD_5 (20°C)	mg/l		26	Nitrate (by N)	mg/l	
5	COD	mg/l		27	Total nitrogen	mg/l	
6	TSS	mg/l		28	Phosphate (by P)		
7	TDS	mg/l		29	Total phosphorous (by P)	mg/l	
8	Arsenic	mg/l		30	Chlorine	mg/l	
9	Mercury	mg/l		31	Residual Chlorine	mg/l	
10	Lead	mg/l		32	Total organic chlorine plant protection chemicals	mg/l	
11	Cadimi	mg/l		33	Total organic phosphorous plant	mg/l	

No.	*Parameter*	*Unit*	*Quantity*	*No.*	*Parameter*	*Unit*	*Quantity*
					protection chemicals		
12	Cr(VI)	mg/l		34	Total PCB	mg/l	
13	Cr(III)	mg/l		35	Coliform	MPN or CFU/100ml	
14	Copper	mg/l		36	Salmonella	Microorganisms/100ml	
15	Zinc	mg/l		37	Shigella	Microorganisms/100ml	
16	Nickel	mg/l		38	Vibrio cholera	Microorganisms/100ml	
17	Manganese	mg/l		39	Total α active radioactivity	Bq/l	
18	Iron	mg/l		40	Total β active radioactivity	Bq/l	
19	Total cyanide	mg/l		41	Total surface active substances	mg/l	
20	Total phenol	mg/l		42	Easy Absorbed Organic Halogen (AOX)	mg/l	
21	Total oil/grease	mg/l		43	Dioxin	pgTEQ/l	
22	Animal/plant oil/grease	mg/l					

APPENDIX 5. DEVELOPMENT OF WASTEWATER SOURCE DATA SET

1. Select the data set management software according to the following criteria:
- Simple, so that environmental managers can use
- Compatible with GIS environment
- Can be integrated into the environment database

Recommendation: use QGIS

2. Data digitization:
- Select the data file structure for the wastewater sources, containing the attribute data that fully describe the sources and spatial data for presenting the waste sources on the map.

Recommendation: Use simple Excel file with the columns aggregated from the Wastewater source Questionnaire sheet, DONRE wastewater source report sheet, and the wastewater source Information Sharing Sheet of the Water Resources Management Department

3. Data editing
- The results of data collection on wastewater sources are procceed and put into the selected excel file

Recommendation: In order to avoid duplication in data entry, the data providers are required to transfer both the data file and the written report.

4. Development of base map of the concerned area:
- Select the area of interest for wastewater management:
- Development of a GIS base map

Recommendation:
- The area of concern for the central government is the whole country or an inter-provincial river basin, while for the provinces are provincial territory or intra-provincial river basin.
- Base maps should be agreed between the central and local authorities on the scale and reference system for the purpose of online information exchange

5. Development of map of wastewater sources:
- Choose how the map is displayed

Recommendation:
- Map could show different type of wastewater sources
- Could display basic information about the establishment and the wastewater source

6. Management of data set
- The relevant central management agency is responsible for the overall management of the structure and content of the data set.
- Other relevant agencies update wastewater data and manage data sets within the scope of their responsibilities and authorities.
- Different parties are connected each with other for transferring data automatically

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT (MONRE)

MANUAL
ON
WASTEWATER DISCHARGE SOURCE INVENTORY (WDSI) DEVELOPMENT
FOR
RIVER BASIN WATER ENVIRONMENT MANAGEMENT

September 2017

JICA Expert Team

Manual on Wastewater Discharge Source Inventory (WDSI) Development for River Basin Water Environment Management (*2nd Draft*)

Table of Contents

Attachments

1. Formats of Point Source Survey
2. General QC Procedures for Inventory

List of Tables

List of Figures

Abbreviation

DONRE	Departments of Natural Resources and Environment
DQOs	Data Quality Objectives
EIA	Environmental Impact Assessment
EPP	Environmental Protection Planning
EPP	Environmental Protection Plans
GIS	Geographic Information System(s)
GPS	Global Positioning System
JET	JICA Expert Team
JICA	Japan International Cooperation Agency
MONRE	Ministry of Natural Resource and Environment
OS	Operating System
QC	Quality Control
QCVN	National Technical Regulations
RBO	River Basin Organization
SEA	Strategic Environmental Assessment
VEA	Vietnamese Environment Administration
VSIC	Vietnamese Standard Industrial Classification
WDSI	Wastewater Discharge Source Inventory

PART A. OBJECTIVES AND COMPONENTS OF THE MANUAL

A-1. Preface

Water environment conditions in Vietnam have been degraded due to increase of pollution load accompanied by the rapid urbanization and industrial development, and shortage of wastewater treatment facilities as well as their operation and maintenance capabilities.

Many of industrial manufacturing processes produce some quantities of wastewaters. In almost all cases, the indiscriminate disposal of these wastewaters has a detrimental effect on the environment. The continued growth of Vietnamese industry will undoubtedly require significant reductions in the amounts of pollutants in wastewaters now being discharged to the environment.

In reality, the water environment in Vietnam has been deteriorating, especially in three big river basins including Cau river, Nhue-Day river and Dong Nai river.

Understanding the status of discharges and/or releases of water pollutants to the environmental media such as surface water body is the starting point of water quality management and control include river basin management. Information and data concerning water discharges can be obtained from a variety of ways such as source survey, regular monitoring, factory inspection and so on. These kinds of information and data are vital and crucial requirement for the management and control of water quality problems. A Wastewater Discharge Source Inventory (WDSI) can provide these kinds of information systematically. Thus, the management and control of water quality in a river basin necessitates the Wastewater Discharge Source Inventory.

A-2. Objectives of This Manual

This manual is one of the technical manual to support the draft circular named "Regulating the Procedure of Inventory and Setting Up Data Set on Wastewater Sources (hereinafter "the Circular")" which is developing through the Project for Strengthening Capacity of Water Environmental Management in River Basin (hereinafter "the Project").

This Manual is intended to provide consistent and unambiguous procedures of the development of river basin-wide WDSI, which is defined in Chapter B, for the management and control of a basin-wide water quality by relevant personnel of the central and local regulatory agencies. The procedures contained in this Manual will serve experienced persons in the field of river basin WDSI as a reference, whereas inexperienced persons will find it useful as a logical meaning to learning how a River Basin WDSI should be developed. Major procedures covered in this Manual are given below:

- **Identify all discharge sources in a defined area (such as river basin)**
- **Select methods to estimate discharges from each source**
- **Identify and select data sources for activity levels and other parameters required by a discharge estimation method**
- **Perform QC checks on the inventory**
- **Document discharge estimation methods, data sources, and QC**

A-3. Components of This Manual

This manual comprises of this part and the following three parts;

Part A: Objectives and Components of the Manual (This part)
Part B: Explanation on definition and objectives of River Basin WDSI
Part C: Proposals on development of River Basin WDSI

A-4. Expected User of This Manual

Expected users of this manual are described on next page.

(1) Vietnamese Environment Administration/Ministry of Natural Resource and Environment (VEA/MONRE)
This manual assists VEA to:

- ✓ To prepare a plan to develop WDSI for river basin water environment management,
- ✓ To develop pollution source management system in river basin level,
- ✓ To grasp ways to use WDSI for river basin water environment management.

(2) Departments of Natural Resources and Environment (DONREs)
This manual assists DONREs to:

- ✓ To prepare a plan to develop WDSI considering river basin water environment management,
- ✓ To review existing WDSI,
- ✓ To check reliability of pollution source information collected,
- ✓ To share pollution source information at river basin level.

(3) River Basin Organization (RBOs)
This manual assists River Basin Organizations to:

- ✓ To prepare a plan to develop WDSI for river basin water environment management,
- ✓ To develop pollution source management system in river basin level,
- ✓ To grasp ways to use WDSI for river basin water environment management.

A-5. Definition of Pollution Source

Pollution sources which described on this manual, it is defined as follows;

- WDSI focus on Point Pollution Sources

- ✓ Point sources of pollution: Point source of pollution is the single identifiable source or point from which pollutants are discharged.
- ✓ Nonpoint sources of pollution: Nonpoint source of pollution is the pollutant source which cannot be attributed to a particular source or point, and therefore are interpreted as the source from a certain area.

- If there are wastewater treatment facilities, it is categorized as one pollution source
- Target pollution sources are followings based on the Vietnamese Standard Industrial Classification Code (VSIC 2007)

PART B. DEFINITION AND FUNCTION OF RIVER BASIN WASTEWATER DISCHARGE SOURCE INVENTORY

B-1. Classification of Inventory

A word "inventory" is commonly used in the field of environmental management and protection as a meaning of "a list of itemized environmental issues that provides data and information to manage and control the environmental problems". There are diverse types of inventories according to the end use of them. Following gives several typical environmental related inventories:

- ✓ Water Wastewater Discharge Source Inventory,
- ✓ River Basin Water Wastewater Discharge Source Inventory,
- ✓ Toxic release inventory,
- ✓ Air emissions inventory,
- ✓ National resources inventory,
- ✓ Greenhouse Gas inventory,
- ✓ Substance-specific inventory.

Among the variety of inventories mentioned above, this manual takes up the Wastewater Discharge Source Inventory (WDSI) for water environment, especially limited to a river basin Wastewater Discharge Source Inventory. A river basin WDSI is a kind of WDSI specialized in the area of river basins.

B-2. Definition of Wastewater Discharge Source Inventory (WDSI)

"Wastewater Discharge Source Inventory is a comprehensive list of point sources of water pollutants and estimates of their discharges within a specific geographical area for a specific time interval".

The WDSI is a kind of database compiled mainly focusing on pollution source related information.

B-3. Definition of River Basin Water Wastewater Discharge Source Inventory (River Basin WDSI)

"River basin water Wastewater Discharge Source Inventory (River Basin WDSI) is a comprehensive list of water pollutants and estimates of their discharges within specific river basins for a specific time interval", especially for point-pollution source control.

As mentioned in the definition above, River Basin WDSI intents to deal with a specific geographic area. The WDSI dealt with in this manual focuses on the River Basin WDSI for the management and control of water quality of river basins.

B-4. Objectives of Development of River Basin WDSI

River Basin WDSI has a function as one of support tools for the following objectives:

- ❑ **Identify serious pollution sources to be controlled in target area,**
- ❑ **Set target figures on decreasing of pollution load amount,**
- ❑ **Develop water quality management/control strategies, and**
- ❑ **Compare estimated pollution load amount before and after implementation of a water environment management plan**

The River Basin WDSI is one of support tools to plan, implement, and evaluate water environment management plan in a river basin level.

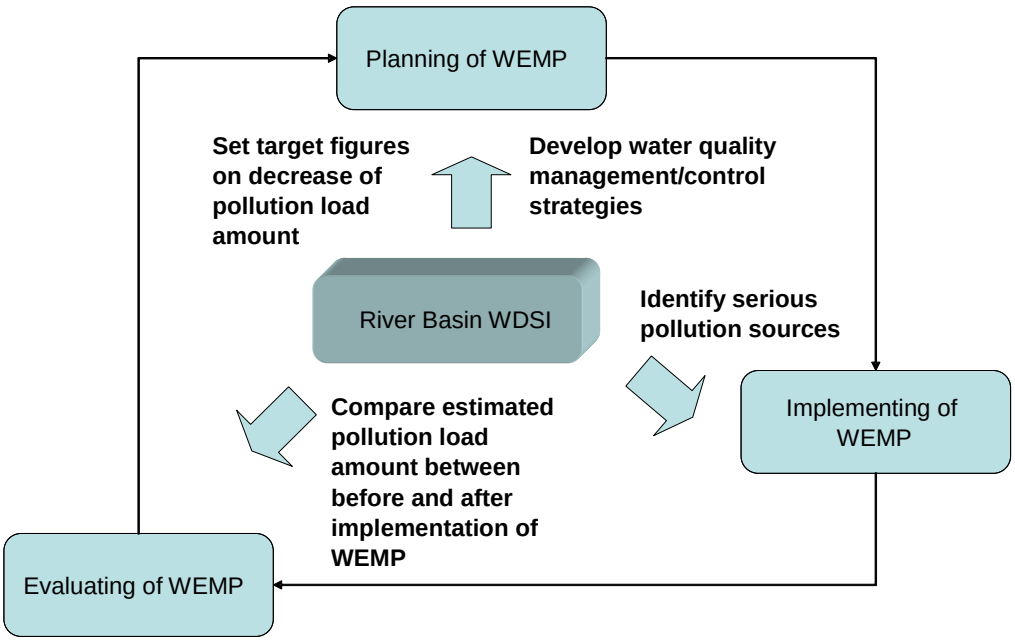


Figure B-1 Function of River Basin WDSI to Support River Basin Management

(1) Identification of Inventory Uses

Although there are varieties of inventories, the end uses of inventories prescribe the structure of inventory, type of source categories, and resource allocation, etc. The first step in inventory development planning should be to clearly define the end uses, and identify who will be potential users of the final product. The inventory dealt with in this manual is the river basin pollution source as mentioned. The final product of the inventory is to be utilized by the relevant agencies concerned such as VEA, DONREs, and river basin organizations for management and control of the water quality of river basins.

(2) Significance and Use of River Basin WDSI

The River Basin WDSI is one of the fundamental tools for water quality management and control. Although there are various types of the River Basin WDSIs, and range from a simple summary of estimated effluents compiled from previously-published effluents data to a comprehensive inventory of a facility using specific source test data, their usage can be divided into two major categories; namely for use in policy processes and for scientific applications.

For example, the applications for WDSI data include use of the data in annual reports, implementation of the governmental environmental management plan such as Cau River Basin Master Plan and Dong Nai River Basin Master Plan, compliance demonstrations, discharge fee program, and in modeling activities. For application to these master plans, basin-wide WDSI is a fundamental building element in developing a river water quality management, control and maintenance strategy. WDSI may also be developed for research purposes. For example, pilot studies or field tests of new control techniques or devices may require preparation of effluent discharges from a single source to verify effectiveness of the techniques. In other word, it can be said that the River Basin WDSI can accelerate environmental compliance by providing an information base for understanding pollution problems, identifying priority actions, making informed decisions, and identifying opportunities for waste minimization and cleaner production.

(3) Function of River Basin WDSI for Water Quality Improvement

This manual focuses mainly on dealing with WDSI limited to the use for a tool to support water

environment management plan at river basin level.

The main objective of water environment management plan is to improve river and lake water quality. The concept of water quality improvement process and the role of WDSI is shown below.

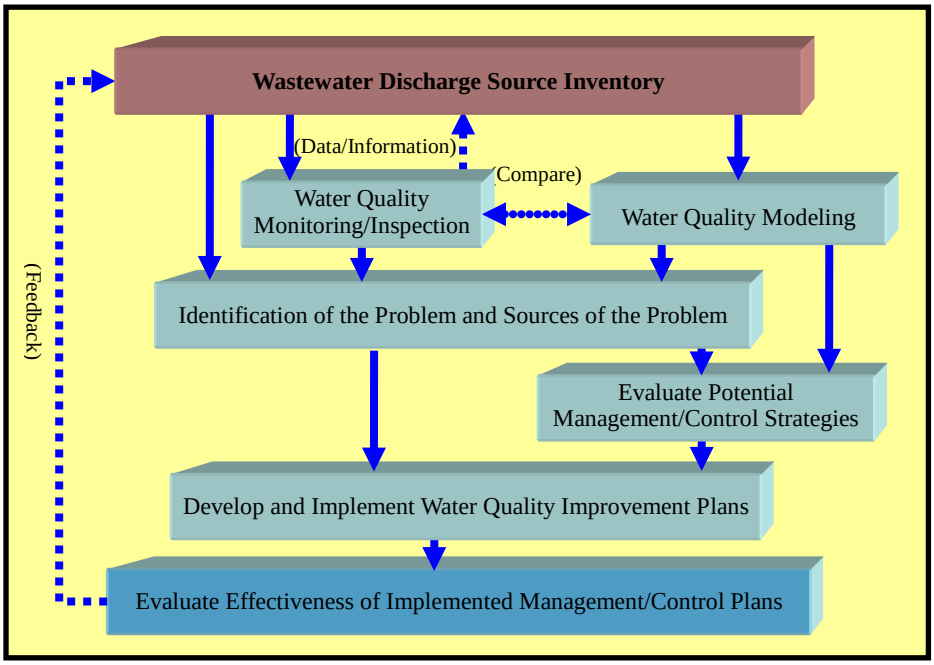


Figure B-2 Water Quality Improvement Process and Role of River Basin WDSI

(4) Relation between River Basin WDSI and Water Quality Monitoring

It is essential to grasp the status of river water quality for management and control of water environment in river basins. In order to promote water quality management in river basins, water quality monitoring needs to be conducted. Monitoring river water quality can be carried out in a variety of ways: by making quantitative measurements of physical, chemical, and biological characteristic and qualitative descriptions of some features such as odor, transparency, etc. However, it should be confirmed that the prime objective of a monitoring is to provide information which directly or indirectly aids the management and control of water resources, whether this is by establishing trends, checking compliance with guide/standard, or determining the effects of contaminant transfer.

On the other hand, the River Basin WDSI is a kind of database compiled mainly focusing on pollution source related information, and can provide information on pollution sources.

In order to evaluate the effects and/or the contributions of pollution sources to the environmental water qualities, it is necessary to examine and compare thoroughly both data of the monitoring and inventory. The data of the inventory accelerate and support the utilization of the monitoring data. Data provided by the inventory are also useful to water quality simulation calculation.

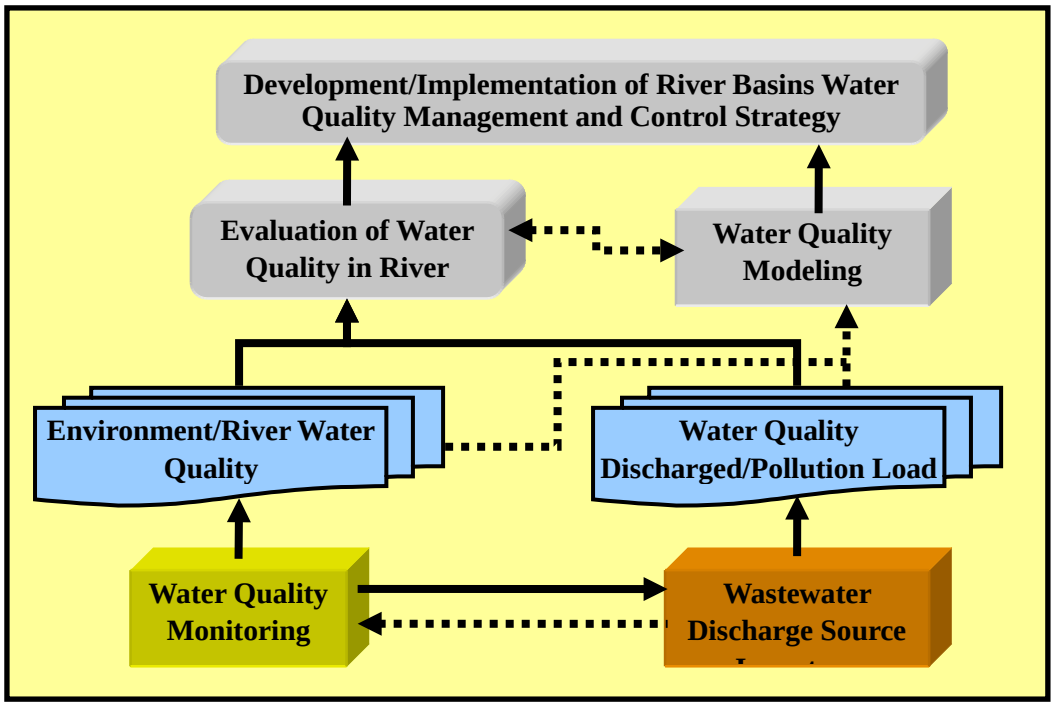


Figure B-3 Water Quality Monitoring and River Basin WDSI

B-5. Characteristics of River Basin WDSI

Considering the definition and significance of a river basin WDSI, the river basin WDSI should have the following aspects:

- ❑ The identified river basin area (or target area) covered,
- ❑ The types of activities that cause discharges,
- ❑ The chemical or physical identity of the pollutants included,
- ❑ The period for which emissions are estimated.

B-6. Criteria for Target Pollution Source Selection

The types of pollution sources targeted are point-sources controlled by MONRE/DONREs. Besides, the wastewater treatment facilities collecting and treating of wastewater from pollution sources considered as point source generally, such as treatment facilities of domestic wastewater, livestock wastewater, and craft villages. It is necessary to consider both "discharge volume" and "industrial sector" for selection of target pollution sources as follows.

(1) Wastewater Discharge Volume

On the Circular, there are 4 levels of wastewater volume as shown in Table B-1. This table is also shown about these levels and set basis of these levels.

Table B-1 Lelves of Wastewater Discharge Volume

Level	Wastewater Volume (m^3/day)	Set Basis
Level 1:	Not less than 200 m^3/day	VEA has decision to request the facilities with effluent quantity not less than 200m^3/day.
Level 2:	Not less than 50 m^3/day	In area of Japan where the Total Pollutant Load Control System is implemented, as the factories with effluent quantity not less than 50m^3/day are addressed. In addition, through pilot activities of the Project, it is

Level	Wastewater Volume (m^3/day)	Set Basis
		found that 50 m^3/day is one of the appropriate criteria as shown in Table C-7 & Table C-9 of Box-1 of this manual.
Level 3:	Not less than 20 m^3/day	The Decree No. 25/2013/ND-CP on Environmental Protection Charge for Wastewater regulate Coefficient K. This value is depending on the wastewater volume. The facilities with less than 20 m3/day wastewater volume is adapted smallest coefficient.
Level 4:	Wastewater sources from the establishments which must have permits for discharge of wastewater into water sources according to the provisions of law on water resources.	Decree No.201/2013/ND-CP on detailed provisions for implementation of a number of articles of the Law on Water Resources stipulate wastewater sources which must have permits for discharge of wastewater as of August 2017 (Decree can be updated/replaced in future.)

(2) Establishment Types (Target Industrial Sector)

1) Appendix 1 of the Circular

On Appendix 1 of the Circular, there are 14 establishment types as shown in Table B-2.

Table B-2 List of Establishment Types under the Inventory on Wastewater Sources

No.	Type of Establishment
1	Centralized urban sewage treatment facility
2	Wastewater treatment facility in industrial park
3	Petrol storage or station
4	Textile-dyeing establishment
5	Paper and paper pulp production establishment
6	Ethanol production establishment
7	Fish processing establishment
8	Natural rubber processing establishment
9	Steel production establishment
10	Mining area
11	Trade village
12	Livestock farm
13	Medical center
14	Solid waste disposal site

2) Selection Background of the Establishment Type for the Circular

The 14 establishment types were selected various discussion and studies through the Project. Basically, following aspects were considered when VEA and JICA Expert Team (JET) selected the types of establishments.

a) Decree No.18/2015/ND-CP, Decree on EPP, SEA, EIA, and EPP

There is “List of entities subject to EIA” as Appendix II of the Decree. And also, there is “List of projects under assessment and approval for EIA reports of the MONRE” as appendix III. These enterprises could be candidates of target pollution sources. This decree is effective as of August 2017 (Decree can be updated/replaced in future).

b) QCVNs which Defined for Specific Industrial Sector

As of August 2017, there are some sector specific wastewater QCVN (National Technical Regulations) as shown in below table.

Table B-3 Category and related National Technical Regulations for Specific Industrial Sector

Category	Related National technical regulations/standards
Urban wastewater treatment plan	1) QCVN 14 2008 BTNMT – Domestic Wastewater (note: Domestic wastewater treatment facilities)
Industrial Zone (IZ) wastewater treatment facilities	2) QCVN 40: 2011 / BTNMT - Industrial Wastewater
Factory located outside of IZ which has industrial sector specific QCVNs described on right column.	3) QCVN 29: 2010 / BTNMT - Effluent of warehouses and petrol stations 4) QCVN 13: 2015 / BTNMT - Effluent of textile dyeing 5) QCVN 12: 2015 / BTNMT - Effluent of industrial paper and pulp 6) QCVN 60: 2015/BTNMT - Effluent of bioethanol processing 7) QCVN 11: 2015/BTNMT - Effluent of Aquatic Products Processing industry 8) QCVN 01: 2015/BTNMT - Effluent of natural rubber processing industry 9) QCVN 52-2013/BTNMT - Effluent of Steel industry.
Livestock facility	10) QCVN 62-MT: 2016 / BTNMT - Livestock Wastewater
Hospital	11) QCVN 28: 2010 / BTNMT – Medical Wastewater
Solid Waste Disposal Site	12) QCVN 25: 2009 / BTNMT - Wastewater from landfill
Other types industrial establishment	13) QCVN 40: 2011 / BTNMT - Industrial Wastewater

c) The Criteria of the Pilot Project

In addition, VEA, DONREs, and JET used the criteria for the Pilot Project as shown in Table C-5. This criteria was developed based on above idea. Through the Pilot Project, JET's budget and survey duration were considered and made 3 levels as "highest priority", "higher priority", and "others".

B-7. Legal Basis of River Basin WDSI

There are five regulations which refer as the legal basis of the Circular as follows.

1. the Law on-Environmental Protection, April 26, 2014
2. the Law on Water Resources, June 21, 2012
3. the Government's Decree No. 38/2015/ND-CP of April 24, 2015 on the management of waste and scrap
4. the Government's Decree No. 73/2017 / ND-CP of June 14, 2017 on the collection, management, exploitation and use of natural resources and environmental information and data;
5. the Government's Decree No. 36/2017/NĐ-CP of April 04, 2017, stipulating the functions, tasks, powers and organizational structure of the ministry of natural resources and environment

PART C. DEVELOPMENT OF RIVER BASIN WDSI

C-1. Overall Procedure of Development of River Basin WDSI

Although development of the River Basin WDSI, which starts from the preparatory work and ends by the data management and inventory application, it can be divided into four (4) main components;

(1) Preparatory work,

(2) Collection of data and information,

(3) Compilation and arrangement of data, and

(4) Data management and inventory application.

Each component is also made up several element tasks. The figure on next page shows the concept of overall procedure of developing a river basin Wastewater Discharge Source Inventory.

The users can refer to the following parts depending on the objectives.

To identify scope of inventory,	: ***See C-1***
To select methods for information collection,	: ***See C-2, C-3***
To see case studies of the WDSI Survey,	: ***See C-3.3***
To implement information collection,	: ***See C-3***
To digitize collected data, To compile collected data	: ***See C-4***
To manage data and application (pollution Source Map),	: ***See C-5***
To identify resource for development WDSY,	: ***See C-6***
To check reliability of collected data,	: ***See C-7***

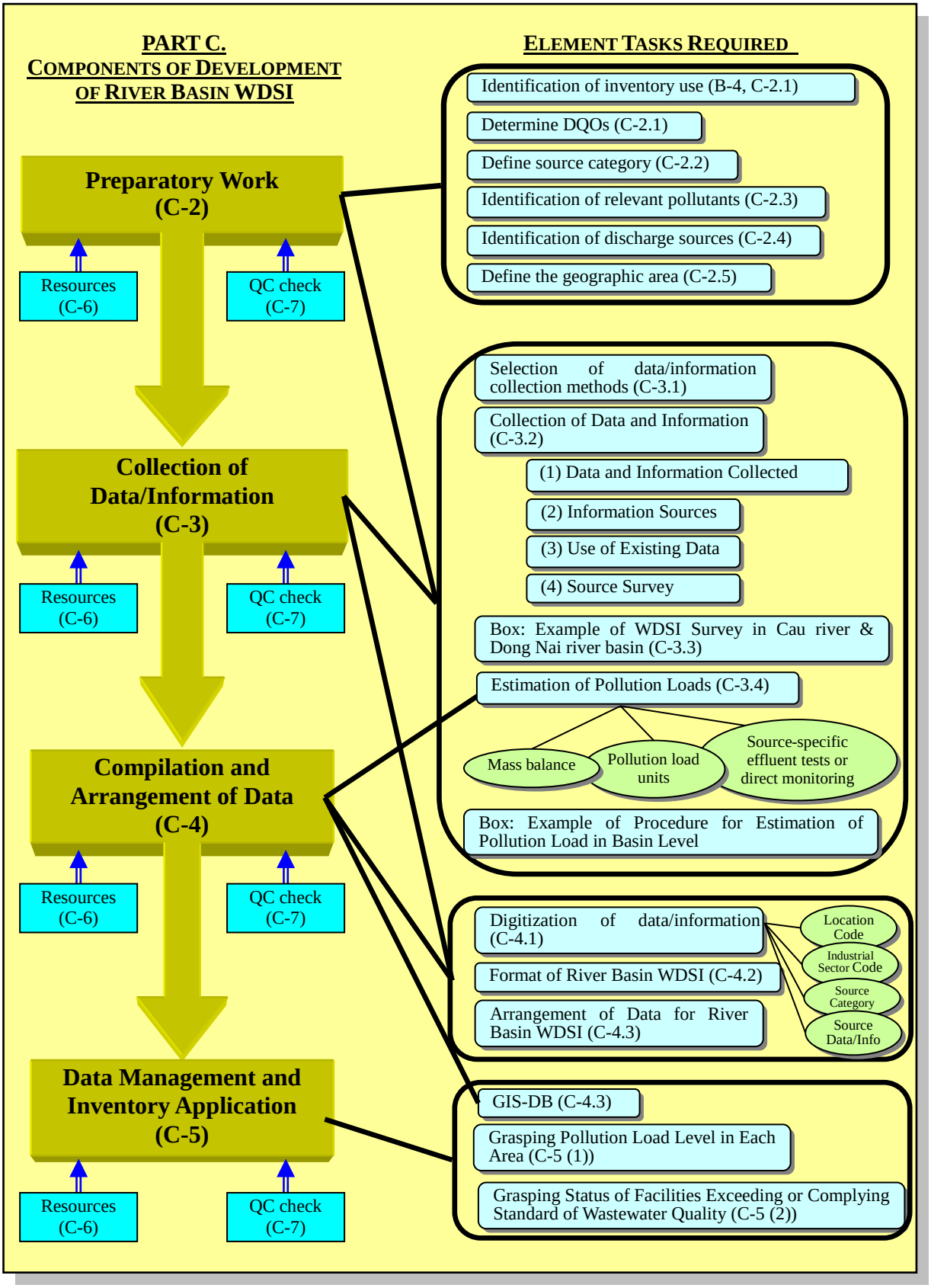


Figure C-1 Overall Procedure of Development of River Basin WDSI

C-2. Preparatory Work and Scope of River Basin WDSI

The preparatory work includes several tasks that enable the following two works; i) the collection of data/information and ii) the compilation and arrangement of data, to carry out them smoothly and effectively. Element tasks include in the preparatory work are:

- Identification of inventory use,
- Determination of Data Quality Objectives (DQOs),[1]
- Definition of geographic area,
- Definition of source category,
- Identification of pollutants to be surveyed,
- Identification of discharge sources,
- Definition of time interval,
- Selection of data/information collection method,
- Selection of data/information estimation method/technique,
- Definition of all procedures to be used to determine discharges,
- Definition of ways of the data for storage, management, and documentation, and
- Other preparatory works concerned, if required.

Some of the tasks mentioned above are overlapped with those of the collection of data/information. The tasks in the preparatory work are basically to be conducted to determine the frameworks of River Basin WDSI and/or the procedures of the following works such as collection of data/information. As given above, the major tasks of the preparatory work are definition and/or identification of the scope of inventory. Other major task that covers the preparatory work and the collection of data/information is pollution source surveying.

The first step of planning the River Basin WDSI is to define the scope of the proposed inventory. Together with the identification of its use, the scope includes the following:

- Identification of the inventory use,
- Pollutants,
- Discharge sources,
- Source categories, and
- Geographical boundaries

C-2.1 Identification of River Basin WDSI Uses

The end users of the WDSI will prescribe the level of effort required for the River Basin WDSI, the structure of the inventory, the data quality objectives (DQOs), the required staffing and resources allocation, and the type of source categories that need to be included. The first step in inventory planning should be to define the end uses, and identify who will be the potential users of the final product.

With the situation of data and information concerning the water pollution sources in Vietnam as they are now, it will be difficult to collect sufficient quality and quantity data that cover all potential pollution sources. In order to collect data and information that cover all potential pollution sources, integration of the collection methods, both direct collection at the source and indirect collection including the estimates, is required. Considering the quality and quantity of data and information to be available and utilizable at present in the inventory area for developing a Wastewater Discharge Source Inventory, use of these kinds of data and information might be suitable for understanding a macroscopic environmental

1 DOQs are qualitative and quantitative statements to identify the level of uncertainty that a decision-maker is willing to accept. The purpose of DQOs is to ensure the final data will be sufficient for the intended use.

status of relatively wide river basin areas. Therefore, this manual aims to develop the River Basin WDSI that can be used to grasp the general tendency of water pollution loads, and introduce case study as pilot areas of Cau River Basin and Dong Nai river basin through JICA Project. The inventory is also to be utilized as reference material for formulation of policy management plan for the heavily polluted areas.

Purpose to Use River Basin WDSI

- ❑ Use for the management and control of a basin-wide water quality by relevant personnel of the central and local regulatory agencies.
- ❑ Grasp of general tendency of water pollution loads.
- ❑ Use for reference material for planning of management policy to the areas to be considered heavily polluted.

C-2.2 Pollutants

Pollutants to be grasped should be selected taking into account the inventory uses and the resources to be committed to the inventory development efforts such as budget, time, available data/information, etc. Ideally, the River Basin WDSI is to contain all pollutants that have a potential to be discharged to the river basin environment. Considering the regulatory status and the available pollution source data in Vietnam at present, it is recommended that the River Basin WDSI should contains organic matter related pollutants and nutrient related pollutants.

C-2.3 Point/Nonpoint Source

Discharge sources can be divided into two categories; one is point sources and the other is nonpoint sources or area sources. Point sources are large, stationary, identifiable sources that release pollutants into the watercourses. Point sources are typically large manufacturing or production plants. Nonpoint sources are diffuse sources that are not qualified as point sources such as runoff from agricultural areas draining into a river, and generally used synonymously with area sources. As described before, only point source is listed on River Basin WDSI. The nonpoint source shall be considered on water simulation model, and it shall be managed by state management agency as necessary.

C-2.4 Discharge Sources

Discharge sources mentioned above are classified into 4 levels of discharge volume and 14 types of establishment on the Circular (See Table B-1& Table B-2).

C-2.5 Geographical Boundaries

For most inventories, the geographic area covered is typically defined by political boundaries such as county lines, provincial boundaries, etc. The end use of inventory also prescribes the exact geographic area covered.

This manual focuses on developing the River Basin WDSI. The case study which described on the box of this manual, it was selected Cau river basin and Dong Nai river basin as the geographical boundary.

Table C-1 gives the summary of the scope defined for the river basin WDSI as case study.

Table C-1 Scope of River Basin WDSI as Case Study

Pollutant	Source category	Discharge source	Geographical boundary
● BOD ● COD $_{CrO}$ ● NO_3^- ● NO_2^- ● NH_4^+ ● PO_4^{3-} ● SS ● Other pollutants are to	● Point source	● Factory and Production Facilities, ● Industrial Zones/ Industrial Clusters, ● Mining Facilities, ● Craft Village ● Livestock Facility ● Healthcare Facilities	● Cau river basin and Dong nai river basin (Cau river and Dong nai river pilot project area)

be inventoried as required		(Hospital, healthcare centers, etc.) ● Landfills and Solid Waste Disposal Site Facilitates	
Inventory Use			
● Use for the management and control of a basin-wide water quality by relevant personnel of the central and local regulatory agencies ● Grasp of general tendency of water pollution loads in the target area ● Use for reference material for planning of management policy to the areas to be considered heavily polluted.			

C-3. Collection of Data and Information

C-3.1 Selection of Data and Information Collection Methods

Collection of data and information plays a key role in developing the River Basin WDSI. Since River Basin WDSI is to contain large amount and various kinds of data and information, the collection of data and information should be conducted effectively and smoothly.

To conduct data and information collection effectively and smoothly, suitable data and information collection methods should be selected taking into account the type of pollution sources targeted, end user of inventory, available resources, etc.

Sources of data and information can be divided into two categories; direct collection at pollution sources and indirect collection. Each source contains follows:

(A) Direct Collection

- ❑ Source survey (e.g. Questionnaire survey),
- ❑ Source inspection,
- ❑ Source test data, and
- ❑ Direct monitoring

(B) Indirect Collection

- ❑ Report of EPP, EIA, SEA and EPP
- ❑ Published literatures,
- ❑ Census and statistics,
- ❑ Discharge model,
- ❑ Estimation/calculations of Pollution load unit, and
- ❑ Extrapolation

Data/information needed for developing WDSI are to be gathered through sources mentioned above. Normally, it is difficult to gather all the data/information needed for developing WDSI by one data source. Therefore, integrated use of more than two data/information sources is required.

There are several methods or techniques of gathering pollution source data. Questionnaire, point pollution source inspection, and agency water pollution files are some of the methods that are useful in collecting discharge data as well as source activity and control data.

Selection of appropriate methods of data collection should include consideration of the desired level of detail of the River Basin WDSI. The most common method is the direct collection at pollution sources. The direct collection method can obtain data and information by contacting each point source in the target area.

Data and information related to pollution sources can be also obtained by indirect pollution source contact methods, such as reference of previously-published documents, census, statistics, studies, literatures, etc.

MONRE and DONRE and other state management agencies have accumulated data and information through implementation of the regulatory systems of the EPP, SEA, EIA, and EPP under Decree No.18/2015/ND-CP. Examining this kind of data and information in these agencies are included in both

direct and indirect methods because of the reason that the competent pollution sources also possess same data and information jointly with the agencies. The figure below shows the data sources for the River Basin WDSI schematically.

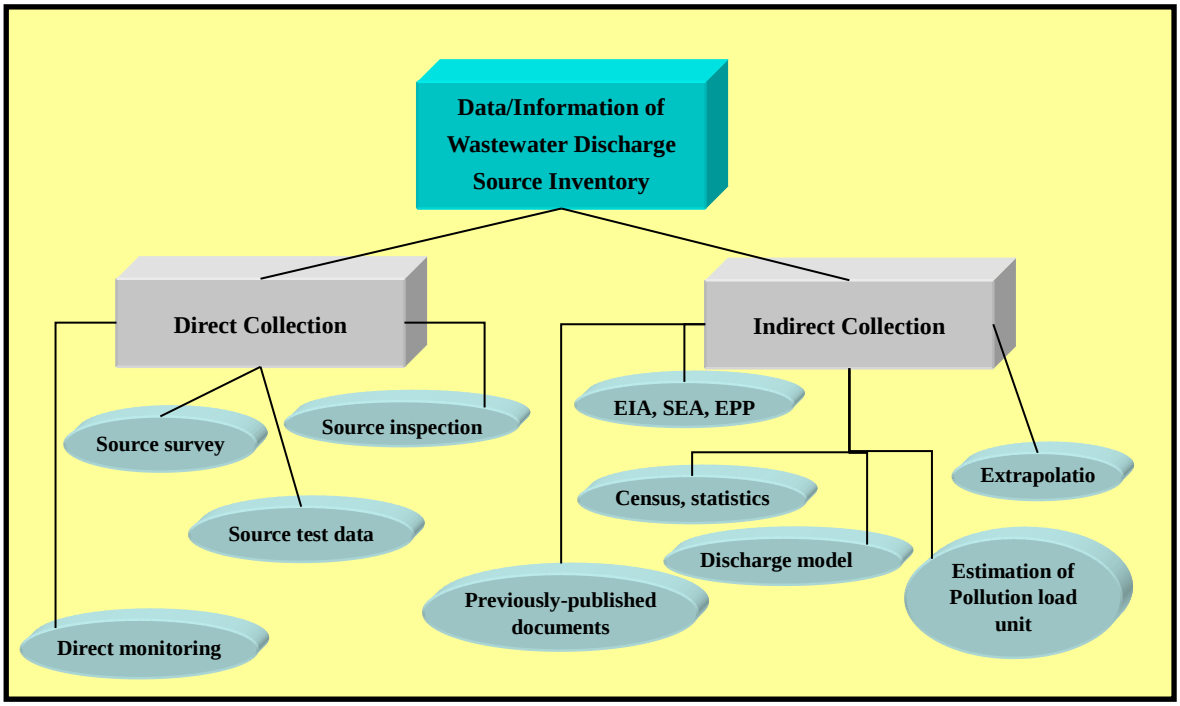


Figure C-2 Data/Information Collection for River Basin WDSI

Although the data and information obtained by direct collection at pollution source have normally the highest reliability, due to certain constraints such as time, budgets, resources, etc. it may be necessary to select the available method for inclusion in the River Basin WDSI. In case that the direct collection method is not possible and also data of census, statistics, studies, literatures, etc. are not available, estimation of pollution source data such as pollution loads that are obtained using readily available data is to be adopted.

According to the available data, estimation techniques should be selected. Pollution data obtained by these techniques are so called secondary or under secondary data. Prioritization of the data and information sources including an estimation of pollution data is commonly done for this reason in the inventory planning. This prioritization should be clearly documented in the work plan, with the rationale or the criteria for how the ranking was established.

C-3.2 Collection of Data and Information

(1) Data and Information Collected

Since the River Basin WDSI is to contain large amount and various kinds of data and information, the collection of data and information should be conducted effectively and smoothly. Types and kinds of data and information to be collected for development of the River Basin WDSI can be classified into five categories mentioned below.

- ❑ Activity data,
- ❑ Pollution load data/Pollution load unit[2],

2 Pollution load unit: Quantified indicator to present the wastewater discharges per unit activity of facilities such as amount of product, number of employee, area of facility, etc.

- ❑ Facility information,
- ❑ Spatial and temporal data, and
- ❑ Pollutant/Speciation data/Information

In Vietnam, there are several related regulations for point pollution source information. Table C-2 summarizes the collectable data and information by types of data and information sources.

Table C-2 Sources of Data/Information and Types of Data/Information Collectable

Source Type		Major Data/Information
Direct Collection	Source survey	● Pollution load data/Pollution load unit ● Facility activity data/information(Note) ● Facility information ● Spatial and temporal data ● Pollutant/Speciation data/information
	Source inspection	● Pollution load data/Pollution load unit ● Facility activity data/information ● Source information ● Spatial and temporal data ● Pollutant/Speciation data/information
	Source test data	● Pollutant/Speciation data/information ● Pollution load data/Pollution load unit
	Direct monitoring	● Pollutant/Speciation data/information
Indirect Collection	Report of EIA/EPP	● Pollutant/Speciation data/information ● Pollution load data/Pollution load unit ● Facility activity data/information ● General facility data/information
	Published literatures	● General wastewater data/information ● General facility data/information ● Other related information
	Census and statistics	● General wastewater data/information ● General facility data/information ● Other related information
	Discharge model	● Wastewater data (quality and quantity)
	Estimates/calculations of Pollution load units	● Pollution load data/Pollution load unit ● Pollutant/Speciation data/information
	Extrapolation	● Pollution load data/Pollution load unit ● Pollutant/Speciation data/information

Note: Facility activity data: is the data and information that presents conditions and/or status of operations of concerned facility, such as kind of products, amount of products, water consumption, number of employee, kinds and amount of raw materials, area of facility, etc.

(2) Information Sources

Considering the end users of the River Basin WDSI intended in this manual and the availability of pollution source data and information at present, major recommendable data/information sources in this manual are:

- ❑ Direct collection data by the pollution source survey
- ❑ Agency files (permit applications and compliance files/EIA, SEA and EPP Report)
- ❑ Published documents, census, statistics, studies, literatures, etc.
- ❑ Estimation by using pollution load units
- ❑ Others

(3) Use of Existing Data

Since every River Basin WDSI is to contain large amount and various kinds of data and information, the collection of data and information should be conducted effectively and smoothly. A major inventory planning consideration is whether, and to what extent, existing information can be used. For example, VEA/MONRE and DONREs possess the data and information relating to pollution sources through their activities such as EPP, EIA, SEA, and EPP permitting, compliance, and source inspections. Those resources can serve as a starting point, and should be utilized effectively for developing the River Basin WDSIs.

(4) Source Survey

1) Preparatory Work

A source survey is a measure of direct information collection considered to be able to get reliable information. However, to implement the source survey effectively, sufficient preparatory work should be implemented including the following works.

- ❑ Listing target facilities,
- ❑ Classification of target facilities, and
- ❑ Meeting with target facilities for explanation and demonstration,

2) Preparation of Pollution Source Survey Format

Before implementation of pollution source survey, survey formats should be prepared depending on the type of target facilities. Process for preparation of the questionnaire sheet can be divided into the following steps.

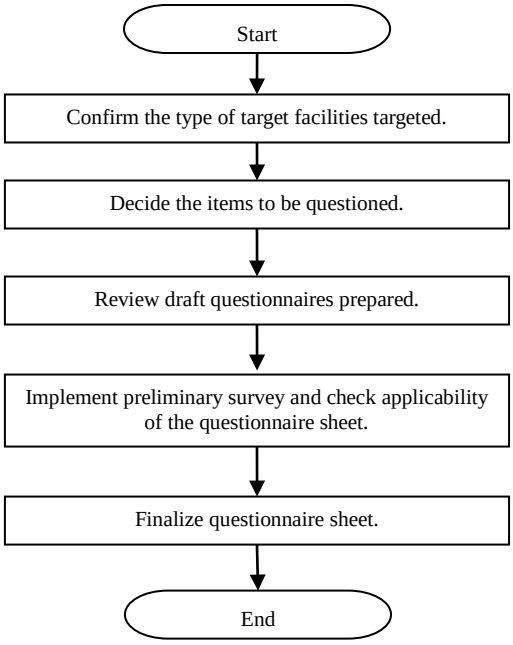


Figure C-3 Process of Preparation of Questionnaire Sheet

Items to be included in the questionnaire are shown in Table C-3.

Table C-3 Examples of Items to be Questioned

Basic information	name of factory, name of manager, name of the person in charge of environmental management, address and contract address of enterprise, type of activity, established year, number of employee, amount of production and its trend, GPS coordination
Production process	name of products, raw materials and amount of usage, amount of water usage, scale, operation condition and pattern (daily and seasonal) of production process discharging pollutants, flowchart of the process
Wastewater	type and concentration of discharged pollutants, amount of discharged wastewater and its trend, discharge point of wastewater, operation condition of existing wastewater treatment facility, future plan to construct wastewater treatment facility, wastewater quality analytical result, record of illegal wastewater discharge

The following viewpoints are for check adequacy of the format.

Table C-4 Viewpoints to Check Adequacy of Source Survey Format

Items to be Reviewed	Viewpoints for Review
Availability of the format on each industrial sector	● Format is required to be able to record various pollutants discharged from each industrial sector
Possibility to collect required information by the format	● Format is need to collect required information for estimation of important data when target enterprise does not have statistical data (For example, when target enterprise does not have statistical data of water usage amount, it should be estimated by other information such as operated hours of water pump.)
Convenience on inventory surveyor	● Format is expected to have functions for collection of necessary information rapidly, checking unreliable data easily, and user-friendly for surveyor and interviewee.
Securing accuracy of collected important information	● Format is expected to have functions to clarify important information to collect, to be able to required supplemental information, and support fresh inventory surveyors.
Easy to extract unreliable data	● Format is expected to be easy to check unreliable data in the field, and to have supplemental questions to recollect reliable data.

Reference questionnaire formats are attached on this Manual.

3) Checking of Reliability of Collected Data

Items to be checked to identify unreliable data are shown below.

- Amount of discharged wastewater is quite different from amount of water usage. When such significant difference is confirmed, its reason should be examined. For example, if the target factory uses groundwater from their well without any record of water usage, such difference should be checked.
- Comparing with other factories in same sector, amount of water usage/discharged wastewater is quite different even though same level of amount of products.
- Kinds of discharged pollutants reported through source survey are unreliable, considering type of activities. (e.g. from food industries, generally, heavy metals are not discharged.)
- Comparing with other factories in same sector adopting same treatment method on discharged wastewater, and discharging same amount of wastewater, concentration of discharged pollutants is quite different.

4) Update of the River Basin WDSI

River Basin WDSI is once prepared, it should be maintained and updated properly. There are two major sources that supply data and information to the inventory for renewal or maintenance of that:

- Post EIA/EPP report,
- Source inspection (Facility inspection) data

Data and information contained in the River Basin WDSI should be supplementary replaced using the post-EIA/EPP reports and/or the source inspection data, that is to say the facility inspection data. Source inspections are also to be conducted mainly by DONREs regularly.

Figure C-4 shows the overall process of data collection and update.

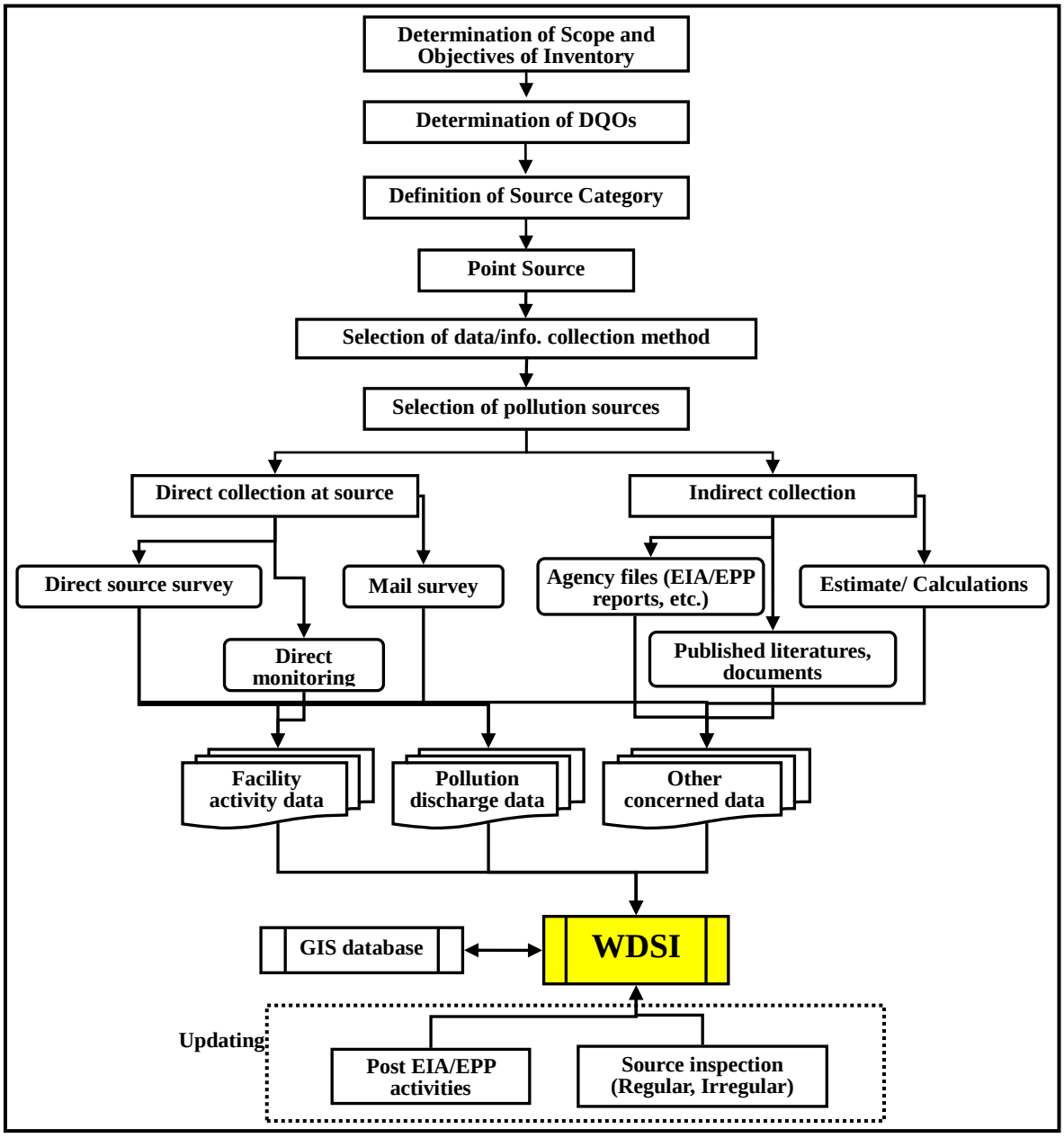


Figure C-4 Data Collection and Update Process

5) Case Study of Source Survey

Examples of source survey in Cau river basin and Dong Nai river basin implemented under the Project for Strengthening Capacity of Water Environmental Management in River Basin are shown in the box-1.

C-3.3 Box: Example of WDSI Survey in Cau river & Dong Nai river basin

The Project for Strengthening Capacity of Water Environmental Management in River Basin had surveys as one of pilot project activities in 2016. The experts and VEA/DONREs discussed about TOR of the survey and selected subcontractor. This box shows summary of the survey, and results of each target river basins.

(1) Objectives and Summary of Work Scopes of the Survey

1) Objectives

The survey objectives of the subcontract work are;

1. To acquire data and information for water pollution control activity and river basin water environmental management, and
2. To develop wastewater discharge source inventory (the WDSI) of main pollution sources in the target river basin and to prepare pollution source map prepared by GIS to be used as pilot project

2) Scope of Work

Major Scope of Work of the sub-contract work of the Survey are as follows:

1) To review the existing WDSIs and related information,
2) To prepare the format of WDSI,
3) To prepare master list of pollution sources and to select target wastewater discharge sources on inventory survey,
4) To collect pollution sources information through i) questionnaire survey and ii) water sampling/analyzing survey,
5) To develop WDSIs of the pollution sources,
6) To develop pollution source maps with GIS,
7) To prepare reports

(2) Target Area

1) Cau River Basin

The target area was downstream area of Cau river basin (the basin structured by Cau river and its tributaries) in Thai Nguyen province, Bac Giang province and Bac Ninh province (see Figure C-5).

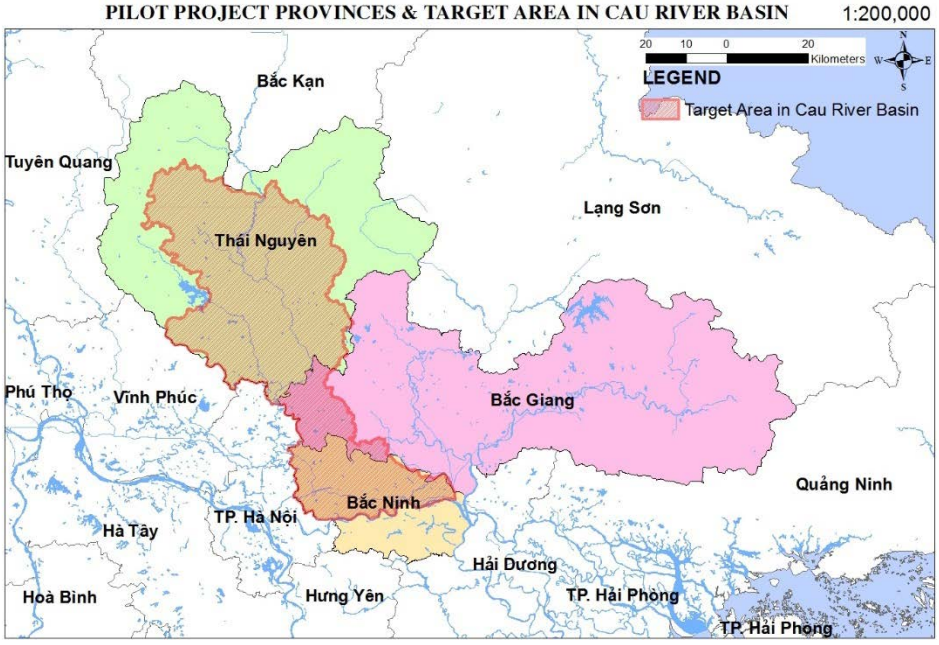


Figure C-5 Target Area of Cau River Basin

2) Dong Nai River Basin

The target area was a part of Sai Gon river and Dong Nai river basin (the basin structured by Sai Gon river, Dong Nai river and its tributaries) in Ho Chi Minh city, Binh Duong province and Dong Nai province (see Figure C-6).

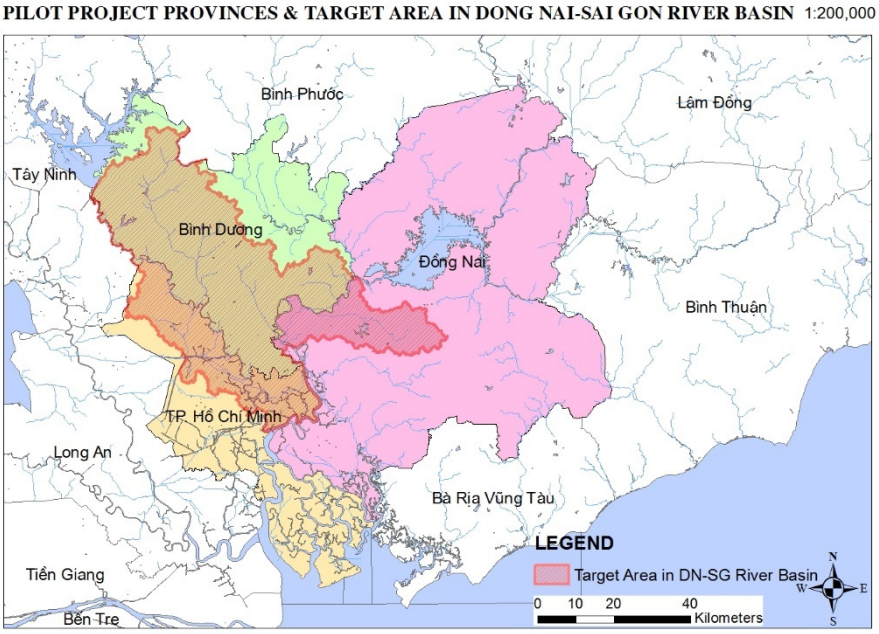


Figure C-6 Target Area of Dong Nai River Basin

(3) Wastewater discharge source information to be collected

Through the wastewater discharge source inventory survey, the following information were collected.

(a) Name of factory (b) Type of activity (c) Tel & Fax number
(d) Number of employee (e) Amount of products (f) Amount of effluents discharged
(g) Pattern of operation of production process
(h) Existence and operation of effluent treatment facility (i) Wastewater monitoring results
(j) Type of raw material (k) Location of effluent discharge point (with GPS system)
(l) Name of manager and contact person (m) GPS coordination, etc…

(4) Selection of Target Facilities for the Survey

This survey was pilot activities, therefore, JET and VEA/DONREs were implemented both indirect survey and direct survey. Existing pollution source information were reviewed as indirect survey. And master lists, a list of all existing information, were prepared. Based on the master list information, facilities located in target area were categorized as highest and higher priorities for both questionnaire surveys and wastewater analysis survey. The Criteria for categorization are shown in Table below.

Table C-5 Criteria which were used for the Pilot Project Activity

Category	A. Highest Priority (Questionnaire Survey& Water Analysis)	B. Higher Priority (Questionnaire Survey)	C. Others (No WDSI survey during the Project)
1. Factory (include Industrial Zone wastewater treatment facilities, and domestic wastewater treatment facilities)	a) Large scale (Discharging more than 100m^3/day (Cau river) 500 m^3/day (Dong Nai river) wastewater) of factories belonging to the following sector - Basic metal manufacturer - Fabricated metal manufacturer - Machinery and equipment manufacturer - Food products and beverage manufacturer - Paper manufacturer - Textile manufacturer -Tanning enterprise -Industrial Zone wastewater treatment facilities	Medium scale (e.g. discharging 10~100m^3/day (Cau river), 100~500m^3/day (Dong Nai river) wastewater) of factories belonging to the sectors shown left. Large factories (e.g. discharging more than 100m^3/day wastewater) belonging	Other factories

Category	A. Highest Priority (Questionnaire Survey& Water Analysis)	B. Higher Priority (Questionnaire Survey)	C. Others (No WDSI survey during the Project)
		to other sectors than ones shown left.	
2. Mining area	Mining areas along Cau river	Mining areas along tributary of Cau river	Other mining areas.
3. Craft village	Craft villages along Cau river	Craft villages along tributary of Cau river	Other craft villages.
4. Livestock facility	Facilities targeted by Decision No. 64/2003/QD-TTgand Decision No. 1788/2013/QD-TTg, or related other Decision issued by Province	Stockbreeding facilities along Cau river	Other livestock facilities.
5. Hospital	Facilities targeted by Decision No. 64/2003/QD-TTg and Decision No. 1788/2013/QD-TTg, or related other Decision issued by Province	Community hospitals along Cau river	Other hospitals.
6. Solid Waste Disposal Site	Facilities targeted by Decision No. 64/2003/QD-TTg and Decision No. 1788/2013/QD-TTg, or related other Decision issued by Province	Solid waste disposal site along Cau river	Other solid waste disposal sites.

(5) Results of the Survey

1) Cau river Basin

a) Target Facilities to collect WDSI information

Through the survey, a master list which is developed by indirect collection was prepared. In Cau river basin, there are 824 facilities wastewater pollution information on the master list. From theses 824 facilities, the project collected 93 highest priority facilities information and 102 higher priority facilities information. As described on C-4.1 Digitization of Information of this manual, there are the standard industrial code in Vietnam. Table C-6 shows total numbers and sector code of collected information.

Table C-6 Numbers of Collected Information with VSIC 2007 in Cau river Basin

VSIC 2007 Level 1 /Description	VSIC 2007 Level3	Description	Highest Priority				Higher Priority			
			Thai Nguyen	Bac Giang	Bắc Ninh	Total	Thai Nguyen	Bac Giang	Bắc Ninh	Total
A. AGRICULTURE, FORESTRY, FISHERIES	014	Livestock			1	**1**	10	3	1	**14**
B. MINING	051	Extraction and collection of coal and lignite	4			**4**	1			**1**
	071	Iron ore mining	1			**1**	4			**4**
	072	Mining non-ferrous metals (except precious metal ores)	5			**5**	2			**2**
	073	Mining precious metals	1			**1**				
	081	Mining sand and gravel	1			**1**				
C. MANUFACTURING	107	Manufacture of other food products			3	**3**		1	2	**3**
	108	Production of animal feed, poultry and seafood							1	**1**
	110	Manufacture of beverages	1		3	**4**		2	3	**5**
	132	Manufacture of other textiles		2		**2**		1	1	**2**
	141	Apparel (except fur apparel)	3	5	2	**10**	3	3		**6**
	162	Manufacture of wood & wood products						8		**8**
	170	Manufacture of paper and paper products	1		3	**4**			10	**10**
	191	Production of coke	1			**1**				
	210	Production of pharmaceutical chemicals and botanical products		1		**1**			1	**1**
	222	Production of plastic packaging			1	**1**				
	231	Manufacture of glass and glass products			2	**2**				

VSIC 2007 Level 1 /Description	VSIC 2007 Level3	Description	Highest Priority				Higher Priority			
			Thai Nguyen	Bac Giang	Bắc Ninh	Total	Thai Nguyen	Bac Giang	Bắc Ninh	Total
	239	Manufacture of non-metallic mineral products	4			**4**	1			**1**
	241	Production of iron, steel, cast	3			**3**	3		1	**4**
	242	Manufacture of basic precious &other non-ferrous					3		1	**4**
	243	Casting of metals							2	**2**
	251	Manufacture of structural metal products	3		1	**4**				
	259	Manufacture of other fabricated metal products	2		2	**4**	1		2	**3**
	261	Manufacture of electronic components	1		4	**5**				
	262	Manufacture of computers and peripheral equipment of computer			1	**1**				
	264	Production of consumer electronics products			1	**1**				
	271	Manufacture of electric transformers & electricity							1	**1**
	325	Manufacturing orthopedic, rehabilitation	1			**1**				
D. ELECTRICITY, AIR CONDITIONING SUPPLY	351	Production of electricity	1			**1**	1			**1**
E. WATER SUPPLY, SEWERAGE, WASTE MANAGEMENT	370	Sewerage and sewer treatment activities			2	**2**		2		**2**
	381	Waste collection is non-toxic		1		**1**				
	382	Waste treatment and disposal							4	**4**
L. REAL ESTATE ACTIVITIES	681	Real estate activities with own or leased property	3	2	9	**14**		2	5	**7**
Q. HUMAN HEALTH AND SOCIAL WORK ACTIVITES	861	Hospital, dispensary activities	5	1	5	**11**	8	2	4	**14**
	869	Other human health care							2	**2**
		TOTAL	**41**	**12**	**40**	**93**	**37**	**24**	**41**	**102**

b) Confirmation of wastewater volume from collected information

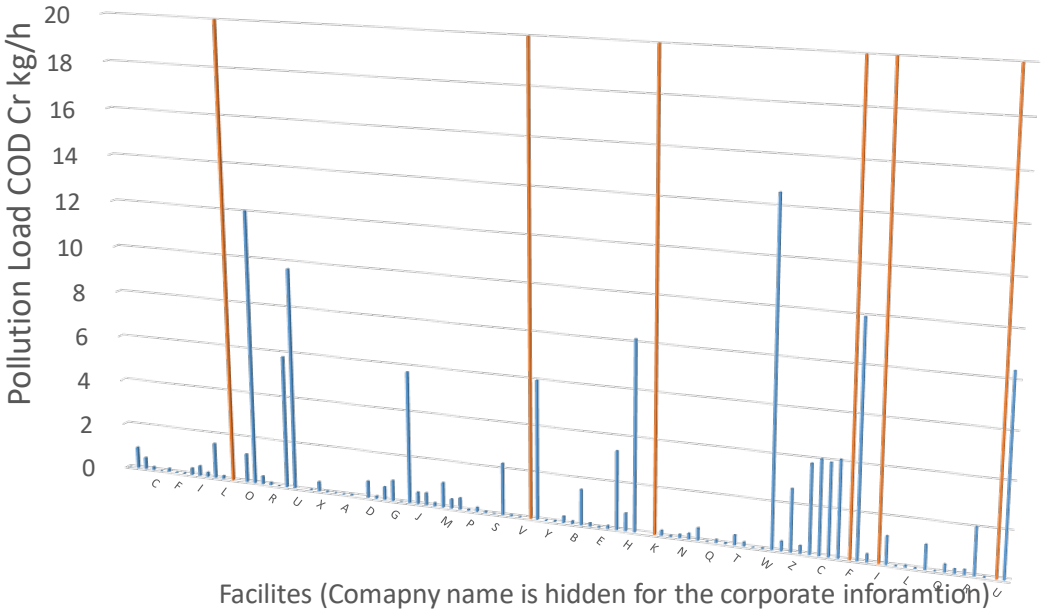
Percentages of volume of wastewater from collected information was checked through the Pilot Project (PP). Total accumulated wastewater volume is 354,390 m^3/day. There are 404 facilities (55.3%) which has more than 5 m^3/day wastewater volume. However, accumulated wastewater volume from these 404 facilities has9 9.9% of total accumulated wastewater volume. In addition, 179 facilities (24.5 %) which has more than 50 m^3/day wastewater volume have 98.7% of total accumulated wastewater volume as shown in Table C-7.

Table C-7 Accumulated Wastewater Volume from Different Wastewater Volume Facilities

No.	Category	Result of PP
1	Total Nos. (facilities)	824
2	Total Nos. WW volume info(facilites)	730
3	Total Nos. WW volume info(%) ("1"/"2"*100)	88.6%
4	Total accumulated WW volume（m3/day)Σ"2" m3/day	354,390
A-1	Total Nos. facilities have more than 5m3/day WWV(facilities)	404 (55.3%)
A-2	Accumulated WW volume of more than 5m3/day(m3/day)	354,202
A-3	"A-2"/"4" 100 (%) Percentages from Total WW volume	99.9%
B-1	Total Nos. facilities have more than 50 m3/day WWV(facilities)	179(24.5%)
B-2	Accumulated WW volume of more than 50m3/day(m3/day)	349,737
B-3	"B-2"/"4" 100 (%) Percentages from Total WW volume	98.7%

c) Calculation of pollution load from target facilities

Pollution loads from target faculties were calculated through the Pilot Project. Method of pollution loads estimation is shown in C-3.3 of this guideline. There are several facilities which has high pollution load as shown in Figure C-7.



Note:[ ] means the facility which has more than 20 COD CrO kg/h pollution load

Figure C-7 Results of Calculated Pollution Load from Target Facilities

d) Preparation of pollution source map

Pollution source map was prepared by the Pilot Project activities as shown in Figure C-8..The software WGIS was utilized to develop the map. QGIS is a Geographic Information System (GIS) software similar to ArcGIS, but it has advantages, such as it is free, open-source, easy to install and utilize, and cross-platform (Windows, mac OS and GNU/Linux).

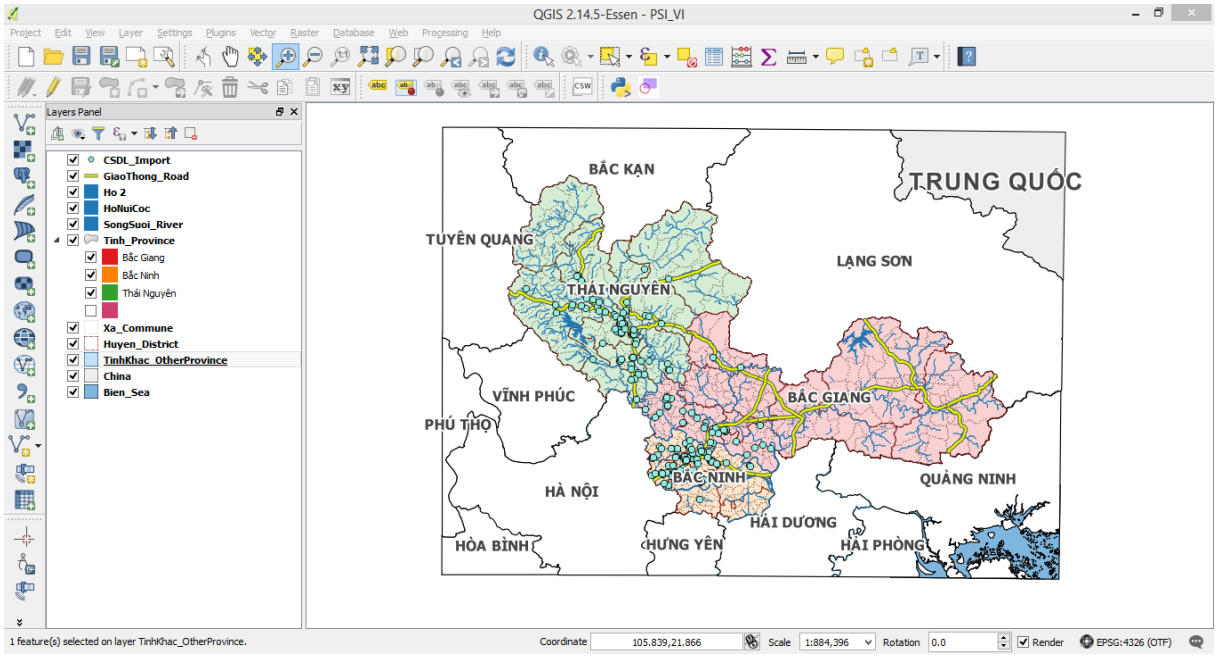


Figure C-8 Pollution Source Map in the Pilot Project Area of Cau River Basin

2) Dong Nai river Basin

a) Target Facilities to collect WDSI information

Through the survey, a master list which is developed by indirect collection was prepared. In Dong Nai river basin, there are 15,416 facilities wastewater pollution information on the master list. From theses 15,416 facilities, the project collected 100 highest priority facilities information and 204 higher priority facilities information. Table C-8 shows total numbers and sector code of collected information.

Table C-8 Numbers of Collected Information with VSIC 2007 in Dong Nai River Basin

VSIC 2007 Level 1 /Description	VSIC 2007 Level 3	Description	Highest Priority				Higher Priority			
			Binh Duong	Dong Nai	HCMC	Total	Binh Duong	Dong Nai	HCMC	Total
A. AGRICULTURE, FORESTRY, FISHERIES	011	Growing of non-perennial crops				**0**			2	**2**
	014	Livestock	1			**1**	3		2	**5**
	032	Aquaculture				**0**			3	**3**
B. MINING	081	Mining sand and gravel		2		**2**		5		**5**
C. MANUFACTURING	101	Processing and preserving of meat		1	1	**2**			1	**1**
	102	Processing and preserving of fish, crustaceans and molluscs	1			**1**	2		1	**3**
	103	Processing and preserving of fruit and vegetables	1			**1**	2		6	**8**
	104	Manufacture of vegetable and animal oils and fats				**0**			2	**2**
	105	Manufacture of dairy products	2		2	**4**	1	2	1	**4**
	106	Manufacture of grain mill products, starches and starch products		1		**1**				**0**
	107	Manufacture of other food products		1	1	**2**			5	**0**
	110	Manufacture of beverages	3		3	**6**	1		2	**3**
	131	Spinning, weaving and finishing of textiles	4		2	**6**		1	7	**8**
	132	Manufacture of other textiles				**0**		1		**1**
	141	Apparel (except fur apparel)			5	**5**	7	3	7	**17**
	152	Manufacture of footwear	3	3	3	**9**	6	1	0	**7**
	161	Sawmilling and planning of wood; wood reservation				**0**			1	**1**
	162	Manufacture of wood & wood products	1	1		**2**	2			**2**
	170	Manufacture of paper and paper products	4	1		**5**	7		6	**13**
	201	Manufacture of basic chemicals, fertilizer	4			**4**	2	4	2	**8**
	202	Manufacture of other chemical products				**0**		1		**1**
	210	Production of pharmaceutical chemicals and botanical products	2			**2**	1	1	2	**4**
	221	Manufacture of rubber products	5			**5**	5		2	**7**
	222	Production of plastic packaging		1		**1**				**0**
	239	Manufacture of non-metallic mineral products	1			**1**	3		2	**5**
	241	Production of iron, steel, cast				**0**	1	1	1	**3**
	251	Manufacture of structural metal products	1			**1**	1			**1**
	259	Manufacture of other fabricated metal products	1			**1**		1		**1**
	272	Manufacture of batteries and accumulators				**0**		1		**1**
	291	Manufacture of motor vehicles		2		**2**				**0**
	293	Manufacture of parts and accessories for motor vehicles				**0**			1	**1**

VSIC 2007 Level 1 /Description	VSIC 2007 Level 3	Description	Highest Priority				Higher Priority			
			Binh Duong	Dong Nai	HCMC	Total	Binh Duong	Dong Nai	HCMC	Total
	310	Manufacture of furniture				**0**	2			**2**
	325	Manufacturing orthopedic, rehabilitation				**0**	1			**1**
	331	Repair of fabricated metal products, machinery and equipment	1			**1**	1			**1**
E. WATER SUPPLY, SEWERAGE, WASTE MANAGEMENT	360	Water collection, treatment and supply			2	**2**				**0**
	370	Sewerage and sewer treatment activities	2		6	**8**			1	**1**
	381	Waste collection is non-toxic				**0**			1	**1**
	382	Waste treatment and disposal	1			**1**			1	**1**
F. CONSTRUCTION	410	Construction of buildings			2	**2**			8	**8**
G. WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES	464	Wholesale of household goods			1	**1**				**0**
	471	Retail sale in non-specialized stores				**0**			3	**3**
	477	Retail sale of other goods in specialized stores				**0**	1			**1**
	478	Retail sale via stalls and markets				**0**			2	**2**
H. TRANSPORTATION AND STORAGE	511	Passenger air transport				**0**			1	**1**
I. ACCOMMODATION AND FOOD SERVICE ACTIVITIES	551	Short-term accommodation activities			6	**6**			38	**38**
	559	Other accommodation			6	**6**	1		6	**7**
L. REAL ESTATE ACTIVITIES	681	Real estate activities with own or leased property			1	**1**				**0**
P. EDUCATION	854	Higher education				**0**			2	**2**
Q. HUMAN HEALTH AND SOCIAL WORK ACTIVITES	861	Hospital, dispensary activities		1	6	**7**		6	11	**17**
S. OTHER SERVICE ACTIVITIES	962	Washing and cleaning of textile and fur products			1	**1**			1	**1**
		TOTAL	**38**	**14**	**48**	**100**	**50**	**28**	**131**	**204**

b) Confirmation of wastewater volume from collected information

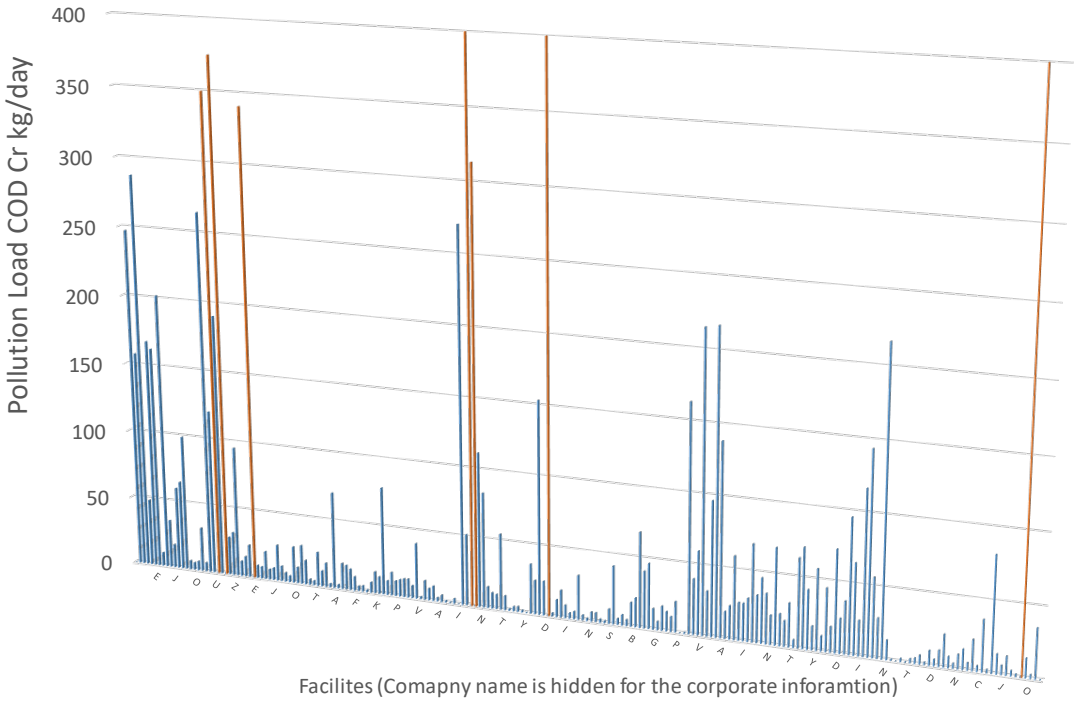
Percentages of volume of wastewater from collected information was checked through the Pilot Project. Total accumulated wastewater volume is 640,443 m^3/day from collected wastewater volume information. There are 708 facilities (34.0%) which has more than 50 m^3/day wastewater volume. Accumulated wastewater volume from these 708 facilities has 96.9% of total accumulated wastewater volume as shown in Table C-9.

Table C-9 Accumulated Wastewater Volume from Different Wastewater Volume Facilities

No.	Category	Result of PP
1	Total Nos. (facilities)	15,416
2	Total Nos. WW volume info(facilites)	2,080
3	Total Nos. WW volume info(%) ("1"/"2"*100)	13.5%
4	Total accumulated WW volume（m3/day)Σ"2" m3/day	640,443
A-1	Total Nos. facilities have more than 5m3/day WWV(facilities)	2074(99.7%)
A-2	Accumulated WW volume of more than 5m3/day(m3/day)	640,427
A-3	“A-2"/"4" 100 (%) Percentages from Total WW volume	100.0%
B-1	Total Nos. facilities have more than 50 m3/day WWV(facilities)	708(34.0%)
B-2	Accumulated WW volume of more than 50m3/day(m3/day)	620,328
B-3	“B-2"/"4" 100 (%) Percentages from Total WW volume	96.9%

c) Calculation of pollution load from target facilities

Pollution loads from target faculties were calculated through the Pilot Project. There are several facilities which has high pollution load as shown in Figure C-9.



Note:[ ] means the facility which has more than 300 COD CrO kg/h pollution load

Figure C-9 Results of Calculated Pollution Load from Target Facilities

d) Preparation of pollution source map

Pollution source map was prepared by the Pilot Project activities as shown in Figure C-10.

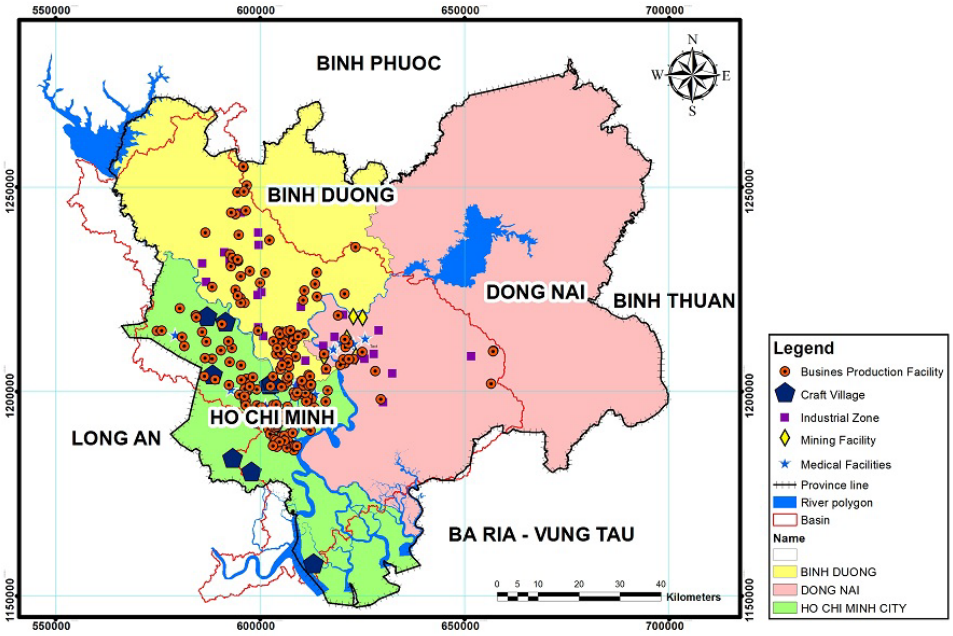


Figure C-10 Pollution Source Map in the Pilot Project Area of Dong Nai River Basin

(6) Lessons from the Pilot Project activities

Through the Pilot Project activities, the following lessons were found.

a) Information Collection

- ❑ Through the survey, noncooperative targets were found. To implement the survey smoothly, a legal-base requirement on inventory survey should be clarified to target facilities.
- ❑ The most target facilities did not provide wastewater quality monitoring data. Additionally, the craft villages did not have the information on amount of water usage. To collect required information, both direct and indirect measures should be adopted at the same time, such as use of existing reports, and indirect information collecting measures introduced in C-3 of this guideline.
- ❑ Pollution source data/information was dispersed, was not systematic. And the list of factories and other pollution sources issued officially did not exactly provide latest information of name and contact address of the target facilities. To prepare a master list of the target facilities, it was necessary to make interview on DONREs.
- ❑ There is different concept/definition of "pollution source". Therefore, it is necessary to have common concept. Example is introduced in A-5of this guideline.
- ❑ Type of products are too general and there is lack of information of wastewater flow and substances. In addition, name of facilities (pollution sources) are not unified among different sources. Therefore, it is recommended to use Tax code and address code introduced in C-4.2 of this guideline.
- ❑ Low awareness of interviewees on pollution control hindered to collect reliable information. It was considered that awareness raising on environmental managers of pollution sources should be carried out.
- ❑ Numbers of facilities refused to provide pollution source information because they think the data is sensitive information for operation.

b) Sampling and Analysis

- ❑ There is lack of outlet location information. Some facilities have been discharging through some outlets. Therefore, it is necessary to have wastewater discharge source inventory and need to accumulate data.
- ❑ Craft villages are in the highest priority group in the survey, However, due to the production characteristics and the poor management, the collected information is very limited. The wastewater quality data are not available. It is necessary to collect such information with the effort of state management agency.

C-3.4 Estimation of Pollution Loads

(1) Method of Pollution Loads Estimation

To compile the River Basin WDSI, the concerned pollutants discharged from sources must be identified and quantified. Identification and quantification are done in the process of development of the River Basin WDSI to estimate pollution loads in the area. The biggest concern is how to quantify or estimate the pollutants from the sources. Although there are several methodologies or techniques of pollution loads estimation, these should be selected based on intended use of the River Basin WDSI. The best method of estimating a source's discharge can be the use of source test data. Source test data is the data obtained or supplied by the facilities or the source itself. However, in sometimes, or usually, due to lack of source test data, it is difficult to estimate or quantify all pollutants in River Basin WDSI. Apart from the reliability of data, there exist several items that restrict selection the methodologies or the techniques of pollution load estimation. For the selection of those, following items should be considered:

- End use of River Basin WDSI,
- Availability of existing data,
- Availability of time and resources, and
- Level of concern or pressure to improve water quality

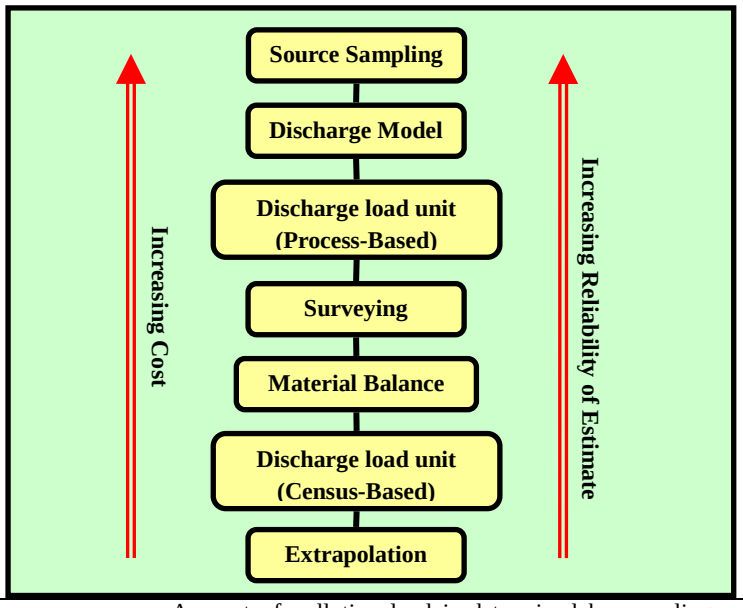
(2) Selection of Discharge Estimation Methodology/Technique

Several methodologies or techniques are proposed to estimate pollutants. In general, they can be categorized into four types of methodologies or techniques including source test data:

- Sampling or direct monitoring (source test data),
- Usage of pollution load units,
- Grasping of mass balance, and
- Other engineering calculations

The greater part of the data and information collected through the pollution source survey above mentioned are kind of source test data to be gripped in the River Basin WDSI. Source test data usually have a high reliability. However, two items should be noted when using source test data to evaluate discharges. First, because most source tests are generally only conducted over several hours or days at most, adjustments may need to be made when using these data to estimate discharges over longer time intervals or for conditions different from those under which the tests were performed. Secondly, a source test supplied by a plant may not adequately describe a given facility's annual or seasonal operating pattern.

Source tests data or continuous monitoring data are usually preferred for estimating a source's discharges because those data provide the best representation of the tested source's discharges. However, test data from individual sources are not always available and, even then, they may not reflect the variability of actual discharges over time. Thus, pollution load units are frequently the best or only method available for estimating discharges, in spite of their limitations. The following figure below shows hierarchy of the reliability of data.



Source sampling:	Amount of pollution load is determined by sampling and analytical results of discharged wastewater at discharge points.
Discharge model:	Amount of pollution load is estimated with pollution load discharged model.
Discharge load unit (Process-Based):	Amount of pollution load is calculated with the information collected by inventory survey and existing pollution load units by each pollution sources.
Surveying:	Amount of pollution load is estimated with the information collected by field survey.
Material balance:	Amount of pollution load is estimated by comparison of products with raw materials.
Discharge load unit (Census-Based):	Amount of pollution load is calculated with the figures obtained by census and existing pollution load units.
Extrapolation:	Amount of pollution load is prospected with similar cases.

Figure C-11 Hierarchy of Reliability of Data

(3) Pollution Load Unit

Pollution load units is a representative value that attempts to relate the quantity of a pollutant discharged to the watercourse with an activity associated with the discharge of that pollutant. These units are usually expressed as the weight of pollutant divided by a unit weight, volume, area, turnover, or duration of the activity discharging the pollutant (e. g., COD (kg) / product (ton)). Such units facilitate estimation of discharges from various sources of water pollution. In most cases, these units are simply averages of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category.

Box-2 Example of Procedure for Estimation of Pollution Load in Basin Level

Step-1: Collection of Basic Information

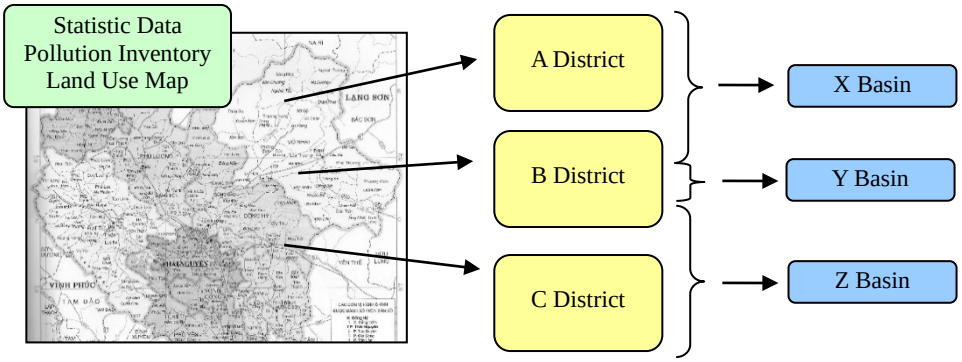
Point Source

- Statistic Data
  - Population, Number of Employee, and Number of Livestock
- Pollution Inventory
  - Factory, Mining area, Craft village, LS facility, Hospital, SWD site

Non-Point Source

- Land Use Map
  - **Non-point source is not covered on this Manual. For the river basin management, it is necessary to consider*
  - Urban Land, Paddy Field, Forest Area and Agriculture

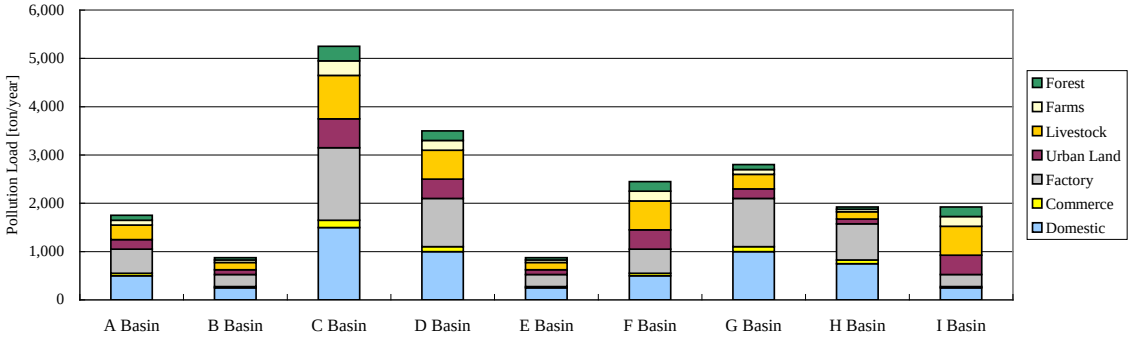
Step-2: Exchange Basic Information from Administrative Area to Basin Area



Step-3: Pollution Load Calculation by Multiplying Basic Information and Pollution Load Unit

Ex) Factory Pollution Load [kg/year]	=	Water Quality [mg/L]	x Discharge [m^3/day]
Domestic Pollution Load [kg/year]	=	Population	x Unit [g/day/person]
Agriculture Pollution Load [kg/year]	=	Agricultural Area [km^2]	x Unit [kg/km^2/year]

Step-4: Estimation of Pollution Load in Basin by Summarizing each Category



C-4. Compilation and Arrangement of Data

C-4.1 Digitization of data and Information

In order to process, sort, retrieve, analyze and update, the following information collected should be digitized.

- ❑ Other information besides values such as name of district, type of industrial sector, category of pollution sources, business type, and so on,
- ❑ Figures to be grouped into several categories for convenience of data analysis, and
- ❑ Geographical information.

Data and information collected are recorded and stored in a prescribed format, namely in a form of spreadsheet. The River Basin WDSI is to develop with the intention of applying to river basin water quality management. Therefore the format of the River Basin WDSI is prescribed by this end use of the inventory. The data and information recorded are processed to achieve the end use. In order to process, sort, retrieve, analyze, update the data and information effectively and smoothly, they are recorded and stored in computer. Applying of a Geographical Information System (GIS), which can be a useful tool in handling spatially distributed data, is a typical example of a computer use to the River Basin WDSI. This type of system can locate each point source and define the boundaries around each area source. Information stored in a GIS can be the most direct method of spatially allocating activity data and may allow the use of more detailed surrogates that would be too labor-intensive to use without a GIS.

Use of computer to the River Basin WDSI expands and promotes the potential application of the River Basin WDSI such as a case of GIS application. However, it should be noted that the use of sophisticated computer technology can be made possible on the assumption that the data and information collected would be digitized. In this meaning, data and information should be digitized. The followings show the data and information to be digitized for the development of the river basin WDSI.

(1) Location

Location codes of pollution source in the pilot area of Cau river and Dong nai river basin are recorded in the River Basin WDSI based on the code which is defined on Decision No.124/2004/QD-TTg of the list of administrative units Vietnam using maximally 5 digits. Examples of the location codes of Thai Nguyen province are shown below.

Example:

Binh Duong Province: 74, Thu Dau Mot District: 718, Phường Hiệp Thành Commune: 25741

(2) Industrial Sector

Type of industrial sector is to digitize using Vietnamese Standard Industrial Classification (VSIC). As of September 2017, VSIC 2007 effect to use. Following figure gives an example of VSIC 2007.

Vietnamese Standard Industrial Classification (VSIC)
(B: MINING, C: INDUSTRIAL PROCESSING AND MANUFACTURE, E: WATER SUPPLY: WASTEWATER AND GARBAGE MANAGEMENT AND TREATMENT, Q: Medical and Social Support Activities)

	Level 2	Level 3	Level 4	Level 5	Name of industries
B					MINING
	5				Hard coal and lignite exploitation
		51	510	5100	Hard coal exploitation and collection
		52	520	5200	Lignite exploitation and collection
	6				Crude oil and natural gas exploitation
		61	610	6100	Crude oil exploitation
		62	620	6200	Natural gas exploitation
	7				Mineral ore exploitation
		71	710	7100	Ferrous ore exploitation

Figure C-12 Example of Vietnamese Standard Industrial Classification (VSIC 2007)

(3) Type of Pollution Source Category

Pollution sources should be codified by types of source categories using the following classification.

Table C-10 Categories of Pollution Sources

Source Category	Factory	Mining area	Craft village	Livestock facility	Hospital	Solid waste dumping site	Domestic waste water	Others
Code	F	M	CV	LS	H	SW	DW	OT

(4) Source of Data and Information

Sources of data and information should be clarified using the following code.

Table C-11 Idea of Source of Data and Information

Source Name	Source survey	Source inspection	EIA/EPP	Source test data	Direct monitoring
Code	SS	SI	E	ST	DM
Source Name	Documents	Census/Statistic	Discharge model	Pollution load unit	Others
Code	DOC	CS	DCM	PLU	OT

C-4.2 Format of River Basin WDSI

The data needed to develop the River Basin WDSI is drawn from a wide range of sources. The responsible agency for development of the River Basin WDSI may collect some of the data specifically. The collected data and information are recorded and stored in form of spreadsheets. The spreadsheets prepared are to be manipulated for processing stored data and to be used for management of the river basin water quality.

The structure of the River Basin WDSI is prescribed according to the end user. The data elements that should be inventoried in the River Basin WDSI are summarized below.

Table C-12 Data Elements to be Inventoried in River Basin WDSI

	Data Element	Recorded by:		Data Element	Recorded by:
Location	Province	Name, Code	Discharge information	Flow rate of wastewater	m3/day, etc.
	City/Town/District	Name, Code		Wastewater treatment facility	Code (Type of facility)
	Ward/Town/Commune	Name, Code		Destination of wastewater	Code
	Latitude	x coordinate		Sampling data	Date
	Longitude	y coordinate		pH	Concentration
Source information	Pollution source category	Name, Code		EC	Concentration
	Industrial type	Name, VSIC		TDS	Concentration
	Major products	Name, Amount		BOD5	Concentration
	No. of employee	No. of employee		CODCr	Concentration
	Area of source	Hectare		NO3-N	Concentration
	Annual turnover	Milln. DON, Code		NO2-N	Concentration
	Business type	Capital type code		NH3-N	Concentration
	River basins	River basin Code		TKN	Concentration
	Data/Info. source	Code		PO4	Concentration
	EIA/EPP	Yes/No, Date		SS	Concentration
-	-	-		T-Coliform	Concentration

Data Element		Recorded by:	Data Element		Recorded by:
-	-	-		T-Cr	Concentration
-	-	-		Cr(III)	Concentration
-	-	-		CN	Concentration
-	-	-		Pb	Concentration
-	-	-		Other pollutants as required	Concentration

As mentioned, the River Basin WDSI format is to be prepared in a form of electronic spreadsheet using a computer.

To maintain acceptable data quality, it is important to practice adequate quality control (QC) measures during the development and reviewing of spreadsheets. The information presented in a spreadsheet should be evaluated to determine if input data are transcribed correctly, calculated results are technically sound, and the final results are reported in a manner that will allow the data to be evaluated. Procedures to follow when developing, documenting, and evaluating the accuracy of spreadsheets are described in the C-7 of this manual.

Considering the end use of the River Basin WDSI and the data elements, the River Basin WDSI format shall be as follows:

Table C-13 Examples of Spreadsheet (General information)

STT	Name of establishment	Operation type	Address	Provincial code	District code	Commune code	Tax code	Location		Water amount used (m^3/year)	Wastewater amount (m^3/year)	Water receiving source	Wastewater receiving location	
								Longitude	Latitude				Longitude	Latitude
1														
2														
3														

Table C-14 Examples of Spreadsheet (Wastewater quality)

No	Name of establishment	Concentrations of pollutants in the wastewater																
		T^0	Color	pH	BOD5 (20°C)	COD	...	...										
1																		
2																		
3																		

Wastewater quality parameters:

No.	Parameter	Unit	Quantity	No.	Parameter	Unit	Quantity
1	T^0	°C		23	Sulfate (by H_2S)	mg/l	
2	Color	Pt/Co		24	Florine	mg/l	
3	pH			25	Ammonium (by N)	mg/l	
4	BOD_5 (20°C)	mg/l		26	Nitrate (by N)	mg/l	
5	COD	mg/l		27	Total nitrogen	mg/l	
6	TSS	mg/l		28	Phosphate (by P)		
7	TDS	mg/l		29	Total phosphorous (by P)	mg/l	
8	Arsenic	mg/l		30	Chlorine	mg/l	
9	Mercury	mg/l		31	Residual Chlorine	mg/l	
10	Lead	mg/l		32	Total organic chlorine plant protection chemicals	mg/l	
11	Cadimi	mg/l		33	Total organic phosphorous	mg/l	

No.	Parameter	Unit	Quantity	No.	Parameter	Unit	Quantity
					plant protection chemicals		
12	Cr(VI)	mg/l		34	Total PCB	mg/l	
13	Cr(III)	mg/l		35	Coliform	MPN or CFU/100ml	
14	Copper	mg/l		36	Salmonella	Microorganisms/100ml	
15	Zinc	mg/l		37	Shigella	Microorganisms/100ml	
16	Nickel	mg/l		38	Vibrio cholera	Microorganisms/100ml	
17	Manganese	mg/l		39	Total α active radioactivity	Bq/l	
18	Iron	mg/l		40	Total β active radioactivity	Bq/l	
19	Total cyanide	mg/l		41	Total surface active substances	mg/l	
20	Total phenol	mg/l		42	Easy Absorbed Organic Halogen (AOX)	mg/l	
21	Total oil/grease	mg/l		43	Dioxin	pgTEQ/l	
22	Animal/plant oil/grease	mg/l					

C-4.3 Arrangement of Data for River Basin WDSI

Arrangement of data for River Basin WDSI should be easily understandable one to decide pollution control approach. In addition, as mentioned in "C-4.1 Digitization of Information", linkage between Wastewater Discharge Source Inventory and GIS is crucial function for understanding information on pollution in river basin visually and spatially.

This manual shows the following examples of data summarization by using GIS System:

- Linkage between Wastewater Discharge Source Inventory and GIS,
- Pollution load level in each area, and
- Grasping status of facilities which discharge effluent exceeding water quality standard

(1) Linkage between Wastewater Discharge Source Inventory and GIS

Method of linkage between pollution sources and GIS is very simple. GIS can load database including location information (Latitude: X and Longitude: Y) on pollution source. In addition, GIS can read all information from loaded database.

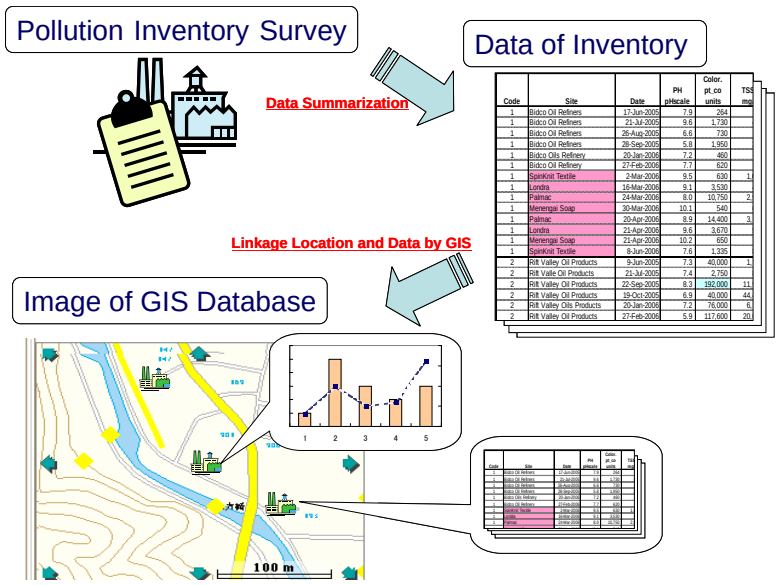


Figure C-13 Linkage between Wastewater Discharge Source Inventory and GIS

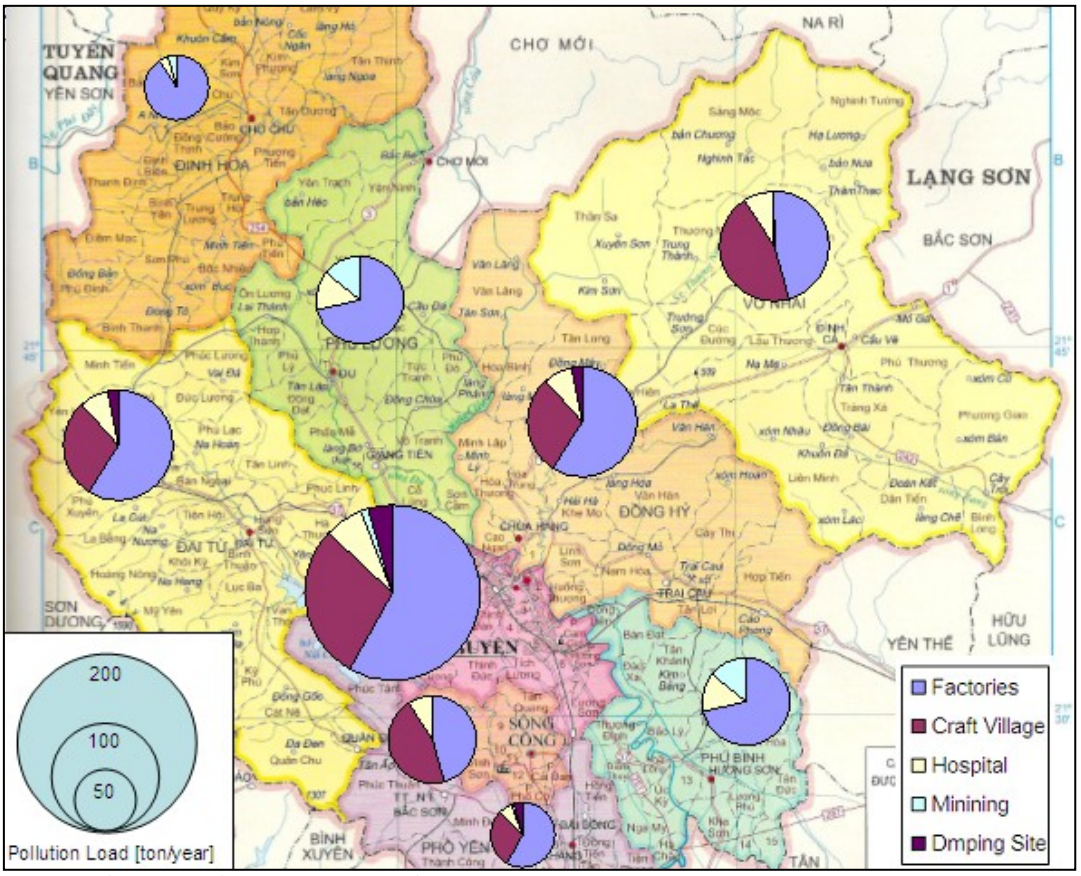
C-5. Data Management and River Basin WDSI Application

The River Basin WDSI established can be used for the following objectives.

- ❑ Estimate regional pollution load for formulating concrete action plans of a river basin management plan and evaluating their effectiveness,
- ❑ Specify the important targets to be addressed by applicable pollution control measures, and
- ❑ Grasp of generated pollution load.

(1) Grasping Pollution Load Level in Each Area

The pollution load in each area (e.g. river basin and province) can be summarized and calculated from database of pollution inventory source. In addition, not only information on pollution load but also number of facilities, employees, enterprise type can be displayed. Figure C-14 shows pollution load level of each district as example display.

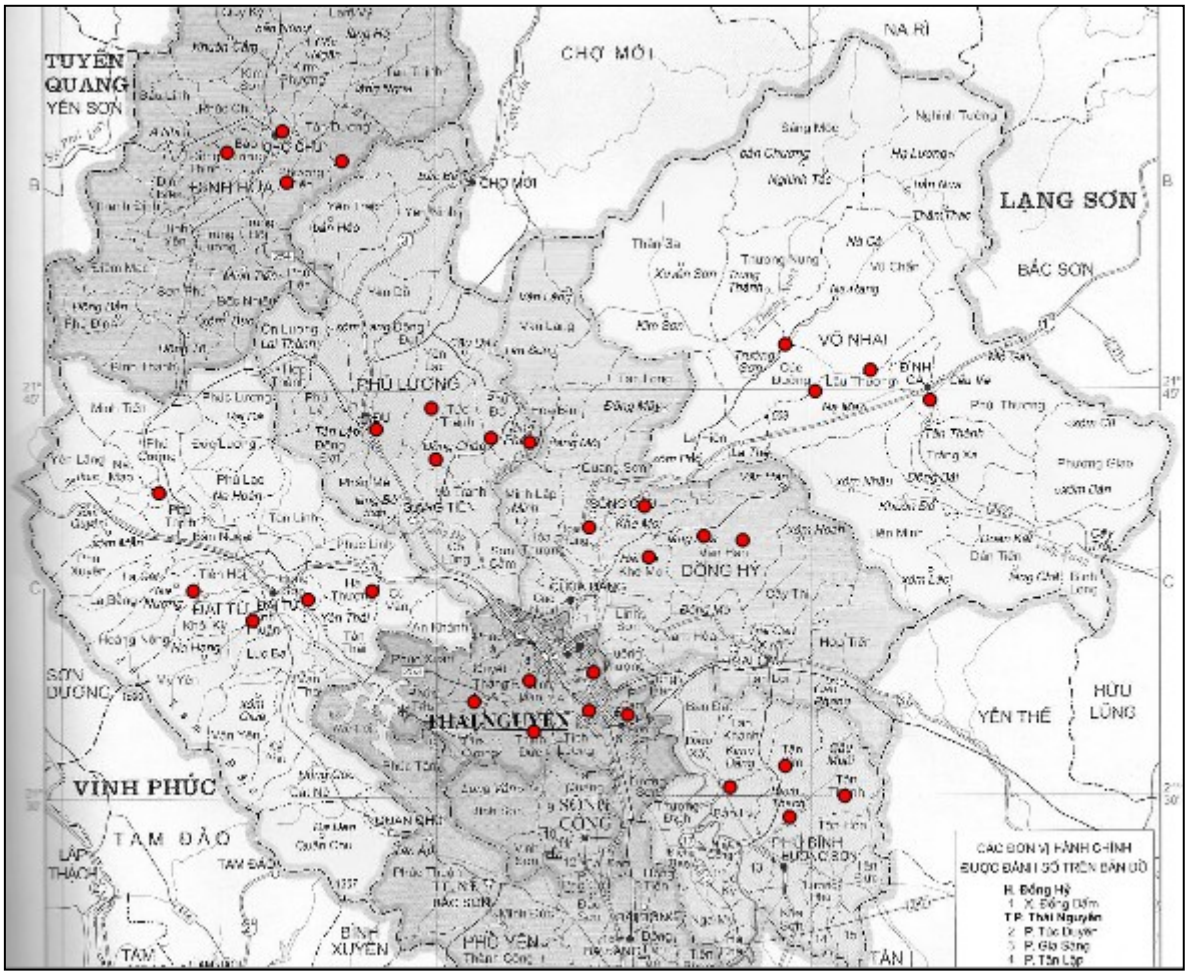


Note: This figure is just for showing example of display, and pollution load levels are not based on actual data but assumption.

Figure C-14 Example of Display on Pollution Load Level in Each District

(2) Grasping Status of Facilities Exceeding or Complying Standard of Wastewater Quality

Grasping status of facilities exceeding or complying with standard of wastewater quality in river basin can be identified by comparison effluent waste water and standard in database of the River Basin WDSI. This information can help to decide prioritization of pollution control. Figure C-15 shows distribution of facilities exceeding the standard of waste water quality as example display.

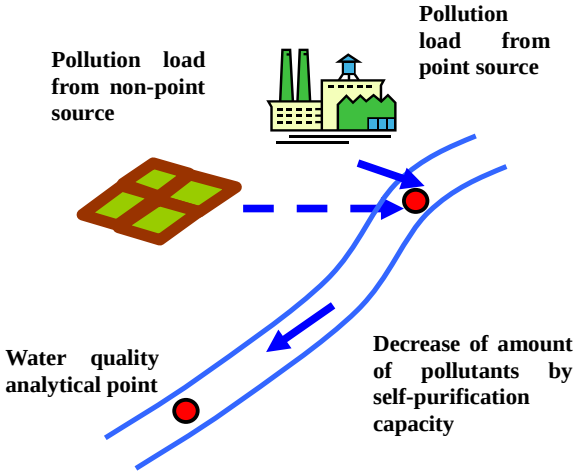


Note: This figure is just for showing example of display, and the facilities in the figure are not actual ones,

Figure C-15 Example of Display on Distribution of Facilities Exceeded of Standard of Waste Water Quality

Box-3 Estimation of Self-purification Capacity

Each river has a self-purification capacity to be able to decrease amount of pollutants. The capacity can be digitized by a self-purification coefficient. Each river has own self-purification coefficients by its several sections from upper reach to lower reach. To estimate the figures of self-purification coefficient, the amount of pollution load discharged to rivers directly and indirectly should be calculated, and river water quality analytical should be monitored. A database of Wastewater Discharge Source Inventory is necessary to calculate the amount of pollution load discharged to rivers.



C-6. Resources and Organizations

Resource to develop the River Basin WDSI can be divided into human resources and equipment as shown below.

(A) Human resources

- ❑ Supervisor for development the River Basin WDSI,
- ❑ Inventory surveyor,
- ❑ Data arrangement staff, and
- ❑ GIS expert

(B) Equipment

- ❑ Computer to store pollution source information,
- ❑ Microsoft Excel, Microsoft Access and other Database software,
- ❑ GIS application, and
- ❑ Internet

(1) Human Resources

To collect reliable information to establish the River Basin WDSI, the ability of inventory surveyors are very important. The inventory surveyors should have the following knowledge and skills.

- Objectives to establish the River Basin WDSI, and necessary information to be collected,
- Legislation to clarify jurisdiction of the River Basin WDSI,
- Knowledge on Quality Control (QC) to secure reliability of collected data,
- Knowledge on existing information source to collect required data,
- Communication skills with noncooperative targets,
- General concentration of wastewater discharged from highest priority targets

(2) Equipment

To make WDSI, it is necessary to have computers to store pollution source information. Software to input data is necessary such as Microsoft Excel, Access, and other database software. When the pollution source map developed, GIS application is necessary such as QGIS, ArcGIS, etc…

(3) Network to Collect Existing Information

Reliable data can be obtained by direct source survey, but the target facilities frequently do not have required data to establish the River Basin WDSI. It is important to use existing information such as EIA reports to supplement the direct source survey, and a network to the concerned organization to exchange existing information should be established at basin-wide level.

(4) Cooperation with Experts for Indirect Collection of Required Data

Indirect collection of required information should be carried out to establish the River Basin WDSI. Some measures on indirect collection require special technical knowledge and skills. Human resource information to cooperate with such experts should be shared at basin wide level.

(5) Data Sharing and Updating

The River Basin WDSI prepared by several implementation bodies for river basin water environment management should be shared and updated by all implementation bodies.

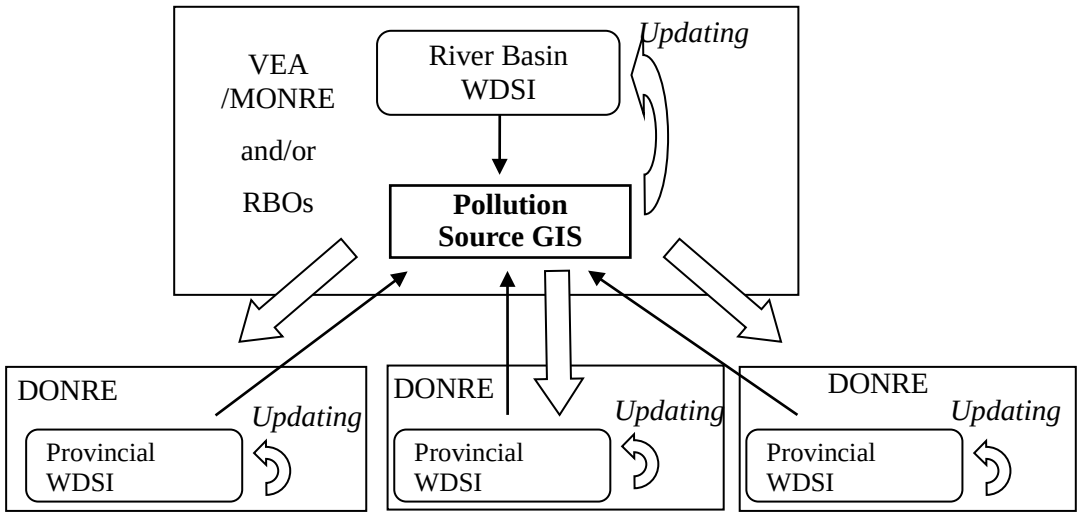


Figure C-16 Sharing and Updating of Wastewater Discharge Source Inventory (Idea)

C-7. Quality Control (QC)[3]

Quality Control (QC) activities should be implemented on the following procedures for development of the River Basin WDSI. Items to be checked are as follows.

(A) Preparatory Work

- ❑ Are the types of target pollution sources targeted adequate to achieve scope of inventory?
- ❑ Are the survey area and time schedule for data and information collection suitable considering available resources?

(B) Collection of Data and Information

- ❑ Are the information and data collection measures adopted suitable considering type of pollution sources targeted?
- ❑ Does the source survey format have questions on all of information to be collected?
- ❑ Is the source survey format suitable for the type of pollution sources targeted?
- ❑ Is the source survey format user-friendly for inventory surveyors?
- ❑ Can the source survey format be used to check reliability of data and information collected?
- ❑ Is reliability of collected data checked?

(C) Complication and Arrangement of Data

- ❑ Do not the digitizing of data and information collected have mistaken?
- ❑ Are the measures adopted for complication and arrangement of data and information suitable to satisfy scope of the River Basin WDSI?

The QC is the overall system of routine technical activities that are designed to measure and control the quality of the River Basin WDSI as it is being developed. Quality assurance (QA) is an integrated system or program of activities involving planning, QC, quality assessment, reporting, and quality

3 Quality Control – QC comprises the activities undertaken by all members of the inventory team during the inventory preparation that will result in the correction of specific problems such as mistaken assumptions, lost or uncollected data, and calculation and data entry errors. (EPA)

improvements which are designed to help ensure that the inventory meets the data quality goals or objectives established prior to developing the River Basin WDSI.

The main objective of any QC for the River Basin WDSI is the development of precision, accuracy, adequacy, useful and reliable data. Therefore, the development of a reasonable and comprehensive Wastewater Discharge Source Inventory requires the implementation of QC procedures throughout the entire inventory process. These procedures should be applied consistently by the state or local agency in preparing or reviewing inventories

Quality Control (QC)

Quality control is the performance of standardized activities during the course of inventory preparation to ensure data quality. Quality control activities include technical reviews, accuracy checks, and the use of approved standardized procedures for discharges calculations. These internal activities are designed to provide the first level of quality checking and should be included in inventory development planning, data collection, data analysis, discharges calculation, and reporting. In order to achieve the objectives of QC of WDSI, the standardized QC checklists are commonly used. The procedures and tasks to be checked by the QC checklist are as follows:

- Data collection,
- Data calculation,
- Discharge estimations,
- Data validity,
- Data reasonableness,
- Data completeness,
- Data coding and recording, and
- Data tracking

The checklist includes questions concerning completeness (e.g., questions whether all the pollution sources are covered?); use of approved procedures (e.g., questions as to what pollution load units were used to estimate wastewater discharge loads); and reasonableness (e.g., data collected or estimated are considered to be representative one?). Example of QC checklist is attached in Attachment-2.

Attachments

Attachment-1

Source Survey Format

This questionnaire intends to collect data and information for grasping pollution load and wastewater information to the (*Target river*) system. The data and information collected shall be used exclusively for development and implementation of the relevant environmental conservation activities in the basin. Respondents are kindly requested to reply to respective questions, as accurately as possible. Thank you very much for your corporation in advance.

FACTORY QUESTIONAIRE

I. General information

1. Name of Factory: .....

2. Address:

i) Province/city: …….…… Province/city Code(1): ☐☐

ii) District: …….…….…… District Code (1): ☐☐☐

ii) Commune/ward: ……... Commune/ward Code (1): ☐☐☐☐☐

iv) Hamlet/street/road: .....

3. Coordinate*1: i) Latitude:…… ii) Longitude: …… iii) Elevation:.....

4. Name of Owner:.....

Telephone…… Fax:…… Website:.....

5. Name of Staff in charge of environment: .....

Telephone…… Fax:…… E-mail Address:.....

II. Facility information

1. Established year: .....

2. Business license No.: .....

3. Facility Type (2): ……..…… VSIC 2007 (2): C-☐☐☐☐

4. Ownership (Business Type):

☐ 1) Government ☐ 2) Joint-stock company ☐ 3) Limited company

☐ 4) Join venture company ☐ 5) 100% foreign capital ☐ 6) Others

5. Factory Scale

i) Total area (allocated area): ..... (m^2)

*1 The position of outlet of discharge water.

ii) The number of employees: .....(people)
iii) Annual turnover:.....VND/year (2015)

6. Government that is being managed: [☐National, ☐Provincial, ☐ District, ☐ Commune]

7. Operation condition:

Operation status (2015)	QI Jan.-Mar.	QII Apr.-Jul.	QIII Aug.-Sep.	QIV Oct..-Dec.
7.1. Average working days in each quarter (days/month)				
7.2. Average daily working hours in each quarter (hour / day)				

8. Material consumption for production in factory (2015)

8.1. Water (monthly average)	
Amount of Water Consumption	**Amount of effluent discharged**
a) Domestic water supply:….. m^3/day	A) Process water:….m^3/day
b) Underground water from private well:…..m^3/day	B) Cooling water: …… m^3/day
c) River, lake, pond, and stream water:… m^3/day Name of river/stream: ……	C) Domestic water:…….. m3/day
d) Other water resource : …… m^3/day	D) Others: …….. m^3/day
e) Total water consumption : …… m^3/day	E) Total water discharged: …. m^3/day

8.2 Fluctuation of water usage:	Maximum	Average	Minimum
	m^3/ month (%)	m^3/ month (100%)	m^3/ month (%)

8.3. Average electricity consumption: .....kWh/month.

8.4. Others fuel	Diesel:… …...(l/month)	Coal:…...(ton/month)	Gas:… …(ton/month)
8.5. Others materials/ chemicals	1)…….(……/ month)	2)… ….....(……/month)	3)……...(……/ month)
	4)…….(……/ month)	5)……...(……/ month)	6)……...(……/ month)

9. Main Productions (2015)

1)……....(……/ month)	2)……....(……/ month)	3)……....(……/ month)

4)……....(……/ month)	5)……....(……/ month)	6)……....(……/ month)

10. Production technology diagram (Please show the main production network system in a schematic diagram. Please attach the diagram (s) if you have.)

III. Environmental information

1. Wastewater

1.1. Total wastewater flow: ……(m^3/day) ……(m^3/month)
a. Production wastewater: ……(m^3/day) ……(m^3/month)
b. Domestic wastewater: ……(m^3/day) ……(m^3/month)
c. Other wastewater: ……(m^3/day) ……(m^3/month)

1.2. Rainfall and wastewater separation system: ☐ Yes ☐ No

1.3. Wastewater treatment system: ☐ Yes ☐ No

a. Type of wastewater treatment work:

☐ A)Neutralization/ Adjusting	☐ B) Sedimentation	☐ C) Floatation	☐ D) Sand filtration
☐ E) Absorption by activated carbon	☐ F) Oil separator	☐ G) Activated sludge	☐ H) Other biological treatment
☐ I) Trickling filtration	☐ J) Aeration pond	☐ K) Anaerobic digestion	☐ L) Other treatment

b. Description of treatment system (Please show the wastewater discharge network system in a schematic diagram (please attach the diagram(s) if you have.)

d. Operating costs of wastewater treatment system:.....(million VND/month)

1.4. Facility does regular wastewater quality monitoring (Self-monitoring):
☐ Yes ☐ No ☐ Occasionally

a. Facility submitting self-monitoring report to state agency (e.g. District DONRE):
☐ Yes ☐ No

b. Monitoring frequency: [☐ 4 time/year, ☐ 2 time/year, ☐ 1time/year, ☐ Other ( )

c. Monitoring result: (*Please enter the analytical result from latest self-monitoring report and attach it on this questionnaire)*

Date monitored (Month/Year): (/)

pH		**mg/L**	**BOD_5**		**mg/L**	**COD_{Cr}**		**mg/L**	**TSS**		**mg/L**
EC		**μ S/cm**	**NH_3-N**		**mg/L**	**NO_3**		**mg/L**	**NO_2**		**mg/L**
PO_4		**mg/L**	**TP**		**mg/L**	**TN**		**mg/L**	**Cr(III)**		**mg/L**
Cr(VI)		**mg/L**	**CN**		**mg/L**	**Pb**		**mg/L**	**Cd**		**mg/L**
As		**mg/L**	**Oil & Grease**		**mg/L**	**Total Coliform**		**(CFU/ 100ml)**	**Zn**		**mg/L**
Ni		**mg/L**	**Mn**		**mg/L**	**Fe**		**mg/L**	**Hg**		**mg/L**

d. Monitoring, and analysis organization

.....

1.5. Wastewater receiver (Discharge to):

☐ [SW]: Sewerage Network ☐ [DI]: Drainage system inside the factory ☐ [DO]: Drainage system outside the factory

☐ [RV]: River/Stream directly ☐ [LI]: Land (infiltration) ☐ [OT]Other (……)

2. Environment fee (Along the Decree No.25/2013/ND-CP, Environmental protection charge for wastewater)

The amount that facility has paid for wastewater (VND/3 month, or VND/year)

3. Environmental licenses

- SEA/EIA report	☐ Yes	☐ No	☐ Not required
- Post EIA report (to check environmental facilities described in EIA Report)	☐ Yes	☐ No	
- Environment protection commitment	☐ Yes	☐ No	☐ Not required
- Environment protection project	☐ Yes	☐ No	☐ Not required
- Registration of waste generator	☐ Yes	☐ No	
- Water resource use certificate	☐ Yes	☐ No	☐ Not required
- Wastewater discharge permit	☐ Yes	☐ No	
- ISO 14001	☐ Yes	☐ No	
- Others (*if any,*…….....)	☐ Yes	☐ No	

Instructions:
(1): Province/city, District, Commune/ward Code is referred from Decision No. 124/2004/QĐ-TTg.
e.g. Binh Duong Province: 74, Di An District: 724, Binh Thang ward: 25954

(2): Vietnamese Standard Industrial Classification (VSIC). Use one of the codes below and the attached list to describe the facility (Questionnaire surveyor will instruct to questionee).
A – Agriculture, Forestry and Fishery include livestock
B – Mining
C – Industrial Processing and Manufacture
E – Water Supply, Wastewater and Garbage Management and Treatment
Q – Medical and Social Support Activities

Questionee

(Signature and full name)

Source Survey Format

This questionnaire intends to collect data and information for grasping pollution load and wastewater information to the (*Target river*) system. The data and information collected shall be used exclusively for development and implementation of the relevant environmental conservation activities in the basin. Respondents are kindly requested to reply to respective questions, as accurately as possible. Thank you very much for your corporation in advance.

INDUSTRIAL ZONE (IZ)/ INDUSTRIAL CLUSTER (IC) QUESTIONNAIRE

I. General information

1. Facility name:.....

2. Address:

i) Province/city: ……..…..… Province/city Code(1): ☐☐

ii) District: ……..……..……..… District Code (1): ☐☐☐

ii) Commune/ward: ……... Commune/ward Code (1): ☐☐☐☐☐

iv) Hamlet/street/road: .....

3. Coordinate*[1]: Latitude:…… Longitude: …… Elevation: .....

4. Name of Investor/ Owner: .....

Telephone……. Fax:…… Website:.....

5. Name of Staff in charge of environment: .....

Telephone……. Fax:…… E-mail Address:.....

II. Facility information

1. Established year: .....

2. Business license No.: .....

3. Ownership (Business Type):

☐ 1) Government ☐ 2) Joint-stock company ☐ 3) Limited company

☐ 4) Join venture company ☐ 5) 100% foreign capital ☐ 6) Others

4. Operation Scale

i) Total area (allocated area): ..... (m^2)
ii) The number of operated enterprises in IZ/IC: ..... (Enterprises)
iii) Annual turnover:.....VND/year (2015)

*[1] The position of outlet of central wastewater treatment system's discharge water.

iv) Percentage land leaving in IZ:..... (%)

5. Type of Main Productions:.....

6. Water and electricity consumption for whole factory (inside IZ/IC) (2015)

6.1. Water (monthly average)	
Amount of Water Consumption	**Amount of effluent discharged**
a) Domestic water supply:….. m^3/day	A) Process water:….m^3/day
b) Underground water from private well:…..m^3/day	B) Cooling water: …… m^3/day
c) River, lake, pond, and stream water:… m^3/day Name of river/stream: ……	C) Domestic water:…….. m3/day
d) Other water resource : …… m^3/day	D) Others: …….. m^3/day
e) Total water consumption : …… m^3/day	E) Total water discharged: …. m^3/day

6.2 Fluctuation of water usage:	Maximum	Average	Minimum
	m^3/ month (%)	m^3/ month (100%)	m^3/ month (%)

6.3. Average electricity consumption: .....kWh/month.

6.4. Others fuel	Diesel:… …...(l/month)	Coal:…...(ton/month)	Gas:… …(ton/month)
6.5. Others materials/ chemicals	1)…….(……/ month)	2)… …....(……/month)	3)……...(…….…/ month)
	4)…….(……/ month)	5)……...(……/ month)	6)……...(……/ month)

III. Environment information

1. Wastewater

1.1. Total wastewater flow: ……(m^3/day) ……(m^3/month)
a. Production wastewater: ……(m^3/day) ……(m^3/month)
b. Domestic wastewater: ……(m^3/day) ……(m^3/month)
c. Other wastewater: ……(m^3/day) ……(m^3/month)

1.2. Rainfall and wastewater separation system: ☐ Yes ☐ No

1.3. Centralized treatment of wastewater treatment system of IZ: ☐ Yes ☐ No

a. Effective treatment of wastewater treatment system: ..... (%)

b. Type of wastewater treatment work:

☐ A)Neutralization/ Adjusting	☐ B) Sedimentation	☐ C) Floatation	☐ D) Sand filtration
☐ E) Absorption by activated carbon	☐ F) Oil separator	☐ G) Activated sludge	☐ H) Other biological treatment
☐ I) Trickling filtration	☐ J) Aeration pond	☐ K) Anaerobic digestion	☐ L) Other treatment

c. Description of treatment system (Please show the wastewater discharge network

system in a schematic diagram (please attach the diagram(s) if you have.)

d. Operating costs of wastewater treatment system:.....(million VND/month)

1.4. Facility does regular wastewater quality monitoring (Self-monitoring):

☐ Yes ☐ No ☐ Occasionally

a. Facility submitting self-monitoring report to state agency (e.g. District DONRE):

☐ Yes ☐ No

b. Monitoring frequency: [☐ 4 time/year, ☐ 2 time/year, ☐ 1time/year, ☐ Other ( )

c. Monitoring result: (*Please enter the analytical result from latest self-monitoring report and attach it on this questionnaire)*

Date monitored (Month/Year): (/)

pH		**mg/L**	**BOD_5**		**mg/L**	**COD_{Cr}**		**mg/L**	**TSS**		**mg/L**
EC		**μS/cm**	**NH_3-N**		**mg/L**	**NO_3**		**mg/L**	**NO_2**		**mg/L**
PO_4		**mg/L**	**TP**		**mg/L**	**TN**		**mg/L**	**Cr(III)**		**mg/L**
Cr(VI)		**mg/L**	**CN**		**mg/L**	**Pb**		**mg/L**	**Cd**		**mg/L**
As		**mg/L**	**Oil & Grease**		**mg/L**	**Total Coliform**		**(CFU/ 100ml)**	**Zn**		**mg/L**
Ni		**mg/L**	**Mn**		**mg/L**	**Fe**		**mg/L**	**Hg**		**mg/L**

d. Monitoring, and analysis organization .....

1.5. Wastewater receiver (Discharge to):

☐ [SW]: Sewerage Network ☐ [DI]: Drainage system inside the factory ☐ [DO]: Drainage system outside the factory

☐ [RV]: River/Stream directly ☐ [LI]: Land (infiltration) ☐ [OT]Other (……)

2. Environment fee (Along the Decree No.25/2013/ND-CP, Environmental protection charge for wastewater)

The amount that facility has paid for wastewater (……VND/3 month, or……VND/year)

3. Environmental licenses

- SEA/EIA report	☐ Yes	☐ No	☐ Not required
- Post EIA report (to check environmental facilities described in EIA Report)	☐ Yes	☐ No	
- Environment protection commitment	☐ Yes	☐ No	☐ Not required
- Environment protection project	☐ Yes	☐ No	☐ Not required
- Registration of waste generator	☐ Yes	☐ No	
- Water resource use certificate	☐ Yes	☐ No	☐ Not required
- Wastewater discharge permit	☐ Yes	☐ No	
- ISO 14001	☐ Yes	☐ No	
- Others (*if any,*…….....)	☐ Yes	☐ No	

Instructions:
(1): Province/city, District, Commune/ward Code is referred from Decision No. 124/2004/QĐ-TTg.
e.g. Binh Duong Province: 74, Di An District: 724, Binh Thang ward: 25954

(2): Vietnamese Standard Industrial Classification (VSIC). Use one of the codes below and the attached list to describe the facility (Questionnaire surveyor will instruct to questionee).
A – Agriculture, Forestry and Fishery include livestock
B – Mining
C – Industrial Processing and Manufacture
E – Water Supply, Wastewater and Garbage Management and Treatment
Q – Medical and Social Support Activities

Questionee

(Signature and full name)

Source Survey Format

This questionnaire intends to collect data and information for grasping pollution load and wastewater information to the (*Target river*) system. The data and information collected shall be used exclusively for development and implementation of the relevant environmental conservation activities in the basin. Respondents are kindly requested to reply to respective questions, as accurately as possible. Thank you very much for your corporation in advance.

MINING AREA QUESTIONAIRE

I. General information

1. Name of Facility: .....

2. Address:

i) Province/city: ……..…..… Province/city Code(1): ☐☐

ii) District: ……..……..……..… District Code (1): ☐☐☐

ii) Commune/ward: ……... Commune/ward Code (1): ☐☐☐☐☐

iv) Hamlet/street/road: .....

3. Coordinate*1: i) Latitude:…… ii) Longitude: …… iii) Elevation:.....

4. Name of Owner (Organizer operating Facility):.....

Address of Head office: .....

Telephone……. Fax:…… Website:.....

5. Name of Staff in charge of environment: .....

Telephone……. Fax:…… E-mail Address:.....

II. Facility information

1. Established year: .....

2. Business license No.: .....

3. Facility Type (2): ……..……. VSIC 2007 (2): B-☐☐☐☐

4. Type of Industry:

☐ 1) Exploitation and Collection ☐ 2) Dressing ☐ 3) Smelting ☐ 4) Other

5. Ownership (Business Type):

☐ 1) Government ☐ 2) Joint-stock company ☐ 3) Limited company

☐ 4) Join venture company ☐ 5) 100% foreign capital ☐ 6) Others

*1 The position of outlet of discharge water.

5. Factory Scale
i) Total area (allocated area): .....(m^2)
ii) The number of employees: .....(people)
iii) Annual turnover:.....VND/year (2015)

6. Government that is being managed: [☐National, ☐Provincial, ☐ District, ☐ Commune]

7. Operation condition:

Operation status (Year of 2015)	QI Jan.-Mar.	QII Apr.-Jul.	QIII Aug.-Sep.	QIV Oct..-Dec.
7.1. Average working days in each quarter (days/month)				
7.2. Average daily working hours in each quarter (hour / day)				

8. Material consumption for production in factory (2015)

8.1. Water (monthly average)

Amount of Water Consumption	**Amount of effluent discharged**
a) Domestic water supply:….. m^3/day	A) Process water:….m^3/day
b) Underground water from private well:…..m^3/day	B) Cooling water: …… m^3/day
c) River, lake, pond, and stream water:… m^3/day Name of river/stream: ……	C) Domestic water:…….. m3/day
d) Other water resource : …… m^3/day	D) Others: …….. m^3/day
e) Total water consumption : …… m^3/day	E) Total water discharged: …. m^3/day

8.2 Fluctuation of water usage:	Maximum	Average	Minimum
	m^3/ month (%)	m^3/ month (100%)	m^3/ month (%)

8.3. Average electricity consumption: .....kWh/month.

8.4. Others fuel	Diesel:… …...(l/month)	Coal:…...(ton/month)	Gas:… …(ton/month)
8.5. Others materials/ chemicals	1)…….(……/ month)	2)… ….....(……/month)	3)……...(…….…/ month)
	4)…….(……/ month)	5)……...(……/ month)	6)……...(……/ month)

9. Main Productions (2015)

1)……....(……/ month)	2)……....(……/ month)	3)……....(……/ month)

4)……....(……/ month)	5)……....(……/ month)	6)……....(……/ month)

10. Production technology diagram (Please show the main production network system in a schematic diagram. Please attach the diagram (s) if you have.)

III. Environmental information

1. Wastewater

1.1. Total wastewater flow: ……(m^3/day) ……(m^3/month)
a. Production wastewater: ……(m^3/day) ……(m^3/month)
b. Domestic wastewater: ……(m^3/day) ……(m^3/month)
c. Other wastewater: ……(m^3/day) ……(m^3/month)

1.2. Rainfall and wastewater separation system: ☐ Yes ☐ No

1.3. Wastewater treatment system: ☐ Yes ☐ No

a. Type of wastewater treatment work:

☐ A)Neutralization/ Adjusting	☐ B) Sedimentation	☐ C) Floatation	☐ D) Sand filtration
☐ E) Absorption by activated carbon	☐ F) Oil separator	☐ G) Activated sludge	☐ H) Other biological treatment
☐ I) Trickling filtration	☐ J) Aeration pond	☐ K) Anaerobic digestion	☐ L) Other treatment

b. Description of treatment system (Please show the wastewater discharge network system in a schematic diagram (please attach the diagram(s) if you have.)

d. Operating costs of wastewater treatment system:.....(million VND/month)

1.4. Facility does regular wastewater quality monitoring (Self-monitoring):
☐ Yes ☐ No ☐ Occasionally

a. Facility submitting self-monitoring report to state agency (e.g. District DONRE):
☐ Yes ☐ No

b. Monitoring frequency: [☐ 4 time/year, ☐ 2 time/year, ☐ 1time/year, ☐ Other ( )

c. Monitoring result: (*Please enter the analytical result from latest self-monitoring report and attach it on this questionnaire)*

Date monitored (Month/Year): (/)

pH		**mg/L**	**BOD_5**		**mg/L**	**COD_{Cr}**		**mg/L**	**TSS**		**mg/L**

EC		**μ S/cm**	**NH_3-N**		**mg/L**	**NO_3**		**mg/L**	**NO_2**		**mg/L**
PO_4		**mg/L**	**TP**		**mg/L**	**TN**		**mg/L**	**Cr(III)**		**mg/L**
Cr(VI)		**mg/L**	**CN**		**mg/L**	**Pb**		**mg/L**	**Cd**		**mg/L**
As		**mg/L**	**Oil & Grease**		**mg/L**	**Total Coliform**		**(CFU/ 100ml)**	**Zn**		**mg/L**
Ni		**mg/L**	**Mn**		**mg/L**	**Fe**		**mg/L**	**Hg**		**mg/L**

d. Monitoring, and analysis organization .....

1.5. Wastewater receiver (Discharge to):

☐ [SW]: Sewerage Network ☐ [DI]: Drainage system inside the factory ☐ [DO]: Drainage system outside the factory

☐ [RV]: River/Stream directly ☐ [LI]: Land (infiltration) ☐ [OT]Other (……)

2. Environment fee (Along the Decree No.25/2013/ND-CP, Environmental protection charge for wastewater)

The amount that facility has paid for wastewater (……VND/3 month, or……VND/year)

3. Environmental licenses

- SEA/EIA report	☐ Yes	☐ No	☐ Not required
- Post EIA report (to check environmental facilities described in EIA Report)	☐ Yes	☐ No	
- Environment protection commitment	☐ Yes	☐ No	☐ Not required
- Environment protection project	☐ Yes	☐ No	☐ Not required
- Registration of waste generator	☐ Yes	☐ No	
- Water resource use certificate	☐ Yes	☐ No	☐ Not required
- Wastewater discharge permit	☐ Yes	☐ No	
- ISO 14001	☐ Yes	☐ No	
- Others (*if any,*…….....)	☐ Yes	☐ No	

Instructions:

(1): Province/city, District, Commune/ward Code is referred from Decision No. 124/2004/QĐ-TTg.

e.g. Binh Duong Province: 74, Di An District: 724, Binh Thang ward: 25954

(2): Vietnamese Standard Industrial Classification (VSIC). Use one of the codes below and the attached list to describe the facility (Questionnaire surveyor will instruct to questionee).

A – Agriculture, Forestry and Fishery include livestock
B – Mining
C – Industrial Processing and Manufacture
E – Water Supply, Wastewater and Garbage Management and Treatment
Q – Medical and Social Support Activities

Questionee

(Signature and full name)

Source Survey Format

This questionnaire intends to collect data and information for grasping pollution load and wastewater information to the (*Target river*) system. The data and information collected shall be used exclusively for development and implementation of the relevant environmental conservation activities in the basin. Respondents are kindly requested to reply to respective questions, as accurately as possible. Thank you very much for your corporation in advance.

CRAFT VILLAGE QUESTIONNAIRE

I. General information

1. Name of Craft Village:.....

2. Address:

i) Province/city: ……..…….… Province/city Code(1): ☐☐

ii) District: ……..……..……..… District Code (1): ☐☐☐

ii) Commune/ward: ……... Commune/ward Code (1): ☐☐☐☐☐

iv) Hamlet/street/road: .....

3. Coordinate*1: i) Latitude:…… ii) Longitude: …… iii) Elevation:.....

4. Name of Leader: .....

Telephone…….…… Fax: .....

5. Name of Staff in charge of environment (*if any*):.....

Telephone……. Fax:…… E-mail Address:.....

6. Year recognition:.....

7. Profession:

☐ 1) Livestock, food, slaughter processing	☐ 2) Textile, dyeing, silk, tanning leather	☐ 3) Construction material and stone exploitation
☐ 4) Handicraft	☐ 5) Recycling scrap	☐ 6) Others

7. Total area of Village:..... (m^2)

II. Craft village operation information

1. Total household in village:..... (household)
2. Total Households engaged in manufacturing: …… (household); including ..... (%)
3. Total employees engaged in manufacturing: ..... (people)
4. Annual turnover: ..... VND/year (2015)

*1 The position of outlet of discharge water.

5. Production form: ☐ Centralized production ☐ Dispersed families

6. Current status of technology, and equipment

☐ Manual, Semi-mechanics ☐ Mechanics ☐ Automation

7. Operation condition:

Operation status (2015)	QI Jan.-Mar.	QII Apr.-Jul.	QIII Aug.-Sep.	QIV Oct..-Dec.
7.1. Average working days in each quarter (days/month)				
7.2. Average daily working hours in each quarter (hour / day)				

8. Material consumption for production in factory (2015)

8.1. Water (monthly average)	
Amount of Water Consumption	**Amount of effluent discharged**
a) Domestic water supply:….. m^3/day	A) Process water:….m^3/day
b) Underground water from private well:…..m^3/day	B) Cooling water: …… m^3/day
c) River, lake, pond, and stream water:… m^3/day Name of river/stream: ……	C) Domestic water:…….. m3/day
d) Other water resource : …… m^3/day	D) Others: …….. m^3/day
e) Total water consumption : …… m^3/day	E) Total water discharged: …. m^3/day

8.2 Fluctuation of water usage:	Maximum	Average	Minimum
	m^3/ month (%)	m^3/ month (100%)	m^3/ month (%)

8.3. Average electricity consumption: .....kWh/month.

8.4. Others fuel	Diesel:… …...(l/month)	Coal:…...(ton/month)	Gas:… …(ton/month)
8.5. Others materials/ chemicals	1)…….(……/ month)	2)… ….....(……/month)	3)……...(…….…/ month)
	4)…….(……/ month)	5)……...(……/ month)	6)……...(……/ month)

9. Main Productions (2015)

1)……....(……/ month)	2)……....(……/ month)	3)……....(……/ month)
4)……....(……/ month)	5)……....(……/ month)	6)……....(……/ month)

10. Production technology diagram (Please show the main production network system in a schematic diagram. Please attach the diagram (s) if you have.)

III. Environment information

1. Wastewater

1.1. Total wastewater flow: ……(m^3/day) ……(m^3/month)
a. Production wastewater: ……(m^3/day) ……(m^3/month)
b. Domestic wastewater: ……(m^3/day) ……(m^3/month)
c. Other wastewater: ……(m^3/day) ……(m^3/month)

1.2. Wastewater treatment system for craft village: ☐ Yes ☐ No

a. Type of wastewater treatment work:

☐ A)Neutralization/ Adjusting	☐ B) Sedimentation	☐ C) Floatation	☐ D) Sand filtration
☐ E) Absorption by activated carbon	☐ F) Oil separator	☐ G) Activated sludge	☐ H) Other biological treatment
☐ I) Trickling filtration	☐ J) Aeration pond	☐ K) Anaerobic digestion	☐ L) Other treatment

b. Description of treatment system (Please show the wastewater discharge network system in a schematic diagram (please attach the diagram(s) if you have.)

d. Operating costs of wastewater treatment system:.....(million VND/month)

1.4. Facility does regular wastewater quality monitoring (Self-monitoring):
☐ Yes ☐ No ☐ Occasionally

a. Facility submitting self-monitoring report to state agency (e.g. District DONRE):
☐ Yes ☐ No

b. Monitoring frequency: [☐ 4 time/year, ☐ 2 time/year, ☐ 1time/year, ☐ Other ( )

c. Monitoring result: (*Please enter the analytical result from latest self-monitoring report and attach it on this questionnaire)*

Date monitored (Month/Year): (/)

pH		**mg/L**	**BOD_5**		**mg/L**	**COD_{Cr}**		**mg/L**	**TSS**		**mg/L**
EC		**μ S/cm**	**NH_3-N**		**mg/L**	**NO_3**		**mg/L**	**NO_2**		**mg/L**
PO_4		**mg/L**	**TP**		**mg/L**	**TN**		**mg/L**	**Cr(III)**		**mg/L**
Cr(VI)		**mg/L**	**CN**		**mg/L**	**Pb**		**mg/L**	**Cd**		**mg/L**
As		**mg/L**	**Oil & Grease**		**mg/L**	**Total Coliform**		**(CFU/ 100ml)**	**Zn**		**mg/L**
Ni		**mg/L**	**Mn**		**mg/L**	**Fe**		**mg/L**	**Hg**		**mg/L**

d. Monitoring, and analysis organization .....

1.5. Wastewater receiver (Discharge to):

☐ [SW]: Sewerage Network	☐ [DI]: Drainage system inside the factory	☐ [DO]: Drainage system outside the factory
☐ [RV]: River/Stream directly	☐ [LI]: Land (infiltration)	☐ [OT]Other (……)

Instructions:
(1): Province/city, District, Commune/ward Code is referred from Decision No. 124/2004/QĐ-TTg.
e.g. Binh Duong Province: 74, Di An District: 724, Binh Thang ward: 25954

(2): Vietnamese Standard Industrial Classification (VSIC). Use one of the codes below and the attached list to describe the facility (Questionnaire surveyor will instruct to questionee).
A – Agriculture, Forestry and Fishery include livestock
B – Mining
C – Industrial Processing and Manufacture
E – Water Supply, Wastewater and Garbage Management and Treatment
Q – Medical and Social Support Activities

Questionee

(Signature and full name)

Source Survey Format

This questionnaire intends to collect data and information for grasping pollution load and wastewater information to the (*Target river*) system. The data and information collected shall be used exclusively for development and implementation of the relevant environmental conservation activities in the basin. Respondents are kindly requested to reply to respective questions, as accurately as possible. Thank you very much for your corporation in advance.

LIVESTOCK FACILITY QUESTIONAIRE

I. General information

1. Name of Company: .....

2. Address:

i) Province/city: ……..…..… Province/city Code(1): ☐☐

ii) District: ……..……..……..… District Code (1): ☐☐☐

ii) Commune/ward: ……... Commune/ward Code (1): ☐☐☐☐☐

iv) Hamlet/street/road: .....

3. Coordinate*1: i) Latitude:…… ii) Longitude: …… iii) Elevation:.....

4. Name of Owner:.....

Telephone…… Fax:…… Website:.....

5. Name of Staff in charge of environment: .....

Telephone…… Fax:…… E-mail Address:.....

II. Facility information

1. Established year: .....

2. Business license No.: .....

3. Facility Type (2): ……..……. VSIC 2007 (2): A-☐☐☐☐

4. Ownership (Business Type):

☐ 1) Government ☐ 2) Joint-stock company ☐ 3) Limited company

☐ 4) Join venture company ☐ 5) 100% foreign capital ☐ 6) Others

5. Facility Scale

i) Total area (allocated area): .....(m^2)

ii) The number of employees:.....(people)

*1 The position of outlet of discharge water.

iii) Annual turnover:.....VND/year (2015)

6. Government that is being managed: [☐National, ☐Provincial, ☐ District, ☐ Commune]

7. Material consumption for production in factory (2015)

7.1. Water (monthly average)	
Amount of Water Consumption	**Amount of effluent discharged**
a) Domestic water supply:….. m^3/day	A) Process water:….m^3/day
b) Underground water from private well:…..m^3/day	B) Cooling water: …… m^3/day
c) River, lake, pond, and stream water:… m^3/day Name of river/stream: ……	C) Domestic water:…….. m3/day
d) Other water resource : …… m^3/day	D) Others: …….. m^3/day
e) Total water consumption : …… m^3/day	E) Total water discharged: …. m^3/day

7.2 Fluctuation of water usage:	Maximum	Average	Minimum
	m^3/ month (%)	m^3/ month (100%)	m^3/ month (%)

7.3. Average electricity consumption: .....kWh/month.

7.4. Others fuel	Diesel:… …...(l/month)	Coal:…...(ton/month)	Gas:… …(ton/month)
7.5. Others materials/ chemicals	1)…….(……/ month)	2)… ….....(……/month)	3)……...(…….…/ month)
	4)…….(……/ month)	5)……...(……/ month)	6)……...(……/ month)

8. Number of Livestock (2015)

1) Cattle: ……..…… 2) Pig: …… Head 3) Horse:…..…… Head
4) Fowl: …...…… 5) Sheep: …… Head 6) Others: …… Head

III. Environmental information

1. Wastewater

1.1. Total wastewater flow: ……(m^3/day) ……(m^3/month)
a. Production wastewater: ……(m^3/day) ……(m^3/month)
b. Domestic wastewater: ……(m^3/day) ……(m^3/month)
c. Other wastewater: ……(m^3/day) ……(m^3/month)

1.2. Rainfall and wastewater separation system: ☐ Yes ☐ No

1.3. Wastewater treatment system: ☐ Yes ☐ No

a. Type of wastewater treatment work:

☐ A)Neutralization/ Adjusting	☐ B) Sedimentation	☐ C) Floatation	☐ D) Sand filtration
☐ E) Absorption by activated carbon	☐ F) Oil separator	☐ G) Activated sludge	☐ H) Other biological treatment
☐ I) Trickling filtration	☐ J) Aeration pond	☐ K) Anaerobic digestion	☐ L) Other treatment

b. Description of treatment system (Please show the wastewater discharge network system in a schematic diagram (please attach the diagram(s) if you have.)

d. Operating costs of wastewater treatment system:.....(million VND/month)

1.4. Facility does regular wastewater quality monitoring (Self-monitoring):

☐ Yes ☐ No ☐ Occasionally

a. Facility submitting self-monitoring report to state agency (e.g. District DONRE):

☐ Yes ☐ No

b. Monitoring frequency: [☐ 4 time/year, ☐ 2 time/year, ☐ 1time/year, ☐ Other ( )

c. Monitoring result: (*Please enter the analytical result from latest self-monitoring report and attach it on this questionnaire)*

Date monitored (Month/Year): (/)

pH		**mg/L**	**BOD_5**		**mg/L**	**COD_{Cr}**		**mg/L**	**TSS**		**mg/L**
EC		**μ S/cm**	**NH_3-N**		**mg/L**	**NO_3**		**mg/L**	**NO_2**		**mg/L**
PO_4		**mg/L**	**TP**		**mg/L**	**TN**		**mg/L**	**Cr(III)**		**mg/L**
Cr(VI)		**mg/L**	**CN**		**mg/L**	**Pb**		**mg/L**	**Cd**		**mg/L**
As		**mg/L**	**Oil & Grease**		**mg/L**	**Total Coliform**		**(CFU/ 100ml)**	**Zn**		**mg/L**
Ni		**mg/L**	**Mn**		**mg/L**	**Fe**		**mg/L**	**Hg**		**mg/L**

d. Monitoring, and analysis organization

.....

1.5. Wastewater receiver (Discharge to):

☐ [SW]: Sewerage Network	☐ [DI]: Drainage system inside the factory	☐ [DO]: Drainage system outside the factory
☐ [RV]: River/Stream directly	☐ [LI]: Land (infiltration)	☐ [OT]Other (……)

2. Environment fee (Along the Decree No.25/2013/ND-CP, Environmental protection charge for wastewater)

The amount that facility has paid for wastewater (……VND/3 month, or……VND/year)

3. Environmental licenses

- SEA/EIA report ☐ Yes ☐ No ☐ Not required

- Post EIA report (to check environmental facilities described in EIA Report)	☐ Yes	☐ No	
- Environment protection commitment	☐ Yes	☐ No	☐ Not required
- Environment protection project	☐ Yes	☐ No	☐ Not required
- Registration of waste generator	☐ Yes	☐ No	
- Water resource use certificate	☐ Yes	☐ No	☐ Not required
- Wastewater discharge permit	☐ Yes	☐ No	
- ISO 14001	☐ Yes	☐ No	
- Others (*if any,*…….....)	☐ Yes	☐ No	

Instructions:
(1): Province/city, District, Commune/ward Code is referred from Decision No. 124/2004/QĐ-TTg.
e.g. Binh Duong Province: 74, Di An District: 724, Binh Thang ward: 25954

(2): Vietnamese Standard Industrial Classification (VSIC). Use one of the codes below and the attached list to describe the facility (Questionnaire surveyor will instruct to questionee).
A – Agriculture, Forestry and Fishery include livestock
B – Mining
C – Industrial Processing and Manufacture
E – Water Supply, Wastewater and Garbage Management and Treatment
Q – Medical and Social Support Activities

Questionee

(Signature and full name)

Source Survey Format

This questionnaire intends to collect data and information for grasping pollution load and wastewater information to the (*Target river*) system. The data and information collected shall be used exclusively for development and implementation of the relevant environmental conservation activities in the basin. Respondents are kindly requested to reply to respective questions, as accurately as possible. Thank you very much for your corporation in advance.

HEALTHCARE FACILITY QUESTIONNAIRE

I. General information

1. Name of Health care facility:.....

2. Address:

i) Province/city: ……..…..… Province/city Code(1): ☐☐

ii) District: ……..……..……..… District Code (1): ☐☐☐

ii) Commune/ward: ……... Commune/ward Code (1): ☐☐☐☐☐

iv) Hamlet/street/road: .....

3. Coordinate*1: i) Latitude:…… ii) Longitude: …… iii) Elevation:.....

4. Name of Owner:.....

Telephone…… Fax:…… Website:.....

5. Name of Staff in charge of environment: .....

Telephone…… Fax:…… E-mail Address:.....

II. Health care facility information

3. Managed by:

☐ Ministry of Health ☐ Province/City ☐ District

1. Established year: .....

2. Facility Type (2): ☐ General (Q- 8610)
☐ Special (specification)……VSIC 2007 (2): Q- ☐☐☐☐

3. Managed by:

☐ 1) Ministry of Health ☐ 2) Province/City ☐ 3) District ☐ 4) Others

4. Operation Scale

*1 The position of outlet of discharge water.

i) Total area (allocated area): .....(m^2)
ii) The number of beds:.....(bed)
iii) The number of employee: ..... (persons)

5. Material consumption for operating hospital (2015)

5.1. Water (monthly average)	
Amount of Water Consumption	**Amount of effluent discharged**
a) Domestic water supply:….. m^3/day	A) Clean and hygienic water:...m^3/day
b) Underground water from private well:…..m^3/day	B) Cooling water: …… m^3/day
c) River, lake, pond, and stream water:… m^3/day Name of river/stream: ……	C) Domestic water:…….. m3/day
d) Other water resource : …… m^3/day	D) Others: …….. m^3/day
e) Total water consumption : …… m^3/day	E) Total water discharged: …. m^3/day

5.2 Fluctuation of water usage:	Maximum	Average	Minimum
	m^3/ month (%)	m^3/ month (100%)	m^3/ month (%)

5.3. Average electricity consumption: .....kWh/month.			
5.4. Others fuel	Diesel:… …...(l/month)	Coal:…...(ton/month)	Gas:… …(ton/month)
5.5. Others materials/ chemicals	1)…….(……/ month)	2)… ….....(……/month)	3)……...(…….…/ month)
	4)…….(……/ month)	5)……...(……/ month)	6)……...(……/ month)

III. Environment information

1. Wastewater

1.1. Total wastewater flow: ……(m^3/day) ……(m^3/month)
a. Health wastewater: ……(m^3/day) ……(m^3/month)
b. Domestic wastewater: ……(m^3/day) ……(m^3/month)
c. Other wastewater: ……(m^3/day) ……(m^3/month)

1.2. Rainfall and wastewater separation system: ☐ Yes ☐ No

1.3. Drainage system of the hospital (if any, please attach on this questionnaire)

1.4. Hospital has centralized treatment of wastewater treatment system: ☐ Yes ☐ No

a. Type of wastewater treatment work:

☐ A)Neutralization/ Adjusting	☐ B) Sedimentation	☐ C) Floatation	☐ D) Sand filtration
☐ E) Absorption by activated carbon	☐ F) Oil separator	☐ G) Activated sludge	☐ H) Other biological treatment
☐ I) Trickling filtration	☐ J) Aeration pond	☐ K) Anaerobic digestion	☐ L) Other treatment

b. Description of treatment system (Please show the wastewater discharge network system in a schematic diagram (please attach the diagram(s) if you have.)

d. Operating costs of wastewater treatment system:.....(million VND/month)

1.5. Hospital does regular wastewater quality monitoring (Self-monitoring):

☐ Yes ☐ No ☐ Occasionally

a. Facility submitting self-monitoring report to state agency (e.g. District DONRE):

☐ Yes ☐ No

b. Monitoring frequency: [☐ 4 time/year, ☐ 2 time/year, ☐ 1time/year, ☐ Other ( )

c. Monitoring result: (*Please enter the analytical result from latest self-monitoring report and attach it on this questionnaire)*

Date monitored (Month/Year): (/)

pH		**mg/L**	**BOD_5**		**mg/L**	**COD_{Cr}**		**mg/L**	**TSS**		**mg/L**
EC		**μ S/cm**	**NH_3-N**		**mg/L**	**NO_3**		**mg/L**	**NO_2**		**mg/L**
PO_4		**mg/L**	**TP**		**mg/L**	**TN**		**mg/L**	**Cr(III)**		**mg/L**
Cr(VI)		**mg/L**	**CN**		**mg/L**	**Pb**		**mg/L**	**Cd**		**mg/L**
As		**mg/L**	**Oil & Grease**		**mg/L**	**Total Coliform**		**(CFU/ 100ml)**	**Zn**		**mg/L**
Ni		**mg/L**	**Mn**		**mg/L**	**Fe**		**mg/L**	**Hg**		**mg/L**

d. Monitoring, and analysis organization

.....

1.6. Wastewater receiver (Discharge to):

☐ [SW]: Sewerage Network	☐ [DI]: Drainage system inside the factory	☐ [DO]: Drainage system outside the factory
☐ [RV]: River/Stream directly	☐ [LI]: Land (infiltration)	☐ [OT]Other (……)

2. Environment fee (Along the Decree No.25/2013/ND-CP, Environmental protection charge for wastewater)

The amount that facility has paid for wastewater (……VND/3 month, or……VND/year)

3. Environmental licenses

- SEA/EIA report	☐ Yes	☐ No	☐ Not required
- Post EIA report (to check environmental facilities described in EIA Report)	☐ Yes	☐ No	
- Environment protection commitment	☐ Yes	☐ No	☐ Not required

- Environment protection project	☐ Yes	☐ No	☐ Not required
- Registration of waste generator	☐ Yes	☐ No	
- Water resource use certificate	☐ Yes	☐ No	☐ Not required
- Wastewater discharge permit	☐ Yes	☐ No	
- ISO 14001	☐ Yes	☐ No	
- Others (*if any,*…….....)	☐ Yes	☐ No	

Instructions:
(1): Province/city, District, Commune/ward Code is referred from Decision No. 124/2004/QĐ-TTg.
e.g. Binh Duong Province: 74, Di An District: 724, Binh Thang ward: 25954

(2): Vietnamese Standard Industrial Classification (VSIC). Use one of the codes below and the attached list to describe the facility (Questionnaire surveyor will instruct to questionee).
A – Agriculture, Forestry and Fishery include livestock
B – Mining
C – Industrial Processing and Manufacture
E – Water Supply, Wastewater and Garbage Management and Treatment
Q – Medical and Social Support Activities

Questionee

(Signature and full name)

Source Survey Format

This questionnaire intends to collect data and information for grasping pollution load and wastewater information to the (*Target river*) system. The data and information collected shall be used exclusively for development and implementation of the relevant environmental conservation activities in the basin. Respondents are kindly requested to reply to respective questions, as accurately as possible. Thank you very much for your corporation in advance.

SOLID WASTE DISPOSAL SITE QUESTIONAIRE

I. General information

1. Name of Facility: .....

2. Address:

i) Province/city: ……..…… Province/city Code(1): ☐☐

ii) District: ……..……..…… District Code (1): ☐☐☐

ii) Commune/ward: …….... Commune/ward Code (1): ☐☐☐☐☐

iv) Hamlet/street/road: .....

3. Coordinate*10: i) Latitude:…… ii) Longitude: …… iii) Elevation: .....

4. Name of Owner (Organizer operating Facility):.....

Address of Head office: .....

Telephone……. Fax:…… Website:.....

5. Name of Staff in charge of environment: .....

Telephone……. Fax:…… E-mail Address:.....

II. Facility information

1. Established year (Start operation):.....

2. Business license No.: .....

3. Type of waste disposal (2): ……..……. VSIC 2007 (2): E-382☐

4. Type of Wastes:

☐ 1) Domestic: ton, m^3/day☐ 2) Industrial: ton, m^3/day

☐ 3) Hospital: ton, m^3/day ☐ 4) Other: ton, m^3/day

5. Total area (allocated area):..... (m^2)

*10 The position of outlet of discharge water.

6. The number of employees:.....(people)

III. Environmental information

1. Wastewater

1.1. Total wastewater flow: ……(m^3/day) ……(m^3/month)
a. Leachate water (*if any*): ……(m^3/day) ……(m^3/month)
b. Domestic wastewater: ……(m^3/day) ……(m^3/month)
c. Other wastewater: ……(m^3/day) ……(m^3/month)

1.2. Leachate treatment facility: ☐ Yes (Exist) ☐ No (Not Exist)
If you have facilities, please answer following questions

a. Type of wastewater treatment work:

☐ A)Neutralization/ Adjusting	☐ B) Sedimentation	☐ C) Floatation	☐ D) Sand filtration
☐ E) Absorption by activated carbon	☐ F) Oil separator	☐ G) Activated sludge	☐ H) Other biological treatment
☐ I) Trickling filtration	☐ J) Aeration pond	☐ K) Anaerobic digestion	☐ L) Other treatment

b. Description of treatment system (Please show the wastewater discharge network system in a schematic diagram (please attach the diagram(s) if you have.)

d. Operating costs of wastewater treatment system:.....(million VND/month)

1.4. Facility does regular wastewater quality monitoring (Self-monitoring):
☐ Yes ☐ No ☐ Occasionally

a. Facility submitting self-monitoring report to state agency (e.g. District DONRE):
☐ Yes ☐ No
b. Monitoring frequency: [☐ 4 time/year, ☐ 2 time/year, ☐ 1time/year, ☐ Other ( )
c. Monitoring result: (*Please enter the analytical result from latest self-monitoring report and attach it on this questionnaire)*

Date monitored (Month/Year): (/)

pH		**mg/L**	**BOD_5**		**mg/L**	**COD_{Cr}**		**mg/L**	**TSS**		**mg/L**
EC		**μ S/cm**	**NH_3-N**		**mg/L**	**NO_3**		**mg/L**	**NO_2**		**mg/L**
PO_4		**mg/L**	**TP**		**mg/L**	**TN**		**mg/L**	**Cr(III)**		**mg/L**
Cr(VI)		**mg/L**	**CN**		**mg/L**	**Pb**		**mg/L**	**Cd**		**mg/L**
As		**mg/L**	**Oil & Grease**		**mg/L**	**Total Coliform**		**(CFU/ 100ml)**	**Zn**		**mg/L**
Ni		**mg/L**	**Mn**		**mg/L**	**Fe**		**mg/L**	**Hg**		**mg/L**

d. Monitoring, and analysis organization .....
1.5. Wastewater receiver (Discharge to):

☐ [SW]: Sewerage Network	☐ [DI]: Drainage system inside the factory	☐ [DO]: Drainage system outside the factory
☐ [RV]: River/Stream directly	☐ [LI]: Land (infiltration)	☐ [OT]Other (……)

2. Environment fee (Along the Decree No.25/2013/ND-CP, Environmental protection charge for wastewater)

The amount that facility has paid for wastewater (……VND/3 month, or……VND/year)

3. Environmental licenses

- SEA/EIA report	☐ Yes	☐ No	☐ Not required
- Post EIA report (to check environmental facilities described in EIA Report)	☐ Yes	☐ No	
- Environment protection commitment	☐ Yes	☐ No	☐ Not required
- Environment protection project	☐ Yes	☐ No	☐ Not required
- Registration of waste generator	☐ Yes	☐ No	
- Water resource use certificate	☐ Yes	☐ No	☐ Not required
- Wastewater discharge permit	☐ Yes	☐ No	
- ISO 14001	☐ Yes	☐ No	
- Others (*if any,*…….....)	☐ Yes	☐ No	

Instructions:

(1): Province/city, District, Commune/ward Code is referred from Decision No. 124/2004/QĐ-TTg.

e.g. Binh Duong Province: 74, Di An District: 724, Binh Thang ward: 25954

(2): Vietnamese Standard Industrial Classification (VSIC). Use one of the codes below and the attached list to describe the facility (Questionnaire surveyor will instruct to questionee).

A – Agriculture, Forestry and Fishery include livestock
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E – Water Supply, Wastewater and Garbage Management and Treatment
Q – Medical and Social Support Activities

Questionee

(Signature and full name)

Attachment-4

General QC Procedures for Inventory

QC Activity	Procedures
Check that assumptions and criteria for the selection of activity data, pollution load units, and other estimation parameters are documented.	Cross-check description of activity data, pollution load units and other estimation parameters with information on categories and ensure that these are properly recorded and archived.
Check for transcription errors in data input and references.	Confirm that bibliographical data references are properly cited in the internal documentation. Cross-check a sample of input data from each category (either measurements or parameters used in calculations) for transcription errors.
Check that discharges and removals are calculated correctly.	Reproduce a set of discharges and removal calculations. Use a simple approximation method that gives similar results to the original and more complex calculation to ensure that there is no data input error or calculation error.
Check that parameters and units are correctly recorded and that appropriate conversion factors are used.	Check that units are properly labeled in calculation sheets Check that units are correctly carried through from beginning to end of calculations. Check that conversion factors are correct. Check that temporal and spatial adjustment factors are used correctly.
Check the integrity of database files.	Examine the included intrinsic documentation to: confirm that the appropriate data processing steps are correctly represented in the database. confirm that data relationships are correctly represented in the database. ensure that data fields are properly labeled and have the correct design specifications. ensure that adequate documentation of database and model structure and operation are archived.
Check for consistency in data between categories.	Identify parameters (e.g., activity data, constants) that are common to multiple categories and confirm that there is consistency in the values used for these parameters in the discharge/removal calculations.
Check that the movement of inventory data among processing steWDSIs correct.	Check that discharges and removals data are correctly arranged from lower reporting levels to higher reporting when preparing summaries. Check that discharges and removals data are correctly transcribed between different intermediate products.
Check that uncertainties in discharges and removals are estimated and calculated correctly.	Check that qualification of individuals providing expert judgment for uncertainty estimates are appropriate Check that qualifications, assumptions and expert judgments are recorded. Check that calculated uncertainties are complete and calculated correctly. If necessary, duplicate uncertainty calculations on a small sample of the probability distributions.
Check time series consistency.	Check for temporal consistency in time series input data for each category. Check for consistency in the algorithm/method used for

QC Activity	Procedures
	calculations throughout the time series. Check methodological and data changes resulting in recalculations. Check that the effects of mitigation activities have been appropriately reflected in time series calculations.
Check completeness	Confirm that estimates are reported for all categories and for all years from the appropriate base year to the period of the current inventory. For subcategories, confirm that entire category is being covered. Provide clear definition of 'Other ' type categories. Check that known data gaps that result in incomplete estimates are documented, including a qualitative evaluation of the importance of the estimate in relation to total discharges.
Trend checks	For each category, current inventory estimates should be compared to previous estimates, if available. If there are significant changes or departures from expected trends, re-check estimates and explain any differences. Significant changes in discharges or removals from previous years may indicate possible input or calculation errors. Check value of implied discharge pollution load units across time series. Do any years show outliers that are not explained? If they remain static across time series, are changes in discharges or removals being captured? Check if there are any unusual and unexplained trends noticed for activity data or other parameters across the time series.
Review of internal documentation and archiving	Check that there is detailed internal documentation to support the estimates and enable reproduction of the discharge, removal and uncertainty estimates. Check that inventory data, supporting data, and inventory records are archived and stored to facilitate detailed review. Check that the archive is closed and retain secure place following completion of the inventory. Check integrity of any data archiving arrangements of outside organizations involved inventory preparation.

(Source: 2006 IPCC Guidelines for National Greenhouse Gas Inventories)

SUMMARY OF QC CHECK

Instructions:
The first page of this form summarizes the results of the checks. After completion of other remaining pages of check forms, significant findings and actions to be take should be filled in this format.

Date of preparation: _____ Prepared by (Name/Affiliation): _____

Summary of results of checks and corrective actions taken:

Suggested checks to be performed in the future:

Any residual problems after corrective actions have been taken:

Checklist for WDSI QC

Component/Item		Check completed			Corrective action		Supporting documents
		Date	Name checked	Errors (Y/N)	Date	Name checked	
Preparatory Work							
1.	Inventory use is identified?						
2.	Geographical area is defined?						
3.	DQOs are determined?						
4.	Time interval is specified?						
5.	Pollution source category is defined?						
6.	Discharge sources are identified?						
7.	Interest pollutants are identified?						
8.	Other (specify)						
Collection of Data and Information							
9.	Data/information collection methods are selected?						
10.	Questionnaires are prepared?						
11.	Cover letters are prepared, if necessary?						
12.	Pollution sources are categorized?						
13.	Facility list is drawn up?						
14.	Types of data/information are identified?						
15.	Questionnaires are mailed out to all target facilities?						
16.	Data/information sources are identified?						
17.	Pollution discharge estimation methodologies are specified?						
Compilation and Arrangement of Data							
18.	Inventory format is prepared?						
19.	Data and information needed for inventory are collected?						
20.	All necessary information is codified or digitized?						
21.	Codification or digitization system is suitable for the use of inventory?						
22.	All data/information sources are identified?						
23.	Transcription errors in data input and references are checked?						
24.	All reference information and published documents used for spreadsheet development are recorded?						
25.	Units are properly labeled in spreadsheets?						
26.	Units are correctly carried through from beginning to end of calculations?						
27	Conversion factors are correct?						

Component/Item		Check completed			Corrective action		Supporting documents
		Date	Name checked	Errors (Y/N)	Date	Name checked	
.							
28.	Temporal and spatial factors are used correctly?						
29.	Accuracy and precision of data gathered at site survey are checked?						
30.	Accuracy and precision of bibliographical data are checked?						
31.	Accuracy and precision of data used for estimates are checked?						
32.	Discharge data are correctly arranged from lower reporting levels to higher reporting?						
33.	Discharge data are correctly transcribed between different intermediate products?						
34.	Modification of estimate methodologies are implemented and documented as appropriate?						
35.	Estimates of pollution discharge and methodologies are validated periodically?						
36.	All data transcribe into the spreadsheet correctly?						
37.	All equations used to generate results entered correctly and used appropriately?						
38.	The sources of original data are referenced in the spreadsheet?						
39.	All variables within equations defined?						

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT (MONRE)

GUIDELINES
OF
DATA AND INFORMATION SHARING FOR LOADING CAPACITY CALCULATION, AND WASTEWATER DISCHARGE SOURCES INVENTORY DEVELOPMENT

April 2018

JICA Expert Team

Guidelines of
Data and Information Sharing for Loading Capacity Calculation, and Wastewater Discharge Sources Inventory Development

Table of Contents

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List of Tables

1. Introduction

1.1 Objectives and Contents of the Guidelines

(1) Objectives

Water environment conditions in Vietnam have been degraded due to an increase of pollution load accompanied by the rapid urbanization and industrial development, and shortage of wastewater treatment facilities as well as their operation and maintenance capabilities. One of the important aspect of river basin management is the calculation of river loading capacity to consider non-point sources and point sources. As for point sources, it is necessary to develop the wastewater discharge sources inventory. And for the non-point sources, it is important to develop some system of the total pollution load assessment. The guidelines aim to provide guidance with the basic principle of data and information sharing for water environmental management in river basin including a collection of necessary information. Especially, it is focused on above two topics, the calculation of river loading capacity, and wastewater discharge sources inventory development as an important action for river basin management.

This guideline focuses on the river water environment management. In this guideline, the river basin management means "Water environment management".

(2) Contents

The main contents of the guidelines are;

a) To identify required data and information to be collected for conducting activities concerning river basin management,
b) To provide technical guidance related to the process of data and information collection, such as expected sources of information and data collection format,
c) To identify items to be remarked for sharing data and information, and outcomes related to river basin management mentioned above,
d) To identify responsibility of relevant organizations for data and information collecting and sharing concerning activities mentioned above, and
e) To guide the implementation manner/way for the information collection and sharing activities.

1.2 Expected User of the Guidelines

Expected users of the guidelines are described below.

(1) Organizations for River Basin Management (namely "River Basin Organizations" (RBOs)) , Ministry of Natural Resource and Environment(MONRE), Vietnamese Environment Administration (VEA/MONRE)

The guidelines assist RBO, MONRE, VEA to:

- To understand required data and information to be collected for conducting activities concerning river basin management,
- To check the process of data and information collection,
- To know the items to be remarked for sharing data and information, and

- To clarify responsibility of relevant organizations for data and information collecting and sharing concerning activities mentioned above.

(2) Provincial Departments of Natural Resources and Environment (DONREs)

The guidelines assist DONREs to:

- To understand required data and information to be shared for conducting activities concerning river basin management,
- To check the process of data and information sharing, and
- To know the items to be remarked for sharing data and information

(3) District DONRE and Commune DONRE

- To understand necessary data and kinds of data sources
- To do preliminary checking of data
- To report information to DONRE

1.3 Target River Basins

The target river basins are ones which plan to establish the river basin organization (RBO) under the draft decision of river basin management in future.

(1) Hồng - Thái Bình river basin
(2) Cửu Long river basin
(3) River basins managed by north-central area river basin committee
(4) River basins managed by south-central area river basin committee
(5) Sê San - Srêpốk river basin
(6) Đồng Nai river basin

2. Responsible Organizations and Mechanism of Information Sharing

2.1 Responsible Organizations of Information Sharing

2.1.1. Loading Capacity Assessment

MONRE have responsibilities to manage river basin environmental conditions. Planning and implementing loading capacity assessment is also one of the important activities for river basin management. Therefore, it is recommended for MONRE to supervise the information sharing activity. According to the Circular No. 76/ 2017/ TT-BTNMT, Circular on Regulating Assessment of Wastewater Receiving Capacity and Loading Capacity of Rivers and Lakes, Department of Water Resources Management (DWRM/MONRE) has prime responsibility for evaluating wastewater receiving capacity (Article 15 of the Circular). In addition, when the RBOs are established, RBOs will be the responsible agencies to manage environmental river basin under control by MONRE, in future.

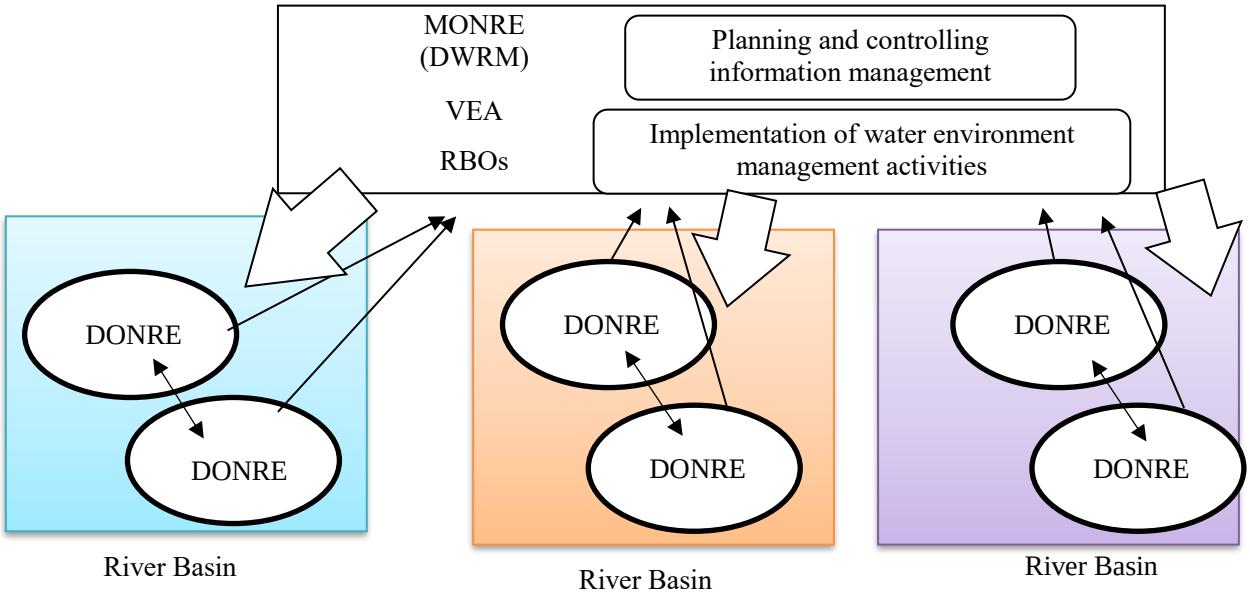
2.1.2. Wastewater Discharge Source Inventory (WDSI)

MONRE especially VEA have a responsibility to manage point pollution source information. Developing WDSI is also one of the important activities for river basin management. Therefore, it is recommended for VEA/MONRE to supervise the information sharing activity. Decision No.140 on Approving the Project "Survey and Evaluation, Classification and Building Database of Hazardous Waste" was issued on January 26, 2018. According to this Decision, MONRE leads and coordinate with ministries and other stakeholders to implement this project (Article 2 of the Decision).

2.2 Mechanism of Information Sharing

2.2.1. Basic Idea of Information sharing

The basic idea of information sharing is shown in Figure 2-1. Necessary information for river basin management can be gathered to VEA/MONRE and/or RBOs from each DONERs separately. After that, related information of river basin can be shared to related DONREs.



Source: JET

Figure 2-1 Sharing of River Basin Water Environmental Information

2.2.2. Idea of how to share the information

As a general concept, the environmental data is "the public goods". Based on this principle, all of data and information for environment should be shared to everyone freely (without any charge). Under the current Vietnamese regulations, when the concerned organizations need to share required data and information, it can be done without any charge between governmental organizations. On the other hand, Vietnamese law prescribes the principle that meaningful data and information to be share have a worth to be paid, so it may have to be conducted data and information sharing with any charge in some cases. The maintenance and operation of the database, these operational costs can be required to users. This pricing of data (will/shall) be regulated by MONRE. Therefore, the following options may have to be examined.

Option A: All of data and information for loading capacity assessment and WDSI development will be carried out without any charge, based on the existing regulations with setting additional regulations, if necessary.

Option B: For some information, it can be proposed to pay a certain charge for sharing data and information. The charge could be used for proceeding activities on collecting and arranging data and information at each organization to be developed data and information set. For example, DONRE for developing WDSI (the task will be new activity, so it may be difficult to secure their budget to develop WDSI at each province. But if responsible organizations for information sharing pay some charge, the charge would assist to develop WDSI in each province).

3. Items to be shared for Loading Capacity Assessment, and WDSI Collection and Storage of Necessary Data for Information Sharing

3.1 Available Database for Information Sharing

3.1.1. Hydro-meteorological information and Data

All the hydro-meteorological information and data is to be accumulated to the hydro-meteorological database in Vietnam center of hydro-meteorological data, basically. It is regulated by the circular 07/2016/TT-BTNMT "Specifies data sets, data standards builds, manage national meteorological and hydrological database". The meteorological information and data include the necessary information and data for loading capacity assessment such as rainfall/precipitation, air temperature, humidity, solar radiation, wind direction and its speed. The hydrological information and data include the necessary information and data for loading capacity assessment such as cross-sectional data of river and canal, water level, tidal data, discharge monitoring/flow velocity data and water level with H-Q Curve (height and quantity curve).

3.1.2. Water Quality Data of the River

Water quality data of the river such as COD, BOD, T-N, T-P, pH, conductivity, water temperature is periodically observed by CEM/VEA at their sampling points, and by DONRE at their sampling points. CEM/VEA has developed the database of water quality monitoring results for Cau river, Dong Nai river, and Nhue-Day river, and processed data is available.

3.1.3. Collecting Information through the Circular 19/2016/TT-BTNMT on Environmental Protection Report

MONRE issued the Circular 19/2016/TT-BTNMT on Environmental Protection Report on 24 August 2016. The main implementer is CEID (Center for Environmental Information and Data) under VEA. Based on the description of this circular, there are several data can be used for the calculation of loading capacity and development of wastewater discharge inventory. On the column of "Related Regulations" of Table 3-1 show the possible data can be collected from this circular. However, according to CEID officer, there are many difficulties for implementing of this circular. The year 2018 is the first year to receive reports from DONREs, but they did not submit the report

(only 8-9 of 63 provinces submitted), the quality of reports not meet the requirement, and DONREs do not know how to prepare the report.

3.1.4. Newly Planned Database of MONRE Activities

MONRE is going to prepare a circular to establish a unified environmental database named Circular regulating information and data collection in the field of environment and water resources. DINRE (Department of information technology) under MONRE is responsible organization. Center for Environmental Monitoring (CEM/VEA) is working with DINTE for this circular. According to CEM, CEM submitted the all contents of the Circular related to "environment" as of March 2018. Hopefully, most of the necessary data under MONRE activities will be available from the unified database at DINTE.

3.1.5. Project "Survey and Evaluation, Classification and Building Database of Hazardous Waste

Prime Minister issued the Decision 140 on 26 January 2018 which was proposed by Minister of MONRE. The project has three main tasks;

1) Investigating, evaluating and classifying waste sources nationwide
2) Developing a database on waste sources
3) To review, formulate and promulgate legal documents and regulations for the management, exploitation, operation, updating, and use of information and databases on waste sources

At the Decision, the Prime Minister also directed the implementation of the project implementing measures including specific criteria and plans to investigate, assess and classify waste sources to ensure full implementation. The project will be implemented in 3 years (2018 - 2021).

3.1.6. Existing Database of WDSI (Wastewater Discharge Source Inventory)

Regarding the Inventory of wastewater discharge sources, no inventory which covers specific river/river basin and periodically updated is available. Some results of the pilot project as a database under the project sponsored by the international donor is existing but it was prepared only one time during the project and it has not been updated. For example, under Vietnam Provincial Environmental Governance (VPEG, 2009-2013) sponsored by Canadian International Development Agency (CIDA), WDSI called Environmental Information Management Portal Bình Duong was established in Binh Duong DONRE as result of a pilot project. It has been updating as by Binh Duong DONRE by themselves. Under the project for strengthening capacity of water environmental management in river basin (JICA), WDSIs in two pilot project area in Cau river basin and Dong Nai river basin were prepared in Excel sheet and distributed to Bac Giang DONRE, Thai Nguyen DONRE and Bac Ninh DONRE for Cau river basin, and to Binh Duong DONRE, Dong Nai, HCMC and Ba Ria-Vung Tau DONRE for Dong Nai river basin.

3.1.7. Other potential databases

There are some Department/Center/Committee which have databases of pollutants concentration in river water monitoring potentially.

1) DWRM (Department of Water Resources Management)
2) National Center for Water Resources Planning and Investigation (MONRE)
3) Vietnam National Mekong Committee (MONRE)

3.2 Loading Capacity Assessment

3.2.1. Data and Information to be Collected

For loading capacity assessment, the following information needs to be collected. To collect information, the information source described in the following table can be available.

Table 3-1 Data and Information to be collected for Loading Capacity Assessment

No.	Data Type		Data Source	Related Regulations (if any)	Lesson & Learned through Project
1.	Basic map		MONRE, DONRE Vietnam Publishing House of Natural Resources, Environment and Cartography Company Limited (NARENCA - Under MONRE)		Many public sector and private firm have the basic map (GIS map). DEM of 1-arc resolution from USGS can be downloaded. Maps (paper and digital) can be purchased quickly from NARENCA DONRE has a detailed map
2.	Location and type of activity/industry (industry data/ profile)		MONRE, DONRE, DOIT National Business Registration Portal – Ministry of Planning and Investment (https://dangkykinhdoanh.gov.vn) – fees applied for advanced information General Statistics Office	Circular 19/2016/TT-BTNMT on environmental protection report: II.2.1-II.2.3 Total number and areas of industrial zone, production zone, Hi-Tech zone; Economic zone; Industrial cluster (quantity, ha) II.2.5-II.2.10 Total number and production of facilities: thermal power, metallurgy, textile & dyeing, tanning, pulp, chemicals, cement (quantity, ton) II.2.12 Number of other industrial establishments located outside industrial zones or industrial clusters II.2.13 Industrial wastewater (m3/day) II.9.1-II.9.9 Craft villages: metal, plastic, paper, agricultural products, tanning, handicraft, ceramics, etc. (number of villages, total products, income). II.9.10 Total wastewater from craft villages (m^3/day)	It could be referred to "Manual on wastewater discharge source inventory (WDSI) development for river basin water environment management".
3.	Demography and its distribution		General Statistics Office Statistical Yearbook of Viet Nam Data is available on web; https://www.gso.gov.vn/Default.aspx?tabid=512	Decision 43/2016/QD-TTg, on promulgating the national statistical survey program. Circular 109/2016/TT-BTC, Regulations on cost-estimation, management, use and settlement of funds for conducting statistical surveys and national statistical surveys. Circular 19/2016/TT-BTNMT on environmental protection report: I.1.1 Amount and area of urban (quantity, ha) I.1.2 Amount and area of centralized rural (quantity, ha)	Data from provincial Statistical Year Book is available, commercially sold. In addition, in order to assure higher spatial-resolution, data from district or commune Statistical Year Book is also available. Some provinces publish Provincial Statistical Yearbook on their website. If not found, SYB can be bought at the Statistical Publishing House. Statistical Bureau of DONRE may have more detailed data.
4.	River characteristics	DEM data	MONRE / Department of National Remote Sensing / Center for Remote Sensing Data & Information VAST / Vietnam National Satellite Center Free Digital Elevation Model (DEM) is available from the following sources.		DEM is important for delineating watershed into sub-watersheds, so the spatial resolution should be taken into account.

No.	Data Type		Data Source	Related Regulations (if any)	Lesson & Learned through Project
			1) ASTER: https://gdex.cr.usgs.gov/gdex/ 2) SRTM http://srtm.csi.cgiar.org/SELECTION/inputCoord.asp		
		River and canal network (GIS)	MONRE / DWRM, DEM data MONRE/ National Hydro-Meteorological Service / Vietnam Center of Hydro-Meteorological Data: http://cmh.com.vn/en/		If the latest network data is not available, it is one option to create stream network from DEM data, satellite images, or aerial photographs.
		Cross-sectional data of river and canal	MONRE / National Hydro-Meteorological Service / Vietnam Center of Hydro-Meteorological Data: http://cmh.com.vn/en/ In some cases, it will cost large money.		some money is required to have the data and the cross-section data is not new. The number, places or freshness of cross-section should be concerned and situations of these factors should be improved.
		Water level, tidal data	DONRE, MONRE / DWRM MONRE / National Hydro-Meteorological Service / Vietnam Center of Hydro-Meteorological Data: http://cmh.com.vn/en/	Circular 05/2016/TT-BTNMT, regulating hydro-meteorological monitoring contents for stations within national hydro-meteorological monitoring network. Circular 07/2016/TT-BTNMT, regulating database, data standards, development and management of national hydro-meteorology data. Circular 197/2016/TT-BTC, regulating the norms, regime of collection, remittance, management and use of charges for the exploitation and use of hydro-meteorological information and data.	some money is required to have the data. Basically, availability of these factors is not enough in terms of number of observation stations. Survey on this factor can be considered depending on each model. Data was not submitted from DONRE, MONRE
		River discharge and flow velocity monitoring data	MONRE / DWRM, MONRE / National Hydro-Meteorological Service / Vietnam Center of Hydro-Meteorological Data: http://cmh.com.vn/en/ Vietnam River Network (http://vrn.org.vn) (monthly average only)	Circular 05/2016/TT-BTNMT, regulating hydro-meteorological monitoring contents for stations within national hydro-meteorological monitoring network. Circular 07/2016/TT-BTNMT, regulating database, data standards, development and management of national hydro-meteorology data. Circular 65/2017/TT-BTNMT, regulating technique for determining minimal flow on rivers, streams, and development of inter-reservoirs operation procedures. Circular 197/2016/TT-BTC, regulating the norms, regime of collection, remittance, management and use of charges for the exploitation and use of hydro-meteorological information and data.	some money is required to have the data. Basically, availability of these factors is not enough in terms of number of observation stations. Survey on this factor can be considered depending on each model.
		Water level with H-Q Curve (Water level - Discharge Curve)	MONRE / National Hydro-Meteorological Service / Vietnam Center of Hydro-Meteorological Data: http://cmh.com.vn/en/		some money is required to have the data. Place which has the H-Q curve is limited. H-Q curve is complementary to cross-section data in terms of calculation of river discharge, so either of them should be

No.	Data Type		Data Source	Related Regulations (if any)	Lesson & Learned through Project
					available, especially at representative points or observation points
5.	Hydro-Meteorological condition	Rainfall (precipitation), air temperature, humidity, solar radiation, wind direction and speed for the target year.	MONRE/National Hydro-Meteorological Service/ Vietnam Center of Hydro-Meteorological Data: http://cmh.com.vn/en/	Circular 05/2016/TT-BTNMT, regulating hydro-meteorological monitoring contents for stations within national hydro-meteorological monitoring network. Circular 07/2016/TT-BTNMT, regulating database, data standards, development and management of national hydro-meteorology data. Circular 197/2016/TT-BTC, regulating the norms, regime of collection, remittance, management and use of charges for the exploitation and use of hydro-meteorological information and data.	some money is required to have the data. If a target river basin is quite large, characteristics of meteorology might be various. At that time, data at multiple meteorological stations should be obtained in order to represent parts of the river basin.
6.	Water Quality	COD, BOD, T-N, T-P, pH, Conductivity, Water Temperature at CEM/VEA sampling points and DONREs' sampling points	VEA / CEM, DONRE / CEM DAS (Data Acquisition System), mainly for online monitoring data	Circular 43/2015/TT-BTNMT, on state of environment report, environmental indicator sets, and management of environmental monitoring data. Circular 24/2017/TT-BTNMT stipulating environmental monitoring techniques Official Letter No. 2789/BKHDT-KTDN, on the introduction of UN-EU Guideline on local cost-norms of cooperation development with Vietnam (updated version in 2015) Letter No. 5417/BTNMT-TCMT guideline for transmission and receipt of online monitoring data No. 5999/STNMT-BVMT by Thanh Hoa DONRE on the transmission of online monitoring data to DONRE (example)	Water Quality data monitored by CEM needs to be sorted out for using in simulation model. Some money may be required for data processing. In order to check trend of water quality in a target point, at least 3 years' data should be collected. Many DONREs are not ready to receive the online monitoring transmitted from the enterprises. They lack facilities (PC, network) and their staff have not been trained to process the data
7.	Non-point sources (current and future planning, if possible)	Domestic Septic Tank Pit toilet Ventilated improved pit (VIP) latrines	Statistical Yearbook of Viet Nam Existing environmental protection plan. Estimation from coverage ratio of sewerage system and population	Decision 43/2016/QD-TTg, on promulgating the national statistical survey program. Circular 109/2016/TT-BTC, Regulations on cost-estimation, management, use and settlement of funds for conducting statistical surveys and national statistical surveys. Circular 43/2015/TT-BTNMT, on state of environment report, environmental indicator sets, and management of environmental monitoring data. Circular 37/2017/TT-BTNMT, promulgating technical regulations and economic - technical norms of investigation and assessment of the status of discharge of wastewater into water sources. Circular 19/2016/TT-BTNMT on environmental protection report: II.1.3, II.1.4 Total amount of domestic wastewater in urban areas; or rural areas (tons/day)	Data from provincial Statistical Year Book is available, commercially sold. In addition, in order to assure higher spatial-resolution, data from district or commune Statistical Year Book is also available. Statistical Bureau of DONRE may have more detailed data. As for domestic wastewater, spatial resolution of users of each wastewater treatment system is not high, for example district-based, so these data should be collected and integrated into GIS format.

No.	Data Type		Data Source	Related Regulations (if any)	Lesson & Learned through Project
				III.3.1.3, 3.1.4 Ratio of treated wastewater in urban, or rural areas to meet QCVN (%) III.3.1.8 Ratio of rural households having sanitary latrines	
		Livestock Amount, location and load unit of each animal.	Statistical Yearbook of Viet Nam Existing environmental protection plan Department of Agriculture and Rural Development (DARD)	Decision 43/2016/QD-TTg, on promulgating the national statistical survey program. Circular 109/2016/TT-BTC, Regulations on cost-estimation, management, use and settlement of funds for conducting statistical surveys and national statistical surveys. Circular 19/2016/TT-BTNMT on environmental protection report: II.8.6-II.8.9 Number of establishments and total number of cattle and poultry (quantity, thousand heads) II.8.11 Total livestock wastewater discharge (m^3/day) III.3.6 Agriculture: Rate of establishments and households having biogas tanks (%)	Data from provincial Statistical Year Book is available, commercially sold. In addition, in order to assure higher spatial-resolution, data from district or commune Statistical Year Book is also available. Statistical Bureau of DONRE may have more detailed data.
		Cultivation Area, location and load unit of each crops.	Statistical Yearbook of Viet Nam DARD Land use map: DONRE, MONRE/General Department of Land Administration/Data & Information Center for Land Management Vietnam River Network (http://vrn.org.vn) (downloadable in shape file format)	Circular 28/2014/TT-BTNMT, on regulating land statistics, land use inventory, and development of land use map Circular 29/2014/TT-BTNMT, on detailing the development and amendment of land use plans, planning. Circular 19/2016/TT-BTNMT on environmental protection report: I.1.1-I.1.4 Areas of natural land, paddy field, cash crops, forest land, bare land (ha) II.8.1 Total area of cultivated land (ha) II.8.2 Gross food production (ton) II.8.10 Total area of grazing land (ha)	Data from provincial Statistical Year Book is available, commercially sold. In addition, in order to assure higher spatial-resolution, data from district or commune Statistical Year Book is also available. Statistical Bureau of DONRE may have more detailed data.
		Forest Area, location and load unit of each type.	Statistical Yearbook of Viet Nam Forestry Section - DARD Land use map: DONRE, MONRE/General Department of Land Administration/Data & Information Center for Land Management Vietnam River Network (http://vrn.org.vn) (downloadable in shape file format)	Circular 28/2014/TT-BTNMT, on regulating land statistics, land use inventory, and development of land use map Circular 29/2014/TT-BTNMT, on detailing the development and amendment of land use plans, planning. Circular 19/2016/TT-BTNMT on environmental protection report: I.4.1-I.4.4 Areas of all forests, protection forest, special-use forest, mangrove forest, primary forest (ha)	Data from provincial Statistical Year Book is available, commercially sold. In addition, in order to assure higher spatial-resolution, data from district or commune Statistical Year Book is also available. Statistical Bureau of DONRE may have more detailed data.
		Aquaculture Area, location and load unit of each type.	Statistical Yearbook of Viet Nam Aquaculture Section - DARD Land use map: DONRE, MONRE/General Department of Land Administration/Data & Information Center for Land Management	Circular 28/2014/TT-BTNMT, on regulating land statistics, land use inventory, and development of land use map Circular 29/2014/TT-BTNMT, on detailing the development and amendment of land use plans, planning.	Data from provincial Statistical Year Book is available, commercially sold. In addition, in order to assure higher spatial-resolution, data from district or commune Statistical Year Book is also available.

No.	Data Type		Data Source	Related Regulations (if any)	Lesson & Learned through Project
			Vietnam River Network (http://vrn.org.vn) (downloadable in shape file format)	Circular 19/2016/TT-BTNMT on environmental protection report: II.8.13 Total area and production of aquaculture (ha, tons)	Statistical Bureau of DONRE may have more detailed data.
		Information/map of existing land use, and future land use planning	DONRE MONRE / General Department of Land Administration / Data & Information Center for Land Management The Global Land Cover by National Mapping Organizations (GLCNMO), download at: https://globalmaps.github.io/glcnmo.html	Circular 28/2014/TT-BTNMT, on regulating land statistics, land use inventory, and development of land use map Circular 29/2014/TT-BTNMT, on detailing the development and amendment of land use plans, planning. Circular 19/2016/TT-BTNMT on environmental protection report: I.1 Land use area (ha)	DONRE or MONRE may have the most detailed land use map. Maps could be bought in both paper-based, or GIS formats. The data from GLCNMO are free, available in form of GIS raster data, which might be more coarse in terms of spatial resolution and outdated. Land use planning is published in each DONRE.
8.	Point pollution sources (current and future planning, if possible)	WWTP (Sewerage system) Location Capacity and target population	MOC / DOC Sewage and Drainage Company Limited (under city's People's Committee) Development plan Existing international and national study reports PPC Decisions	Decree 80/2014/ND-CP, on drainage and wastewater treatment. Circular 19/2016/TT-BTNMT on environmental protection report: III.3.1.1, 3.1.2 Number and percentage of urban areas and residential areas with centralized wastewater treatment systems (quantity, %)	PPC have each decision for approving the planning on water drainage systems and wastewater treatment of the residential, so these decisions can be considered as a reference to future planning. In order to reflect the current situation of sewerage system, more organized material may be necessary, if it is possible, in GIS-based format.
		Industrial pollution sources such as pulp and paper industry, Rubber industry, Textile, Iron, Steel, battery, Tanning, chemical industry	Wastewater discharge sources inventory (WDSI) / PSI MONRE, DONRE, DOIT National Business Registration Portal – Ministry of Planning and Investment (https://dangkykinhdoanh.gov.vn) – fees applied for advanced information General Statistics Office	Circular 19/2016/TT-BTNMT on environmental protection report: II.2.13 Industrial wastewater (m^3/day) II.9.10 Craft village wastewater (m^3/day)	Data from provincial Statistical Year Book is available, commercially sold. In addition, in order to assure higher spatial-resolution, data from district or commune Statistical Year Book is also available. Statistical Bureau of DONRE may have more detailed data. Data in environmental monitoring reports by enterprises is largely ignored.
		Mining	WDSI, VINACOMIN	Circular 19/2016/TT-BTNMT on environmental protection report: II.3.1-II.3.2 Number of projects exploiting natural minerals, construction materials II.3.3 Number and total capacity of hydropower plants (quantity, MW)	
		Hospital	WDSI, DOH (Department of Health)	Circular 19/2016/TT-BTNMT on environmental protection report: II.7.1-II.7.3 Total number of medical establishments, beds, and medical wastewater (quantity, m^3/day)	
9	Existing plan of Water resource	Environmental protection plan Economic growth	Provincial, District, River Basin Environmental protection, Socio economic development and spatial plans	Circular 27/2015/TT-BTNMT regulating strategic environmental assessment, environmental impact assessment, and environmental protection plan.	Economic and population growth can be calculated based on social-economic development plan for each 10 years.

No.	Data Type		Data Source	Related Regulations (if any)	Lesson & Learned through Project
	use and development plan	Population growth	DONREs MONRE / VEA, MONRE / DWRM	Decree 92/2006/ND-CP, On the development, approval and management of master plans on socio-economic development. Decree 04/2008/ND-CP, on adding some Articles on the Decree 92/2006/ND-CP.	

Source: JET

3.2.2. Other factors for improving conditions in terms of information for river basin management

(1) To recognize where necessary data for river basin management is located

As can be seen in Table 3-1, necessary data for data basin management is quite various, and as a result, responsible organizations are divergent. Thus, first of all, it is the most important to realize where necessary data for river basin management is located. Because departments or bureaus do not consider whether their data is required for river basin management, it is necessary to ask them about whether they can provide data related to river basin management so that data location or responsible organization is identified.

(2) To make framework for accumulating necessary data for river basin management

After recognizing responsible organizations for data, framework for accumulating necessary data is required for the organizations to submit it. Because a target area of river basin management is generally wide-ranged, a framework such as RBO is very useful for stakeholders to submit data. Under the framework, obligation of responsible organizations for submission of data should be clarified. At the same time, if rules for "data format" are stipulated, availability or efficiency of data sharing should be enhanced. For example, when statistical data such as population is formatted in a spreadsheet style, it can be used easily. As for land use map, if the map is digitalized in GIS format, its usability is very high for analyzing pollution load analysis.

(3) To enhance quality or quantity of necessary data by comparing data under RBO framework

By utilizing the framework above, stakeholders such as MONRE or DONREs can discuss quantity or quality related to river basin management. For example, comparison of land use maps between DONREs might reveal that a land use map of one DONRE is 10 years older than that of other DONRE, and they might agree that the older land use map should be revised in order to correspond to a standard year of data, which leads to quality of analysis or river basin management. Therefore, sharing data necessary for river basin management can invoke a plan for improving quality and quantity of data by comparing data availability under the framework such as RBO.

3.3 Wastewater Discharge Source Inventory (WDSI) and Pollution Source Map

For development of WDSI, the relevant information of the following pollution sources needs to be collected.

Table 3-2 Sources needs to be collected for WDSI

1) Centralized urban sewage treatment facility	8) Natural rubber processing establishment
2) Wastewater treatment facility in industrial park	9) Steel production establishment
3) Petrol storage or station	10) Mining area
4) Textile-dyeing establishment	11) Trade village
5) Paper and paper pulp production establishment	12) Livestock farm
6) Ethanol production establishment	13) Medical center
7) Aquatic products processing establishment	14) Solid waste disposal site

Source: Discussion between VEA/MONRE and JICA Project team of the Project for Strengthening Capacity of Water Environmental Management River Basin

In addition, a pollution source map is the visualization of potential polluters (industrial entities, sewage treatment plant, petrol station etc.) in respect to their geographic location in the province or

river basin. This will help the water resources managers to identify and pay more attention the parts of the river which will likely be affected by wastewater discharge from those potential pollution sources. More measures will be applied to these parts of the river, such as more frequent water quality sampling, install online water quality monitoring station nearby, regular inspection more stringent control to the potential polluters, etc.

Pollution source map shall be developed using a GIS-based software, such as ArcGIS, and files format should be unified between DONREs so they can be interchangeable. If ArcGIS is not available, an open source alternative such as QGIS can be considered to reduce the cost of development.

4. Example of Outcomes on Loading Capacity Assessment and Wastewater Discharge Sources Inventory Development

4.1 Necessity to Share Outcomes on Loading Capacity Assessment and WDSI

For better river basin management, the outcomes on loading capacity assessment and WDSI development shall be shared among concerned stakeholders. Example and important outcomes are as follows;

- WDSI in target river basin
- Pollution source map in river basin
- Generated pollution load analytical result of each province in target river basin
- Loading capacity assessment result in river basin

Through the Project for Strengthening Capacity of Water Environmental Management in the River Basin (the Project), above outcomes had been shared among the concerned provinces in the pilot project area. In the guidelines, examples of outcomes are shown for reference as case study results.

4.2 WDSI in Target River Basin

Through discussion among VEA/MONRE, DONRE, and JICA Project Team, considering the end use of the WDSI in river basin and the data elements, the WDSI formats are as follows:

Table 4-1 Examples of Spreadsheet (General information)

STT	Name of establishment	Operation type	Address	Provincial code	District code	Commune code	Tax code	Location		Water amount used (m^3/year)	Wastewater amount (m^3/year)	Water receiving source	Wastewater receiving location	
								Longitude	Latitude				Longitude	Latitude
1														
2														
3														

Source: JET

Table 4-2 Examples of Spreadsheet (Wastewater quality)

No	Name of establishment	Concentrations of pollutants in the wastewater																
		T^0	Color	pH	BOD5 (20°C)	COD	...	...										

1																		
2																		
3																		

Source: JET

(1) Cau River Basin

1) Target Facilities to collect WDSI information

Through the survey of the Project, 93 highest priority facilities information (direct sampling wastewater and questionnaire survey) and 102 higher priority facilities information (questionnaire survey) were collected. There is the standard industrial code in Vietnam named VSIC (Vietnamese Standard Industrial Classification Code). Table 4-3 shows total numbers and sector code of collected information.

Table 4-3 Numbers of Collected Information with VSIC 2007 in Cau river Basin

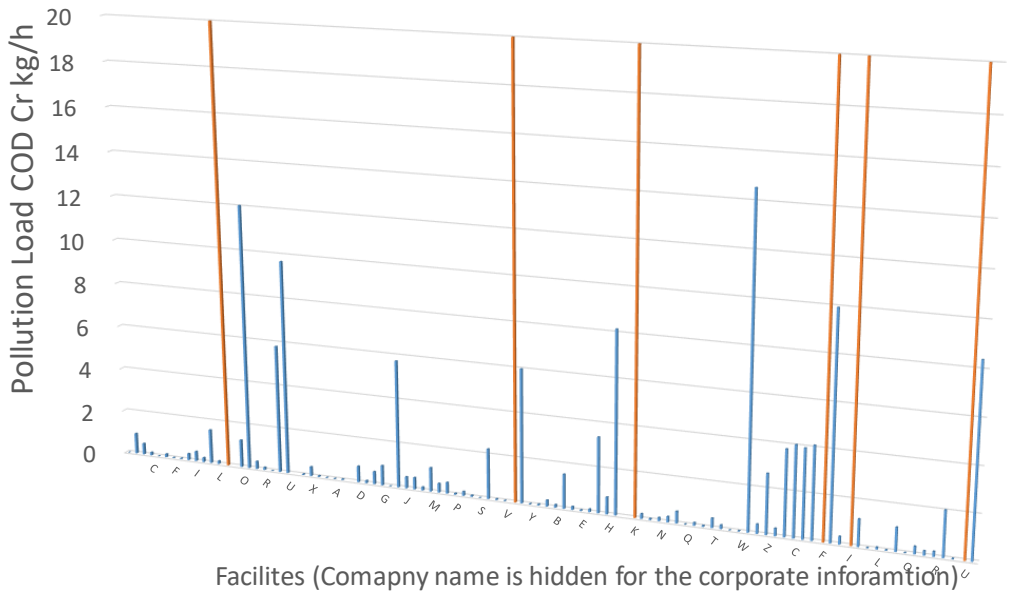
VSIC 2007 Level 1 /Description	VSIC 2007 Level3	Description	Highest Priority				Higher Priority			
			Thai Nguyen	Bac Giang	Bắc Ninh	Total	Thai Nguyen	Bac Giang	Bắc Ninh	Total
A. AGRICULTURE, FORESTRY, FISHERIES	014	Livestock			1	**1**	10	3	1	**14**
B. MINING	051	Extraction and collection of coal and lignite	4			**4**	1			**1**
	071	Iron ore mining	1			**1**	4			**4**
	072	Mining non-ferrous metals (except precious metal ores)	5			**5**	2			**2**
	073	Mining precious metals	1			**1**				
	081	Mining sand and gravel	1			**1**				
C. MANUFACTURING	107	Manufacture of other food products			3	**3**		1	2	**3**
	108	Production of animal feed, poultry and seafood							1	**1**
	110	Manufacture of beverages	1		3	**4**		2	3	**5**
	132	Manufacture of other textiles		2		**2**		1	1	**2**
	141	Apparel (except fur apparel)	3	5	2	**10**	3	3		**6**
	162	Manufacture of wood & wood products						8		**8**
	170	Manufacture of paper and paper products	1		3	**4**			10	**10**
	191	Production of coke	1			**1**				
	210	Production of pharmaceutical chemicals and botanical products		1		**1**			1	**1**
	222	Production of plastic packaging			1	**1**				
	231	Manufacture of glass and glass products			2	**2**				
	239	Manufacture of non-metallic mineral products	4			**4**	1			**1**
	241	Production of iron, steel, cast	3			**3**	3		1	**4**
	242	Manufacture of basic precious &other non-ferrous					3		1	**4**
	243	Casting of metals							2	**2**
	251	Manufacture of structural metal products	3		1	**4**				
	259	Manufacture of other fabricated metal products	2		2	**4**	1		2	**3**
	261	Manufacture of electronic components	1		4	**5**				
	262	Manufacture of computers and peripheral equipment of computer			1	**1**				
	264	Production of consumer electronics products			1	**1**				
	271	Manufacture of electric							1	**1**

VSIC 2007 Level 1 /Description	VSIC 2007 Level3	Description	Highest Priority				Higher Priority			
			Thai Nguyen	Bac Giang	Bắc Ninh	Total	Thai Nguyen	Bac Giang	Bắc Ninh	Total
		transformers & electricity								
	325	Manufacturing orthopedic, rehabilitation	1			**1**				
D. ELECTRICITY, AIR CONDITIONING SUPPLY	351	Production of electricity	1			**1**	1			**1**
E. WATER SUPPLY, SEWERAGE, WASTE MANAGEMENT	370	Sewerage and sewer treatment activities			2	**2**		2		**2**
	381	Waste collection is non-toxic		1		**1**				
	382	Waste treatment and disposal							4	**4**
L. REAL ESTATE ACTIVITIES	681	Real estate activities with own or leased property	3	2	9	**14**		2	5	**7**
Q. HUMAN HEALTH AND SOCIAL WORK ACTIVITES	861	Hospital, dispensary activities	5	1	5	**11**	8	2	4	**14**
	869	Other human health care							2	**2**
		TOTAL	**41**	**12**	**40**	**93**	**37**	**24**	**41**	**102**

Source: JET

2) Calculation of pollution load from target facilities

Pollution loads from target faculties were calculated through the Pilot Project. There are several facilities which has high pollution load as shown in Figure 4-1.



Source: JET

Note: [ ] means the facility which has more than 20 COD CrO kg/h pollution load

Figure 4-1 Results of Calculated Pollution Load from Target Facilities

(2) Dong Nai River Basin

1) Target Facilities to collect WDSI information

Through the survey of the Project, 100 highest priority facilities information (direct sampling wastewater and questionnaire survey) and 204 higher priority facilities information (questionnaire survey) were collected. Table 4-4 shows total numbers and sector code of collected information.

Table 4-4 Numbers of Collected Information with VSIC 2007 in Dong Nai River Basin

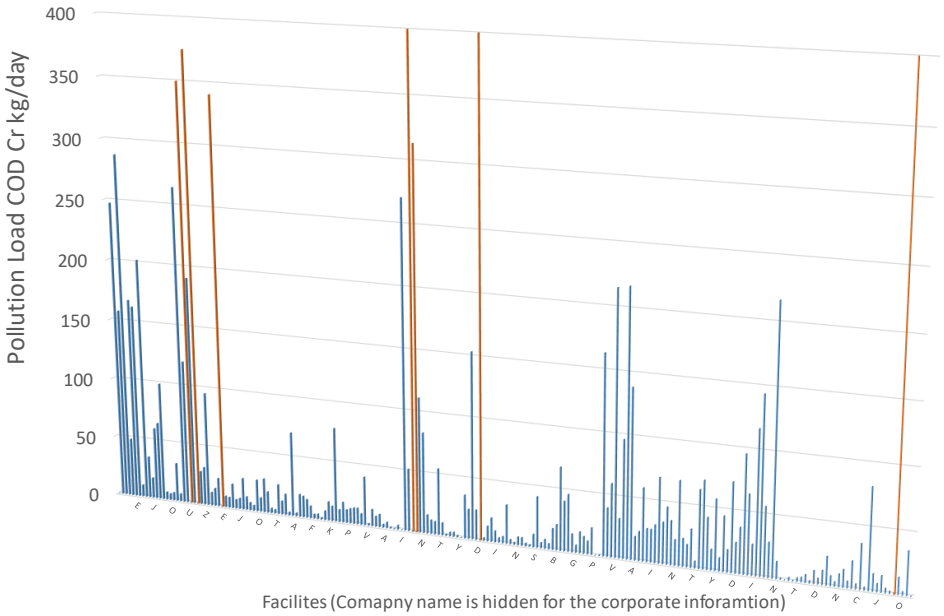
VSIC 2007 Level 1 /Description	VSIC 2007 Level 3	Description	Highest Priority				Higher Priority			
			Binh Duong	Dong Nai	HCM C	Total	Binh Duong	Dong Nai	HCM C	Total
A. AGRICULTURE, FORESTRY, FISHERIES	011	Growing of non-perennial crops				**0**			2	**2**
	014	Livestock	1			**1**	3		2	**5**
	032	Aquaculture				**0**			3	**3**
B. MINING	081	Mining sand and gravel		2		**2**		5		**5**
C. MANUFACTURING	101	Processing and preserving of meat		1	1	**2**			1	**1**
	102	Processing and preserving of fish, crustaceans and molluscs	1			**1**	2		1	**3**
	103	Processing and preserving of fruit and vegetables	1			**1**	2		6	**8**
	104	Manufacture of vegetable and animal oils and fats				**0**			2	**2**
	105	Manufacture of dairy products	2		2	**4**	1	2	1	**4**
	106	Manufacture of grain mill products, starches and starch products		1		**1**				**0**
	107	Manufacture of other food products		1	1	**2**			5	**0**
	110	Manufacture of beverages	3		3	**6**	1		2	**3**
	131	Spinning, weaving and finishing of textiles	4		2	**6**		1	7	**8**
	132	Manufacture of other textiles				**0**		1		**1**
	141	Apparel (except fur apparel)			5	**5**	7	3	7	**17**
	152	Manufacture of footwear	3	3	3	**9**	6	1	0	**7**
	161	Sawmilling and planning of wood; wood reservation				**0**			1	**1**
	162	Manufacture of wood & wood products	1	1		**2**	2			**2**
	170	Manufacture of paper and paper products	4	1		**5**	7		6	**13**
	201	Manufacture of basic chemicals, fertilizer	4			**4**	2	4	2	**8**
	202	Manufacture of other chemical products				**0**		1		**1**
	210	Production of pharmaceutical chemicals and botanical products	2			**2**	1	1	2	**4**
	221	Manufacture of rubber products	5			**5**	5		2	**7**
	222	Production of plastic packaging		1		**1**				**0**
	239	Manufacture of non-metallic mineral products	1			**1**	3		2	**5**
	241	Production of iron, steel, cast				**0**	1	1	1	**3**
	251	Manufacture of structural metal products	1			**1**	1			**1**
	259	Manufacture of other fabricated metal products	1			**1**		1		**1**
	272	Manufacture of batteries and accumulators				**0**		1		**1**
	291	Manufacture of motor vehicles		2		**2**				**0**
	293	Manufacture of parts and accessories for motor vehicles				**0**			1	**1**
	310	Manufacture of furniture				**0**	2			**2**
	325	Manufacturing orthopedic, rehabilitation				**0**	1			**1**
	331	Repair of fabricated metal products, machinery and equipment	1			**1**	1			**1**
E. WATER SUPPLY, SEWERAGE, WASTE MANAGEMENT	360	Water collection, treatment and supply			2	**2**				**0**
	370	Sewerage and sewer treatment activities	2		6	**8**			1	**1**
	381	Waste collection is non-toxic				**0**			1	**1**

VSIC 2007 Level 1 /Description	VSIC 2007 Level 3	Description	Highest Priority				Higher Priority			
			Binh Duong	Dong Nai	HCM C	Total	Binh Duong	Dong Nai	HCM C	Total
	382	Waste treatment and disposal	1			**1**			1	**1**
F. CONSTRUCTION	410	Construction of buildings			2	**2**			8	**8**
G. WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES	464	Wholesale of household goods			1	**1**				**0**
	471	Retail sale in non-specialized stores				**0**			3	**3**
	477	Retail sale of other goods in specialized stores				**0**	1			**1**
	478	Retail sale via stalls and markets				**0**			2	**2**
H. TRANSPORTATION AND STORAGE	511	Passenger air transport				**0**			1	**1**
I. ACCOMMODATION AND FOOD SERVICE ACTIVITIES	551	Short-term accommodation activities			6	**6**			38	**38**
	559	Other accommodation			6	**6**	1		6	**7**
L. REAL ESTATE ACTIVITIES	681	Real estate activities with own or leased property			1	**1**				**0**
P. EDUCATION	854	Higher education				**0**			2	**2**
Q. HUMAN HEALTH AND SOCIAL WORK ACTIVITES	861	Hospital, dispensary activities		1	6	**7**		6	11	**17**
S. OTHER SERVICE ACTIVITIES	962	Washing and cleaning of textile and fur products			1	**1**			1	**1**
		TOTAL	**38**	**14**	**48**	**100**	**50**	**28**	**131**	**204**

Source: JET

2) Calculation of pollution load from target facilities

Pollution loads from target facilities were calculated through the Pilot Project. There are several facilities which has high pollution load as shown in Figure 4-2.



Source: JET

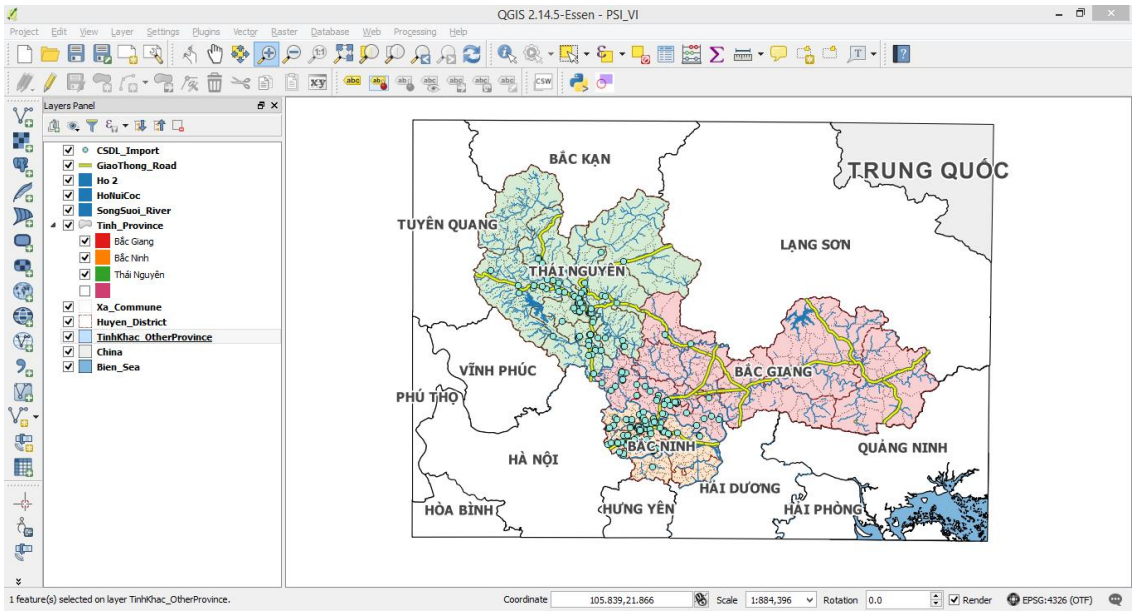
Note:[ ] means the facility which has more than 300 COD CrO kg/h pollution load

Figure 4-2 Results of Calculated Pollution Load from Target Facilities

4.3 Pollution Source Map in River Basin

(1) Cau River Basin

Pollution source map was prepared by the Pilot Project activities as shown in Figure 4-3. The software QGIS was utilized to develop the map. QGIS is a Geographic Information System (GIS) software similar to ArcGIS, but it has advantages, such as it is free, open-source, easy to install and utilize, and cross-platform (Windows, Mac OS, and GNU/Linux).

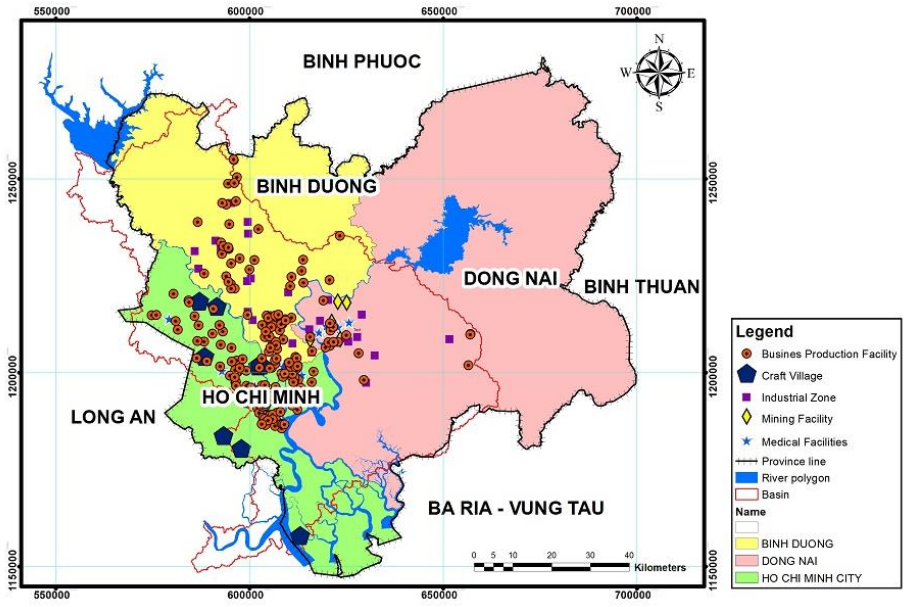


Source: JET

Figure 4-3 Pollution Source Map in the Pilot Project Area of Cau River Basin

(2) Dong Nai River Basin

Pollution source map was prepared by the Pilot Project activities as shown in Figure 4-4.



Source: JET

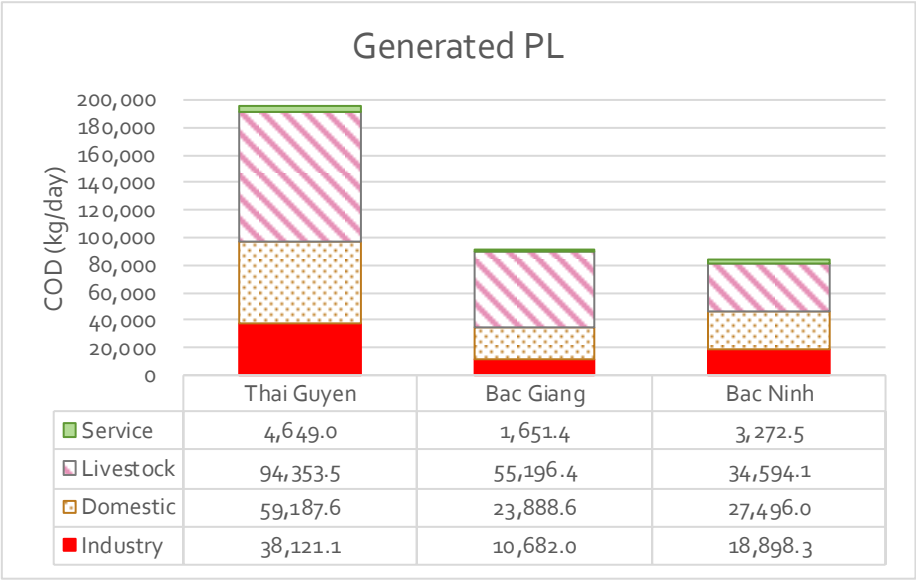
Figure 4-4 Pollution Source Map in the Pilot Project Area of Dong Nai River Basin

4.4 Generated pollution load analytical result of each province in target river basin

Through the Project, pollution load analysis with setting control point in river basin level by water quality simulation model was conducted.

(1) Cau River Basin

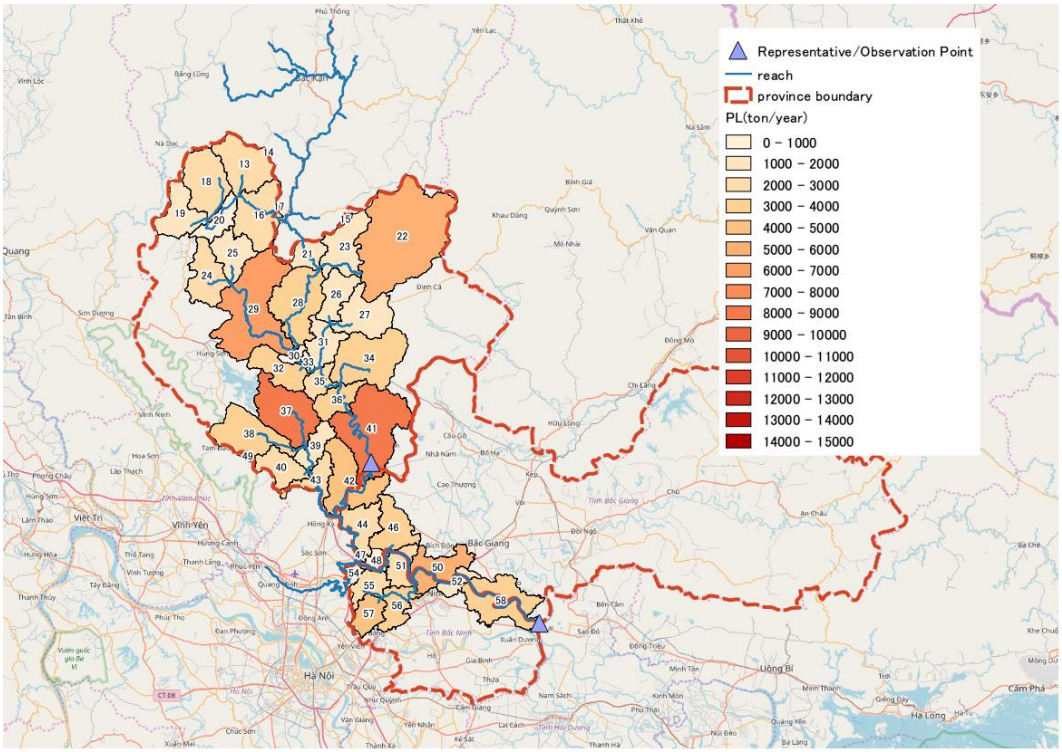
Generated pollution load in target province is shown in Figure 4-5, and the map in each sub-basin is shown in Figure 4-6.



	Thai Guyen	Bac Giang	Bac Ninh
Service	4,649.0	1,651.4	3,272.5
Livestock	94,353.5	55,196.4	34,594.1
Domestic	59,187.6	23,888.6	27,496.0
Industry	38,121.1	10,682.0	18,898.3

Source: JET

Figure 4-5 Generated Pollution Load in Target Province (COD (kg/day))

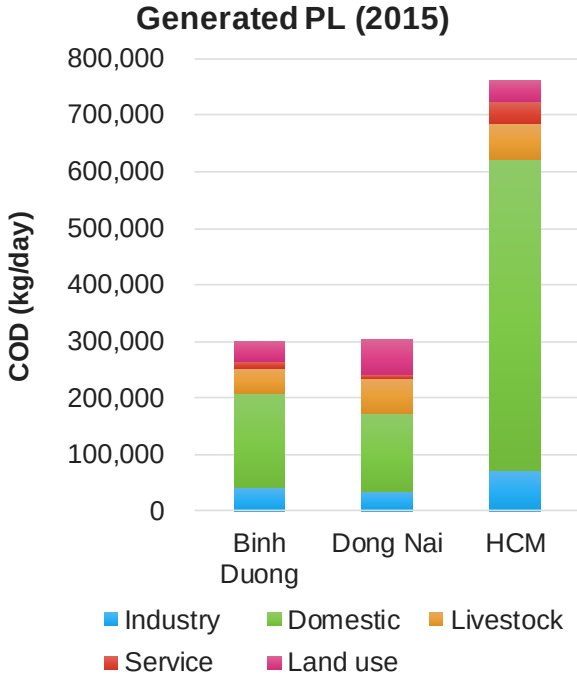


Source: JET

Figure 4-6 Pollution Load in each Sub-basin (COD (ton/year))

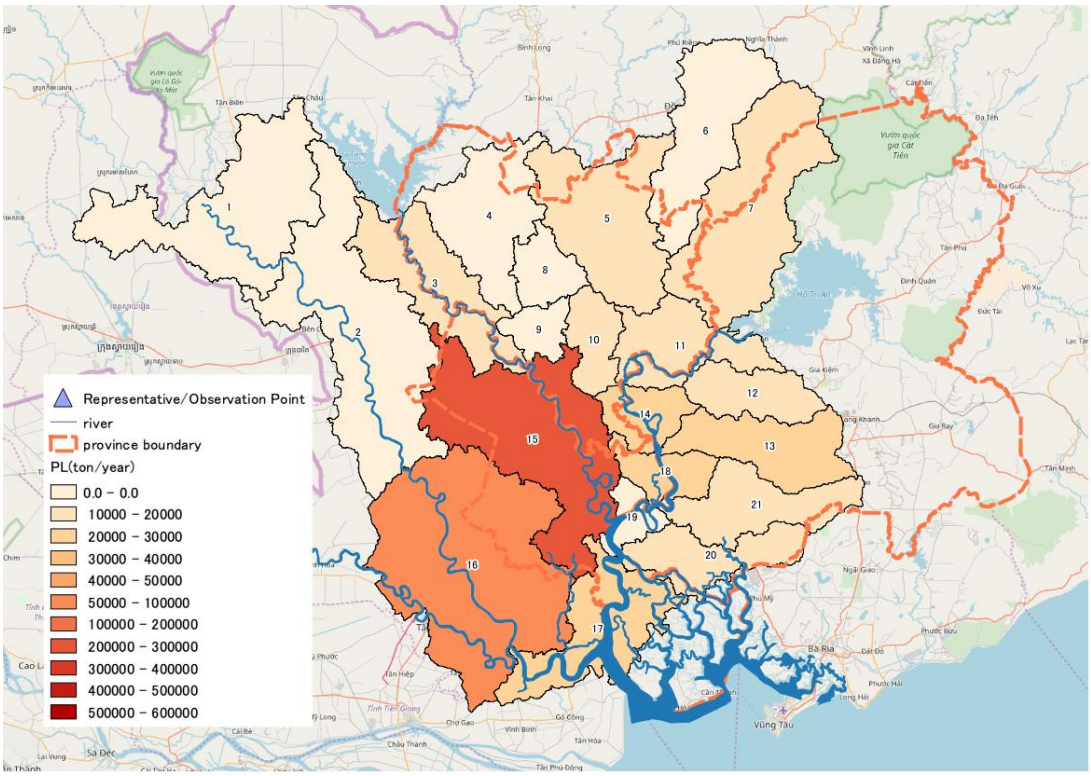
(2) Dong Nai River Basin

Generated pollution load in target province is shown in Figure 4-7 Figure 4-5, and the map in each sub-basin is shown in Figure 4-6.



Source: JET

Figure 4-7 Generated Pollution Load in Target Province (COD (kg/day))



Source: JET

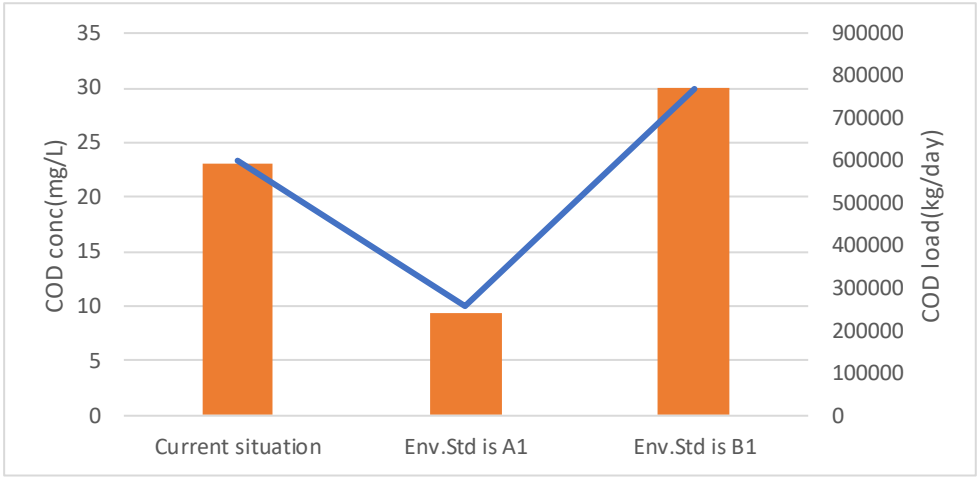
Figure 4-8 Pollution Load in each Sub-basin (COD (ton/year))

4.5 Loading capacity assessment result in river basin

Through the Project, loading capacities of each river basin by water quality simulation model were calculated.

(1) Cau River Basin

Comparison of loading capacity of environmental standard (QCVN) and current pollution load in Cau river basin is shown in Figure 4-9. Current pollution load is higher than loading capacity of A1 environmental standard and less than B1 environmental standards.

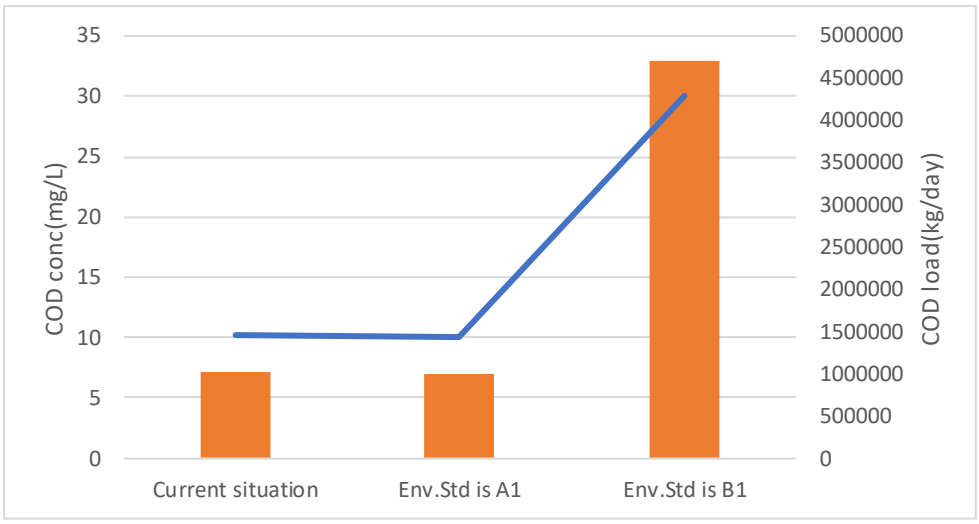


Source: JET

Figure 4-9 Comparison of Loading Capacity and Current Pollution Load in Cau River Basin

(2) Dong Nai River Basin

Comparison of loading capacity of environmental standard (QCVN) and current pollution load in Dong Nai river basin is shown in Figure 4-10. Current pollution load is higher than loading capacity of A1 environmental standard and less than B1 environmental standards.



Source: JET

Figure 4-10 Comparison of Loading Capacity and Current Pollution Load in Dong Nai River Basin

5. General Proposals on Data and Information Sharing

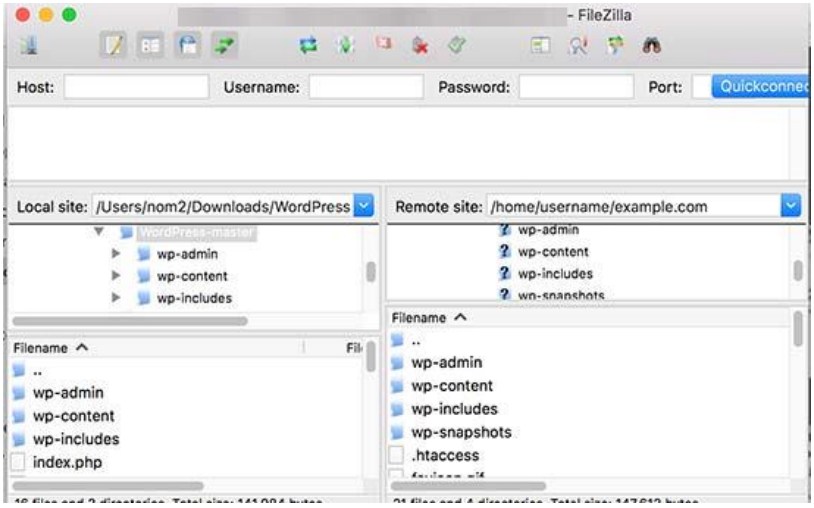
To proceed proper river basin management in future, the proposals are described in the guideline for the following contents.

(1) Adopting advanced technology for data and information sharing

- Expected specification and structure of database
- Unification of various databases which belongs to different organizations within DONRE and between DONREs
- Method to share the database, for example, File Transfer Protocol (FTP), Cloud storage or web interface.

a) File Transfer Protocol (FTP)

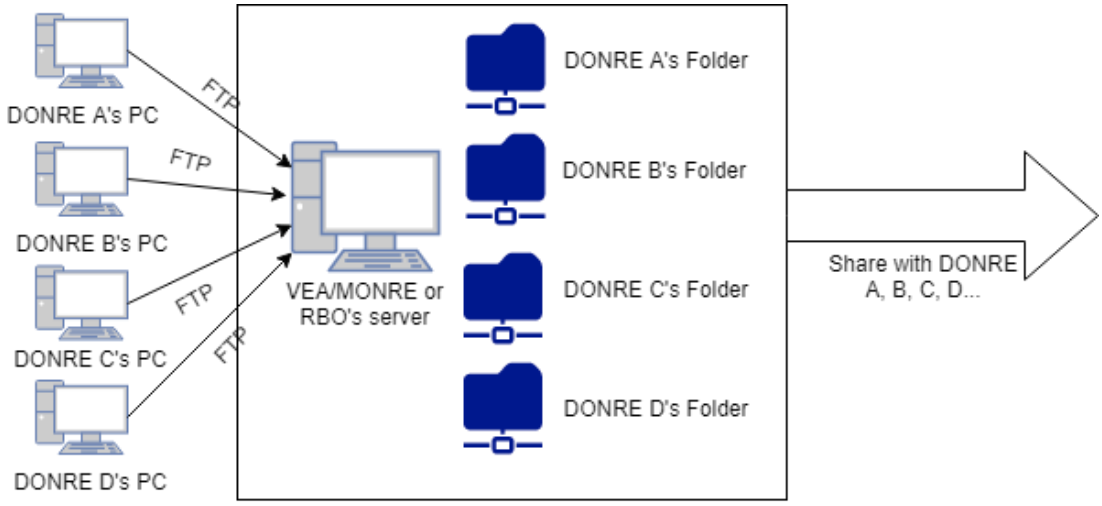
To use FTP, each DONRE is given an account which gives the users the right to upload the data to a specific folder. To avoid data is being deleted or modified unintentionally or intentionally, it is recommended that users from a DONRE can only READ the data uploaded by other DONREs.



Source: JET

Figure 5-1 An example of user interface of an FTP client

Figure 5-1 shows an example of user interface of an FTP client. A user has to input username and password to upload files from their local computer (left window) to the server (right window).



Source: JET

Figure 5-2 Folder permission on an FTP server

Figure 5-2 shows an example of giving folder permission on an FTP server, which users from DONRE A can upload and download data from a folder where permission is given specifically for them, but can only view (download) data uploaded by other DONREs.

b) Website

The use of website is the best way to share the data, however it requires that users need to be trained to manage the data. Also the development of the website needs to be done by IT professionals.

It is recommended to use an existing software to build the website to reduce the cost and time of development.

An example of an existing software which was previously developed in VPEG project, namely EIA review database and monitoring database (ERD+MD) software. One of the advantages of this software is it integrates GIS information, so users can be known exactly where the samples were taken.

The software and other supporting documents are available at http://im.vpeg.vn/softwa/monitoring.

The basic steps are as follows:

- Step 1: Finding a web hosting service which supports PHP and MySQL;
- Step 2: Install the ERD+MD software on the web hosting service;
- Step 3: Restore the database template using MySQL;
- Step 4: Start inputting data into the monitoring database;

(2) Frequency of updating of shared data and information

- From the viewpoint of socio-economic development plan
- From the viewpoint of simulation modeling in river basin

- From the viewpoint of WDSI that can be used for pollution source control in river basin level

(3) Right of access

The access rights shall be divided into:

- Administrator, who can manage the entire system
- Sub-administrator for each folder of river basin, who can create folders and upload new data to that river basin folder only;
- Viewer, who can view/download the data, but is not allowed to upload or delete the data.

(4) Backup

Regardless the mechanism of data sharing (internal server, cloud storage etc.), data shall be backed up to a local hard disk drive by each DONRE member of the RBO with certain frequency.

(5) Possibility to use environmental fund

- Clarifying type of information that can be shared
- Clarifying organizations that can be accessed data and information

(6) Possible financial source for developing structure for data and information sharing

- Possibility to use environmental fund
- Securing budget for data and information sharing by RBOs in future
- From technical cooperation project

End of the Guidelines

Guideline for Coordination Mechanism in Pollutant Load Discharge Management

MONRE / VEA
JICA Expert Team

Contents

1 Background and Objectives of the Guideline

1-1 Water Environmental Management in Vietnam

In Vietnam, the Law on Water Resources (LWR) intends to manage River Basin (RB) water resources comprehensively including aspects of water exploitation and use, of protection (embracing water environmental protection), and of prevention, control and remedy of harmful effects caused by water. In conjunction with LWR, the Law on Environmental Protection (LEP) regulates environmental protection for river water/ RB water environment.

River Basin Water Environmental Management (RBWEM) is a part of River Basin Water Resources Management (RBWRM) administered by LWR and LEP. Both LWR and LEP hire a RB oriented pollutant loads concept for surface water quality (WQ) management as one of core subjects for RBWEM.

Under the above legal framework, the Decree No. 38/ 2015/ NDCP (Decree No. 38) pursuant to LEP has developed the usage of the concept by utilizing "load capacity of water environment" and "allocation of Wastewater Discharge Quotas (WDQs)" as a management tool to restrain excessive wastewater discharges into the RB.

Since the RB oriented pollutant loads correspond to a total pollutant load (TPL) discharged from the upper RB relevant to the specific point of the river/ RB, RBWEM in Vietnam is designed to apply TPL control (TPLC) approach.

Considering that TPLC approach is usually applied in addition to the ordinary application of wastewater WQ standards for the discharging sources or other applicable environmental standards for addressing the severe water pollution problem, the legal system of Vietnam is ready for applying TPLC approach for pollution problem cases which require stricter pollutant discharge control for the particular RB water environment.

1-2 Linkage of WDQ Allocation (WDQA) with Socioeconomic Development

WDQ Allocation (WDQA) is linked with state management tools for socioeconomic development such as the socioeconomic development plans (SEDPs) and sector plans, and considerations and approval of investment policies and projects by Decree No. 38 as one of the confining factors of socioeconomic development. Considering the linkage, Provincial-level People's Committees (PPCs) must be the pertinent primary receivers of the WDQs of an inter-provincial RB as development confining factor with their discretions in executing further extensive WDQA for RBWEM.

At the same time, the Decree No. 38 provides responsibilities WDQA only to PPCs by its Clause 3, Article 44, while MONRE has no responsibility in WDQA (refer to Article 43). PPCs are sole responsible agencies to conduct WDQA. WDQs, however, are not able to be identified by single provincial territorial consideration for the case of inter-provincial river basin. For dealing with the situation, the coordination mechanism among the pertinent PPCs

is required to identify provincial receiving capacities (RCs) as additionally acceptable pollutant load and to allocate them as provincial level WDQs.

Since the provincial allocation of WDQs shall reflect the various aspects of the current and future socioeconomic and natural environmental conditions, consensus among the pertinent PPCs is imperative for the allocation which involves wills for the future by the PPCs as state management agencies in charge of socioeconomic development. The allocating figures must be convincing to all the pertinent PPCs. Such figures must not be attained from plain calculation or authoritarian decision by a higher authority but are availed through adjustments by collaboration or consensus among the PPCs with other stakeholder state management agencies' supports as nature.

1-3 Objectives of the Guideline

This Guideline for a Coordination Mechanism in Pollutant Load Discharge Management (Guideline) intends to provide referential information for understanding the processes of identifying a total RC of RB and provincial RCs in RB as basis to conduct TPLC for RBWEM in an inter-provincial RB. The identification and allocations shall be the commencing and base formulation activity to implement WDQA in inter-provincial RB. It is only able to be materialized with the essential coordination mechanism required for inter-provincial RBWEM.

Guideline also intends further for providing required coordinated efforts and knowledge on prioritized consideration factors in identifying provincial RCs and their allocations. The knowledge on the subjects provided by Guideline may consist integral part in formulating practical institutional arrangements for the agreement on provincial RCs among PPCs for inter-provincial RBWEM.

The coordination mechanism involves technical difficulties in calculating subject figures of RCs which may result in impediment for decision-making and adoption of identified RCs by the pertinent PPCs. To cope with the difficulties, proper comprehensions of the nature, purpose and requirements of the provincial RCs identification among the pertinent PPCs and other stakeholders are indispensable. Guideline intends to provide basic information necessary for proper understanding of the coordination mechanism for its formulation and execution.

1-4 RBWEM in This Guideline

RBWEM indicates surface water quality control on RB in general. Its meaning could be two dimensional in accordance with its goal: one pursues creation/ re-creation of ideal RB water environment with clean and pleasant water sources and surroundings, maximum-possible biodiversity, protection/ recovery of preferable eco-system, and so on; and the other aims to prevent or to remedy water pollution problem in a RB based on water quality (WQ) suitable for water uses.

RBWEM in this Guideline means the latter one to deal with the water pollution problem in RB.

2 Framework of RBWEM in Vietnam

2-1 TPLC as Part of RBWRM in Vietnam

In Vietnam, LWR (Law on Water Resources), Law No. 17/2012/QH13 dated June 21, 2012 intends to conduct RBWRM including aspects of water exploitation and use, of protection in terms of quantity and of quality, and of prevention, control and remedy of harmful effects caused by water comprehensively (Clause 1, Art. 1 and Clause 1, Art. 3). It employs the concept of "water source's capacity to receive wastewater" as "the capacity of water source to additionally receive a volume of wastewater while still maintaining its quality for use purposes accordingly to Vietnam's standards and technical regulations or foreign standards and technical regulations permitted for application of competent state agencies" for the environmental protection of water resources or RBWEM.

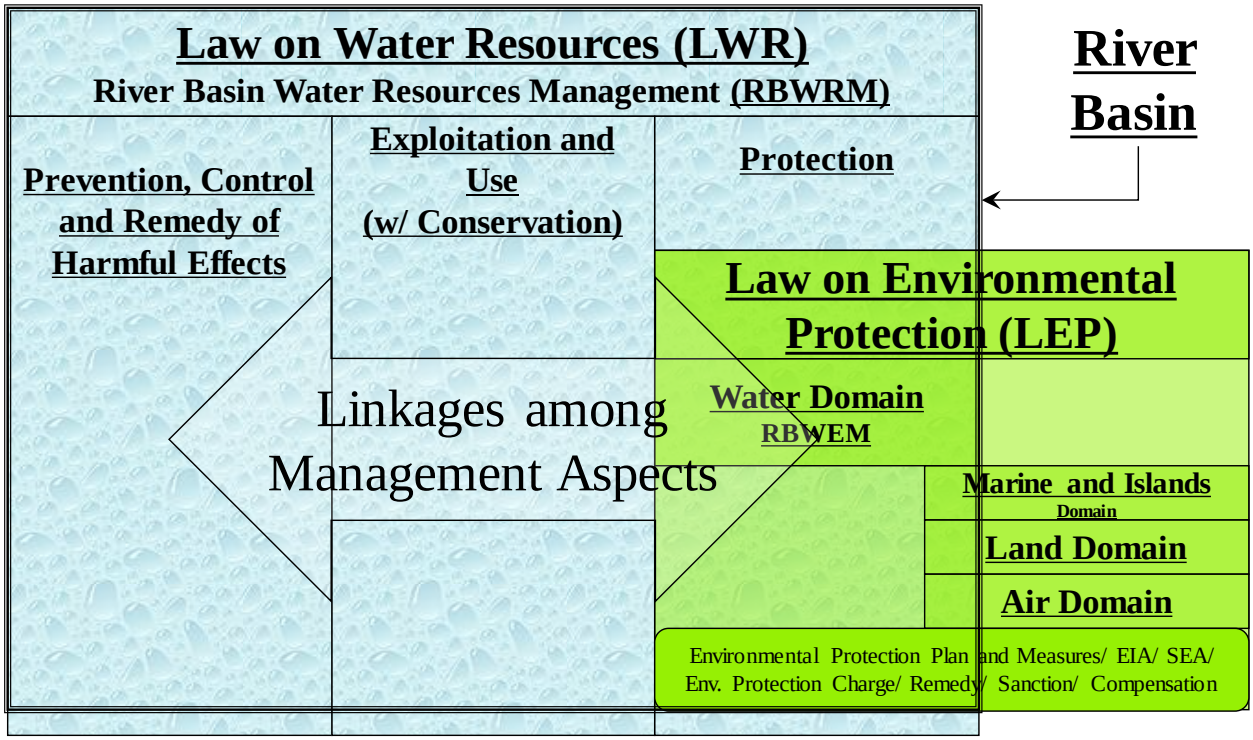
In conjunction with LWR, LEP (Law on Environmental Protection), Law No: 55/2014/QH13 dated June 23, 2014 regulates environmental protection for river water and of other water sources by its Section 1 and 2, Chapter VI, respectively including clear indication that "River water environment protection shall constitute one of the fundamental contents of the planning, plans of exploitation, use river water (Clause 1, Art. 52)" which means RBWEM is a part of RBWRM.

LEP employs a similar concept with the above mentioned one by LWR which is "assimilative capacity of environment." It is defined as "the allowable limit of the environment to receive and absorb pollutants" (Clause 17, Art. 3) for water environmental protection in controlling wastewater discharge volume into a particular RB (Clause 3, Art. 52).

LEP concerns the total admissible amount of pollutant load of RB from its relevant RB area, while LWR focuses on the additional admissible amount of wastewater as pollutant load of identical one. Both LWR and LEP hire RB oriented pollutant load concept or TPL (Total Pollutant Load) for RBWEM.

As a result, both are designed to use TPLC approach in RBWEM.

Basic relationship between LWR and LEP in the RB context is shown in the chart below.



2-2 Introduction of WDQA in Legal System

A concept of WDQ is introduced by Decree No. 38 (Decree No. 38/ 2015/ NDCP) dated April 24, 2015 on waste and scrap management proposed by the Minister of Natural Resources and Environment (MONRE) which is pursuant to Law on Organization of the Government dated December 25, 2001and to LEP. Decree No. 38 has developed the usage of the concept of assimilative capacity by utilizing concepts of "load capacity" and WDQA in RBWEM.

WDQ is defined in Decree No. 38 as

"Wastewater Discharge Quota is load limit of each pollutant or parameter in wastewater issued by State management agencies for each receiving waters to ensure the discharge of wastewater not to exceed the load capacity of the water environment" (Clause 26, Art. 3),

in association with the definition of the "load capacity" in the Clause 25, Art 3 as

"Load capacity of the water environment is ability to receive more pollutants while ensuring the concentration of pollutants not to exceed the limited values specified in environmental standards for the use purpose of receiving sources." The definition of "load capacity" is identical to LWR's definition of "water source's capacity to receive wastewater" which is further defined as "the capacity of water source to additionally receive a volume of wastewater while still maintaining its quality for use purposes accordingly to Vietnam's standards and technical regulations or foreign standards and technical regulations permitted for application of competent state agencies." By these definitions, both LWR and LEP employ the identical concepts for RBWEM.

Since WDQs are issued for each receiving water based on the load capacity which is derived

from the assimilative capacity minus current or expected TPL of RB based on the WQ, it embraces a spatial nature. This spatial nature in conjunction with RB oriented extensive spatial coverage differentiates the other wastewater control measures like wastewater discharge license, protective zoning, environmental protection charge, EIA, etIBy LWR and LEP.

2-3 Functions of WDQA

Functions of WDQA designed by the Decree No. 38 are to:

- Identify allowable pollutant loads by wastewater in a particular area in accordance with the current pollutant loads and socioeconomic planning, and utilizing it for basin-wide pollutant discharge control (Clause 1 and 2, Art. 41),
- Constrain socioeconomic activities/ conditions through SEDPs and sector plans with investment project planning and approval by limited volume of the pollutant loads by the wastewater discharging from a particular area (Clause 3 and 4, Art. 41),
- Indirectly induce investments in public and other wastewater treatment projects for utilizing the spared WDQs by the projects for accommodating more development oriented activities (Clause 4, Art. 41 and Art. 42).

The above stated functions of WDQA indicate that it is a spatial pollutant discharge volume control tool. It is appropriate to be designated to PPCs with their discretions as a subject for the state management considering the administrative jurisdiction.

2-4 Status of WDQA Implementation

WDQA is pioneering institutional arrangement by the Government of Vietnam (GOV) to control additional pollutant loads into the receiving water environment within the tolerable level for the receiver considering its assimilative capacity in a RB context in basic. It can be expanded its use in reducing the pollutant loads by using the negative figures for the additional pollutant loads. In its application, it functions as an adjusting tool of TPL under RB context.

The prevalent existing institutional arrangements in practice like TMDL (Total Maximum Daily Load) in the U.S. and TPLCS (Total Pollutant Load Control System) in Japan aim to reduce the overshot pollutant load discharge into a water environment. On the other hand, WDQA by the GOV includes preemptive arrangement to prevent the overshooting situation as well as alleviation of overshot cases. This makes the GOV's arrangement as pioneering one which can be called as a system for pollutant load adjustment.

It is, however, not in practice until now due to absence of official calculation methods for the assimilative capacity, load capacity, and RB TPL. Necessary procedure for allocating WDQs is still yet for development.

2-5 Needs of More Effective RBWEM with TPLC Approach

The basic approach in RBWEM is to constrain pollutant discharge or wastewater discharge

independently and to implement projects for installing public sewerage system. Although wastewater standards are applied to discharging sources, sometimes water pollution problems occur especially in and around the highly-developed areas.

For solving the problems, causes for such overload of the pollutants to water sources must be revealed. It could be due to excessive pollutant discharges against the standard by the specific sources, to ineffective protection zoning implementation, to unexpectedly large number of discharging sources exist in RB more than the normally expected level, to insufficiency in application of reduction measures especially by public ones, to the other factors, or to a combination of them. Tighter application practices of standards on discharging sources, stricter implementation of protective zoning, extra restriction on pollutant discharge, additional application of reduction measures, other measures, or the combination is required for solving the problem.

In Vietnam water quality problems in RBs of Cau, Nhue - Day, and Sai Gon - Dong Nai were officially cited in "The Environmental Report of Vietnam" by MONRE in 2006. The problems have been persistent until now.

Systematic and prioritized application of measures for identifying and solving the problem is yet to be in practice. The implementation of TPLC approach, which reveals degrees of contributions by spatial distribution of and by category oriented pollution discharging sources, is required for controlling pollution involving varieties of pollution sources such as the organic substances indicated by COD/ BOD and substances causing eutrophication such as phosphorus and nitrogen by the said application of measures.

3 Identification Provincial RCs and Agreement by the Pertinent PPCs

3-1 Nature of Provincial RCs Identification and Agreement by the Pertinent PPCs

Since the Decree No. 38 only provides responsibilities WDQA to PPCs while MONRE has no responsibility in WDQA as stated in 1-2, WDQA process in inter-provincial river is compelled to commence with the identification provincial RCs and agreement by the pertinent PPCs on them.

As described in "2-3 Functions of WDQA," WDQA has a restraining aspect on socioeconomic development when the overloaded pollution at (a) specific point(s) within the RB happen(s) or is (are) expected. The aspect tends to be regarded as negative factor by PPCs as responsible organizations for development of their territories although it could be managed by proper adjustment in spatial development, application of tighter wastewater discharge restrictions, and/ or other measures in general. For PPCs, adoption of provincial RIBy the agreement means accepting the adjustment of their socioeconomic development somehow.

From this viewpoint willingness of the pertinent PPCs for adopting provincial RCs are essential for securing effectiveness of the WDQA system in inter-provincial RB context in

Vietnam. Then consensus on the allocation among or collaborative decision-making on the allocation by the PPCs is indispensable for sustaining their willingness for the adoption and the effectiveness of RBWEM.

For the sake, provincial RCs have to be identified or determined mainly by collaboration or with consensus of the respective PPCs in association with the RB Organization (RBO) including Environmental Protection Committee (EPC), and MONRE and relating agencies listed in 4-1-2. The collaboration or consensus is indispensable for assuring commitments of the relating entities in formulation and implementation of plans to achieve RBWEM.

3-2 Use of WQ Simulation Model in Provincial RCs Identification

For implementing TPLC approach, use of a RB WQ simulation model is prevalent for projecting future TPL conditions of RB based on the current situations including degrees of contributions by spatial and category oriented pollutant loads in TPL measured at the evaluation points consist of the representative point and the observation points. The model is used for discounting the TPL at the discharging points for the projection of the WQ at the evaluation points.

Since pollutant loads generated by sources in RB do not fully reach to the evaluation points as described in Step 4 of "Technical Guideline for Calculating Loading Capacity and Discharge Quota (TG)," direct application of the TPL figure derived basically from the evaluation points' WQs multiplied by the relevant water volumes, which usually smaller than the original volume of TPL at the discharge points. As a result, direct application of the simple multiplication as an admissible TPL figure of RB to control TPL volume at the discharge points become too strict restriction on pollutant discharges.

Projection of impacts on WQ of RB by the expected future volume of TPL is derived from the current figures indicating environmental conditions with the projected future conditions incorporating the intended development and intervention plans by simulation model formulation and execution. It is, however, quite challenging due to complex, ambiguous, and changing relationships among factors involved in the simulation. The current insufficient availability and accuracy of necessary data for proper model establishment in Vietnam exacerbate this aspect.

Even a precise projection of the future TPL is too much demanding, however, a trend of the WQ conditions could be availed by model applications. Identified RCs by agreement basis among the pertinent PPCs based on the approximate volume of TPL attained as trend is recommended for advancement in RBWEM. In the case, continuous monitoring and evaluation on the WQ at the evaluation points with associating adjustment of RCs are indispensable for complementing uncertainty.

3-3 Consideration Factors in Provincial Level RCs Identification

Discharge volumes of pollutant loads are basically correlated with the socioeconomic expansion of the society while the application and the evolution of the technologies are decreasing factors of the pollutant loads.

Thus, limitation of the dischargeable pollutant load volume for the specific spatial context constrains the economic and population growth of the respective area in certain degree.

On the other hand, water volume of the pollution bearing river flow or replacement in water source constitutes the base of target water source's WQ or basiIBearing capacity of pollutant loads: Larger the volume, larger the assimilative capacity in general.

Based on the above principle, allocations of the dischargeable pollutant loads have to be determined in consideration of the following factors:

- Water flow/ substitution volume of target water source,
- Functional characteristics of the spatial extents in the corresponding RB especially on the places embracing the water generating sources,
- Accumulating nature of the pollutant loads from upstream to downstream in basic,
- Current socioeconomic activities/ conditions in conjunction with the current volume of the pollutant loads and corresponding WQ as basis to estimate expected volumes of pollutant loads in future,
- Expected/ planned future magnitudes of the socioeconomic activities/ conditions in the space for calculating future volume of pollutant loads and WQ bases,
- Planned/ expected and applicable measures to reduce the expected pollutant loads, and
- National spatial development and preservation/ protection policies.

3-4 Process of Provincial Level RCs Identification and Agreement

Process of identifying RCs and agreement by the pertinent PPCs of a particular inter-provincial RB or Provincial Level WDQA Steps (Steps) on them is recommended as follows:

Step 1: Designation of RB Adopting TPLC and Institutional Body Establishment,
Step 2: Shared Cognition of Current and Expected Water Environmental Conditions,
Step 3: Shared Consciousness on RBWEM Issues,
Step 4: Review on Intervention Viabilities and Formulation of RBs Alternatives
Step 5: Agreeing Total RC and Provincial Level RCs w/ Intervention Scenarios
Step 6: Reflections in Development Plans of Pertinent PPCs and Implementation,

The Steps are phased by 4 in:

- Preparatory Phase (Step 1),
- Common Understanding Formulation Phase (Step 2 and 3)
- Identification and Allocation Phase (Step 4 and 5), and
- Post Identification and Allocation Phase (Step 6).

Step 1 is the Preparatory Phase to define a target RB and pertinent PPCs for TPLC and to

mobilize resources for establishing decision making and secretariat bodies.

Step 2 and 3 comprise Common Understanding Formulation Phase. The common understanding means shared understanding among the stakeholders of RC decision-making which are mainly done by the pertinent PPCs. The Phase embraces the activities to collect necessary data and information, to present them in organized manner, to attain proper understanding of situations regarding water environmental conditions and issue(s) in the RB, and to attain consensus on the subject issue(s) for RBWEM. The activities involve analyses and use of simulation model prepared accordingly to the TG on the RBWEM situation.

The RB situations to be comprehended by the stakeholders of RC decision-making involve basically two points in timeframe; current ones and expected ones. Step 2 and 3 require majority of the activities and outputs under the conducts in accordance with TG except for future simulations with extra intervention scenarios. The simulation results for the target year without extra pollutant load reduction measures and/ or with planned extra pollutant load reduction measures to the expected pollution discharging situations play important role in this phase. The simulation is required to fulfill the requirement stipulated by Clause 2, Art. 41, Decree No. 38.

Formulation of common understanding on the conditions of and the issues of RB is indispensable and important for attaining the consensus on the decision or for conducting the collaborating decision-making. Especially for complex decisions like RCs identification in association with relevant intervention scenario if necessary, lack of factual common understanding on the subject situation may cause confusion and fragmentation among the members.

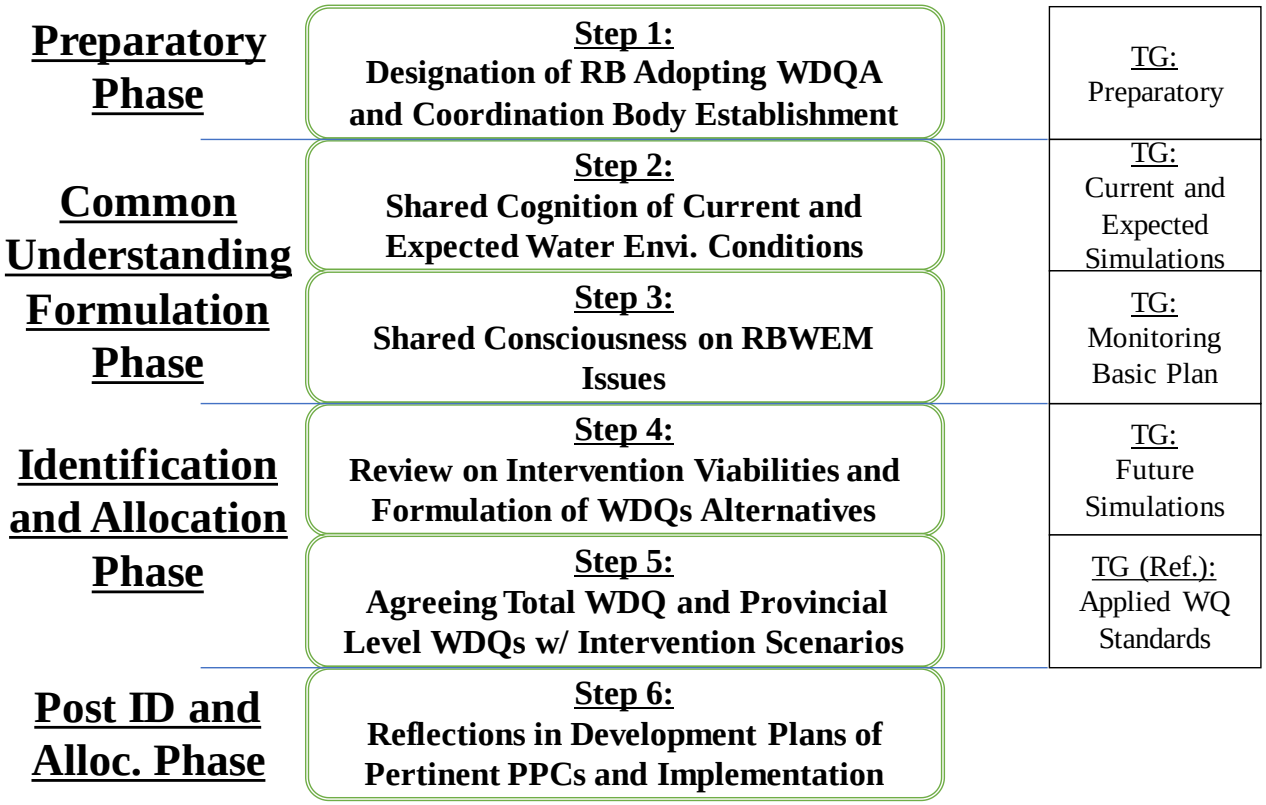
Step 4 and 5 constitute Identification and Allocation Phase. Step 4 is integral part for formulating the alternatives for the collective decision-making or consensus on the identified and agreed provincial RCs by the pertinent PPCs in Step 5.

It includes the activities in TG to simulate the WQ conditions at the target year with application of extra intervention measures. Formulation of intervention scenarios and respective simulations to provide sound references for establishing appropriate target WQs and to identify and to allocate associating provincial RCs with the WQs to be adopted in accordance with TG.

Step 5 is to identify and to allocate the provincial RCs from alternatives formulated by Step 4 for RBWEM with associating intervention scenarios.

Step 6 as Post Identification and Allocation Phase embraces PPCs' actions on integrating adopted scenarios for achieving respective RCs into their development plans and their implementation, and monitoring and evaluation (M&E) for the planning and implementation activities.

The following chart illustrate the above descriptions.



4 Steps for Identifying and Allocating Provincial Level WDQs (Steps)

4-1 Step 1: Designation of RB Adopting TPLC and Institutional Body Establishment

Step 1 is Preparatory Phase of Steps for Identifying and Agreeing Provincial RQs (Steps). For commencing RBWEM based on TPLC in inter-provincial RBs, subject RBs adopting TPLC have to be designated by GOV, by RBO, or collectively by the pertinent PPCs of the subject RB. The designation shall be conducted based on needs for RBWEM to deal with the existing and/ or expected water pollution problem(s) in a subject RB.

After the designation, establishing activities for a Institutional Body (IB) to identify and to allocate provincial RCs for inter-provincial RBWEM follow. The coordination body may bear M&E functions of the RBWEM activities and performances by the pertinent PPCs based on the TPLC in addition to the identification and the allocation. The body shall consist of 3 functional entities of 1) Decision-Making Group, 2) Secretariat, and 3) Advisory Group (AG). It can be a part of RBO for inter-provincial RB or a single purpose coordination body for inter-provincial RBWEM such as EPC.

4-1-1 Designation of Target RB for TPLIBased RBWEM

Designation of a subject RB for inter-provincial REBWEM based on TPLC is conducted for dealing with the water pollution problem(s) which require(s) efforts by the multiple provinces' contributions for the solution. Possible designation procedures are three: 1) by Governmental

Decision, 2) by RBO decision in case it already exists, and 3) by voluntary collective designation by the pertinent PPCs.

Designation shall associate RB boundary delineation necessary for the solution while details of the delineation may follow the establishment of the coordination body. By the designation the representative point adequately representing WQ and TPL of the subject RB, and observation points for evaluating WQs and the pollutant load conditions of relevant territories against the focal sites/ locations with significances for RBWEM described in TG must be appointed.

The points are appointed tentatively in accordance with the TG for the model establishment and for the basic future projections. The appointments are finalized after the attainment of common understanding on the conditions and the problems for WDQA in RBWEM through the processes of Step 2 and Step 3.

Considering the subject issues for RBWEM, relevant subject pollution substance(s) is/ are selected among the organic substances indicated by COD/ BOD and substances causing eutrophication such as phosphorus and nitrogen. Due to the characteristics of the TPLC approach the above-mentioned types of substances are appropriate as the subject. Further, the approach is suitable for the pollution caused by various types and extended numbers of sources with associating tools including WQ simulation models.

4-1-2 Establishing Institutional Body (IB)

IB is constituted by 3 functional components of 1) Decision Making Group (DMG), 2) Secretariat, and 3) Advisory Group (AG). Steps are basically conducted by DMG with substantial assistance by Secretariat of IB and technical supports by AG. AG consists of concerned agencies providing technical and financial support for RBWEM is an associating entity with DMG for supporting its planning, coordination, M&E, and decision-making functions which are substantially assisted by Secretariat.

A Decision-Making Group (DMG)

DMG is the decision-making body in conducting Steps for identification and allocation of provincial WDQs. DMG for TPLC consists of representatives from the pertinent PPCs in basic.

In case the subject RB is designated by GOV or RBO, initiating and leading entity for DMG activities is required to guide the group. MONRE or RBO is appropriate as the entity. In case the RB is designated voluntarily by the pertinent PPCs, a lead agency which is MONRE or RBO shall be assigned as necessary by the pertinent PPCs.

The pertinent PPCs are the PPCs embracing part of the RB area within their territories.

Lead agency takes initiative and facilitating role in DMG for provincial RCs identification and agreement process especially in formulating reasonably adoptable provincial RCs

alternatives for the PPCs. Supporting agencies basically provide technical and administrative advices on the formulation of RCs alternatives and on the decision-making.

B Secretariat

Secretariat consists of Working Group (WG) and Planning Expert Group (PEG). Secretariat conducts both technical and administrative roles of IB.

WG conducts most of the activities described in TG in addition to the administrative activities. On the other hand, PEG conducts activities for ensuring inclusion of development plans' data and information into model formulation and simulations, and preparing additional intervention scenario alternatives. WG is mainly engaged in the model related activities in addition to the ordinary secretariat jobs, while PEG deals with figuring out and gauging the impacts relating to identification and agreement on RCs with intervention scenarios.

C Advisory Group (AG)

Stakeholder agencies selected from ministries and/ or their subordinate agencies for the respective issues concerned for the RBWEM form AG in addition to MONRE and RBO. MONRE or RBO cam be a leading agency of AG. They take dual roles of the lead agency of DMG and AG in case they take a lead agency role.

Candidate ministries include Ministry of Construction (MOC), Ministry of Agriculture and Rural Development (MARD), Ministry of Industry and Trade (MOIT), Ministry of Science and Technology (MOST), Ministry of Transport (MOT), and Ministry of Health (MOH), Ministry of Planning and Investment (MPI), Ministry of Finance (MOF), and other ministries as necessary. In general, MOC is an essential agency for supporting planning and implementing the public wastewater treatment and physical development planning and implementation.

4-1-3 Model Selection, Data and Information Collection, and Model Establishment

Selection of the appropriate model for the calculation of loading capacity and RCs, collecting necessary data and information for establishing the model and for conducting simulations, and establishment of the WQ simulation model including the pollutant load analysis must be conducted accordingly to the TG.

DMG and AG are responsible for attainment of necessary data and information for establishing and running simulation model by WG. PEG collects and provide WG the required planning information and associating data.

DMG is responsible for the determination of the model, facilitation and support for the data and information acquisition, and the approval regarding the model establishment with substantial assistance of Secretariat and advises and technical input by AG.

Secretariat execute the necessary activities.

4-1-4 Target Year of TPLC

The target year of TPLC must be identical to the end of the five-year SEDP in accordance with Clause 3, Art. 41, Decree No. 38.

It is preferable to establish long-term target for 20 to 30 years corresponding to the visions associating to the development plans

4-1-5 Required Coordination for Preparatory Activities

Basic consents and coordinated activities in this Step as preparatory phase follow:

1) Defining quality and quantity of necessary physical data and information for understanding the RB water environmental conditions and/ or for use of the model (monitoring points, observation subjects and timings, data acquisition methods including cost, precision of data, and so on) and their acquisition/ sharing,
2) Selecting appropriate model, and
3) Defining necessary data and information including plans for indicating current and expected future socioeconomic conditions and their acquisition/ sharing.

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4-2 Step 2: Shared Cognition of Current and Expected Water Environmental Conditions

To formulate common understanding on RB conditions and problems for attaining a consensus on the decision or for conducting collaborating decision-making on identification and agreement on RCs, shared proper cognition of the current RB water environmental conditions among stakeholders including DMG and AG is prerequisite. For the cognition, all the stakeholders have to comprehend the situations not only for the current but also for the expected future reflecting SEDP (Clause 2, Art. 41, Decree No. 38) and preferably sector plans in addition to the trends derived from the current and historical data and information.

To attain the proper comprehensions of the stakeholders, use of simulation model facilitates a lot to understand the relationship between current conditions of pollutant loads in terms of spatial and source category oriented distributions and intensities, and current and expected future WQ indicators at the representative and observation points. The current and expected future results of the model illustrate degrees of contributions by categories of discharge sources, by spatial distributions of discharge sources, and by both. The results of the model help comprehending the basic relationship between socioeconomic activities and the RB WQs as indicator for RBWEM.

At the same time, Wastewater Discharge Sources Inventory (WDSI) supplement more precise understanding of contribution by the discharge source category oriented pollutant loads and their spatial distributions in the WQ degradations, in addition to its contribution in establishing the models and calculation of load capacity.

4-2-1 Understanding Current Conditions of RB Water Environment

The comprehensions by DMG members commence from the current WQs and TPL conditions of RB utilizing the results of the model, and WDSI data and information.

Secretariat (WG with support of PEG) prepares presentation materials of the results including explanatories or hypotheses on relationships between pollution sources and WQs. Secretariat also prepares an explanatory on extent of model's reliability including the availability, appropriateness, and reliability of data and information used. The availability may include existence of monitoring station or physical availability, and availability/ accessibility to responsible entities of possession.

Secretariat presents the prepared materials to DMG members for their collective and uniform understanding of the current WQs and TPL conditions in RB including reliability of model and data/ information.

Consensus on the explanatories by DMG with necessary adjustment and/ or revision are critical for conducting Step 3, since the explanatories form base of the evaluation of the current conditions.

The understanding of DMG shall be written in a report format and unanimously approved by DMG.

AG supports the process by its technical and administrative knowledge and expertise as necessary.

4-2-2 Understanding Expected Future Conditions of RB Water Environment

The process of attaining common cognition proceeds for understanding the expected future conditions of RB water environment utilizing the simulation results of the model.

Secretariat (WG with support of PEG) makes sure the incorporation of expected pollution source conditions in conjunction with socioeconomic conditions and reduction measures in accordance with the development plans including SEDP and sector development plans to the simulation model execution.

Secretariat prepares presentation materials of the results including explanatories or hypotheses on relationships between pollution sources and WQs on the future simulation results. Secretariat also prepares an explanatory on extent of model's reliability including the availability, appropriateness, and reliability of data and information used.

Secretariat presents the expected future results as same manner as for the current ones stated above with brief notes on the data/ information issues to DMG members for their collective and uniform understanding of the expected future WQs and TPL conditions in RB.

Adjustment and revision of the explanatories by DMG are critical for conducting Step 3, since the explanatories constitute base of the evaluation of the current conditions. The adjustment

or revision of the results is not admitted in basic except for the case of finding important failure in model establishment.

The understanding of DMG shall be written in a report format and unanimously approved by DMG.

AG supports the process by its technical and administrative knowledge and expertise as necessary.

4-2-3 Candidate Supplementary Monitoring Points for WQs and Water Quantities

Assessment process of reliability of the utilized model with available data and information may reveal the necessity of supplementary monitoring points especially for WQ and water quantity gauging. Purposes of supplementation include model precision upgrading and more precise data acquisition for intended protection.

Secretariat prepares the list of monitoring points in necessity and DMG endorses it. The list shall be utilized for recommendation/ suggestion of additional monitoring stations to the responsible authorities.

AG supports the process by its technical and administrative knowledge and expertise as necessary.

4-3 Step 3: Shared Consciousness on RBWEM Issues

Issues to be dealt as RBWEM are derived from the shared cognition of the RB water environmental conditions in conjunction with the current and expected future socioeconomic conditions attained through Step 2. The issues must be determined unanimously by IB based on shared consciousness of the RB's water environmental issues.

Following processes are conducted based on the shared cognition of RB situations.

4-3-1 Evaluation of Current and Expected Future Load Capacities Based on Water Use

For beginning this process, the following decisions must be agreed among DMG with supports by AG:

1) Points to be taken as observation point for monitoring WQs for comparison with purpose oriented WQ standards which are required for attaining data regarding their pollution issues, and
2) Selection of the representative point representing RB WQ for comparison of its WQ with the WQ standard to be applied.

Technically the candidate points are limited to the monitoring points considering the requirements of the following processes.

Based on the decisions, identification of the levels of subject WQs or figures of differences against the respective WQ standards ought to be applied in accordance with the relevant use

purposes are conducted.

Secretariat (WG) prepares the comparison list of the agreed points.

It has to be noted that the differences of the WQs provide the following implications for dealing with the TPL in principle:

1) In case the current WQs exceed the ought-to-be applied WQs, the total volume of RIBecomes negative figure indicating needs of TPL reduction;
2) In case the expected future WQs exceed the ought-to-be applied WQs, the total volume of RC provides dischargeable additional pollution volumes with additional reduction/ restraining measures to the currently planned ones for restraining TPL increase; and
3) In case both the current and the expected future WQs do not exceed the ought-to-be applied WQs, the total volume of RIBecome larger amount than the result of the simulation integrating the expected future socioeconomic conditions and implementation plans for the reduction/ restriction measures.

Evaluation of the pollution problems in their seriousness, priorities, and/ or urgency follows to the gap identification.

Evaluation format integrating the aspects and local conditions for the points is prepared by Secretariat (PEG with support of WG) with necessary supports by AG. Evaluation is better to be conducted collectively by all the DMG members. Unanimous consent on the result is imperative.

4-3-2 Define Issues to be Dealt by TPLC

Based on the evaluation results produced by 4-3-1, issues to be dealt by TPLC are defined. Definition of issues has to address elements including problematic points by water pollution, major pollution sources causing the water pollution, degrees of pollution in terms of WQs and TPL and needs of the problem solution.

Brief considerations on the locational development potentials within the RB and PPC territories are incorporated in the process of defining the problems.

Based on the DMG's discussion with supports by AG, Secretariat (PEG) prepares the draft definition and DMG endorses the draft with necessary revisions.

4-3-3 Necessary Monitoring Points for Planning and M&E

Based on the issues to be dealt by TPLC and monitoring conditions figured out in the above process, improvements in monitoring shall be proposed by Secretariat (WG) with supports by AG and be approved by DMG.

4-4 Step 4: Review on Intervention Viabilities and Formulation of WDQs Alternatives

For formulating provincial RCs alternatives for decision-making by DMG, collective reviews

on viabilities of already planned and the additionally applicable TPL reduction measures and on their countability are imperative.

General process of Step 4 to formulate provincial RCs alternatives for decision-making follows:

4-4-1 Identifying TPL Reduction Measures

Firstly, TPL reduction/ restriction measures must be identified from the current administrative activities including the following:

1) Infrastructure investment approach including a) sewerage system development/ improvement in urban area, and b) collective wastewater treatment system in suburban area/ rural center area and for craft village.
2) Administrative approach including a) pollution source establishment control, b) wastewater treatment standard application, c) imposing charges, and d) incentive provisions for better wastewater treatment/ discharging practice.

Based on the current activities, additionally applicable TPL reduction measures are identified considering the applications of current measures in terms of spatial coverage, coverage of pollution sources, degrees of performance, degrees of effectiveness, and so on.

List of identified measures are prepared by Secretariat (PEG) with supports of AG and verified by DMG.

4-4-2 Assessment of TPL Reduction Measures' Effectiveness

Identified measures are assessed at least by the following criteria:

1) Expected effect as current or expected reduction volume of TPL,
2) Possible performance level in terms of reduction/ restriction of TPL, and
3) Cost effectiveness of the measures.

Assessment of the measures categorized in 1) infrastructure investment approach in 4-4-1 is rather straightforward. Design/ planned current or expected volumes and costs of measures are used for the criteria 1), 2) and 3) with necessary confirmation of figures.

On the other hand, assessment of measures under 2) administrative approach is complex. A measure for restricting increase of pollution sources nominated as a) pollution source establishment control requires comparison of its with and without cases for attaining reduction volume. Its possible performance is sometimes questioned although the 100% implementation performance is officially expected. It must be regarded as nominal.

A measure b) wastewater treatment standard application also requires the comparison. Subject figures for comparison are different from cases of stricter enforcement of the standard and cases of applying tighter standard. Assessment of performance involves reliabilities of self-

conducting monitoring, difficulties in inspection, and/ or effectiveness of penalty imposing for reduction.

Measures c) and d) involves gauging problems in all the aspects.

Considering the above, assessment of the measures is recommended by grading in three to five ranks by the aspects. Assessment aspects can be increased for the requirement basis for particular RB.

List of the assessed measures with grading are prepared by Secretariat (PEG) with supports of AG and verified with necessary modification by DMG.

4-4-3 Identifying Additional Measures against Issues/ Focal Points including Planned Ones

Next process is identification of additional reduction/ restriction measures to the current ones with the emphasis on the issues/ focal points defined in Step 3.

List of identified measures are prepared by Secretariat (PEG) with supports of AG and verified by DMG.

4-4-4 Counting Viabilities of TPL Reduction Measures

Identified measures in 4-4-3 are prioritized by expected impacts based on the countability in implementation effectiveness or viability in basic with cost factor. The performance assessment list prepared in 4-4-2 is utilized as a reference for prioritizing.

Identical to or slightly modified grading system of one used in 4-4-2 is applied for the prioritizing.

List of the prioritized measures with grading are prepared by Secretariat (PEG) with supports of AG and verified with necessary modification by DMG.

4-4-5 Formulating Provincial RCs Alternatives with Associating Intervention Scenarios

In this process numbers of simulations executed by Secretariat (WG) in accordance with DMG's requests are required to be conducted with viable combinations of reduction/ restriction measure applications.

Packages of measures are formulated considering the priorities applied by 4-4-4 and spatial development priorities. Possibilities in exchanging placements of allowable pollution sources within RB, which is a kind of pollution trading, must be part of the considerations. Degrees of required efforts for implementation of the measures must be incorporated for the packaging.

In addition, following factors are required to be considered in provincial RCs for the equity of PPCs: investment volume of infrastructure measures, current coverage of the infrastructures against required areas currently and in future, socioeconomic potentials recognized by nationally/ regionally, natural roles of areas in RB water cycle, and so on.

Packaging of measures differentiates a total volume of RCs and their figures for allocation to PPCs.

Negative RCs are allocated in case the estimated current TPL exceeds the assimilative capacity of RB based on the selected WQ standard. Since the total amount of RCs depends on the applied WQ to the representative point and WQs applied to the observation points has significant impacts on the RC figures to the PPC, determination of the applying WQs options for provincial RCs is critical for conducting TPLC.

Recommended number of provincial RCs alternatives is three (3) to five (5) which illustrate differences of impacts of intervention packages, required intervention packages, and/ or provincial distribution of RCs to achieve the target WQ(s) of the subject RB.

Secretariat (PEG) integrates the entire discussions of Step 4 among DMG and AG, and prepares 3 - 5 provincial RCs alternatives for DMG's discussion and selection with revisions.

4-5 Step 5: Agreeing Total RC and Provincial RCs w/ Intervention Scenario

In this Step, the target total RC of RB envisaging the target year is collectively determined or selected from alternatives derived from the collective reviews on the intervention scenarios and the relevant results in association with allocation alternatives with RCs. Since the target total RC of RB is a synthesis of agreed provincial RCs result and the associating intervention scenario, three of them are simultaneously determined.

4-5-1 Agreeing Provincial RC

From the alternatives prepared in Step 4, provincial RCs are agreed or determined unanimously by DMG with the following factors:

1) Tolerable degree of excess in RCs and expected achievement timing
2) Implementation possibilities of payable efforts.

4-5-2 Authorization by GOV

The target total RC and the agreed provincial RCs are formalized by the GOV.

4-6 Step 6: Reflections in Development Plans of Pertinent PPCs and Implementation

Actions/ projects listed in the associating intervention scenario to the formalized provincial RCs must be incorporated into the SEDPs and/ or sector plans by respective competitive agencies in addition to utilize agreed RCs as the limiting factor for SEDP, sector plans, investment plans and approvals. The plans shall be conducted with corresponding investments, promotions and permitting activities.

DMG in substantial assistance of Secretariat and supports by AG shall conduct M&E on the planning and implementation activities associating with TPLC.

5 Organizational Arrangement

5-1 Required Organizational Structure for TPLIBased RBWEM

As described in "3 Identification and Allocation of Provincial RCs" an opportunity to identify provincial RCs and of agreement on the RCs by the pertinent PPCs is indispensable to commence provincial TPLC activities for RBWEM for an inter-provincial RB. For providing the opportunity to the concerned entities especially to the pertinent PPCs, institutional arrangement as establishment of a Institutional Body (IB) is necessary as stated in the Step 1.

IB consists of 3 functional entities of 1) Decision Making Group (DMG), 2) Secretariat, and 3) Advisory Group (AG).

DMG is a core of IB and comprised of the pertinent PPCs and, most of the cases, a lead agency which is MONRE or RBO.

Secretariat assists DMG throughout provincial RCs identification and agreement process especially by providing technical documents and services required for DMG's decision-making in addition to the ordinary administrative works for IB. It is comprised of Working Group (WG) conducting ordinary secretariat jobs and simulation model related works, and Planning Expert Group (PEG) to handle development plans and intervention scenario preparation.

AG comprised of MONRE/ RBO and concerned agencies in RBWEM supports DMG and Secretariat by providing technical and administrative advices, and necessary data/ information.

5-2 Duties and Responsibilities of Participating Organizational Entities

Participating organizational entities which are the pertinent PPCs, MONRE, RBO and concerned agencies are responsible for providing necessary data and information for RBWEM.

Members of DMG are abided to conclude collaborative/ anonymous decision on the provincial RCs. For the decision-making, shared understanding on the current and expected RB environmental conditions and consensus on the RBWEM issues are indispensable. The decision-making process may have options of collaborative planning approach and consensus formulation on prepared planning alternatives. The pertinent PPCs' docile acceptances of imposed provincial RCs by third party or by the central agency may jeopardize effective implementation of TPLC system.

5-3 Memo on RBO in Viet Nam

5-3-1 RB Organization (RBO) Stipulated in LWR

RB Organization (RBO) is stipulated in LWR as an organization

- of proposing the regulation and distribution of water sources and supervise the exploitation, use and protection of water resources and the prevention, control and remedy of harmful effects caused by water on one or more than one inter-provincial RB (Item a, Clause 2, Art. 72) under MONRE's coordination (Item c, Clause 2, Art. 72),

- of consulting intended projects for water transfer (Clause 2, Art.6) and for building reservoirs or dams (Clause 3, Art.6), water resources master plans before submitting to competent authorities for approval (Clause 2, Art. 21), and the operation processes of reservoirs or inter-reservoirs built on RBs before submitting to competent authorities for approval (Clause 4, Art. 60), and
- of putting forward measures to assure the implementation of water resource master pans and to propose the settlement of matters arising in the course of implementation of these master plans to competent agencies(Clause 3, Art. 24).

MONRE is responsible for acting as the standing body of the RB organizations (Item j, Clause 2, Art. 70).

5-3-2 Attempted RBO Establishment for Coordinating RBWRM

In 2016 RBO was tried to be established with more assertive roles/ functions in coordinating stakeholders of inter-provincial RB including the pertinent PPCs. Establishment of RBOs for managing inter-provincial RB in certain manners, however, still lacks legal basis now.

6 Technical Notes

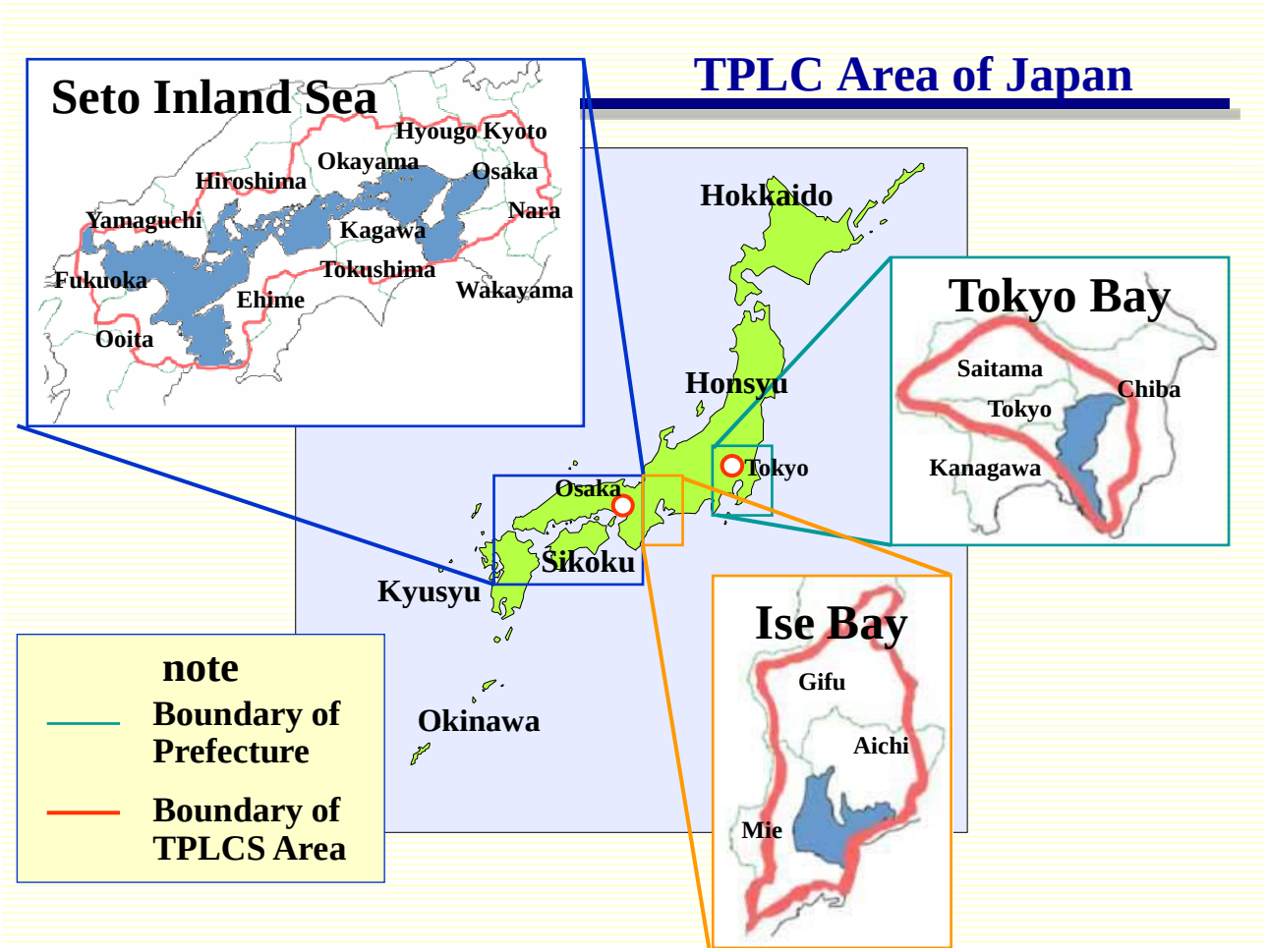
6-1 Total Pollutant Load Control System (TPLCS) in Japan

TPLCS in Japan can be expressed that a legalized system of coordinated voluntary efforts for solving the water pollution problems in enclosed water areas (subject areas are sea areas only although the approach is employed at least for lake environment management) accumulated excessive amounts of pollutants.

The accumulation was caused by concentration of socioeconomic activities such as population, and industrial and other economic activities without appropriate reduction measures although the effluent standards are mostly satisfied by the sources. It caused serious water environmental problems negatively impacted on water ecosystem especially on marine ecosystem. It hindered fishery sector significantly and use of marine environment for recreational uses, and implied health problems.

6-1-1 Background and Basics of TPLCS in Japan

TPLCS in Japan was applied in 1973 to deal with the serious water environmental problems caused by the accumulated and overloaded pollutants in Seto Inland Sea which is enclosed water areas where the water cannot be easily exchanged with outer areas. The system has been introduced and applied to the other 2 enclosed water areas of Tokyo Bay and Ise Bay in addition to Seto Inland Sea since the amendments of Water Pollution Prevention Act and Act on Special Measures concerning Conservation of the Environment of the Seto Inland Sea in 1978. Target areas of the system is shown in the Chart below.



Source: Presentation "Support Project of Total Pollutant Load Control System ("TPLCS") introduction" by Ryuji Tomisaka, Director, Office of Environmental Management of Enclosed Coastal Seas, ministry of Environment, Japan

TPLCS is conducted accordingly to the above stated law based on the Basic Environmental Act and Water Pollution Prevention Act. In TPLCS, Ministry of Environment (MOE) establishes the Basic Policy for Areawide Total Pollutant Load Control. Then the prefectural governments formulate Total Pollutant Load Control Plans in accordance with the Basic Policy.

The Control Plan consist of 3 kinds of pollutant reduction measures: 1) Pollutant discharge Control on large scale effluent sources, 2) Reduction Guidance on small-scale and unregulated businesses, agriculture and livestock activities, and general households, and 3) Project Implementation regarding sewerages. Among them, results of 1) Pollutant discharge Control and 3) Project Implementation occupy majority in the reduction while 2) Reduction Guidance has contributed in raising awareness of the society and the basic reduction.

The TPLC approach is also employed by Law Concerning Special Measures for Conservation of Lake Water Quality.

6-1-2 Principal Measures : 1) Pollutant Discharge Control and 3) Project Implementation

Pollutant Discharge Control is activities to regulates the pollutant discharge load from factories/ business establishments with daily average effluent amount of 50 m3 or more. Effluent national standards are defined under Water Pollution Prevention Act while the prefectural level governments which conducts regulation activities are delegated the authority to apply more strict standards than the national ones for achievement of their TPLC Plans which are accordingly to the national guidelines.

For Project Implementation, Sewerage Law administered by Ministry of Land, Infrastructure, and Transport (MILT) provides the framework of Comprehensive Basin-wide Planning of Sewerage Systems for development of sewage systems and promotion of employment of advanced water treatment at sewage plants for supporting water quality standard achievements including TPLCS.

The Basin-wide Planning framework employs an emission trading concept through the investment and operating cost bearing by insufficient emission level achieving municipalities in other municipality's project achieving smaller emission level than the indicated achievement emission level. The duties of the unsuccessful municipality in sewage emission level are relieved by the contributions. This enables avoiding inefficient investments for achieving basin-wide target of water quality standard based on TPLC approach.

6-1-3 Planning and Implementation Structure

The pertinent Prefectures formulate TPL Reduction Plan based on the TPLCS Policy established by MOE integrating Prefectural Governors' opinions and outputs by environmental conferences.

TPL Reduction Plan establishes objective reduction amounts for effluent sources with 1) objective figures of Maximum Allowable Loading for Pollutant Discharge Control on large scale effluent sources, 2) Reduction Guidance on small-scale and unregulated businesses, agriculture and livestock activities, and general households, 3) Development and maintenance plan on sewage and Johkaso (individual domestic wastewater treatment facility) systems including their sophistication, and others.

Prefectural Governments are the main bodies to take responsibility for planning and implementation of reduction measures. They have authority to promulgate ordinances to enforce stricter effluent standards for attaining the TPLC objectives.

6-2 River Basin Organization in Japan

6-2-1 Ordinary River Basin Committee (RBC) in Japan

By the amendment of River Act in 1997, legal framework for administering river incorporated Environment Management/ Conservation of rivers, in addition to the purposes of Flood Control and Water Uses of rivers. The amendment associated the fundamental change in river

basin planning system to incorporate academic experts' opinion, to reflect public opinions, and heads of local governments.

It has been common that River Basin Committee (RBC) is organized by MILT during River Improvement Plan formulation stage. River Improvement Plan develops measures for river improvement based on the Basic Policy for River Improvement and basic requirements for river improvement. The committee organizing is a measure to satisfy the obligatory process to incorporate opinions/ intentions of stakeholders and experts/ authorities of respective fields.

6-2-2 Emerging Approach for River Basin Management centered by RBC in Japan

After incorporation of RBWEM by 1997 amendment of River Act, integration of water pollution protection or RBWEM into RBWRM or Integrated Water Resource Management (IWRM) has become significant. The emphasis of the RBWEM has shifted from the prevention of water pollution for the recovering water qualities to restoration of preferable water environmental conditions comprehensibly by IWRM approach. Furthermore, Basic Act on Water Cycle Policy in 2014 has been promoting IWRM integrating groundwater and land use aspects in RBWRM.

River environment restoration efforts evolved from effluent control measure centered to comprehensive approach including higher level effluent control, water flow volume control, infiltration and forestry conservation, ecosystem and landscape enhancement and so on. In 70’s rehabilitation of deteriorated rivers in urbanized area were dealt mainly by public wastewater treatment facility and individual domestic wastewater treatment facility installations and enforcement of water discharge quality standards on sources.

There are cases that RBCs have transformed to the central bodies for organizing versatile stakeholders for RBWRM such as residents, national and local (prefectural and municipal) administrative agencies, private sector entities conducting economic activities in RB, academic entities, and NPOs. Also, there are voluntary RBO evolved from RBWEM activities based on the water use point of view for the necessity of conserving water quality.

These activities pursue realization of richness in river environment which requires multifaceted efforts involving versatile stakeholders. It must utilize various legal and institutional arrangements relating to the socioeconomic activities in respective RB contributing to the realization. It could be described that for satisfying the need of mobilization with organizing and coordinating of the stakeholders, RBOs beyond the dependent agent of administrative agency has been emerging in Japan.

6-3 Assessing Provincial RCs

Following memo supplement the descriptions of Step 4 and Step 5 stated in “4-4 Step 4: Review on Intervention Viabilities and Formulation of provincial RCs Alternatives” and “4-5 Step 5: Agreeing Total RC and Provincial RCs w/ Intervention Scenario” from the other view

point.

6-3-1 General Principal of Pollutant Load Distribution in TPLC

Volumes of pollutant contributing in the level of objective WQs at the representative and the observation points are basically correlate with size and intensity of population and socioeconomic activities within the relevant areas in RB. The population aspect or demographic sizes, intensities and characteristics associates various residential, social, cultural and religious activities. The economic activities include manufacturing, agriculture, animal husbandry, mining, service and so on. They also alter the natural conditions such as land uses.

The above relationship implies that provincial RCs are indications of the limitations on extent and characteristics of the socioeconomic expansion in the relevant areas. Amounts of RC, however, just correspond to the aggregated volume of discharged from the various sources categorized in the above stated human activities with spatial discounting factors for contributions in WQs at the points. The combinations of the activities in the relevant area are unlimited while they are foreseeable and controllable in certain degree based on the current conditions, trends, and development plans.

The above features imply that assessment of RC and their distributions based on the WQs at the points involves complex factors in execution of provincial WDQA.

6-3-2 Use of Simulation Model for Revealing Contributions of Pollutant Sources in WQs

Use of the simulation model reveals conditions of the above stated human activities' contributions in WQs by model establishing process reflecting volumes at the discharging points and discounting factors in reaching distances to the gauzing points.

The model produces simulation results based on the expected/ intended changes of pollutant discharge conditions caused by the human activities based on the trend, intended future, or combination of them.

The use of simulation is essential to identify and to understand the composition and the spatial distribution of the aggregated pollutant volumes corresponding to the indicated WQs of evaluation points for RB.

6-3-3 Assessing Provincial RCs for Decision-Making as Consensus on Developments in Region

As stated in 6-3-1, agreeing the provincial RCs can be meant for the pertinent PPCs to agree and to confine their increasing or decreasing degrees of their socioeconomic activities.

It is fundamentally a zero-sum game to share the total RB RC among the penitent PPCs in the circumstance that most of them may desire larger shares. It has to be noted that the valuations of the PPCs' current statuses and development potentials regarding the pollutant discharges are based on the results of implementation of the existing or basic development plans here.

There are basic possible contradictory logics to contend their rights for larger shares in the following contrasting manners:

- Larger the current pollutant discharge => Larger volume in provincial RC (Status Quo valued)
- Larger the current pollutant discharge => Smaller volume in provincial (Quota is used already).

Although it is difficult to attain conclusive results in the above argument directly, certain degree of agreement in the following issues may be possible among the pertinent PPCs:

- Functional roles in RB context => Water sourcing function must be protected more strictly,
- Upper vs. Lower RBs nature => The WQ conditions created by the Upper RB become the preconditions for the Lower RB,
- Characteristics of PPCs' Socioeconomic Activities => Per unit pollutant discharges are differentiated by categories, size, intensity of the socioeconomic activities,
- Extent of development potential => Prioritized for larger potential results in larger the potential, larger the RC amount, and
- Development priority in regional/ national context => Prioritized PPCs must be given larger RCs.

Employment of the issues for the assessment and their logical responses results basically in figuring out developed future of the target RB area taking the water environmental aspects through exploration of the trade-off linkages among the pertinent PPCs. The picture is derived from the logical result of the spatial assessment for developments which are acceptable for the pertinent PPCs rationally.

It is practically an agreement among the pertinent PPCs on or the PPCs' collective intentions for the RB's development reflecting not only public sector but also private sector and people, development potentials in terms of various aspects including physical, economic, cultural, geographic, mineral depository, national physical development policies, and pollutant receiving capacities of respective natural environments.

It is, however, noted that the following adjustment must be incorporated into the assessment

6-3-4 Adjustment by Levels of Pollutant Discharge Reduction Measures Application (PDRMA)

For assessing provincial RCs, current and expected levels of Pollutant Discharge Reduction Measures Application (PDRMA) by the respective activities such as sewage system installation in urbanized areas, effluent treatment system installation for business activities,

and employment of lesser pollution discharging production methods must be included as an adjustment factor. Since degrees of correlation between increase in the pollutant discharging activities and increase in pollutant loads can be differentiated by PDREMA, such equating adjustment by application statuses of the measures must be incorporated in the assessment.

Adjustments can be conducted basically through: 1) Assess provincial RCs based on the condition that all the applicable PDRMs in accordance with the established standard are executed by the target year and fulfillment of insufficiency is attached to provincial RCs agreement as condition, and 2) Discount in RC volumes by expected levels of PDRMA. The application of conducting process 1) is recommended for the advancement of the society, while the combination of the two processes is also a possible alternative for the adjustment.

6-3-5 Sample Process for Formulating Scenario for Required PDRMA

As stated in 6-3-4, provincial RCs agreement may associate the scenario for required PDRMA as conditions in most cases. Sample process for the formulating required PDRMA follows:

- Survey the current and planned PDRMA in the pertinent PPCs,
- Compare the levels of PDRMA in the PPCs
- Conduct analyses for standardizations,
- Establish RB standards on PDRMA,
- Identify insufficiencies in PDRMA in terms of space and activity category,
- Formulate provincial ideal PDRMA program, and
- Formulate provincial RCs with condition of ideal PDRMAs, or discounted allocation amounts with partial PDRMA or without PDRMA.

6-3-6 Spatial Limitation of RC Exchange

Exchange of RC is categorized as an adjustment measure realized by investment and operating cost sharing through virtual trade-off between excess pollutant discharge and surplus receiving capacity.

It has to be noted, however, that the exchange of RC is confined to entities within the RB or sub-RB area relevant to the target WQ gauging point. Since the specific discharge volume contributes to the WQ at the target point, the exchange of virtual decrease in pollutant load beyond the relevant RBs or sub-RBs does not have an effect of cancelling the excess amount of pollutant by the surplus receiving capacity created by the other entity in the different RB or sub-RB.

6-4 Decision-Making Approaches

There are basically three types of decision-making approach applicable in provincial RCs

agreement; consensus/ collaboration, authoritarian, and entrusted third party. Among them consensus/ collaboration approach is recommended for the committed implementation and sustainability.

This guideline is prepared with the recommended approach while the contents are applicable for the other approaches with slight modifications, although the second approach requires minimum coordination activities.

Brief discussion is provided as following.

6-4-1 Consensus/ Collaboration

This type of approach initiating active participation of stakeholders are getting popular as shown by diffusion of democratic systems in the world. Considering the decentralized administrative system in Vietnam, involvement of the PPCs for the consensus/ collaboration may play substantial role in securing the effective implementation of TPLC.

6-4-2 Authoritarian

The authoritarian approach is top down decision and duty delivery/ allocation. Considering the historical and current performance of RBWRM and RBWEM in Vietnam, this type of central government leadership is not expected for attaining PPCs commitments and supports from the relating agencies.

6-4-3 Entrusting Independent Entity and Adopting Conclusion

The approach is to hire reliable entity(ies) to prepare appropriate conclusion and adopting it. Considering the extended degrees of involvement of administrative/ political interests in WDQA, it must be quite difficult to find an entities being entrusted by the stakeholders especially PPCs for preparation of adoptable provincial RCs draft.

Project for Strengthening Capacity of

Water Environmental Management in River Basin

THE FIRST DRAFT CIRCULAR ON STIPULATING PROCEDURES TO REQUEST COMPENSATION FOR ENVIRONMENTAL DAMAGE

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The first draft

CIRCULAR

On stipulating procedures to request compensation for environmental damage

Pursuant to the Law on Environmental Protection dated June 23, 2014;

Pursuant to Decree No.03/2015/ND-CP dated January 6, 2015 of the Government on determination of environmental damage;

At the proposal of the Director General of Vietnam Environment Administration (VEA) and Director of Legislation Department;

The Minister of Natural Resources and Environment hereby promulgates the Circular on stipulating procedures to request compensation for environmental damage

Chapter 1

GENERAL PROVISION

Article 1. Scope of regulation

This Circular provides the procedures and forms to request compensation for environmental damages as stipulated in Clauses 2, 3 and 4 of Article 3 and Clause 2 of Article 7 of Decree No. 03/2015/ND-CP dated 06 January 2015 of the Government on stipulating determination of environmental damage (hereinafter called as Decree No. 03/2015/ND-CP), including:

1. The procedure to request compensation for environmental damage:

a) The responsibility to claim compensation for damage of the People's Committees at communal level, district level, provincial level and Ministry of Natural Resource and Environment,

b) The responsibility of collecting and appraising data, evidence, determining the damages, to identify the compensation liability of people's committees at level of commune, district, province and MONRE for environment and sending the results to organization who are regulated at article 2, Decree 03/2015/NĐ-CP

2. The forms to claim compensation for environmental damage

Article 2. Subjects of application

1. The organizations, individuals that cause environmental pollution, degradation in the territory of the Socialist Republic of Vietnam (*hereinafter called as organization, individual causing environmental pollution, degradation*).

2. The People's Committees at all levels and organizations, individuals that detect signs of environmental pollution or degradation (*hereinafter called as compensation-claiming organization, individual*).

3. The agencies that are responsible to request compensation for environmental damage (*hereinafter called as compensation-request agency*) includes:

a) Vietnam Environment Administration (VEA), Ministry of Natural Resources and Environment (MONRE);

b) People's Committees of provinces, cities under central management (hereinafter called as *provincial People's Committee*);

c) People's Committees of district, town or city (*hereinafter called as district People's Committee*);

d) People's Committee of commune, ward or town (*hereinafter called as communal People's Committee*).

4. The organizations who are responsibility to collect and appraisal the data, evidence, determine the damages and identify the compensation liability (hereiafter called as organization of data, evidence collection and appraisial), who are regulated at point a, b, c, clause 3 of this article.

Article 3. Interpretation

In this Circular, the terms and expressions below are construed as follows:

1. *Procedure to request compensation for environmental damage (hereinafter called as compensation procedure)* means the sequences, manners and measures which has been regulated at clause 1, article 1 of this circular conducted by compensation-request-liable agencies to request the organizations, individuals causing environmental pollution, degradation to pay compensation for environmental damage as prescribed in points a, b, c of Clause 1, Article 1 of the Decree No. 03/2015/ND-CP.

2. The environmental use purpose of the polluted area is the using purpose of the polluted, degraded water, soil environment that have been permitted by the competent authorities and stipulated in the documents of the relevant state management agencies on the use or approval of the planning on use of water, soil environmental components in an area where pollution or degradation occurs.

3. *Service provider* is an organization, agency, or unit that enters the service contract with the compensation-request-liable agency on monitoring, assessment, measurement, collection of data, evidence; determination, calculation of

environmental damages caused by the organization, individual causing environmental pollution, degradation in accordance with the laws.

Article 4. Principles to apply damage compensation procedures

1. The procedures to implement compensation for damages must be easy to understand; and stipulated clearly, openly, transparently, timely.

2. The collection of data, evidence for determination of environmental damage, calculation of environmental damage, and determination of liability to pay compensation for environmental damages resulted from the acts of causing environmental pollution, degradation must be carried out in an accurate and objective manner.

3. The organizations, individuals causing environmental pollution or degradation must pay compensation for all the environmental damages caused by them together with the expenses for determination of damages and implementation of compensation requesting procedures.

4. *Option 1*: To ensure objective, rapid, timely application of compensation requesting procedures, the expenses on monitoring, measurement, collection of data and evidence; determination, calculation of environmental damages; and implementation of damage compensation requesting procedures are advanced by the compensation-request agency and service providers, if the organizations, individuals causing environmental pollution or degradation have not been affordable to pay such expenses, and shall be reimbursed when such organizations, individuals perform their compensation liabilities.

Option 2: The expenses for monitoring, measurement, collection of data and evidence; determination, calculation of environmental damages; and implementation of damage compensation requesting procedures are advanced by the Vietnam Environmental Protection Fund or the Environmental Protection Fund of the province where environmental pollution, degradation occur, in case the organizations, individuals causing environmental pollution or degradation have not paid such expenses, and shall be reimbursed when such organizations, individuals perform their compensation liabilities.

Article 5. Grounds to carry out compensation requesting procedures

1. There must be serious violation of laws by organizations, individuals causing environmental pollution, degradation.

2. The environment is damaged caused polution, degredation as prescribed in Points (a), (b), (c), (d), Clause 1, Article 1 of Decree No. 03/2015/ND-CP.

3. There is a cause-effect relationship between acts of serious violating the environmental protection laws and consequences of such acts on the water environment, soil environment, the eco-system, the species prioritized for protection as prescribed in (a), (b), (c), (d), Clause 1, Article 1 of Decree No. 03/2015/ND-CP.

Chapter II

PROCEDURES TO IMPLEMENT COMPENSATION FOR DAMAGE

Article 6. The steps to request compensation for environmental damage:

Procedures of compensation damages for environment including some main steps:

1. Notification and receiving notices and information of polution and degradation of environment.
2. Checking and verification of information of polution and degradation
3. Selection of service providers
4. Collection of data, evidence and determine and identify the compensation damages
5. Evaluation of data and evidence
6. Claim the organizations, individuals who caused environmental polution for compensation damages.

Article 7. Notification of information of environmental polution and degradation

1. The subjects prescribed in Clause 2, Article 2 of this Circular that detect the signs of environmental pollution and degradation are be responsible to notify the compensation-request-liable agencies in accordance with Clause 2 of this Article in either manner as follow:

a) Sending notification of information of environmental polution and degradation to the agencies who claim damages directly.

b) To send the notification about information of polution and degradation by post to compensation-request agencies. Duration of receiving notification shall be counted from the date of affixing the post stamp by the post office.

2. The dossier of reporting environmental polution and degradation comprises of:

a) A notification about environmental damage using ***Form No.01 attached to this Circular***;

b) The enclosed documents, evidences (if any).

Article 8. Process of receiving notification about environmental pollution and degradation

Upon the notification of environmental pollution and degradation by organizations, individuals, the compensation-request-liable agency shall:

1. Examine the notification dossier and relevant documents in accordance with the current laws on complaints and denunciations, and laws on reception of citizens.

2. The notification dossier of environmental pollution and degradation must be recorded in the citizen reception book with specific information including order number, date or reception, full name, address of the notifying people and content of notification; the process of consideration, settlement by competent agencies, organizations (if any); request, recommendation of the notifying organizations, individuals.

3. In cases the organizations, individuals notifying environmental pollution and degradation do not have or have insufficient dossiers, the compensation-request-liable agencies (reception officer) shall direct them to prepare the notification dossier and provide documents, evidences (if any) as prescribed in Clause 2, Article 6 of this Circular.

4. The compensation-request-liable agencies shall, if determining that the cases do not fall under their handling responsibility, return the dossiers and instruct the notifying organizations, individuals to file the notification dossiers to the suitable compensation-request-liable agencies in accordance with the laws

5. If determining that the notified violations of environmental protection laws may cause serious environmental pollution and degradation and require immediate prevention and settlement measures, the information receiving officers shall report to the leaders of their agencies to make timely notification to the competent environmental management agencies in the location of environmental pollution, degradation for termination and settlement of such violations.

6. Where the dossiers of environmental pollution and degradation are complete and valid, the compensation-request-liable agencies shall receive and inform directly or in writing to the notifying organizations, individuals using ***Form No. 02 attached to this Circular***, and settle the case in accordance with Article 8 of this Circular.

Article 9. Responsibilities of the compensation-request-liable agencies

Within 5 (five) working days from the day of receiving valid dossiers (this time limit may be extended but not exceed 10 working days), the compensation-request-liable agencies shall carry out following processes and procedures:

1. The compensation-request-liable agencies shall appoint officers having expertise and experience in environmental pollution and degradation to the site for inspection and verification of the complaint and denouncement by the compensation-claiming organizations, individuals. Samples shall be taken for analysis and preliminary determination of environmental pollution and degradation level, if necessary. Based on the level, nature of the environmental pollution and degradation, the compensation-request-liable agencies shall conduct the settlement as follows:

a) If the level of environmental pollution and degradation is not too serious, and the receiving environment is able to self-purify or self-cleanse to meet the Vietnamese technical regulations on environment - QCVN (or the local technical regulations on environment), the compensation-request-liable agencies shall

identify organizations, individuals causing environmental pollution or degradation; notify and request such organizations, individuals to carry out measures to treat the pollutant parameters to satisfy the QCVN (or the local technical standard) before being discharged to the environment. If necessary, the compensation-request-liable agencies shall apply administrative sanctions and notify the verification results as well as settlement method to the organizations, individuals causing environmental pollution or degradation. The notification shall be made using ***Form No. 03 attached to this Circular***;

b) If the level of environmental pollution and degradation is serious (very serious, critically serious), the compensation-request-liable agencies shall identify the pollution-causing organizations, individuals and simultaneously request them to stop all the activities that cause environmental pollution, degradation.

c) Regarding environmental incidents that result in serious impacts (critically serious and extremely serious), the compensation-request-liable agencies must take preventive measures and request pollution-causing organizations, individuals to control the pollution source and adopt measures to overcome the consequences caused by environmental incidents.

2. Regarding the environmental pollution and degradation cases provided in Points b and c, Clause 1 of this Article, the compensation-request-liable agencies shall, within their power and authority, organize the implementation of compensation request procedures as stipulated in this Circular.

3. The compensation-request-liable agency shall, if determining that the level and characteristics of environmental pollution and degradation do not fall on their authority, transfer the dossiers, documents as provided in Clause 4, Article 5 of this Circular to the competent compensation-request agency for settlement under law.

Article 10. Selection of service provider to carry out data, evidence collection, calculation and determination of compensation responsibility

Basing on the level and characteristic of environmental pollution, degradation prescribed in Points a, b, c, d, Clause 1, Article 1 of Decree No. 03/2015/ND-CP, the agencies who are collection and appraisial data, evidence shall select and sign a contract, under law, with a service provider to carry out data, evidence collection and determination, calculation of damage compensation liability. The details are described below:

1. In term of the compensation claims related to monitoring, assessment, measurement or collection of data, evidence, the agencies who are collection and evaluation the data, evidence may select and sign a contract with the service providers that have been licensed to practice monitoring, measurement, sampling activities by the competent state management agency;

2. The agencies who are collection and evaluation data, evidence may select and sign a contract with the qualified service providers that are capable of

performing the required works as the case may be, if the claims are related to determination of damage level and calculation of damages to be compensated;

3. The service providers must have relevant functions and duties conferred by the State, if they are public providers, or, must be licensed by the relevant competent authority.

4. The procedures of selecting a service provider must comply with the law regulations.

Article 11. Responsibilities and rights of the service providers

The service providers selected and contracted by the agencies responsible for collection and evaluation the data, evidence to perform data, evidence collection, determination and calculation of compensation liabilities as prescribed in under Articles 11, 12.13 of this Circular shall have rights and duties as follow:

1. To meet the requirements by the compensation-request-liable agencies;

2. To ensure the objectiveness, completeness, truthfulness, concreteness, scientificness;

3. To ensure the punctuality, quality of the service; to take legal responsibility for the provided results;

4. To apply professional measures and use tools, equipment and facilities in accordance with the law to collect data, evidence; assess and calculate the environmental damage level as required by the compensation-request-liable agencies.

5. To request the relevant organizations, individuals to provide data, evidence for assessing environmental damage in accordance with Article 8 of the Decree No. 03/2015/ND-CP dated January 6, 2015 of the Government on determination of environmental damage. Any acts of hindrance, non-cooperation, intentional information distortion, false provision, or evidence concealment, destruction (commonly called as act of hindrance) shall be recorded in written minute using ***Form No. 04 attached to this Circular*** and settled in accordance with the laws

6. To receive fund for rendering the service contract in accordance with the laws;

7. In order to ensure the accuracy, objectiveness of data, evidence, the monitoring, assessment, measurement and sampling activities must be witnessed by representatives of the local authorities and organizations, individuals causing environmental pollution or degradation. The results of monitoring, assessment, measurement, sampling or sealing of data, evidence shall be recorded in minutes using ***Form No. 05 attached to this Circular.*** The minutes must be signed by representatives of the local authorities and organizations, individuals causing environmental pollution or degradation.

In case the organizations, individuals causing environmental pollution or degradation refuse to cooperate or sign in the minutes, the service providers shall

request the representatives of the local authorities to witness and sign the minutes and the sealed samples, evidences; and make a minute using ***Form No. 4 attached to this Circular***.

8. The time limit for data, evidence collection by service provides is 30 days from the effect of the service contract. The time limit may be extended but not exceed 40 days, if the cases involve various complicated circumstances, or not exceed 10 days in the event of environmental incidents or illegal discharge. The prolongation of service rendering duration must be approved in writing by he agencies responsible for collection and evaluation the data, evidence in writing and must be clearly explained.

Article 12. Determination of necessary data, evidence for calculation of environmental damage

The service providers shall cooperate with the agencies responsible for collection and evaluation the data, evidence to determine data, evidence that are necessary for calculation of environmental damage as follow:

1. The water environment

a) Determine the use purpose of the polluted water environment: to be used for one or more purposes in accordance with Decisions, licenses, official documents issued by the competent state management agencies on stipulating the use or approving the planning on use of the water environmental components in the area where pollution and degradation occur;

b) Determine whether the water area is polluted at one or more levels (water flow (river, stream) is normally polluted at various levels including critically serious, serious, partially polluted by the distance from the pollution sources; while the static areas (pond, lake) are normally polluted at one level);

c) Determine the area, volume, amount of water in each polluted area at various levels;

d) Determine pollution level: based on characteristics of the waste sources, define locations and times of sampling in each area to ensure the representative conditions for determination of pollution level, pollutants and their concentration in each polluted area at various levels.

2. Soil environment

a) Determine the using purposes of the polluted land: to be used for one or more purposes in accordance with Decisions, licenses, official documents issued by the competent state management agencies on stipulating the use or approving the planning on the use of the water environmental components in the location of pollution and degradation;

b) Determine whether the land area is polluted at one or more levels: critically serious, serious, partially polluted by the distance from the pollution sources, and characteristic of the soil types;

c) Determine the area, volume, amount of land in each polluted area at various levels;

d) Determine pollution level: based on characteristics of the waste sources, define locations and times of sampling in each area to ensure the representative conditions for determination of pollution level, pollutants and their concentration in each polluted area at various levels.

3. For natural ecosystem

a) Determine conservation level of the natural ecosystem: prescribe one or more areas in various level under Decisions, licenses, documents of the competent state management agency on stipulating the conservation level of the natural ecosystem;

b) Determine whether the natural ecosystem is degraded at one or more levels;

c) Determine the area of natural ecosystem that is degraded at each level;

d) Determine the degradation level of the ecosystem: the degree of decline comparing with the original status.

4. Species prioritized for protection that are injured or dead

a) Determine the protection priority of the species in accordance with the Decisions, official documents issued by the competent state management agencies on stipulating the species protection priority;

b) Determine the number of individuals of the species prioritized for protection that are injured or dead.

5. Determine causes and accountability of the relevant parties including the following matters: pollution sources, activities that cause environmental incidents or directly harm the environment, or are related to the areas of environmental pollution, degradation; basic information about the organizations and individuals related to the polluted or degraded environmental area comprising type of activities; products, capacity, input materials, production process; wastes; discharging points; waste treatment measures; monitoring and analysis of environmental parameters.

Article 13. Damage calculation methods

The methods, principles of determination of environmental damages used by the service providers in accordance with Article 11 of Decree No. 03/2015/ND-CP dated January 6, 2015 of the Government on determination of environmental damage are provided as follows:

1. Damage caused by pollution or degradation to the water or soil environment:

a) To determine the environmental pollution, degradation level in each polluted area based on the monitoring, analysis of the polluted environmental parameters and regulations on criteria for classification of the polluted areas;

b) To determine expense for treating an area, volume or quantity unit of the polluted water, land to meet technical regulations on environment for each using purpose.

c) To calculate damage using the formulas provided in Article 11 of Decree No. 03/2015/ND-CP dated January 6, 2015 of the Government on determination of environmental damage.

2. Damage to the ecosystem:

a) To determine degradation level of the ecosystem in each area based on the data, evidence that have been collected, estimated and assessed;

b) To determine expense for restoring an area unit of the degraded ecosystem at various level;

c) To calculate damage using the formulas mentioned in Clause 4, Article 11 of Decree No. 03/2015/ND-CP dated January 6, 2015 of the Government on determination of environmental damage.

3. Damage to the species prioritized for protection that are dead or injured

a) To determine expense for restoring, replacing an individual of the species prioritized for protection that is dead, expense for rescuing and taking care of an individual of the species prioritized for protection that is injured.

b) To calculate the damage using the formulas provided in Clause 5, Article 11 of Decree No. 03/2015/ND-CP dated January 6, 2015 of the Government on determination of environmental damage.

Article 14. Determination of compensation expense

The service providers, based on the damage calculation results prescribed in Article 12 of this Circular, and the summary of expense for determination of environmental damage and implementation of compensation request procedures provided by compensation-request-liable agencies, shall determine the amounts payable by each organization, individual causing environmental pollution or degradation as follows:

1. Damage causing percentage shall be calculated in proportion to the pollution-causing percentage (%) that is determined through the discharging flow, the pollutant concentration, the total discharge flow using the following formula:

$$TLON_i\ (\%) = \frac{\sum_{j=1}^{n} Q_i x C_{ij}}{\sum_{i=1}^{m}\sum_{j=1}^{n} Q_i x C_{ij}}$$

$TLON_i$ means percentage of pollution caused by organization i

Q_i means the discharge flow of organization i

C_{ij} means concentration of the pollutant j discharged by organization i

m means the number of organizations, individuals causing environmental pollution or degradation

n means the number of substances causing environmental pollution, degradation

2. Compensation liability of organizations, individuals causing environmental pollution or degradation is determined by the following formula:

TN_i (%) = $TLON_i$ (%) x (TH + CP)

TN_i means the compensation liability of organization i

$TLON_i$ means the percentage of pollution caused by organization i

TH means the total damages caused by environmental pollution and degradation.

CP means the total expense for determination of damage and implementation of compensation request procedures.

3. The results of calculation of damages and determination of damage compensation liability shall be recorded in minutes using ***Form No. 06 attached to this Circular.***

Article 15. The Council for appraisal of Data and Evidence (hereinafter called as the appraisal council)

1. Establishment of the appraisal council

Within 7 working days after receiving the results of data, evidence collection, the head of the Agencies responsible for collection and evaluation the data, evidence shall issue the decision on establishment of the council for appraisal of data and evidence using ***Form No. 7 attached to this Circular***. The appraisal council shall meet the below requirements:

a) The appraisal council must comprise 7 to 9 members depending on the complicatedness of the damage to be determined.

b) The council for appraisal of collected data and proof shall comprise the chairman, 01 vice chairmen (if necessary), 01 secretary, 02 opponent members, and other members, of which at least 30% of the members are experts in policy, law making, environmental pollution and degradation; at least 30% of the members are officers in the management sector; other are representatives of the local authorities where the data and proof are collected; representatives of the community and relevant entities.

2. Members of the appraisal council

The members of the appraisal council shall meet the below requirement:

a) The chairman must be an environmental expert in one of the following fields: law, policy making, water environment, natural ecosystem, species prioritized for protection or environmental monitoring, analysis, damage calculation, determination of compensation liability with at least seven (07) years

of experience for university degree holder, at least five (05) years of experience for master degree holder, at least three (03) years of experience for doctoral degree holder; or be the leader of the agency responsible for collection of data and evidence, calculation of damage, and determination of compensation liability related to the damages to be determined.

b) The opponent members must be experts in one of the following fields: law, policy making, water environment, natural ecosystem, species prioritized for protection or environmental monitoring, analysis, damage calculation, determination of compensation liability related to the damages to be determined with at least three (03) years of experience for university degree holders, at least two (02) years of experience for master degree holders, at least one (01) years of experience for doctoral degree holders.

c) Members of the appraisal council must be experts in one of the following fields: law, policy making, water environment, natural ecosystem, species prioritized for protection or environmental monitoring, analysis, damage calculation, determination of compensation liability with at least three (03) years of experience for university degree holders, at least two (02) years of experience for master degree holders, at least one (01) years of experience for doctoral degree holders.

d) The secretary must be an officer of the agency responsible for collection of data and evidence that is processing and handling the damage compensation requesting dossier.

3. Responsibilities of the appraisal council

The appraisal council shall examine, consider and appraise the collected data, evidence to ensure objectiveness, accuracy and completeness as the grounds for the compensation-request-liable agencies to make compensation-requesting decisions.

4. Responsibilities of the chairman

a) To preside at meetings of the appraisal council;

b) To review and process opinions raised in the meetings of the appraisal council and make final conclusions on the collected data, evidence as the grounds for requesting damage compensation;

c) To sign the meeting minutes and take legal responsibility for the conclusions drawn at the meetings.

5. Responsibilities of the members

a) To examine, study the data, evidence provided by the agency responsible for collection of data and evidence that are processing, handling the damage compensation requesting dossiers;

b) To participate in the meetings of the appraisal council;

c) To give opinions about the collected data and evidences for calculation, determination of environmental damage; ensure accuracy of the evidence as the

grounds for requesting damage compensation; take legal responsibility for their opinions.

6. Responsibilities of the secretary

a) To report to the council about the written comments of the council members that did not attend the meeting of the council;

b) To make and sign the minutes of the council meetings and bear legal responsibility for the minute contents;

c) To prepare dossiers and documents for final settlement of activities of the council.

Article 16. Responsibilities to provide, study and consider information, data and evidence of the agency responsible for collection of data and evidence **and the appraisal council**

1. Provision of information, data, evidence

Upon the issuance of decision on establishment of the appraisal council, the agency responsible for collection of data and evidence must provide the members of the appraisal council with the following information:

a) Data, evidence that have been collected and the relevant information (if any);

b) Basic information about organizations, individuals causing environmental pollution or degradation;

c) All the relevant applicable documents promulgated by the competent state management agencies on permitting the use or approving a planning on use of the components of the water, soil environment, the natural ecosystem, the species prioritized for protection in the area where pollution or degradation occurs;

d) All the relevant documents of the competent state management agencies on stipulating the conservation level of the natural ecosystem (if any) and the protection priority of the species (if any).

2. Examination and review of the collected information, data, evidence:

After receiving all information, document mentioned in Clause 1 of this Article, the members of the appraisal council must study, evaluate these relevant matters under their field of expertise. The details are as follows:

a) To identify necessary data, evidence for calculation of damage, determination of compensation liability;

b) To examine the collected data, evidence to determine whether they are suitable for calculation of damage, determination of compensation liability;

c) To examine whether the results of for calculation of damage, determination of compensation liability of organizations, individuals causing environmental pollution or degradation are sufficient and appropriate as the grounds for requesting damage compensation;

d) To point out the inappropriate issues, if any, and request adjustment.

Article 17. Organization of the appraisal council meetings

1. Conditions for organizing meetings of the appraisal council:

Besides the participation of the agency responsible for collection of data and evidence, the meetings of the appraisal council shall only be organized if the below conditions are met:

a) At least two-thirds of the council's members attend the meeting, of which the presence of the chairman or the vice chairman, if authorized by the chairman, (hereinafter called as the meeting chairman), the secretary and at least one (01) opponent member is mandatory;

b) There must be the attendance of the representative of the service provider.

c) To encourage participation of representative of organizations, individuals who are caused environmental pollutions and degradations

2. Sequence and content of the council meeting:

a) The secretary reads the decision on establishment of the appraisal council and introduces the participants of meeting;

b) The meeting chairperson prescribes the meeting within his/her power;

c) The representative of the agency responsible for collection of data and evidence delivers general presentation about the formation and settlement of the case; method for collection of data, evidence, determination and calculation of damages and other relevant matters;

d) The representative of the service provider presents about the measures, methods for collection of data, evidence; determination and calculation of damages and damage compensation liability.

e) The opponent members and other members make presentation about their comments;

f) The secretary reads the written comments of the absent members (if any);

g) Other opinions at the meeting (if any).

3. Ballot or vote on the results of data and evidence appraisal:

a) After obtaining opinions of the members, the meeting chairman shall decide to ballot or vote on the data, evidence collection results generated by the service provider;

b) The ballots must be stamped by the agency responsible for collection of data and evidence.

Each ballot must contain three types of options: approval, approval but with amendment and supplementation, and disapproval. Stamp of the agency responsible for collection of data and evidence must be affixed on the left margin of the ballots.

4. The voting or balloting results must be recorded in minutes and approved at the meeting. The ballots or votes of the members of the appraisal council must be sealed and filed.

Article 18. Conclusion of the appraisal council

1. After having the balloting or voting results of the council members, the meeting chairman shall, on behalf of the appraisal council, make conclusions of the appraisal meeting.

2. The conclusions drawn by the meeting chairman must meet the following requirement:

a) Analyze, assess the results, limitations, shortcomings of the collected data, evidence, the appropriateness, accuracy of calculation of environmental damage and determination of damage compensation liability; provide requests, recommendations related to supplementation of the parameters to be monitored, assessed, measured or the parameters to be re-monitored, re-assessed, and re-measured to ensure better accuracy and representation;

b) Make conclusion on the approval without adjustment or supplementation if all the council members attending the meeting cast their votes on approval without adjustment, supplementation; approval with adjustment, supplementation if at least two-thirds (2/3) of the present council members including at least one (01) opponent member (mandatory) cast their votes on approval with adjustment, supplementation; disapproval if more than one-thirds (1/3) of the present council members or both opponent members cast their votes on disapproval..

3. In the event of approval with adjustment, supplementation and disapproval of the collected data and evidence, the agency responsible for collection of data and evidence shall request the service provider to make adjustment, supplementation or re-collection of data, evidence in accordance with the comments provided by the council. When the adjustment, supplementation or re-collection are finished, the Council shall organize a meeting to re-appraise the adjusted, supplemented or re-collected data and evidence.

4. The meeting chairman shall, on behalf of the council, close the meeting;

5. The meeting minute must be prepared using ***Form No. 08 attached to this Circular*** and meet the following requirement:

a) Opinions and comments of the service providers and council members must be recorded fully, honestly in the meeting minute;

b) The meeting minute must have signature of the meeting chairman and secretary on the bottom of each page, of whom the full name and position must be specified on the last page, and affixed with the stamp of the agency responsible for collection of data and evidence.

Article 19. Compensation Request

Compensation-request-liable agencies, based on the assessment results, the collected data, evidence for determination of environmental damage, the

calculation of damages in term of compensation amounts, shall send a notice to request compensation for damage using ***Form No. 09 attached to this Circular,*** which must be enclosed with relevant documents including the data and evidence that have been collected and assessed, the minute of meeting of the council for appraisal of data and evidence using ***Form No. 08 attached to this Circular*** , the calculation results of environmental damages, and the appraisal council conclusions on environmental compensation liability to the organizations, individuals causing environmental pollution or degradation within 30 working days, using ***Form No. 06 attached to this Circular***

Article 20. Negotiations on compensation

1. In case the organizations, individuals causing environmental pollution or degradation admit their acts of causing environmental pollution and degradation and propose a negotiation, the involved parties may organize a meeting to consider and agree on the compensation amount. The minute of the negotiation meeting shall be recorded using ***Form No. 10 attached to this Circular***.

2. In case the organizations, individuals causing environmental pollution or degradation disagree with the compensation amount requested by compensation-request-liable agencies and can complain and prove that they do not cause or cause environmental pollution, degradation at the level less serious than the level determined by the compensation-request-liable agencies, which is accepted by such agency, they shall not be subject to compensation for damage or entitled to adjustment of the compensation amount.

Article 21. Decision on compensation

Based on the assessment results, the data, evidence for determination of damages, calculation of the compensation amount, other relevant liabilities as well as the results of negotiation, the compensation-request-liable agencies shall issue decision on compensation using ***Form No.11 attached to this Circular*** within 7 working days.

Article 22. Institution of lawsuits to request courts to settle compensation

1. In case the organizations, individuals causing environmental pollution or degradation fail to prove that they do not cause environmental pollution or degradation and do not pay compensation when the time limit for enforcement of compensation decision has expired, the compensation-request-liable agencies shall request arbitration settlement or initiate a lawsuit to courts to request compensation in accordance with the laws.

2. Organizations, individuals causing environmental pollution or degradation have rights to request arbitration settlement or initiate a lawsuit to the courts to request settlement in following cases:

a) Disagree with decision on compensation of compensation-request-liable agencies;

b) The time limit of compensation settlement has expired but the compensation-request-liable agencies do not issue decision on compensation.

Article 23. Settlement of compensation proceeds

1. Organizations, individuals causing environmental pollution or degradation are required to pay compensation amount directly (or by bank transfer) as notified by the compensation-request-liable agencies. The payment, collection, management of compensation proceeds shall comply with the law regulations.

2. The compensation proceeds are settled by the compensation-request-liable agencies as follows:

a) To pay expenditures for performance of monitoring, assessment, measurement, collection of data and evidence; calculation of environmental damages caused by organizations, individuals causing environmental pollution, degradation; implementation of damage compensation procedures advanced by the relevant agencies.

b) The remaining amounts, after deducting all the appropriate and reasonable expenditures, shall be used to remedy and rehabilitate the environment where pollution and degradation occur.

Chapter III

IMPLEMENTATION PROVISIONS

Article 24. Effect

This Circular takes effect on …., …., 201…

Article 25. Organization of implementation

1. The ministers, heads of ministerial-level agencies, heads of governmental agencies and chairpersons of provincial-level People's Committees and relevant organizations, individuals are responsible to implement this Decree.

2. The Director General of Vietnam Environment Administration is responsible to monitor, examine and inspect the implementation of this Circular.

3. Any difficulties arising in the implementation process should be reported to Ministry of Natural Resources and Environment by organizations, individuals, ministries, branches, localities for amendment and supplementation./.

THE MINISTER

Tran Hong Ha

Form No. 01 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

THE SOCIALIST REPUBLIC OF VIETNAM

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NOTIFICATION ABOUT ENVIRONMENTAL POLLUTION AND DEGRADATION

To:.....*(Name of the agency that is responsible to request compensation or compensation-requesting agency for short)*

Name of organization, individual reporting the environmental pollution and degradation:. .....

Address:.....

Basing on regulations in Article... of Circular No..... /201../TT/BTNMT dated…..... on stipulating procedure to implement compensation for environmental damage, I/we would like to inform you about the environmental pollution and degradation, including:

1. Environmental pollution and degradation of water or soil environment:

Name, place name, location (soil or water) that is polluted, degraded.....

Condition (soil or water) of pollution, degradation.....

(Enclosed with legal documents of the relevant state management agencies and supporting evidence, data, if any).

2. Environmental pollution and degradation of the eco-system:

Name, place name, location where the eco-system is polluted, degraded.....

The condition of the polluted, degraded eco-system.....

(Enclosed with legal documents of the relevant state management agencies and supporting evidence, data, if any).

3. Damage to the species prioritized for protection that are dead, injured:

Name of species prioritized for protection that are dead, injured:.....

The condition of the species prioritized for protection that are dead, injured:.....

(Enclosed with legal documents of the relevant state management agencies and supporting evidence, data, if any).

It is requested that the Agency shall consider and request compensation for environmental damages in accordance with the law./.

……... date….. month…..year……

Notifying organization, individual

(Signature, name of organization, full name of individual)

Form No. 02 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

NAME OF AGENCY
———

THE SOCIALIST REPUBLIC OF VIETNAM

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———————————

No. /TB-…

……., date … month … year ……

NOTICE

(Sub: Settlement of compensation for damage to …..)

(Name of compensation-requesting agency).....hereby to inform that:

- Basing on the notification about environmental pollution and degradation by organization, individual... (Address, place of residence) dated....month.....year.....;

- After considering the dossiers and relevant documents as prescribed in Circular No..... /201../TT/BTNMT dated…..... on stipulating procedure to implement compensation for environmental damage, **(**Name of compensation-requesting agency) ..... shall/have implemented procedure to request … (name of organizations, individuals causing environmental pollution, degradation) to make compensation for damages from date.....month.....year.....to date....month....year.....

(Name of compensation-requesting agency) would like to inform the organizations, individuals that have notified the environmental damage for their information.

***Recipient*:**

- Organizations, individuals reporting on environmental pollution and degradation;
- Organization, individual causing environmental pollution, degradation;
- Direct superior agency (for reporting);
- Filed.....

Head of the Agency

(Signature, stamp and full name)

Form No. 03 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

NAME OF AGENCY	**THE SOCIALIST REPUBLIC OF VIETNAM**
———	**Independence - Freedom - Happiness**
No. /TB-…	———————————
	……., date … month … year …..…

NOTICE

(Sub: Settlement of compensation for damage to …..)

(Name of compensation-requesting agency)..... hereby to inform that:

- Basing on the notification about environmental damage by organization, individual... (Address, place of residence) dated....month.....year.....

- After checking and verifying the issues related to the notification dossier of (organization, individual claiming compensation for environmental pollution and degradation;) as prescribed in Circular No..... /201../TT/BTNMT dated…..... on stipulating procedure to implement compensation for environmental damage, **(**name of the compensation-requesting agency) .....has handled the damage-causing organization(s), individual(s) as follows:

1. To request (organization(s), individual(s) causing pollution, degradation) to implement measure to treat the pollutant parameters to meet QCVN before being discharged into the environment ……..

2. To apply administrative sanctions as prescribed in Clause… Article… of Decree…. Or Circular…. on administrative sanction in the field of environment.

(Name of compensation-requesting agency) would like to inform organization, individual reporting environmental pollution and degradation; for information.

***Recipient*:**	**Head of Agency**
- Organization, individual reporting the environmental pollution and degradation; ;	*(Signature, stamp and full name)*
- Organization, individual causing environmental pollution, degradation;	
- The direct superior agency (for reporting);	
- Filed.....	

Form No. 04 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

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MINUTE ON THE ACT HINDERING THE SETTLEMENT OF COMPENSATION FOR ENVIRONMENTAL DAMAGE

Today, date .... month ..... year ....., in (location)....., we are:

1. **Representative of the service provider**

Representative: Mr. (Ms.)……Position:..... ..

2. Legal representative of organization(s), individual(s) causing environmental pollution, degradation:

Mr. (Ms.).....Position:.....

Address:.....……

3. Representative of the local authority (where the compensation case is handled):.....Position:..

4. Other organizations, individuals (if any):.....

We have together prepared the minute on the act hindering the settlement of collection the data, evidence for.....organization, individual (name, address)..... The details are as follows:

a) Describing the hindering acts; level, characteristics, features… of the hindering acts:.....

b) Opinions of relevant organizations, individuals (if any). *(In case the representative of the organization(s), individual(s) causing environmental pollution, degradation does not sign in the minute, it is necessary to specify the reason and provide recommendation).*

The Minute has been read to the involved people that have put their signatures below.

……., date……. month……. year……..

Representative of the organization(s), individual(s) causing environmental pollution, degradation *(Signature and full name)*	**Representative of the service provider** *(Signature and full name)*
Representative of the local authority *(Signature and full name)*	**Other organizations, individuals (if any)** *(Signature and full name)*

Form No. 05 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

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MINUTE ON CONFIRMING THE RESULTS OF MONITORING, ASSESSMENT, MEASUREMENT, SAMPLING, SPECIMEN AND EVIDENCE SEALING (IF ANY)

Today, date .... month ..... year ....., at (location)....., we are:

1. Representative of the service provider

Representative: Mr. (Ms.)……Position:..... ..

2. Legal representative of organization(s), individual(s) causing environmental pollution, degradation:

Mr. (Ms.).....Position:.....

Address:.....

3. Representative of the local authority (where the environmental pollution and degradation **case is handled):**.....Position:….

4. Other organizations, individuals (if any):.....

We have together prepared the minute on confirming the results of monitoring, assessment, measurement, sampling or specimen and evidence sealing (if any), The details are as follows:

a).....

b).....

c).....

Etc.....

b) Opinions of relevant organizations, individuals (if any). *(In case the representative of the organization(s), individual(s) causing pollution, degradation does not sign in the minute, it is necessary to specify the reason and provide recommendation).*

The Minute has been read to the involved people that have put their signatures below.

…….., date……. month……. year……..

Representative of the organization(s), individual(s) causing environmental pollution, degradation	**Representative of the service provider**
(Signature and full name)	*(Signature and full name)*
Representative of the local authority	**Other organizations, individuals (if any)**
(Signature and full name)	*(Signature and full name)*

Form No. 06 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

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THE RESULT OF ENVIRONMENTAL DAMAGE CALCULATION AND CONCLUSIONS ABOUT ENVIRONMENTAL DAMAGE COMPENSATION RESPONSIBILITY

I. The result of environmental damage calculation

1. Damage caused by water environmental pollution, degradation (if any): …. VND

(Calculation is made using formula provided in Clause 2, Article 11 of Decree No. 03/2015/ND-CP dated 6 January 2015 of the Government on determination of environmental damage)

2. Damage caused by pollution or degradation to the soil environment (if any): …. VND

(Calculation is made using formula provided in Clause 3 Article 11 Decree No. 03/2015/ND-CP)

3. Damage caused by pollution or degradation to an ecosystem (if any): …. VND

(Calculation is made using formula provided in Clause 4 Article 11 Decree No. 03/2015/ND-CP dated 6 January 2015)

4. Damage caused by pollution or degradation to species prioritized for protection (if any): …. VND

(Calculation is made using formula provided in Clause 5 Article 11 Decree No. 03/2015/ND-CP dated 6 January 2015)

Total damage: = ……. VND

II. The expense for determination of damage : …….. VND

III. The expense for data and evidence assessment: …….. VND

IV. The expense for implementing procedure to request damage compensation (if any): …….. VND

The total requested compensation for damage (I+II+III+IV):…… VND

V. Environmental damage compensation responsibility

Basing on the data, evidence to be collected to identify the organization, individual causing environmental pollution, degradation, the environmental damage compensation responsibilities … (the location of damage caused by environmental pollution) are provided as follows:

Company A: …… VND (… %)

Company B: ……. VND (…%)

Company C: ……. VND (…%)

Form No. 07 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

NAME OF THE AGENCY	**THE SOCIALIST REPUBLIC OF VIETNAM**
	Independence - Freedom - Happiness
No. /QĐ-…	*……., date … month … year …..…*

DECISION

On establishment of the council for appraisal of data, evidence to determine environmental damage

HEAD OF THE AGENCY REQUESTING DAMAGE COMPENSATION

(Ministerial, Provincial, District, Communal)

Basing on the Decree No. 03/2015/ND-CP dated 6 January 2015 of the Government on determination of environmental damage;

Basing on stipulations prescribed in Article,...Article…. of Circular No..... /201../TT/BTNMT dated…..... on stipulating procedure to implement compensation for environmental damage;

As requested by (the service provider); the organization, individual requesting damage compensation; and organization(s), individual(s) causing environmental pollution, degradation.

TO DECIDE:

Article 1. To establish council for appraisal of data, evidence to determine environmental damage comprising the people that are named below:

1.Mr. (Ms.): full name; academic title, academic distinction; organization, position (if any)..... as the Chairman of the Council.

Article 2. The people mentioned above are responsible to study, consider and provide comments at the meeting of the Council on…. as the grounds for settlement of environmental damage compensation claims, and liable for their comments and opinions.

Article 3. This Decision becomes valid from the signing date. The people named in Article 1 are responsible to implement this Decision.

***Recipient*:**	**Head of the Agency**
- The direct superior agency (for reporting);	*(Signature, stamp and full name)*
- Mr. (Ms.).....(for implementation);	
- Filed.	

Form No. 08 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

THE SOCIALIST REPUBLIC OF VIETNAM

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MINUTE OF THE MEETING OF THE COUNCIL FOR APPRASAL OF DATA, EVIDENCE TO DETERMINE ENVIRONMENTAL DAMAGE

I. Time, location

Today, at .... hour .... date .... month …. year 20…. in ……

II. Participants

1. Mr. (Ms.)… (Full name – Position), the Chairman of the Council for Appraisal of Data, Evidence to determine environmental damage at … (the location of pollution, of which damage must be determined for requesting compensation)

2. Mr. (Ms.)… (Full name – Position);

3. Mr. (Ms.)… (Full name – Position);

4. Mr. (Ms.)… (Full name – Position);

5. Mr. (Ms.)… (Full name – Position);

6. Mr. (Ms.)… (Full name – Position);

7. Mr. (Ms.)… (Full name – Position);

8. Mr. (Ms.)… (Full name – Position);

III. Chairman, secretary of the meeting

1. Chairman.....

2. Secretary. . ……

IV. The working content of the Council

1. Opinions of the agencies responsible for collection and evaluation the data, evidence:…….

2. Opinions of service providers:…….

3. Opinions of the members of the Council:…...

4. Other opinions of organizations, individuals (if any):

5. Supplementation and explanation of contents by the compensation requesting agency as requested by the Council (if any)

6. The Council has organized the meeting to review the supplemented and re-analyzed data, evidences (if any)

Voting result:

Members of the Council	Agree	Agree but with supplementation	Disagree
Number of approval vote			
Number of disapproval vote			

V. Conclusion

The Council concludes that the collected data, evidence…. (guaranteed or not guaranteed) are qualified and suitable to calculate, determine environmental damage in (location damaged by environmental pollution causing acts), and that the damage calculation results and conclusion on responsibility for environmental damage compensation (location damaged by environmental pollution causing acts) …. (guaranteed or not guaranteed) are satisfactory.

Requests of the Council (if any):

a) To supplement the indicators including …

b) To re-conduct monitoring of the indicators including….

c) To re-analyze the indicators including …

d) To re-calculate environmental damage ….

e) To re-determine damage compensation responsibility

The Meeting is closed at ……. hour …… date ……. month ……. year 20 …..

This Minute is made in 03 copies, of which 02 are delivered to the agency responsible to request damage compensation and 01 copy is filed by the Council[1].

THE SECRETARY	**THE CHAIRMAN OF THE COUNCIL**
(Signature, full name)	*(Signature, Full name)*

[1] Affix the stamp of the agency responsible for data, evidence assessment on the first page and across the margins of all pages of the minute

Form No. 09 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

THE SOCIALIST REPUBLIC OF VIETNAM

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NOTICE
ON REQUESTING COMPENSATION FOR DAMAGE

To:.....*(Name of the compensation-liable agency)*

Name of the agency:…… *(Name of agency responsible to request compensation)*

Address:.....

In accordance with the conclusion of the Council for Appraisal of Data, Evidence to determine environmental damage dated… month…. year…. And the environmental damage calculation results (agency responsible for data, evidence collection and assessment), the compensation amount for damages caused by environmental pollution, degradation comprises of following items:

1. The environmental damage: ..... VND

2. The expense for determination of damage:.....VND

3. The expense for data, evidence assessment: .....VND

4. The expense for implementation of procedure to request compensation for damage (if any): .....VND

5. The total claimed compensation amount:..........VND

It is claimed that.... (Name of the compensation-liable agency) shall make compensation for the mentioned-above damages in accordance with the law regulations./.

…..... date….. month….. year…..…

Head of Agency/Unit

(Signature, stamp and full name)

Form No. 10 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

THE SOCIALIST REPUBLIC OF VIETNAM

Independence - Freedom - Happiness

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THE MINUTE OF NEGOTIATION ABOUT DAMAGE COMPENSATION

Today, date .... month ..... year ..... at (location).....,we are:

1. Compensation requesting agency

Represented by Mr. (Ms.)……Position:.....

Representative of organizations, individuals that claim the compensation

Mr. (Ms.): .....

Address:.....

3. Representative of organization, individual causing environmental pollution

Mr. (Ms.): .....

Address:.....…...

We have conducted negotiation about compensation for environmental damage in accordance with the environmental damage compensation claim of the organization, individual: …….....

1. Opinions of representatives of the organization(s), individual(s) causing environmental pollution, degradation

…….....

2. Opinions of representatives of the compensation requesting agency…….....

.....

3. The contents that are negotiated successfully

.....

4. The contents that are not negotiated successfully …….....

.....

This Minute has been read loudly to the involved people that are signed below.

Form No. 11 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

NAME OF AGENCY

THE SOCIALIST REPUBLIC OF VIETNAM

Independence - Freedom - Happiness

No. /QD-…

……, date … month … year ……

DECISION

(Sub: Compensation for environmental damage)

HEAD OF THE AGENCY

- Basing on Decree No. 03/2015/ND-CP date 06/1/2015 of the Government on Determination of Environmental Damage;

- Basing on Circular No..... /201../TT/BTNMT dated…..... on stipulating procedure to implement compensation for environmental damage;

- Basing on the claim for requesting damage compensation of the organization, individual... (address, place of residence) date....month.....year.....on claiming compensation for damage;

- Basing on the data, evidence collection results (name of the service provider) and assessment results of the Council for appraisal of Data and Evidence dated .....month.....year..... .....on implementing procedures to request compensation for damage cause by (name of organization(s), individual(s) causing environmental pollution, degradation);

- Basing on the Minute of Negotiation dated ..... month ..... year ..... between the Compensation requesting agency, organizations, individuals causing environmental pollution or degradation and organization, individual claiming compensation for damages;

TO DECIDE:

Article 1. The compensation shall be made to … (organization, individual who caused pollution claiming the compensation for damage)

Address:.....

Amount: …….....

(In words:…….. …….....)

Reasons:.....

Article 2. This Decision takes effect after 15 days from the signing date.

Article 3. The relevant organization, individual are responsible to implement this Decision./.

***Recipient*:**

- The direct superior agency (for reporting);
- The relevant organization, individual....(for implementation);
- Filed.

Head of Agency

(Signature, stamp and full name)

MINISTRY OF NATURAL RESOURCES AND ENVIROMENT	THE SOCIALIST REPUBLIC OF VIETNAM Independence – Freedom - Happiness
No.: /201…/TT-BTNMT	*Hanoi, date month 201…*

The first draft

CIRCULAR

On stipulating the criteria, method of selection and responsibility of the units that provide the monitoring, assessment and measurement service for data and evidence collection

Pursuant to the Law on Environmental Protection dated June 23rd, 2014;

Pursuant to the Law on Bidding dated November 26th, 2013;

Pursuant to Decree No. 63/2014/ND-CP dated June 26th, 2014 of the Government on detailing the implementation of several provisions of the Law on Bidding regarding the selection of contractors;

Pursuant to Decree No.03/2015/ND-CP dated January 6th, 2015 of the Government on determination of environmental damage;

As requested by the Director General of Vietnam Administration of Environment, Director of the Legislation Department,

The Minister of Natural Resources and Environment hereby promulgates the Circular on stipulating the criteria, method of selection and responsibility of the monitoring, assessment and measurement service providers for data and evidence collection.

Chapter I

GENERAL PROVISION

Article 1. Scope of regulation

This Circular stipulates the criteria, method of selection and responsibilities of the monitoring, assessment and measurement service providers for data and evidence collection.

Article 2. Subjects of application

1. Organizations, individuals that provide monitoring, assessment and measurement service for collection of data and evidence.

2. The agencies that are responsible to collect and appraise the evidences, data for determination of environmental damagescomprise of the people's

committees at district level, people's committees at provincial level, Ministry of Natural Resource and Environment.

3. Other relevant organizations, individuals.

Article 3. Term Interpretation

1. The applicant are the organizations, individuals that apply for selection of the units that provide monitoring, assessment and measurement service for data and evidence collection.

The applicant service providers are divided into two types, including the units that provide services related to monitoring and measurement of environmental parameters and the units that provide services related to calculation of environmental damage and determination of responsibility to make compensation for environmental damage.

2. Selection of the units that provide monitoring, assessment and measurement service for data and evidence collection is a selection process to determine the units that are qualified to provide monitoring, assessment and measurement service for collection of data and evidence.

3. Selection dossier (hereinafter called as Dossier) refers to all the documents, forms prepared and submitted to the selection organizer by the applicants as the foundation to evaluate and select the service providers in accordance with the requirements specified in this Circular.

Article 4. Selection principle

1. The organization of selecting the units that provide monitoring, assessment and measurement service for data and evidence collectionshall ensure the objectiveness, openness and transparency.

2. The selection of (service provider) that provide monitoring, assessment and measurement service for data and evidence collection shall comply with the criteria, requirement prescribed by the laws.

3. The splitting of the service package into several sub-packages for selectingthe units that provide monitoring, assessment and measurement service for data and evidence collectionshall be consistent with the actual situation and ensure the technical characteristics of the environmental field to be monitored, assessed and measured.

4. The selection of the units that provide monitoring, assessment and measurement service for data and evidence collection shall be made basing on theoverall evaluation of technical criteria and price criteria specified in the Appendix I of this Circular.

Article 5. Method of selection

The selection of the units that provide monitoring, assessment and measurement service for data and evidence collection shall be made in accordance with one of the following methods:

1. Select 01 (one) service provider that can meet the conditions for providing the monitoring, assessment and measurement service for data and evidence collection.

This service provider may cooperate, select other service providers to render the monitoring, assessment and measurement service for data and evidence collection.

2. Select 02 (two) service providers, including 01 (one) service provider that carries out the monitoring, measurement of environmental parameters and 01 (one) service provider that provides service related to calculation of environmental damages and determination of damage compensation liability.

3. In special cases, the agencies responsible to collect and verify data, evidence for determining environmental damages shall appoint and select the units that provide monitoring, assessment and measurement service for data and evidence collection basing on the list of service providers eligible to implement environmental monitoring service activities prescribed in Decree No. 127/2014/ND-CP dated 31st December 2014 of the Government on regulating the requirements applicable to environmental monitoring service activities.

Chapter II

THE CRITERIA SET TO SELECT THE UNITS THAT PROVIDE MONITORING, ASSESSMENT AND MEASUREMENT SERVICE FOR DATA AND EVIDENCE COLLECTION

Article 6. Criteria set

The criteria set for selecting provide monitoring, assessment and measurement service for data and evidence collection are classified into 04 groups:

1. Group I: Criteria related to prerequisite condition (01 criterion).

2. Group II: Criteria related to experience and capacity of the service providers (04 criteria).

3. Group III: Criteria related to solutions and methodologies for implementation of the service package (01 criterion).

4. Group IV: Criteria related to personnel for implementation of the service package (04 criteria).

Article 7. Principle in using the criteria set

The use of the criteria set for selectingthe units that provide monitoring, assessment and measurement service for data and evidence collectionshall ensure two principles as follows:

1. Prerequisite condition principle

Only the service providers that meet the criteria specified in Group I shall be evaluated in term of the technical criteria specified in the next criteria groups.

2. Minimum threshold principle

The criteria specified in Group II, III, IV (Technical criteria) are evaluated regarding the importance of the criteria and in compliance with the guideline prescribed in the Law on Bidding and the Decrees guiding the Law on Bidding in the method of combining technical factor and price factor.

Criteria specified in Group II, III, IV are evaluated to meet technical requirement if their technical scores are at least equal to 70% the total score and the score of each criterion related to experience and capacity, solution and methodology, and personnel is not lower than 60% of the maximum score applied to such criterion.

The maximum scoreapplied to tech group are detailed as follows:

Group II: 20 points

Group III: 30 points

Group IV: 50 points

Chapter III

RESPONSIBILITY OF THE UNITS THAT PROVIDE MONITORING, ASSESSMENT AND MEASUREMENT SERVICE FOR DATA AND EVIDENCE COLLECTION

Article 8. Responsibility in monitoring, assessment and measurement to collect data, evidence

During the collection of data, evidence, the units that provide monitoring, assessment and measurement service are responsible to:

1. Conduct monitoring, measurement of environmental parameters to be collected in order to determine damage in conformity with the technical process on site monitoring and environmental analysis.

2. Ensure suitable personnel, equipment and facilities for monitoring and measurement activities on the site.

3. Calculate damage and determine liability to make compensation for damage in appropriate, scientific and objective manner.

4. Conduct monitoring, measurement of the proper parameters, in the proper locations, at proper time; calculate the damages and determine compensation liability in line with the requirement specified in the contract signed with the data, evidence collection and verification agencies.

5. Provide the monitoring, assessment, measurement results on time.

6. Be impartial, objective; ensure the accuracy of the monitoring, assessment and measurement results; and be liable to the laws for the accuracy, legality of the monitoring, assessment and measurement results they are produced by them.

In casethe units that provide monitoring, assessment and measurement service for data and evidence collectionintentionally provide false information, are dishonest or fail to implement the commitments specified in the service provision contract, the agencies that are responsible to collect and verify the data, evidence shall have the right to suspend the contract and the service provider shall be liable to the competent authorities.

Article 9. Responsibility in explanation and additional monitoring, assessment and measurement

The units that provide monitoring, assessment and measurement service for data and evidence collectionare responsible to make explanation and conduct additional monitoring, assessment and measurement as follows:

1. Explain about the method of sampling, monitoring, analysis, assessment and measurement to the Data, Evidence Appraisal Council (if requested).

2. Carry out additional analysis of indicators.

3. Conduct re-monitoring, re-analysis and re-assessment of the data and evidences that are requested by the Council (if any).

Chapter IV

RESPONSIBILITY OF THE STATE AGENCIES IN SELECTION OF THE UNITS THATPROVIDE MONITORING, ASSESSMENT AND MEASUREMENT SERVICE FOR DATA AND EVIDENCE COLLECTION

Article 10. Responsibility of the agencies that collect and verify the data and evidence for determining environmental damage

1. To Organize to collect and verify evidence for calculation of compensation for environmental damage caused by pollution or degradation;

2. To Organize the selection of the units that provide monitoring, assessment, measurement service for data and evidence collection in compliance with the regulations prescribed in this Circular.

3. To Assess environmental damage, determine environmental compensation liability and provide the result for the competent authorities to claim environmental compensation.

Article 11. Responsibility of the People's Committees at all level in data and evidence collection for determination of environmental damage

People's Committees at all levels in the areas of environmental pollution or degradation are responsible to cooperate and provide sufficient and accurate evidence at the request of the authority in charge of collection and assessment of data, evidence and the units that provide monitoring, assessment, measurement service for data, evidence collection.

Chapter V

IMPLEMENTATION PROVISION

Article 12. Effect

This Circular takes effects from date…..month…..201....

Article 13. Organization of implementation

1. The Minister, heads of ministerial-level agencies, heads of governmental agencies and chairpersons of provincial-level People's Committees and relevant organizations, individuals are responsible to implement this Circular.

2. The Director General of Vietnam Environment Administration is responsible to monitor, examine and inspect the implementation of this Circular.

3. Any difficulties arising in the implementation process should be reported to Ministry of Natural Resources and Environment by organizations, individuals, ministries, branches, localities for amendment and supplementation./.

Recipients:
- The Central Office and the Parties Committees;
- The Office of National Assembly;
- The Office of the Prime Minister;
- The Governmental Office;
- The People's Supreme Court;
- The People's Supreme Procuracy;
- Ministries, Ministerial Agencies, Agencies under the Government;
- The Central Bodies of the Unions;
- People's Councils, People's Committees of Provinces, Cities under central management;
- DONREs;
- The Document Checking Department (Ministry of Justice);
- Official Gazette;
- The Electronic Port of the Government;

THE MINISTER

Tran Hong Ha

- Units under MONRE;
- Documented: Admin, Legislation Dept, VEA.

APPENDIX I

THE GUIDELINE ON THE USE OF THE CRITERIA SET FOR SELECTION OF THE UNITS THAT PROVIDE MONITORING, ASSESSMENT AND MEASUREMENT SERVICE FOR DATA AND EVIDENCE COLLECTION TO DETERMINE ENVIRONMENTAL DAMAGE

Promulgated in enclosure with Circular No. / /TT-BTNMT dated month year of the Minister of Ministry of Natural Resource and Environment)

The use of the criteria set to select the service providers that carry out data and evidence collection for determination of environmental damage shall comply with the regulations of Circular No. …… and the specific guideline as follows:

I. Method of selection

The units that provide monitoring, assessment and measurement service for data and evidence collection are selected by evaluating technical criteria and price criteria in accordance with the following specific method:

a) Scoring the price criteria:

The price criteria are scored as follows:

$$\text{Score of price under consideration} = \frac{\text{Glowest} \times 100}{\text{G under consideration}}$$

In which:

Score of price under consideration: Score of price of the financial proposal that is under consideration;

Glowest: The lowest offered bidding price after correction of errors, adjustment of difference minus the discount value (if any) among the contractors whose financial proposal dossiers are evaluated;

G under consideration: The bidding price after correction of errors, adjustment of difference minus the discount value (if any) of the financial proposal dossier that is evaluated.

b) Comprehensive evaluation:

The total score is determined by the following formula:

Total score under consideration = K x Technical scoreunder consideration + G x Score of price under consideration

In which:

Technical score under consideration: is the number of points determined in the technical evaluation step;

Score of price under consideration: is the number of points determined in the price evaluation step;

K: Ratio of technical score, K = 80%.

G: Ratio of score of price stipulated in the total scoring grade, G= 20%.

The selected monitoring, assessment, measurement service providers for collection of data and evidence to determine environmental damages are the service providers that get the highest total score.

II. The criteria set for selection of monitoring, measurement service provider for data and evidence collection

1. Criteria for selection of service providers for monitoring and measuring environmental parameters

- Group 1: Criteria related to the prerequisite conditions

Criteria 1: The monitoring, measurement service providers for data and evidence collection must be eligible to implement environmental monitoring and analysis service in the field to be monitored and analyzed for data and evidence collection.

Group II: Criteria related to experience and competence of the service provider

1. Criteria 2: Accuracy of the monitoring, analysis method.

This criteria is evaluated through the accuracy of the results used to assess the environmental damage.

2. Criteria 3: Accuracy of the machineries, equipment.

This criteria is assessed through the modernity of the machineries, equipment and decides the results that are used to estimate environmental damage.

3. Criteria 4: VILAS-recognized certificate

VILAS certificate certifies that the laboratory is competent in term of technique, management organization, effective operation; and can provide testing and calibration results with satisfactory quality.

4. Criteria 5: Service providing experience

This criteria is evaluated through the professionalism and the possibility of success of the rendered contract. Experience is evaluated through the number of similar contracts that have been implemented and accepted.

- Nhóm III: Criteria related to solutions and methodologies for implementing of the service package:

Criteria 6: Monitoring, assessment, measurement plan for data and evidence collection.

Monitoring, assessment, measurement plan for data and evidence collection developed by the service providers shall comprise of justifications about the locations of sampling, time of sampling, the parameters to be analyzed, monitored, assessed and measured.

- Nhóm IV: Criteria related to personnel for implementation of the service package:

Criteria 7: Number of staffs

Criteria 8: Years of experience

Criteria 9: Technical qualification

Criteria 10: Workmanship tolerance

2. Content of the criteria set for selection of service provider to implement calculation of damage and determination of liability to make compensation for environmental damage

- Group I: Criteria related to prerequisite condition

Criteria 1: The units that provide services on calculation of damage and determination of liability to make compensation for environmental damage must be eligible to operate in the field subject to calculation of environmental damage and determination of compensation liability.

The service provider is required to have establishment decision or scientific and technological activity certificate or business license or the investment certificate issued by the state competent authority that is valid at least in one of the fields of technological design service provision, research and implementation of waste treatment technologies; assessment and pricing of environmental damages.

- Group II: Criteria related to experience and competence of the service provider

Criteria 2: Competence of the service provider

This criteriais evaluated through the suitability of the field of research with the fields subject to calculation of damage and determination of liability to make compensation for damage.

Criteria 3:Experience of the service provider

This criteria is evaluated through the similar contracts that have been implemented and accepted or the similar projects, research assignments on waste treatment, pricing and estimation of environmental damage that have been implemented and accepted.

- Group III: Criteriarelated to solutions and methodologies

Criteria 4: Plan on research, treatment, restoration of the environment in the polluted, degraded areas.

Criteria 5. Plan on calculating the environmental damage compensation liability of the relevant actors

- Group IV: Criteriarelated to personnel

Criteria 6: Number of experts

This criteria is evaluated throughthe number of experts that are competent in either field of environmental technology; natural resource and environmental management economics; determination, pricing and estimation of environmental damage.

Criteria 7: Experience of expert

This criterion is assessed through experience, the suitability of the experts for the implementation of the service package.

III. Evaluate method the criteria

1. Criteria related to prerequisite condition

The criteria in Group I specified in Article 6 of this Circular are evaluated by two grades “Passed” or “Failed”, concretely:

- Passed: Not violate the contents prescribed in the criteria.
- Failed: Violate the contents prescribed in the criteria.

2. Technical Criteria

The scoring of each technical criterion is detailed in the following tables:

Table 1. Criteria and scoring grade for evaluating the units that provide monitoring and measurement environmental parameters service for data and evidence collection

(n is the number of applicant service providers)

	Criteria	**Parameter**	**Value**	**Score**

<table>
<tr><td>1</td><td colspan="5">Experience and competence of the service providers (Maximum 20 points)</td></tr>
<tr><td rowspan="11">1.1</td><td rowspan="11">Capacity</td><td rowspan="5">Accuracy of the method</td><td rowspan="5">Accuracy</td><td>The highest</td><td>4</td></tr>
<tr><td>The second highest</td><td>$4-\frac{3}{n-1}$</td></tr>
<tr><td>The third highest</td><td>$4-\frac{3}{n-1}\times 2$</td></tr>
<tr><td>...</td><td></td></tr>
<tr><td>The lowest</td><td>1</td></tr>
<tr><td rowspan="5">The measurement precision of the equipment</td><td rowspan="5">Accuracy</td><td>The highest</td><td>4</td></tr>
<tr><td>The second highest</td><td>$4-\frac{3}{n-1}$</td></tr>
<tr><td>The third highest</td><td>$4-\frac{3}{n-1}\times 2$</td></tr>
<tr><td>...</td><td></td></tr>
<tr><td>The lowest</td><td>1</td></tr>
<tr><td rowspan="2">The recognized VILAS Certificate</td><td colspan="2">Yes</td><td>2</td></tr>
<tr><td colspan="2">No</td><td>0</td></tr>
<tr><td rowspan="3">1.2</td><td rowspan="3">Service provision experience</td><td rowspan="3">Ability to meet the requirements of customers (through the number of similar contracts that the service provider has done ...)</td><td colspan="2">Having implemented more than 5 similar contracts</td><td>10</td></tr>
<tr><td colspan="2">Having implemented 1-5 similar contracts</td><td>5</td></tr>
<tr><td colspan="2">Having not implemented any similar contracts</td><td>0</td></tr>
<tr><td>2</td><td colspan="5">Solutions and methodology (Maximum 30 points)</td></tr>
</table>

	The plan on monitoring, assessment, measurement for data and evidence collection		Rationality, scientificness	The highest	30
				The second highest	$30-\frac{20}{n-1}$
				The third highest	$30-\frac{2}{n-1}\times 2$
				...	
				The lowest	10
3	**Personnel (Maximum 50 points)**				
	Number of staffs		Evaluation conducted in the sequence of organizations	The most numerous	10
				The second numerous	$10-\frac{8}{n-1}$
				The third numerous	$10-\frac{8}{n-1}\times 2$
				The less numerous	2
	Years of experience		Ranking the order of the applicant service providers	The highest	15
				The second highest	$15-\frac{10}{n-1}$
				The third highest	$15-\frac{10}{n-1}\times 2$
				The lowest	5
	Competence		Ranking the order of the applicant service providers basing on the degree of staffs	The highest	15
				The second highest	$15-\frac{10}{n-1}$
				The third highest	$15-\frac{10}{n-1}\times 2$
				The lowest	5
	Workmanship tolerence			The lowest	10
				The second lowest	$10-\frac{8}{n-1}$

				The third lowest	$10-\frac{8}{n-1}\times 2$
				The highest	2

Table 2. The criteria and scoring grade of criteria to evaluate the units that provide services on calculation of damage and determination of liability to make compensation for damage

(n is the number of applicant service providers)

	Criteria	**Parameter**	**Value**	**Score**
1	**Experience and competence of the service providers (maximum 20 points)**			
1.1	Capacity	the suitability of the field of research and operation with the fields subject to calculation of damage and determination of liability to make compensation	Very suitable	10
			Suitable	5
			Unsuitable	0
1.2	Experience in service provision	Ability to meet the clients' requirement (through number of similar contracts that have been rendered by the service provider, etc.).	Having implemented more than 5 similar contracts projects, research assignments on waste treatment, pricing and estimation of environmental damage	10
			Having implemented one to five similar contracts projects, research assignments on waste treatment, pricing and estimation of environmental damage	5
			Having implemented none similar contract or	0

			projects, research assignment on waste treatment, pricing and estimation of environmental damage		
2	**Solutions and methodologies (Maximum 30 points)**				
	Plan on research, treatment, restoration of the environment in the polluted, degraded areas		Rationality, scientificness	The highest	15
				The second highest	$15-\frac{10}{n-1}$
				The third highest	$15-\frac{15}{n-1}\times 2$
				...	
				The lowest	5
	. Plan on calculating the environmental damage compensation liability of the relevant actors		Rationality, scientificness	The highest	15
				The second highest	$15-\frac{10}{n-1}$
				The third highest	$15-\frac{15}{n-1}\times 2$
				...	
				The lowest	5
3	**Personnel (Maximum 50 points)**				
	Number of competent experts		Evaluation conducted in the sequence of organizations	The highest	25
				The second highest	$25-\frac{10}{n-1}$
				The third highest	$25-\frac{10}{n-1}\times 2$

				The lowest	5
	Experience of experts		Ranking the order of applicant service providers basing on the CVs of the proposed experts in term of their working process and experience related to the implementation of the package	The highest	25
				The second highest	$25-\frac{20}{n-1}$
				The third highest	$25-\frac{20}{n-1}\times 2$
				The lowest	5

APPENDIX II

THE FORM OF SERVICE CONTRACT ON MONITORING, MEASUREMENT FOR DATA AND EVIDENCE COLLECTION TO DETERMINE DAMAGE

THE SOCIALIST REPUBLIC OF VIETNAM

Independence – Freedom - Happiness

……. , date month year

THE CONTRACT ON PROVISION OF MONITORING, ASSESSMENT AND MEASUREMENT SERVICE

No. … /20../HDDV

Service package: ……. (Name of the service package)

Under the assignment: ……. (Name of the assignment)

- Pursuant to the Civil Code 2015;

- Pursuant to the Law on Bidding 2013;

- Pursuant to Decree No. 63/2014/ND-CP dated 26 June 2014 of the Government on detailing the implementation of several articles of the Law on Bidding regarding the selection of contractor;

- Pursuant to Decision No. date month year of on the approval of the bidding results of the service package……(name of the service package) and the bid award notice No…….dated……..of…….(the agency responsible for collection and verification of data, evidence);

- Pursuant to the contract finalization minute signed between (the agency responsible for collection and verification of data, evidence) and (the service provider) on….date….month….year…;

- Pursuant to the needs and capacity of the relevant parties;

Today, date…….month……year… at……, we are:

I. THE PARTY REQUESTING THE MONITORING, ASSESSMENT AND MEASUREMENT SERVICE (PARTY A):

THE AGENCY RESPONSIBLE TO COLLECT AND VERIFY THE DATA, EVIDENCE

Address: ……

Telephone: ……..…. Fax: ……..……. Email: ……

Representative: …… Position……

Telephone: ……..…. Fax: ……..……. Email: ……

Tax code: ……

Account number: ……, at Bank…… ……

Power of Attorney No. … date … month … year… *(in case of authorization).*

II. THE MONITORING, ASSESSMENT AND MEASUREMENT SERVICE PROVIDER (PARTY B):

THE UNITS THAT PROVIDE MONITORING, ASSESSMENT AND MEASUREMENT SERVICE FOR DATA AND EVIDENCE COLLECTION

Address: ……

Telephone: ……..….. Fax: ……..……. Email: ……

Representative: …… Position……

Telephone: ……..….. Fax: ……..……. Email: ……

Tax code: ……

Account number: ……, at Bank ……

Power of Attorney No. … date … month … year… *(in case of authorization).*

Two parties agree to sign the contract on provision of monitoring, measurement contract with the following contents:

Article 1. Subject of the contract

Subject of the contract refers to the services that are specified in Part A. *Term of Reference* in Appendix No. …. enclosed with this Contract.

Article 2. Component of contract

The contract dossier consists of the following documents:

1. The contract (with attached appendices, if any);

2. Contract appendix including the Term of Reference, cost estimate, list of personnel of the service provider, reporting responsibility of the service provider;

3. Contract finalization minute;

4. Decision on approval of the service provider selection results;

5. Written agreement on the contract conditions of the parties, including the general conditions and specific conditions;

6. The proposal dossier and the notes to the proposal of the selected service provider;

7. The dossier of request and the revised, supplemented documents of the dossier of request;

8. Relevant documents.

Article 3. Type of contract

This Contract is implemented in form of fixed-price contract.

Article 4. Contract implementation period

(Specify the contract implementation period in line with the term of reference and contract finalization results between two parties).

Article 5. Contract value and mode of payment

1. Contract value: ……..

(Specify in number, words and currency of the contract. If the contract value is signed in two or three different currencies, value of each currency should be specified in number and word).

This amount is inclusive of all the costs, interest and taxes that Party B is required to pay.

2. Mode of payment:

- Mode of payment is specified in the specific conditions

…….. *(Amount/ percentage and currency)* as *contract becomes effective (except for the case of advance payment).*

…….. *(Amount/ percentage and currency)* when Party A receives and accepts the draft report submitted by the service provider.

…….. *(Amount/ percentage and currency)* when Party A receives and accepts the final report.

Total paid value …….. *(Amount and currency)*

- Time of payment: ……

Time of payment may be changed in line with the output reports as detailed in the Appendix C.

Article 6. Responsibility of Party A

Party A is responsible to:

1. Collect and verify the data, evidence

2. Make full payment to Party B in accordance with the contract value and manner prescribed in Article 5 of this Contract

3. Assign the officer to coordinate the activities under the scope of this Contract.

4. Fulfill all the other obligations and responsibilities specified in the general conditions and specific conditions of the Contract.

Article 7. Responsibility of Party B

Party to is responsible to:

1. Fulfill the obligations specified in the Article 1 of this Contract;

2. Submit the report to Party A in conformity with the time and manners detailed in Part *B. Cost estimate, list of personnel of the service provider* of Appendix No. …. attached to this Contract;

3. Ensure the personnel mobilization and arrangement, cost estimate listed in Part*C. Responsibility of the service provider* of Appendix No. …. attached to this Contract;

4. Perform all the responsibilities specified inArticle 16, 17, 18 và 19 of the Circular No. …….

5. Fulfill all the other obligations and responsibilities specified in the general conditions and specific conditions of the Contract

Article 8. Contract validity

1. The Contract becomes valid since …….. *(specify the date of contract validity in line with the specific conditions).*

2. The Contract becomes invalid when both parties implement the contract liquidation in accordance with the law regulations.

This Contract consists of … appendices that are an integral part of the Contract and become valid since the date this Contract takes effect.

The Contract is prepared in *02 (two)*copies. Each party retains *01 (one)* copy with equal value.

PARTY A	**PARTY B**
Legal representative of the agency responsible to collect and verify the data, evidence	**Legal representative of the service provider**
[Full name, position, signature and stamp]	*[Full name, position, signature and stamp]*

CONTRACT APPENDIX

No. …….

A. The Term of Reference
B. Cost estimate, list of personnel of the service provider
C. Reporting responsibility of the service provider

This Appendix is an integral part of the Contract No. …… and becomes valid since the date the Contract takes effect.

THE GOVERNMENT

REPUBLIC SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

Hanoi, Jan 2018

Draft 04

DECREE

AMENDING AND SUPPLEMENTING TO THE DECREE PROVIDING DETAILED REGULATIONS AND GUIDANCE ON ENFORCEMENT OF ENVIRONMENTAL PROTECTION LAW

Pursuant to the Law on Governmental organization dated June 19th, 2015;

Pursuant to the Law on Environmental Protection dated June 23rd, 2014;

As requested by the Minister of Natural Resources and Environment,

(Alternative idea)

The Government hereby promulgates the Decree amending and supplementing to the Decree No. 18/2015/ND-CP dated 14 May 02nd, 2015 by the Government on environmental protection planning, environmental strategic assessment, environmental impact assessment; Decree No. 19/2015/ND-CP dated Febuary 14th, 2015 by the Government on detailing the implementation of some articles of the Law on Environmental Protection; Decree No. 38/2015/ND-CP of April 24th, 2015 by the Government on regulations of waste management and waste; Decree No. 03/2015/ND-CP dated January 06th, 2015 by the Government on regulations of determination the environmental damage; Decree No. 127/2014/ND-CP of December 31st, 2015 by the Government on stipulating the conditions of organization and operation of environmental monitoring services.....

Amending and supplementing to the Decree No. 03/2015/ND-CP dated January 06th, 2015 by the Government on regulations of determination the environmental damage (herein after referred as Decree 03/2015/ND-CP)

Article 4. Amending and supplementing to the Clause 5, Article 3 as follows

"5. The procedures to implement a claim for the environmental damage

Notification of information of environmental pollution and degradation

a) The subjects prescribed in Clause 1, Article 3 that detect the signs of environmental pollution and degradation are be responsible to notify the compensation-request-liable agencies in either manner as follow:

Sending notification of information of environmental pollution and degradation to the agencies who claim damages directly.

To send the notification about information of pollution and degradation by post to compensation-request agencies. Duration of receiving notification shall be counted from the date of affixing the post stamp by the post office.

The dossier of reporting environmental pollution and degradation comprises of:

A notification about environmental damage using ***Form No.01 Appedix I attached to this Decree;***

The enclosed documents, evidences (if any).

b) Procedure of notification about environmental pollution and degradation

After receiving notification of environmental pollution and degradation of organizations and individuals defined in Clause 1, Article 3, the agencies request the damages specified in Clauses 2 of Article 3 are responsible for implementing the following procedures:Examine the notification dossier and relevant documents in accordance with the current laws on complaints and denunciations, and laws on reception of citizens.

The notification dossier of environmental pollution and degradation must be recorded in the citizen reception book with specific information, including order number, date or reception, full name, address, and content of notification; the process of consideration and settlement by competent agencies, organizations (if any); request, recommendation of the notifying organizations, individuals.

The compensation-request-liable agency shall, if determining that the case is not under it's responsibility, return the dossier and instruct the notifying organizations, individuals to submit the notification dossier to the suitable compensation-request-liable agency in accordance with the laws.

If determining that the notified violation of environmental protection may cause serious environmental pollution and degradation and require immediate prevention and settlement measures, the information receiving officer shall immediately report to the leaders to make timely notification to the competent environmental management agencies in the location of environmental pollution, degradation for termination and settlement of such violations.

Where the dossier of environmental pollution and degradation is complete and valid, the compensation-request-liable agency shall receive the dossier and inform directly or in writing to the notifying organizations, individuals using ***Form No. 02 Appendix I attached to this Decree***, and settle the case in accordance.**c) The procedure for checking, verifying and notifying the contents regulated in the close 2 of this article**

Within 5 (five) working days from the day of receiving valid dossiers (this time limit may be extended but not exceed 10 working days), the compensation-request-liable agency shall carry out following processes and procedures:

- The compensation-request-liable agency shall appoint officers having expertise and experience in environmental pollution and degradation to the site for checking and verification of the complaint and denouncement by the notifying organizations, individuals. Samples shall be taken for analysis and preliminary determination of environmental pollution and degradation level, if necessary. Based on the level, nature of the environmental pollution and degradation, the compensation-request-liable agency shall conduct the settlement as follows:

- If the level of environmental pollution and degradation is less serious, and the receiving environment is able to self-purify or self-cleanse to meet the Vietnamese technical regulations on environment - QCVN (or the local technical regulations on environment), the compensation-request-liable agency shall identify organizations, individuals causing environmental pollution or degradation; notify and request such organizations, individuals to carry out measures to treat the pollution parameters to satisfy the QCVN (or the local technical standard) before being discharged to the environment. If necessary, the compensation-request-liable agency shall apply administrative sanctions and notify the verification results as well as settlement method to the organizations, individuals causing environmental pollution or degradation. The notification shall be made using ***Form No. 03 Appendix Iattached to this Decree***;

- If the level of environmental pollution and degradation is serious (very serious, critically serious), the compensation-request-liable agency shall identify the pollution-causing organizations, individuals and simultaneously request them to stop all the activities that cause environmental pollution, degradation.

- Regarding environmental incidents that result in serious impacts (critically serious and extremely serious), the compensation-request-liable agency must take preventive measures and request pollution-causing organizations, individuals to control the pollution source and apply measures to overcome the consequences caused by environmental incidents.

- The compensation-request-liable agency shall, if determining that the level and characteristics of environmental pollution and degradation do not fall on their authority, immediately transfer the dossier and documents according to regulations to the competent compensation-request agency for settlement under law."

Article 5. Amending and supplementing to Article 6

"1. For cases of pollution and environmental degradation seriously (or the case identified by the Clause 5 of the Article 1 of this Decree), the compensation-request-liable agency shall collect and assess data and evidence in order to determine the damage to the environment. The procedures for collection and assessment of evidence for environmental damage assessment is as follows

a) Determine the necessary evidence to assess environmental damage and claim environmental compensation.

b) Collect the necessary evidence in accordance with a)

c) Assess the environmental damage and prepare documents for claiming environmental compensation.

2 Basing on the level and characteristic of environmental pollution, degradation prescribed in Points a, b, c, d, Clause 1, Article 1 of Decree No. 03/2015/ND-CP, the compensation-request-liable agency shall (or may) select and sign a contract, under law, with a service provider to carry out data, evidence collection and determination, calculation of damage compensation liability. The details are described below:

a) In term of the compensation claims related to monitoring, assessment, measurement or collection of data, evidence, the compensation-request-liable agency may select and sign a contract with the service providers that have been licensed to practice monitoring, measurement, sampling activities by the competent state management agency;

b) the compensation-request-liable agency may select and sign a contract with the qualified service providers that are capable of performing the required works as the case may be, if the claims are related to determination of damage level and calculation of damages to be compensated;

3. The service providers must have relevant functions and duties conferred by the State, if they are public providers, or, must be licensed by the relevant competent authority and have following responsibility.

a) To meet the requirements by the compensation-request-liable agencies;

b) To ensure the objectiveness, completeness, truthfulness, concreteness, scientific based implementation

c) To ensure the punctuality, quality of the service; to take legal responsibility for the provided results;

d) To apply professional measures and use tools, equipment and facilities in accordance with the law to collect data, evidence; assess and calculate the environmental damage level as required by the compensation-request-liable agencies.

e) To request the relevant organizations, individuals to provide data, evidence for assessing environmental damage in accordance with Article 8 of the Decree No. 03/2015/ND-CP. Any acts of hindrance, non-cooperation, intentional information distortion, false provision, or evidence concealment, destruction (commonly called as act of hindrance) shall be recorded in written

minute using ***Form No. 04 Appendix I attached to this Degree*** and settled in accordance with the laws

f) To receive fund for rendering the service contract in accordance with the laws;

g) In order to ensure the accuracy, objectiveness of data, evidence, the monitoring, assessment, measurement and sampling activities must be witnessed by representatives of the local authorities and organizations, individuals causing environmental pollution or degradation. The results of monitoring, assessment, measurement, sampling or sealing of data, evidence shall be recorded in minutes using ***Form No. 05 Appendix I attached to this Degree.*** The minutes must be signed by representatives of the local authorities and organizations, individuals causing environmental pollution or degradation.

h) In case the organizations, individuals causing environmental pollution or degradation refuse to cooperate or sign in the minutes, the service providers shall request the representatives of the local authorities to witness and sign the minutes and the sealed samples, evidences.

i) The time limit for data, evidence collection by service provides is 30 days from the effect of the service contract. The time limit may be extended but not exceed 40 days, if the cases involve various complicated circumstances, or not exceed 10 days in the event of environmental incidents or illegal discharge. The prolongation of service rendering duration must be approved in writing by he agencies responsible for collection and evaluation the data, evidence in writing and must be clearly explained.

3. The procedures of selecting a service provider must comply with the law regulations

a) Criteria for selection of the service provider monitoring, assessment and measurement in order to collect data and evidence

The service providers of monitoring, assessment and measurement in order to collect data and evidence (after collectively referred to as service provider) divided into two types: the services for monitoring and measurement of environmental parameters and the services for calculation of environmental damage and determination of responsibility to make compensation for environmental damage. The criteria set for selecting service provider of monitoring, assessment and measurement for data and evidence collection are classified into 04 groups:

Group I: Criteria related to prerequisite condition

Group II: Criteria related to experience and capacity of the service providers

Group III: Criteria related to solutions and methodologies for implementation of the service package

Group IV: Criteria related to personnel for implementation of the service package

The application of the criteria for selection of the service providers of monitoring, assessment and measurement for data and evidence collection are specific guided in Appendix I attached to this Decree.

b. Responsibilities of the units that provide services

During the collection of data, evidence, the units that provide monitoring, assessment and measurement service are responsible to:

Conduct monitoring, measurement of environmental parameters to be collected in order to determine damage in conformity with the technical process on site monitoring and environmental analysis.

Ensure suitable personnel, equipment and facilities for monitoring and measurement activities on the site.

Calculate damage and determine liability to make compensation for damage in appropriate, scientific and objective manner.

Conduct monitoring, measurement of the proper parameters, in the proper locations, at proper time; calculate the damages and determine compensation liability in line with the requirement specified in the contract signed with the data, evidence collection and verification agencies.

Provide the monitoring, assessment, measurement results on time.

Be impartial, objective; ensure the accuracy of the monitoring, assessment and measurement results; and be liable to the laws for the accuracy, legality of the monitoring, assessment and measurement results they are produced by them.

In case the units that provide monitoring, assessment and measurement service for data and evidence collection intentionally provide false information, are dishonest or fail to implement the commitments specified in the service provision contract, the agencies that are responsible to collect and verify the data, evidence shall have the right to suspend the contract and the service provider shall be liable to the competent authorities.

The units that provide monitoring, assessment and measurement service for data and evidence collection are responsible to make explanation and conduct additional monitoring, assessment and measurement as follows:

Explain about the method of sampling, monitoring, analysis, assessment and measurement to the Data, Evidence Appraisal Council (if requested).

Carry out additional analysis of indicators.

Conduct re-monitoring, re-analysis and re-assessment of the data and evidences that are requested by the Council (if any).

4. **Council for appraisal of Data, evidence**

a. Establishment of the appraisal council

Within 7 working days after receiving the results of data, evidence collection, the head of the Agencies responsible for collection and evaluation the data, evidence shall issue the decision on establishment of the council for appraisal of data and evidence using ***Form No. 6 Appendix I attached to this Degree***.

The appraisal council shall meet the below requirements

The appraisal council must comprise 7 to 9 members depending on the complicatedness of the damage to be determined.

The council for appraisal of collected data and proof shall comprise the chairman, 01 vice chairmen (if necessary), 01 secretary, 02 opponent members, and other members, of which at least 30% of the members are experts in policy, law making, environmental pollution and degradation; at least 30% of the members are officers in the management sector; other are representatives of the local authorities where the data and proof are collected; representatives of the community and relevant entities.

Members of the appraisal council: The members of the appraisal council shall meet the below requirement: The chairman must be an environmental expert in one of the following fields: law, policy making, water environment, natural ecosystem, species prioritized for protection or environmental monitoring, analysis, damage calculation, determination of compensation liability with at least seven (07) years of experience for university degree holder, at least five (05) years of experience for master degree holder, at least three (03) years of experience for doctoral degree holder; or be the leader of the agency responsible for collection of data and evidence, calculation of damage, and determination of compensation liability related to the damages to be determined.

The opponent members must be experts in one of the following fields: law, policy making, water environment, natural ecosystem, species prioritized for protection or environmental monitoring, analysis, damage calculation, determination of compensation liability related to the damages to be determined with at least three (03) years of experience for university degree holders, at least two (02) years of experience for master degree holders, at least one (01) years of experience for doctoral degree holders.

Members of the appraisal council must be experts in one of the following fields: law, policy making, water environment, natural ecosystem, species prioritized for protection or environmental monitoring, analysis, damage calculation, determination of compensation liability with at least three (03) years of experience for university degree holders, at least two (02) years of experience for master degree holders, at least one (01) years of experience for doctoral degree holders.

The secretary must be an officer of the agency responsible for collection of data and evidence that is processing and handling the damage compensation requesting dossier.

b) Responsibilities of the appraisal council

- The appraisal council shall examine, consider and appraise the collected data, evidence to ensure objectiveness, accuracy and completeness as the grounds for the compensation-request-liable agencies to make compensation-requesting decisions.

- Responsibilities of the chairman

To preside at meetings of the appraisal council;

To review and process opinions raised in the meetings of the appraisal council and make final conclusions on the collected data, evidence as the grounds for requesting damage compensation;

To sign the meeting minutes and take legal responsibility for the conclusions drawn at the meetings.

- Responsibilities of the members

To examine, study the data, evidence provided by the agency responsible for collection of data and evidence that are processing, handling the damage compensation requesting dossiers;

To participate in the meetings of the appraisal council;

To give opinions about the collected data and evidences for calculation, determination of environmental damage; ensure accuracy of the evidence as the grounds for requesting damage compensation; take legal responsibility for their opinions.

- Responsibilities of the secretary

To report to the council about the written comments of the council members that did not attend the meeting of the council;

To make and sign the minutes of the council meetings and bear legal responsibility for the minute contents;

To prepare dossiers and documents for final settlement of activities of the council.

Article 6: Revision and supplementation of Article 7 “Article 7: Dossier and **procedure of claiming for the environmental compensation**

1.A dossier of claim for damage to the environment comprises:

a) A written request for damage compensation from the agency defined in Clause 2, Article 3 of this Decree;

b) Data and evidence have been collected and evaluated according to the provisions of Clause 3, Article 3 and Clause 1, Article 6 of this Decree;

c) The written conclusions of the data and evidence appraisal council;

d) The results of calculation of damage to the environment and the conclusion on liability for damage to the environment.

2. The Ministry of Natural Resources and Environment shall guide the form of dossiers of claim for damage to the environment.

3. The procedure for claiming the environment

a) Prepare documents required to pay damages to the environment

Based on the collected, assessed, and appraised data and evidence, the compensation-request-liable agency shall prepare the claim dossier for damage to the environment as defined in Article 2 of this Decree.

b) The procedure of claiming for compensation of damages

Within 30 working days, counting from the end of the appraisal date of data and evidence determining the damage to the environment, the compensation-request-liable agency specified in Clause 2, Article 3 this Decree shall send notice of claim for damage to the pollution - causing organizations or individuals using ***Form 07*** Appendix I issued together with this Decree; and attached documents include: data and evidence has been gathered and appraisal; conclusions of the for appraisal of data and evidence in order to determine the damage to the environment on ***Form 08*** Appendix I issued together with this Decree; Results on calculated damage to the environment and conclusions on compensation liability for environmental damage on ***Form 9*** Appendix Iissued together with this Decree.

Within 10 working days, from the date of receipt of the written Notification of claim for compensation of damages, the pollution – causing organizations and individuals are responsible for consideration, send a written acceptance or unacceptance upon request of compensation for damage to the compensation-request-liable agency.

Where organizations and individuals required to pay for environmental damages and degradation request in writing for negotiation of level of compensation, within 10 working days from the date of receiving the written request, the compensation-request-liable agency shall organize a meeting to consider and agree on the claim. The minutes of negotiation meeting follow the prescribed **Form 10** Appendix I issued together with this Decree.

Where organizations and individuals required to pay for environmental damages and degradation have a in written feedback of unacceptance of compensation, within 20 working days from the date of sending written unacceptance, that organizations and individuals have to provide documents/evidences of not causing pollution and environmental degradation to the compensation-request-liable agency. The process and procedure for proving organizations or individuals do not pollute the environment are made in accordance with Article 13, Clause 5 of this Decree.

Within 07 working days from the date of receiving the written acceptance of organizations and individuals required to pay for environmental damages and degradation or completing negotiation; completing the proving of not causing environmental pollution, environmental degradation, the compensation-request-liable

agency shall issue a decision on claim for compensation on ***Form 11*** or a decision on the conclusion that the organizations or individuals who do not cause environmental pollution on **Form 12** Appendix I issued together with this Decree. After the deadline for implementation of the decision to pay for damages, if the organizations or individuals that cause pollution and environmental degradation do not perform compensation, the compensation-request-liable agency are responsible for request arbitration (case pollution – causing organizations or individuals agree the plan of arbitration) or perform procedures to sue in court to claim under the provisions of law.

Article 7Revision and supplementation of Article 9

Article 9: **Determination of necessary data, evidence for calculation of environmental damage**

1. The costs for determination of damage and implementation of procedure to claim compensation for environmental damage are the actual and proper expenditures on the collection and assessment of the evidence and data for claiming compensation for environmental damage carried out by the competent agency

2. The costs for determination of damage and implementation of procedure to claim compensation for environmental damage consist of the expenditures on the collection of the evidence and data for determining environmental damage; expenditures on the assessment of evidences and data for implementing the procedures to claim compensation for environmental damage, in which:

a) Expenditures on the collection the evidence and data for determining environmental damage are the expenditures for identifying types of evidences, data in order to determine environmental damages; those for monitoring, analysis, determination of the polluted environmental area, volume and pollutant concentration; those for identifying organizations, individuals that cause environmental pollution, degradation. These expenditures normally consist of vehicle rentals (human, machineries, equipment, technical tools) for survey, sampling; accommodation costs; costs for monitoring, analysis, measurement of environmental parameters; costs for hiring experts to make calculation and determination of compensation responsibility.

b) Expenditures on the assessment of evidences and data are the expenditures that are used to assess whether the collected data, evidence are reliable for calculation and determination of damages. These expenditures normally consist of document delivery costs, appraisal council meeting costs, remuneration for members of the appraisal council.

c) Expenditures on implementing the procedures to claim compensation for environmental damage are the expenditures that are necessary to request organizations, individuals to make compensation, including the official document

delivery costs, travelling costs, remuneration for lawyers that pursue the sue at the court, if necessary.

3. The calculation of cost for determination of damage and implementation of procedure to claim compensation

The total costs for determination of damage and implementation of procedure to claim compensation for environmental damage consist of the expenditures on the collection of the evidence and data for determining environmental damage; expenditures on the assessment of evidences and data for implementing the procedures to claim compensation for environmental damage. The contents of the determination are as follows:

a) The water environment

- Determine the use purpose of the polluted water environment: to be used for one or more purposes in accordance with Decisions, licenses, official documents issued by the competent state management agencies on stipulating the use or approving the planning on use of the water environmental components in the area where pollution and degradation occur;

- Determine whether the water area is polluted at one or more levels (water flow (river, stream) is normally polluted at various levels including critically serious, serious, partially polluted by the distance from the pollution sources; while the static areas (pond, lake) are normally polluted at one level);

- Determine the area, volume, amount of water in each polluted area at various levels;

- Determine pollution level: based on characteristics of the waste sources, define locations and times of sampling in each area to ensure the representative conditions for determination of pollution level, pollutants and their concentration in each polluted area at various levels.

b) Soil environment

- Determine the using purposes of the polluted land: to be used for one or more purposes in accordance with Decisions, licenses, official documents issued by the competent state management agencies on stipulating the use or approving the planning on the use of the water environmental components in the location of pollution and degradation;

- Determine whether the land area is polluted at one or more levels: critically serious, serious, partially polluted by the distance from the pollution sources, and characteristic of the soil types;

- Determine the area, volume, amount of land in each polluted area at various levels;

- Determine pollution level: based on characteristics of the waste sources, define locations and times of sampling in each area to ensure the representative

conditions for determination of pollution level, pollutants and their concentration in each polluted area at various levels.

c) For natural ecosystem

- Determine conservation level of the natural ecosystem: prescribe one or more areas in various level under Decisions, licenses, documents of the competent state management agency on stipulating the conservation level of the natural ecosystem;

- Determine whether the natural ecosystem is degraded at one or more levels;

- Determine the area of natural ecosystem that is degraded at each level;

- Determine the degradation level of the ecosystem: the degree of decline comparing with the original status.

d) Species prioritized for protection that are injured or dead

- Determine the protection priority of the species in accordance with the Decisions, official documents issued by the competent state management agencies on stipulating the species protection priority;

b) Determine the number of individuals of the species prioritized for protection that are injured or dead.

đ) Determine causes and accountability of the relevant parties including the following matters: pollution sources, activities that cause environmental incidents or directly harm the environment, or are related to the areas of environmental pollution, degradation; basic information about the organizations and individuals related to the polluted or degraded environmental area comprising type of activities; products, capacity, input materials, production process; wastes; discharging points; waste treatment measures; monitoring and analysis of environmental parameters.

4. The calculation of cost for determination of damage and implementation of procedure to claim compensation shall be conducted in the following steps:

a) Listing all the activities, of which costs can be calculated;

b) Listing all the expenditures necessary for implementing these activities;

c) Calculating the expenditures in accordance with the current regulations or the market price, if regulations on such expenditures are unavailable.

5. Costs for determination of damage and implementation of procedure to claim compensation shall be advanced from the environmental non-business expenditure source and refunded when the organizations, individuals causing environmental pollution, degradation implement the compensation liability.

6. Ministry of Natural Resources and Environment, people’s committees at all levels shall, basing on specific conditions of the province, cooperate with the relevant organizations to determine the expenditure sources that are advanced for collection of

evidence, data for determination of damage and implementations of procedures to claim compensation for environmental damage.

Article 8 Supplementing point e to Clause 2, Article 11 as below:

"e) In case the cost norm for treating a unit of area, volume, mass of water to satisfy the environmental technical regulations on water environment can not be based, it is possible to calculate the damages caused to the water environment basing on the environmental pollution restoration and rehabilitation project, of which the implementation costs are considered as the damages caused to the water environment.

Artcile 9 Amending Clause 1 of the Article 12 as below:

Ministry of Natural Resources and Environment shall prescribe technical guideline on determining the ecosystem degradation level for calculating environmental damages.

Article 10 . Amending Clause 5, Article 13 as below:

5. Procedures for proving that the organizations or individuals do not pollute the environment

a. Organizations or individuals that are requested to make compensation for environmental damages may submit the Dossier to the Agency requesting compensation for damage to obtain permission on proving that they do not cause environmental pollution and be subject to the costs for appraisal of the dossier. The dossier consists of:

The application for proving that organization, individual do not cause environmental damage (***Form No.13 of Appendix I attached to this Decree)***.

The Dossier on proving that organization, individual do not cause environmental damage by type of environment to be proved ***(Form No. 14 or Form No. 15 of Appendix I attached to this Decree).***

b. Upon receiving Dossier Form No.9 and No.10, the compensation-request-liable agency shall check the contents within 10 days after receiving these dossiers. And the agency forwards the dossiers to the Council for Appraisal of Evidence, Data for their assessment. The appraisal process can be implemented in two manners including legal verification and actual verification. The meeting of the Council for Appraisal of Evidence, Data is organized in accordance with Point c, Clause 3, Article 6 of this Decree.

c. Approving, deciding the request for proving that organizations, individuals do not cause environmental damages

- Upon the Council for Appraisal of Evidence, Data reports the dossier appraisal results, if such organizations, individuals comply with all the legal regulations on environmental protection, install satisfactory waste treatment system

and prove that they do not cause environmental pollution, they shall not be subject to compensation for environmental damage and other costs related to determination of damage and implementation of procedure for claiming compensation for environmental damage. The agency competent to request compensation shall approve the conclusions of the organizations/individuals that do not cause environmental pollution in accordance with ***Form No. 12 of Appendix I attached to this Decree***.

- Agency requesting compensation are competent to disclose the conclusions and suspend the claim for compensation.

9. LIST OF FORMS USED IN PROCEDURES FOR IMPLEMENTATION CLAIM FOR ENVIRONMENTAL DAMAGE

Form 01	Notification about environmental pollution and degradation
Form 02	Notification of receiving of degradation, environmental damage
Form 03	Notice of test result notification, verification of environmental damage
Form 04	Minute on the act hindering the settelement of compensation for environmental damage
Form 05	Minute on confirming the results of monitoring, assessment, measurement, sampling, specimen and evidence sealing
Form 06	Decision on establishment of the council for appraisal of data, evidence to determine environmental damage
Form 07	Notice on requesting compensation for damage
Form 08	Conclusions of the Council of evaluation data and evidence to determine the damage to the environment
Form 09	Results of environmental damage calculation and conclusions on environmental damage compensation responsibility
Form 10	The minute of negotiation about damage compensation
Form 11	Decision of compensation for environmental damage
Form 12	Decision on the conclusion that organization, individual do not cause environmental pollution
Form 13	Application for proving that organization, individual do not cause environmental pollution

Form 14	Report on proving that organization, individual do not cause water environmental pollution
Form 15	Report on proving that organization, individual do not cause soil environmental pollution

Form No. 01 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

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NOTIFICATION ABOUT ENVIRONMENTAL POLLUTION AND DEGRADATION

To:.....*(Name of the agency that is responsible to request compensation or compensation-requesting agency for short)*

Name of organization, individual reporting the environmental pollution and degradation:. .....

Address:.....

Basing on regulations in Article... of Circular No..... /201../TT/BTNMT dated…..... on stipulating procedure to implement compensation for environmental damage, I/we would like to inform you about the environmental pollution and degradation, including:

1. Environmental pollution and degradation of water or soil environment:

Name, place name, location (soil or water) that is polluted, degraded.....

Condition (soil or water) of pollution, degradation.....

(Enclosed with legal documents of the relevant state management agencies and supporting evidence, data, if any).

2. Environmental pollution and degradation of the eco-system:

Name, place name, location where the eco-system is polluted, degraded.....

The condition of the polluted, degraded eco-system.....

(Enclosed with legal documents of the relevant state management agencies and supporting evidence, data, if any).

3. Damage to the species prioritized for protection that are dead, injured:

Name of species prioritized for protection that are dead, injured:.....

The condition of the species prioritized for protection that are dead, injured:.....

(Enclosed with legal documents of the relevant state management agencies and supporting evidence, data, if any).

It is requested that the Agency shall consider and request compensation for environmental damages in accordance with the law./.

…….. date….. month…..year……

Notifying organization, individual

(Signature, name of organization, full name of individual)

Form 02 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

NAME OF AGENCY

THE SOCIALIST REPUBLIC OF VIETNAM

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No. /TB-…

……., date … month … year ……

NOTICE

(Sub: receiving notice of degradation, environmental pollution)

(Name of compensation-requesting agency).....hereby to inform that:

- Basing on the notification about environmental pollution and degradation by organization, individual... (Address, place of residence) dated....month.....year.....;

- After considering the dossiers and relevant documents as prescribed in Circular No..... /201../TT/BTNMT dated…..... on stipulating procedure to implement compensation for environmental damage, **(**Name of compensation-requesting agency) ..... shall/have implemented procedure to request … (name of organizations, individuals causing environmental pollution, degradation) to make compensation for damages from date.....month.....year.....to date....month....year.....

(Name of compensation-requesting agency) would like to inform the organizations, individuals that have notified the environmental damage for their information.

***Recipient*:**

- Organizations, individuals reporting on environmental pollution and degradation;
- Organization, individual causing environmental pollution, degradation;
- Direct superior agency (for reporting);
- Filed.....

Head of the Agency

(Signature, stamp and full name)

Form No. 03 (issued together with Decree No. ..... / ND-CP dated ... / ... / 201 ... amending and supplementing the Decree guiding the environmental Protection Act 2014)

NAME oF AGENCY	**SOCIALIST REPUBLIC oF VIETNAM**
	Independence - Freedom - Happiness
Number: / TB ...	- ----------
	.....,day ... month ... year .....

NOTICE

(V / V test result notification, verification of environmental damage)

(nameof agency shall have a claim for damage) ..... notice:

- Pursuant to the notification of information about pollution and environmental degradation of organizations and individuals ..... (address where residence) on January .... year;

- After checking, verification of matters relating to the dossier notified by the (organizations and individuals informed about pollution, environmental degradation), **(Name**of a claim for damage) ..... proceeded to deal with the organization or individual polluters, environmental degradation as follows:

1. Requirements (organization or individual polluters, recession) implement measures for handling parameters achieved QCVN polluting discharge into the environment before ....

2. Apply sanctions for administrative violations prescribed in Clause .... Article ... . at .... Decree sanctioning of administrative violations of the environment.

3. To collect and assess data and evidence to ask organizations and individuals polluters pay damages to the environment.

(Name of the claim) notice to organizations and individuals informed about pollution, environmental degradation know.

Recipients:
- Organizations and individuals informed about pollution and environmental gradation;
- Organizations and individuals causing pollution and degradation MT;
- Agencies immediate superior (to report);
- Save .....

Heads of Agencies

(Sign, seal and full name)

Form No. 04 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

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MINUTE ON THE ACT HINDERING THE SETTLEMENT OF COMPENSATION FOR ENVIRONMENTAL DAMAGE

Today, date .... month ..... year ....., in (location)....., we are:

1. **Representative of the service provider**

Representative: Mr. (Ms.)……Position:..... ..

2. Legal representative of organization(s), individual(s) causing environmental pollution, degradation:

Mr. (Ms.).....Position:.....

Address:.....……

3. Representative of the local authority (where the compensation case is handled):.....Position:..

4. Other organizations, individuals (if any):.....

We have together prepared the minute on the act hindering the settlement of collection the data, evidence for.....organization, individual (name, address)..... The details are as follows:

a) Describing the hindering acts; level, characteristics, features… of the hindering acts:.....

b) Opinions of relevant organizations, individuals (if any). *(In case the representative of the organization(s), individual(s) causing environmental pollution, degradation does not sign in the minute, it is necessary to specify the reason and provide recommendation).*

The Minute has been read to the involved people that have put their signatures below.

…….., date…… month…… year……

Representative of the organization(s), individual(s) causing environmental pollution, degradation *(Signature and full name)*	**Representative of the service provider** *(Signature and full name)*
Representative of the local authority *(Signature and full name)*	**Other organizations, individuals (if any)** *(Signature and full name)*

Form No. 05 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

THE SOCIALIST REPUBLIC OF VIETNAM

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MINUTE ON CONFIRMING THE RESULTS OF MONITORING, ASSESSMENT, MEASUREMENT, SAMPLING, SPECIMEN AND EVIDENCE SEALING (IF ANY)

Today, date .... month ..... year ....., at (location)....., we are:

1. Representative of the service provider

Representative: Mr. (Ms.)……Position:..... ..

2. Legal representative of organization(s), individual(s) causing environmental pollution, degradation:

Mr. (Ms.).....Position:.....

Address:.....

3. Representative of the local authority (where the environmental pollution and degradation **case is handled):**.....Position:….

4. Other organizations, individuals (if any):.....

We have together prepared the minute on confirming the results of monitoring, assessment, measurement, sampling or specimen and evidence sealing (if any), The details are as follows:

a).....

b).....

c).....

Etc.....

b) Opinions of relevant organizations, individuals (if any). *(In case the representative of the organization(s), individual(s) causing pollution, degradation does not sign in the minute, it is necessary to specify the reason and provide recommendation).*

The Minute has been read to the involved people that have put their signatures below.

….…., date……. month…..… year…..…

Representative of the organization(s), individual(s) causing environmental pollution, degradation	**Representative of the service provider**
(Signature and full name)	*(Signature and full name)*
Representative of the local authority	**Other organizations, individuals (if any)**
(Signature and full name)	*(Signature and full name)*

Form No. 06 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

NAME OF THE AGENCY	**THE SOCIALIST REPUBLIC OF VIETNAM**
	Independence - Freedom - Happiness

_____ _____

No. /QĐ-… ……., *date … month … year …..*

DECISION

On establishment of the council for appraisal of data, evidence to determine environmental damage

HEAD OF THE AGENCY REQUESTING DAMAGE COMPENSATION

(Ministerial, Provincial, District, Communal)

Basing on the Decree No. 03/2015/ND-CP dated 6 January 2015 of the Government on determination of environmental damage;

Basing on stipulations prescribed in Article,...Article…. of Circular No..... /201../TT/BTNMT dated…..... on stipulating procedure to implement compensation for environmental damage;

As requested by (the service provider); the organization, individual requesting damage compensation; and organization(s), individual(s) causing environmental pollution, degradation.

TO DECIDE:

Article 1. To establish council for appraisal of data, evidence to determine environmental damage comprising the people that are named below:

1.Mr. (Ms.): full name; academic title, academic distinction; organization, position (if any)..... as the Chairman of the Council.

Article 2. The people mentioned above are responsible to study, consider and provide comments at the meeting of the Council on…. as the grounds for settlement of environmental damage compensation claims, and liable for their comments and opinions.

Article 3. This Decision becomes valid from the signing date. The people named in Article 1 are responsible to implement this Decision.

***Recipient*:**

- The direct superior agency (for reporting);
- Mr. (Ms.).....(for implementation);
- Filed.

Head of the Agency

(Signature, stamp and full name)

Form No. 07 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

THE SOCIALIST REPUBLIC OF VIETNAM

Independence - Freedom - Happiness

NOTICE

ON REQUESTING COMPENSATION FOR DAMAGE

To:.....*(Name of the compensation-liable agency)*

Name of the agency:……. *(Name of agency responsible to request compensation)*

Address:.....

In accordance with the conclusion of the Council for Appraisal of Data, Evidence to determine environmental damage dated… month…. year…. And the environmental damage calculation results (agency responsible for data, evidence collection and assessment), the compensation amount for damages caused by environmental pollution, degradation comprises of following items:

1. The environmental damage: ..... VND

2. The expense for determination of damage:.....VND

3. The expense for data, evidence assessment: .....VND

4. The expense for implementation of procedure to request compensation for damage (if any): .....VND

5. The total claimed compensation amount:..........VND

It is claimed that.... (Name of the compensation-liable agency) shall make compensation for the mentioned-above damages in accordance with the law regulations./.

…..... date….. month….. year……

Head of Agency/Unit

(Signature, stamp and full name)

Form No. 08 (issued together with Decree No. ..... / ND-CP dated ... / ... / 201 ... amending and supplementing the Decree guiding the environmental Protection Act 2014)

SOCIALIST REPUBLIC OF VIETNAM

Independence - Freedom - Happiness

CONCLUSION BOARD EVALUATION DATA, EVIDENCE DETERMINATION OF DAMAGE TO THE ENVIRONMENT IN ... (polluted places NEED DETERMINATION OF DAMAGE TO CLAIM)

Implementing Decision No ... day ... month ... year ... of (heads of agencies are responsible for collecting and evaluating data and evidence) about the evaluation of data and evidence

determine the damage to the environment in ... (where contamination needs to determine the damage to require bồ i usually), Evaluation Council data and evidence held a meeting on the day ... hour .... months. 20 years .... in ..... with the composition of the Board is as follows:

1. Mr. (Ms.) ... (Full name - Position the work), Chairman of the Board evaluation data and evidence

2. Mr. (or Ms.) ... (Full name - Position work - titles in the Council;

3. Mr. (Ms.) ... (Full name - Position work - titles in the Council;

4. He (she) ... (Full name - working title - titles in the Council;

5. Mr. (Ms.) ... (Full name - Position work - titles in the Council;

6. He (she) ... (name - title work - titles in the Council;

7. He (she) ... (Full name - Position work - titles in the Council

...

the Council heard presentations by the agencies collecting and evaluating data and evidence and the service providers to collect data and evidence of damage to the environment ... (where contamination should determine damages for claims) and the steps taken to collect data and evidence, calculate the damage and determine the liability to pay damages; the data and evidence, damage calculation results and the results shall determine compensation made.

Opinion of the particular judgment and the council members

.....

voteResults:

Member Council	agreed to adopt	agreed through editing, additional	disagree through
Number votes			
votes sagreed			

Based on the opinion of the Council members and the voting results, the Board of most conclusions: The data and evidence has been collected .... (guaranteed or not guaranteed) quality, representation, appropriate to calculate, determine the damage to the environment (places damaged by acts causing environmental pollution) Results calculated losses harm and conclusions shall pay damages to the environment (place of damage caused by acts of environmental pollution) .... (guaranteed or not guaranteed) quality.

Council requirements (if any):

a. Adding indicators ...

b. Monitoring the targets ....

c. Analyzing the indicators ...

d. Recalculate damage to the environment ....

e. Redefine liability damages

meeting ended in .... hour day. month ..... year 20 ... ..

This conclusion was made in 03 copies to the agency responsible for the damage claim 02 and archive01.

SECRETARY	CHAIRMAN
(signed with full name)	*(signed with full name)*

Form No. 09 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

THE SOCIALIST REPUBLIC OF VIETNAM

Independence - Freedom - Happiness

THE RESULT OF ENVIRONMENTAL DAMAGE CALCULATION AND CONCLUSIONS ABOUT ENVIRONMENTAL DAMAGE COMPENSATION RESPONSIBILITY

I. The result of environmental damage calculation

1. Damage caused by water environmental pollution, degradation (if any): …. VND

(Calculation is made using formula provided in Clause 2, Article 11 of Decree No. 03/2015/ND-CP dated 6 January 2015 of the Government on determination of environmental damage)

2. Damage caused by pollution or degradation to the soil environment (if any): …. VND

(Calculation is made using formula provided in Clause 3 Article 11 Decree No. 03/2015/ND-CP)

3. Damage caused by pollution or degradation to an ecosystem (if any): …. VND

(Calculation is made using formula provided in Clause 4 Article 11 Decree No. 03/2015/ND-CP dated 6 January 2015)

4. Damage caused by pollution or degradation to species prioritized for protection (if any): …. VND

(Calculation is made using formula provided in Clause 5 Article 11 Decree No. 03/2015/ND-CP dated 6 January 2015)

Total damage: = ……. VND

II. The expense for determination of damage : …….. VND

III. The expense for data and evidence assessment: …….. VND

IV. The expense for implementing procedure to request damage compensation (if any): …….. VND

The total requested compensation for damage (I+II+III+IV):…… VND

V. Environmental damage compensation responsibility

Basing on the data, evidence to be collected to identify the organization, individual causing environmental pollution, degradation, the environmental damage compensation responsibilities … (the location of damage caused by environmental pollution) are provided as follows:

Company A: …… VND (… %)

Company B: ……. VND (…%)

Company C: ……. VND (…%)

Form No. 10 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

THE SOCIALIST REPUBLIC OF VIETNAM

Independence - Freedom - Happiness

_____

THE MINUTE OF NEGOTIATION ABOUT DAMAGE COMPENSATION

Today, date .... month ..... year ..... at (location).....,we are:

1. Compensation requesting agency

Represented by Mr. (Ms.)……Position:.....

Representative of organizations, individuals that claim the compensation

Mr. (Ms.): .....

Address:.....

3. Representative of organization, individual causing environmental pollution

Mr. (Ms.): .....

Address:.....…..

We have conducted negotiation about compensation for environmental damage in accordance with the environmental damage compensation claim of the organization, individual: …….....

1. Opinions of representatives of the organization(s), individual(s) causing environmental pollution, degradation

…….....

2. Opinions of representatives of the compensation requesting agency…….....

.....

3. The contents that are negotiated successfully

.....

4. The contents that are not negotiated successfully …….....

.....

This Minute has been read loudly to the involved people that are signed below.

Form No. 11 (*Promulgated together with Circular No..../201../TT/BTNMT dated .../.../201... on stipulating procedures to request compensation for environmental damage*)

NAME OF AGENCY

THE SOCIALIST REPUBLIC OF VIETNAM

Independence - Freedom - Happiness

No. /QD-…

…….., date … month … year …..…

DECISION

(Sub: Compensation for environmental damage)

HEAD OF THE AGENCY

- Basing on Decree No. 03/2015/ND-CP date 06/1/2015 of the Government on Determination of Environmental Damage;

- Basing on Circular No..... /201../TT/BTNMT dated…..... on stipulating procedure to implement compensation for environmental damage; -
Basing on the claim for requesting damage compensation of the organization, individual... (address, place of residence) date....month.....year.....on claiming compensation for damage;

- Basing on the data, evidence collection results (name of the service provider) and assessment results of the Council for appraisal of Data and Evidence dated .....month.....year..... .....on implementing procedures to request compensation for damage cause by (name of organization(s), individual(s) causing environmental pollution, degradation);

- Basing on the Minute of Negotiation dated ..... month ..... year ..... between the Compensation requesting agency, organizations, individuals causing environmental pollution or degradation and organization, individual claiming compensation for damages;

TO DECIDE:

Article 1. The compensation shall be made to … (organization, individual who caused pollution claiming the compensation for damage)

Address:.....

Amount: …….....

(In words:…….. …….....)

Reasons:.....

Article 2. This Decision takes effect after 15 days from the signing date.

Article 3. The relevant organization, individual are responsible to implement this Decision./.

***Recipient*:**

- The direct superior agency (for reporting);
- The relevant organization, individual....(for implementation);
- Filed.

Head of Agency

(Signature, stamp and full name)

Form No. 12 (Promulgated in enclosure with Decree No..... /ND-CP dated / /201... on amending, supplementing the Decrees on guiding the implementation of Law on Environmental Protection 2014)

NAME OF AGENCY	**THE SOCIALIST REPUBLIC OF VIETNAM**
———	**Independence - Freedom - Happiness**
No.: /QD-…	———————————
	……., date … month … year …..…

DECISION

(Sub: Conclusion that organization, individual do not cause environmental pollution)

HEAD OF THE AGENCY

- Basing on Decree No. 03/2015/ND-CP dated 6th January 2015 of the Government on determination of environmental damage;

- Basing on Decree No..... /ND-CP dated / /201... on amending, supplementing the Decrees on guiding the implementation of Law on Environmental Protection 2014;

- Basing on the application for proving that organization, individual do not cause environmental pollution…. (address, residential place) on date….month…. year….;

- Basing on the dossier on proving that organization, individual do not cause environmental pollution,

DECIDE:

Article 1. Conclude that organization, individual do not cause environmental pollution to.... (the location requested for compensation):

Organization:……

Address:.....

Reason:.....

Article 2. This Decision takes effect since the signing date and is only used for the time of proving that organization, individual do not cause environmental pollution.

Article 3. Relevant organizations, individuals are responsible to enforce this Decision./.

***Recipients*:**	**Head of agency**
- The line superior agency (for reporting);	*(Signature, stamp and full name)*
- Relevant organizations, individuals…. (for ıplementation);	
- Filed.	

Form No. 13 (Promulgated in enclosure with Decree No..... /ND-CP dated / /201... on amending, supplementing the Decrees on guiding the implementation of Law on Environmental Protection 2014)

THE SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

THE APPLICATION FOR PROVING THAT ORGANIZATION, INDIVIDUAL DO NOT CAUSE ENVIRONMENTAL POLLUTION

To:.....*(Name of the agency requesting compensation)*

Name of organization, individual requesting to prove that they do not cause environmental pollution:……

Address:.....

Basing on the regulations provided in Clause 5, Article 13 of Decree No. 03/2015/ND-CP, (Name of organization, individual that requesting to prove that they do not cause environmental pollution) have prepared the proving dossiers in accordance with the regulations.

It is requested that the Agency requesting compensation shall consider and recognize that we do not cause environmental pollution (the area requested for compensation …)

(Enclosed with the proving dossiers)

…….. date….. month….. year……

Requesting organization, individual

(Signature, name of organization, full name of individual)

Form No. 14 (Promulgated in enclosure with Decree No..... /ND-CP dated / /201... on amending, supplementing the Decrees on guiding the implementation of Law on Environmental Protection 2014)

REPORT ON PROVING THAT ORGANIZATION, INDIVIDUAL DO NOT CAUSE WATER ENVIRONMENTAL POLLUTION

I. GENERAL INFORMATION ABOUT THE SUBJECT THAT PROVES THAT THEY DO NOT CAUSE ENVIRONMENTAL POLLUTION

- Legal status

- Project type

- Project size

- Distance of the facility to the area subject to claim for compensation

- Fuels, materials used by the project

- Machineries, equipment, vehicles for the project

- Execution technologies

- Facilities, techniques, specialized equipment for measurement, sampling, treatment, analysis of environmental monitoring samples of the project

- Operation, production process

- Staff

II. DETAILED DESCRIPTION OF THE ACTS, BEHAVIORS OF THE SUBJECT CAUSING WATER ENVIRONMENTAL DAMAGE THAT ARE SUED, REQUESTED TO MAKE COMPENSATION AS CLAIMED BY THE COMPETENT AUTHORITIES

III. PROVING NON-CAUSING OF WATER ENVIRONMENTAL POLLUTION

Organization, individual provides written proof about their compliance with the legal regulations on environmental protection, installation of satisfactory waste treatment system, and proves that there is no relationship between their acts and the consequences caused by environmental pollution, degradation

Reports must be based on some proving criteria as follows:

- To comply with law regulations on environmental protection:

+ Have decision on approving the Environmental Impact Assessment Report/ Environmental Protection Commitment/ Environmental Protection Plan

+ Have the Certificate on Completion of the Environmental Protection Work

+ Have License on discharging wastewater to the water source

+ Have certificate on payment of environmental protection fee for wastewater

+ Have report on wastewater monitoring report (if mandatory)

- The wastewater treatment system/ Waste treatment system performance: Waste treatment system operational record

- Wastewater parameters discharged to the environmental must meet the technical regulations (QCVN), which is demonstrated through periodical environmental report and regular and irregular inspection, checking results.

- Have pollution prevention and control plan

Conclusion

- Overall assessment about environmental quality of the organization, individual

- Overall assessment about the compliance with environmental protection regulations by organization, individual

- Conclusion

Form No. 11 (Promulgated in enclosure with Decree No..... /ND-CP dated / /201... on amending, supplementing the Decrees on guiding the implementation of Law on Environmental Protection 2014)

REPORT ON PROVING THAT ORGANIZATION, INDIVIDUAL DO NOT CAUSE SOIL ENVIRONMENTAL POLLUTION

I. GENERAL INFORMATION ABOUT THE SUBJECT THAT PROVES THAT THEY DO NOT CAUSE ENVIRONMENTAL POLLUTION

- Legal status

- Project type

- Project size

- Distance of the facility to the area subject to claim for compensation

- Fuels, materials used by the project

- Machineries, equipment, vehicles for the project

- Execution technologies

- Facilities, techniques, specialized equipment for measurement, sampling, treatment, analysis of environmental monitoring samples of the project

- Operation, production process

- Staff

II. DETAILED DESCRIPTION OF THE ACTS, BEHAVIORS OF THE SUBJECT CAUSING SOIL ENVIRONMENTAL DAMAGE THAT ARE SUED, REQUESTED TO MAKE COMPENSATION AS CLAIMED BY THE COMPETENT AUTHORITIES

III. PROVING ORGANIZATION, INDIVIDUAL DO NOT CAUSE SOIL ENVIRONMENTAL POLLUTION

Organization, individual provides written proof about their compliance with the legal regulations on environmental protection, installation of satisfactory waste treatment system, and proves that there is no relationship between their acts and the consequences caused by environmental pollution, degradation

Reports must be based on some proving criteria as follows:

The case that the damaged soil environment is related to wastewater discharged by organization, individual:

- To comply with law regulations on environmental protection:

+ Have decision on approving the Environmental Impact Assessment Report/ Environmental Protection Commitment/ Environmental Protection Plan

+ Have the Certificate on Completion of the Environmental Protection Work

+ Have License on discharging wastewater to the water source

+ Have certificate on payment of environmental protection fee for wastewater

+ Have report on wastewater monitoring report (if mandatory)

- The wastewater treatment system/ Waste treatment system performance: Waste treatment system operational record

- Wastewater parameters discharged to the environmental must meet the technical regulations (QCVN), which is demonstrated through periodical environmental report and regular and irregular inspection, checking results.

- Have pollution prevention and control plan

The case that the damaged soil environment is related to solid waste generated by organization, individual

- To comply with law regulations on environmental protection:

+ Have decision on approving the Environmental Impact Assessment Report/ Environmental Protection Commitment/ Environmental Protection Plan

+ Have the Certificate on Completion of the Environmental Protection Work

+ Treat solid water in accordance with the Decision on approving the Environmental Impact Assessment Report/ Environmental Protection Commitment/ Environmental Protection Plan, which is demonstrated through periodical environmental report and regular and irregular inspection, checking results.

- Have pollution prevention and control plan

Conclusion

- Overall assessment about environmental quality of the organization, individual

- Overall assessment about the compliance with environmental protection regulations by organization, individual

- Conclusion

APPENDIX I

THE GUIDELINE ON THE USE OF THE CRITERIA SET FOR SELECTION OF THE UNITS THAT PROVIDE MONITORING, ASSESSMENT AND MEASUREMENT SERVICE FOR DATA AND EVIDENCE COLLECTION TO DETERMINE ENVIRONMENTAL DAMAGE

I. Selection principle and method

1. Selection principle

The selection of service providers of monitoring, assessment and measurement for data and evidence collection shall ensure the objectiveness, openness and transparency.

The selection of service providers of monitoring, assessment and measurement for data and evidence collection shall comply with the criteria, requirement prescribed by the laws.

The splitting of the service package into several sub-packages for selecting the services that provide monitoring, assessment and measurement for data and evidence collection shall be consistent with the actual situation and ensure the technical characteristics of the environmental field to be monitored, assessed and measured.

The selection of the service providers of monitoring, assessment and measurement for data and evidence collection shall be made basing on the overall evaluation of technical criteria and price criteria specified in the Appendix I of this Degree.

2. Method of selection

The selection of the service providers of monitoring, assessment and measurement service for data and evidence collection shall be made in accordance with one of the following methods:

Select 01 (one) service provider that can meet the conditions for providing the monitoring, assessment and measurement service for data and evidence collection.

This service provider may cooperate, select other service providers to render the monitoring, assessment and measurement service for data and evidence collection.

Select 02 (two) service providers, including 01 (one) service provider that carries out the monitoring, measurement of environmental parameters and 01 (one) service provider that provides service related to calculation of environmental damages and determination of damage compensation liability.

In special cases, the agencies responsible to collect and verify data, evidence for determining environmental damages shall appoint and select the units that provide monitoring, assessment and measurement service for data and evidence collection basing on the list of service providers eligible to implement environmental monitoring service activities prescribed in Decree No. 127/2014/ND-CP dated 31st December 2014 of the Government on regulating the requirements applicable to environmental monitoring service activities.

II. Method of selection

The service providers of monitoring, assessment and measurement for data and evidence collection are selected by evaluating technical criteria and price criteria in accordance with the following specific method:

a) Scoring the price criteria:

The price criteria are scored as follows:

$$\text{Score of price under consideration} = \frac{G_{lowest} \times 100}{G_{under\ consideration}}$$

In which:

Score of price under consideration: Score of price of the financial proposal that is under consideration;

Glowest: The lowest offered bidding price after correction of errors, adjustment of difference minus the discount value (if any) among the contractors whose financial proposal dossiers are evaluated;

G under consideration: The bidding price after correction of errors, adjustment of difference minus the discount value (if any) of the financial proposal dossier that is evaluated.

b) Comprehensive evaluation:

The total score is determined by the following formula:

Total score under consideration = K x Technical score under consideration + G x Score of price under consideration

In which:

Technical score under consideration: is the number of points determined in the technical evaluation step;

Score of price under consideration: is the number of points determined in the price evaluation step;

K: Ratio of technical score, K = 80%.

G: Ratio of score of price stipulated in the total scoring grade, G= 20%.

The selected monitoring, assessment, measurement service providers for collection of data and evidence to determine environmental damages are the service providers that get the highest total score.

III. The criteria set for selection of service provider of monitoring, measurement for data and evidence collection

1. Principle in using the criteria set

The use of the criteria set for selecting the service providers of monitoring, assessment and measurement service for data and evidence collection shall ensure two principles as follows:

- Prerequisite condition principle

Only the service providers that meet the criteria specified in Group I shall be evaluated in term of the technical criteria specified in the next criteria groups.

- Minimum threshold principle

The criteria specified in Group II, III, IV (Technical criteria) are evaluated regarding the importance of the criteria and in compliance with the guideline prescribed in the Law on Bidding and the Decrees guiding the Law on Bidding in the method of combining technical factor and price factor.

Criteria specified in Group II, III, IV are evaluated to meet technical requirement if their technical scores are at least equal to 70% the total score and the score of each criterion related to experience and capacity, solution and methodology, and personnel is not lower than 60% of the maximum score applied to such criterion.

The maximum score applied to tech group are detailed as follows:

Group II: 20 points

Group III: 30 points

Group IV: 50 points

2. ***Criteria for selection of service providers for monitoring and measuring environmental parameters***

- Group 1: Criteria related to the prerequisite conditions

Criteria 1: The service providers of monitoring, measurement for data and evidence collection must be eligible to implement environmental monitoring and analysis service in the field to be monitored and analyzed for data and evidence collection.

Group II: Criteria related to experience and competence of the service provider

Criteria 2: Accuracy of the monitoring, analysis method.

This criteria is evaluated through the accuracy of the results used to assess the environmental damage.

Criteria 3: Accuracy of the machineries, equipment.

This criteria is assessed through the modernity of the machineries, equipment and decides the results that are used to estimate environmental damage.

Criteria 4: VILAS-recognized certificate

VILAS certificate certifies that the laboratory is competent in term of technique, management organization, effective operation; and can provide testing and calibration results with satisfactory quality.

Criteria 5: Service providing experience

This criteria is evaluated through the professionalism and the possibility of success of the rendered contract. Experience is evaluated through the number of similar contracts that have been implemented and accepted.

- Group III: Criteria related to solutions and methodologies for implementing of the service package:

Criteria 6: Monitoring, assessment, measurement plan for data and evidence collection.

Monitoring, assessment, measurement plan for data and evidence collection developed by the service providers shall comprise of justifications about the locations of sampling, time of sampling, the parameters to be analyzed, monitored, assessed and measured.

- Group IV: Criteria related to personnel for implementation of the service package:

Criteria 7: Number of staffs

Criteria 8: Years of experience

Criteria 9: Technical qualification

Criteria 10: Workmanship tolerance

3. Content of the criteria set for selection of service provider to implement calculation of damage and determination of liability to make compensation for environmental damage

- Group I: Criteria related to prerequisite condition

Criteria 1: The service providers for calculation of damage and determination of liability to make compensation for environmental damage must be eligible to operate in the field subject to calculation of environmental damage and determination of compensation liability.

The service provider is required to have establishment decision or scientific and technological activity certificate or business license or the investment certificate issued by the state competent authority that is valid at least in one of the fields of technological design service provision, research and implementation of waste treatment technologies; assessment and pricing of environmental damages.

- Group II: Criteria related to experience and competence of the service provider

Criteria 2: Competence of the service provider

This criteria is evaluated through the suitability of the field of research with the fields subject to calculation of damage and determination of liability to make compensation for damage.

Criteria 3:Experience of the service provider

This criteria is evaluated through the similar contracts that have been implemented and accepted or the similar projects, research assignments on waste treatment, pricing and estimation of environmental damage that have been implemented and accepted.

- Group III: Criteria related to solutions and methodologies

Criteria 4: Plan on research, treatment, restoration of the environment in the polluted, degraded areas.

Criteria 5. Plan on calculating the environmental damage compensation liability of the relevant actors

- Group IV: Criteria related to personnel

Criteria 6: Number of experts

This criteria is evaluated through the number of experts that are competent in either field of environmental technology; natural resource and environmental management economics; determination, pricing and estimation of environmental damage.

Criteria 7: Experience of expert

This criterion is assessed through experience, the suitability of the experts for the implementation of the service package.

IV. Evaluate method the criteria

1. Criteria related to prerequisite condition

The criteria in Group I specified in Article 6 of this Circular are evaluated by two grades “Passed” or “Failed”, concretely:

- Passed: Not violate the contents prescribed in the criteria.
- Failed: Violate the contents prescribed in the criteria.

2. Technical Criteria

The scoring of each technical criterion is detailed in the following tables:

Table 1. Criteria and scoring grade for evaluating the units that provide monitoring and measurement environmental parameters service for data and evidence collection

(n is the number of applicant service providers)

<table>
<tr><th></th><th>Criteria</th><th>Parameter</th><th colspan="2">Value</th><th>Score</th></tr>
<tr><td>1</td><td colspan="5">Experience and competence of the service providers (Maximum 20 points)</td></tr>
<tr><td rowspan="3">1.1</td><td rowspan="3">Capacity</td><td rowspan="3">Accuracy of the method</td><td rowspan="3">Accuracy</td><td>The highest</td><td>4</td></tr>
<tr><td>The second highest</td><td>$4-\frac{3}{n-1}$</td></tr>
<tr><td>The third highest</td><td>$4-\frac{3}{n-1}\times 2$</td></tr>
</table>

				...	
				The lowest	1
		The measurement precision of the equipment	Accuracy	The highest	4
				The second highest	$4-\frac{3}{n-1}$
				The third highest	$4-\frac{3}{n-1}\times 2$
				...	
				The lowest	1
		The recognized VILAS Certificate	Yes		2
			No		0
1.2	Service provision experience	Ability to meet the requirements of customers (through the number of similar contracts that the service provider has done ...)	Having implemented more than 5 similar contracts		10
			Having implemented 1-5 similar contracts		5
			Having not implemented any similar contracts		0
2	**Solutions and methodology (Maximum 30 points)**				
	The plan on monitoring, assessment, measurement for data and evidence collection		Rationality, scientificness	The highest	30
				The second highest	$30-\frac{20}{n-1}$
				The third highest	$30-\frac{2}{n-1}\times 2$
				...	

				The lowest	10
3	**Personnel (Maximum 50 points)**				
	Number of staffs		Evaluation conducted in the sequence of organizations	The most numerous	10
				The second numerous	$10-\frac{8}{n-1}$
				The third numerous	$10-\frac{8}{n-1}\times 2$
				The less numerous	2
	Years of experience		Ranking the order of the applicant service providers	The highest	15
				The second highest	$15-\frac{10}{n-1}$
				The third highest	$15-\frac{10}{n-1}\times 2$
				The lowest	5
	Competence		Ranking the order of the applicant service providers basing on the degree of staffs	The highest	15
				The second highest	$15-\frac{10}{n-1}$
				The third highest	$15-\frac{10}{n-1}\times 2$
				The lowest	5
	Workmanship tolerence			The lowest	10
				The second lowest	$10-\frac{8}{n-1}$
				The third lowest	$10-\frac{8}{n-1}\times 2$
				The highest	2

Table 2. The criteria and scoring grade of criteria to evaluate the units that provide services on calculation of damage and determination of liability to make compensation for damage

(n is the number of applicant service providers)

	Criteria	Parameter	Value		Score
1	**Experience and competence of the service providers (maximum 20 points)**				
1.1	Capacity	the suitability of the field of research and operation with the fields subject to calculation of damage and determination of liability to make compensation	Very suitable		10
			Suitable		5
			Unsuitable		0
1.2	Experience in service provision	Ability to meet the clients' requirement (through number of similar contracts that have been rendered by the service provider, etc.).	Having implemented more than 5 similar contracts projects, research assignments on waste treatment, pricing and estimation of environmental damage		10
			Having implemented one to five similar contracts projects, research assignments on waste treatment, pricing and estimation of environmental damage		5
			Having implemented none similar contract or projects, research assignment on waste treatment, pricing and estimation of environmental damage		0
2	**Solutions and methodologies (Maximum 30 points)**				
	Plan on research,		Rationality, scientificness	The highest	15

	treatment, restoration of the environment in the polluted, degraded areas			The second highest	$15-\frac{10}{n-1}$
				The third highest	$15-\frac{15}{n-1}\times 2$
				...	
				The lowest	5
	. Plan on calculating the environmental damage compensation liability of the relevant actors		Rationality, scientificness	The highest	15
				The second highest	$15-\frac{10}{n-1}$
				The third highest	$15-\frac{15}{n-1}\times 2$
				...	
				The lowest	5
3	**Personnel (Maximum 50 points)**				
	Number of competent experts		Evaluation conducted in the sequence of organizations	The highest	25
				The second highest	$25-\frac{10}{n-1}$
				The third highest	$25-\frac{10}{n-1}\times 2$
				The lowest	5
	Experience of experts		Ranking the order of applicant service providers basing on the CVs of the	The highest	25
				The second highest	$25-\frac{20}{n-1}$
				The third highest	$25-\frac{20}{n-1}\times 2$

			proposed experts in term of their working process and experience related to the implementation of the package	The lowest	5

MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

PROJECT

STRENGTHENING CAPACITY OF WATER ENVIRONMENTAL MANAGEMENT IN RIVER BASINS

REPORT

OVERVIEW OF RELEVANT REGULATIONS RELATING TO THE DEVELOPMENT OF CIRCULARS AND THE COMPENSATION FOR ENVIRONMENTAL DAMAGES

Ha Noi, December 2015

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I. Processing of Circular development

1. Processing of Circulars development of Ministers, Heads of Ministerial agencies as follow Law No. 17/2008/QH12

1.1. Processing of development.

Process on development of legal documents was stipulated by the Government of Vietnam through the Article 68 of the Law No. 17/2008/QH12 dated June 03, 2008, on the promulgation of legal documents of the National Assembly (12th Legislature), 3rd Session.

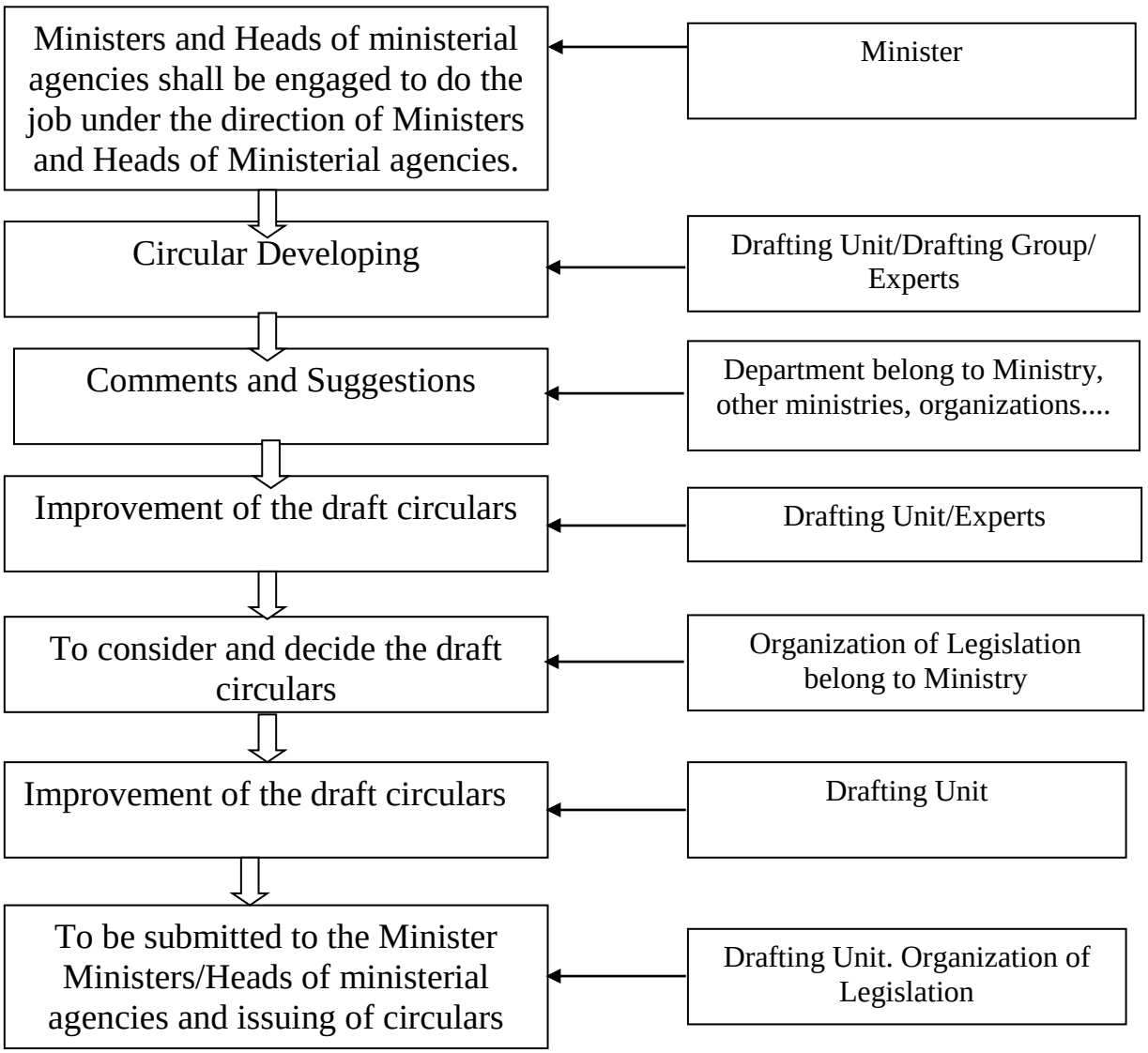

Figure 1: Procedures of formulation and promulgation circulars

1.2. Processing of development and responsibility of relevant agencies

1.2.1. Ministers and Heads of Ministerial agencies shall be engaged to do the job under the direction of Ministers and Heads of ministerial agencies.

- Ministers and Heads of ministerial agencies shall direct the formulation and promulgation of circulars

- To appoint agencies affiliated to ministries and ministerial agencies to draft circular.

1.2.2. Drafting Circulars

- The lead drafting Unit shall developing circular

1.2.3. To collect comments and suggestions

- The draft circular shall be posted on the website of the issuing agency for at least 60 days for agencies, organizations and individuals to submit their comments and suggestions

- Depending on the nature and the content of the draft circular in question, it shall be sent to Minister and Heads of ministerial agencies, Government-affiliated agencies concerned to collect their comments and suggestions

1.2.4. Collecting of comments and suggestions and improvement of the draft circulars

- The agency assigned with the job of preparing the draft circulars shall take the lead responsibility and coordinate with agencies concerned to consider and to adopt comments and suggestions of the assessing agencies, organizations and individuals for the revision and improvement of the draft circulars

1.2.5. To consider and decide the draft

- Responsibilities of assessing agencies*:*

Assessing agencies shall focus their assessment on the following issues:

a) The need to promulgate the legal documents in question, their objects and scopes of regulation;

b) The relevance of the draft documents to the Parties directions and policies;

c) Their constitutionality, legality, consistence with the legal system and relevance to related international treaties of which the Socialist Republic of Viet Nam is a member

d) Their feasibility, including their responsiveness to the actual demands and level of social development as well as required conditions for ensuring their enforcement/implementation;

e) Language and drafting techniques.

The assessing agencies may request the lead drafting agencies to report on the issues related to the contents of the proposed laws/ordinances and draft resolutions, as/if necessary.

- Send the draft back to the lead drafting agency after 20 days.

1.2.6. Draft circular improvement

The lead agency will improve the draft circular after get comments and suggestions from assessing agencies as follow their ideas.

1.2.7. Report to Minister, sign and issue circulars

- Responsibilities of lead agencies (circulars development agency)

Report to the Minister and submit the document to the Minister for signing

- Responsibilities of and Heads of Ministerial agencies

Ministers, Heads of Ministerial agencies shall consider, sign and issue circulars.

2. Processing of formulation, promulgation of circulars as follow Law No. 80/2015/QH13

The Vietnam National Assembly has promulgated the Law on promulgation of legislative documents (Law No. 80/2015/QH13, dated June 22, 2015), it consists of 17 chapters and 173 articles. In which at section 4 regulate the formulation, promulgation of circulars of ministers and head of ministerial agencies as from article 101 to 104. This Law was enacted in June 2015 and it will become affected from July 1, 2016.

2.1. Processing of Circular development

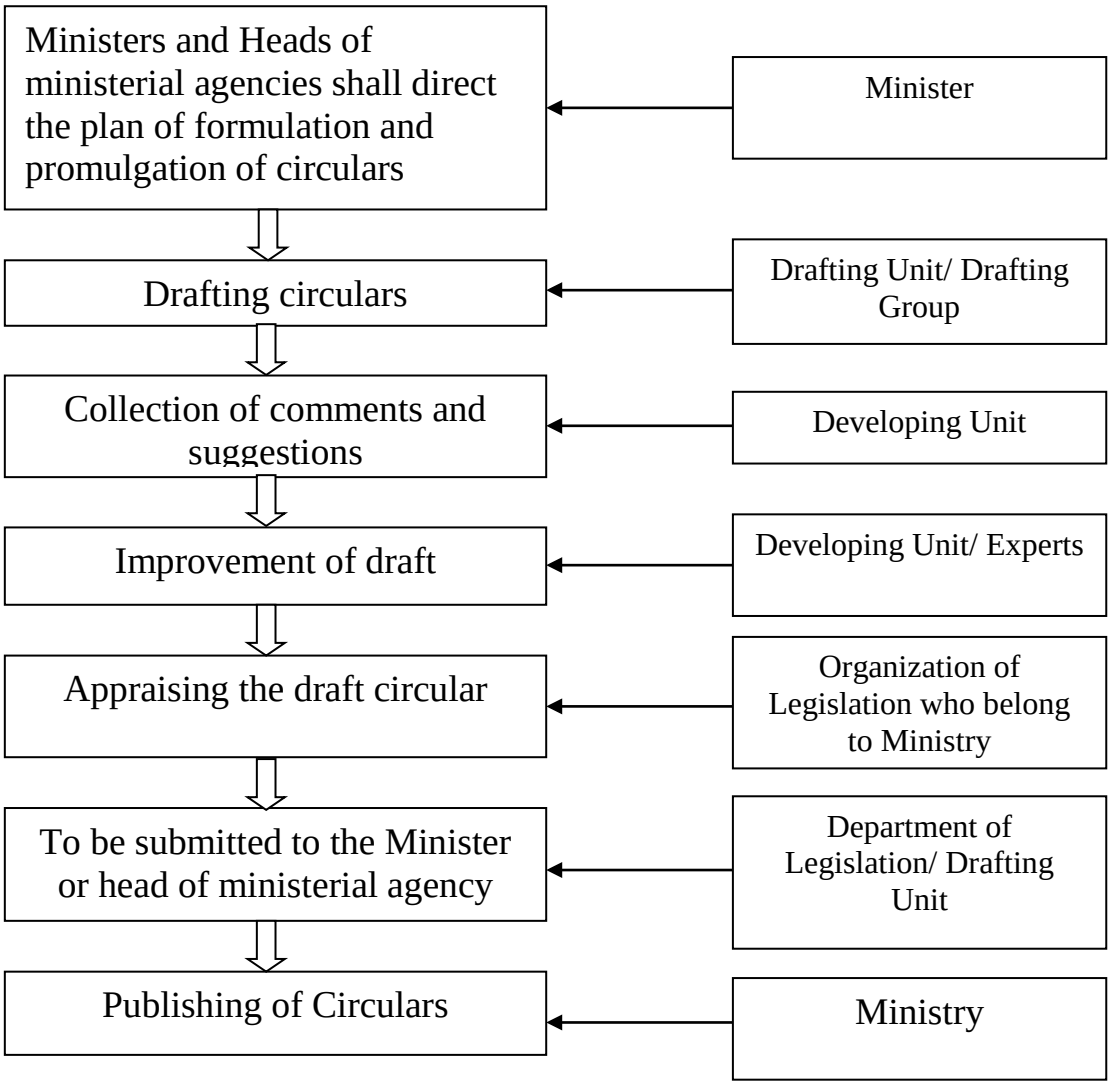

Figure 2: Procedures of formulation and promulgation circulars

2.2. **Processing of Circular development and responsibilities of relevant agencies**

2.2.1. Ministers and Heads of ministerial agencies

- They shall direct the plan of formulation and promulgation of circulars.

- They appoint units affiliated to Ministries and ministerial agencies to cooperate with a legal organization and relevant units in drafting circulars (if the legal organization is not the drafting agency).

2.2.2. Drafting circulars

- The Drafting Agency will develop the circulars.

- The Drafting Agency shall cooperate with department of legal and other relevant agencies.

2.2.3. Processing of collection comments and suggestions

- Drafting Agency has to collect all comments and suggestions from entities under the direct impact of the circular.

- Specify the issues that need opinions and address for receipt of opinions

- Post the entire draft circular on the information portal of the Government and Ministry or ministerial agency for at least 60 days.

- Collection of comments and suggestions from relevant agencies, experts and scientist (depending on the characteristics and contents of the Circular), the enquired organizations must give written responses within 20 days from the receipt of the request.

2.2.4. Improvement of draft circulars

- Drafting Agency collects all comments and improves the draft until then.

2.2.5. Appraising the draft circular

a. Responsibilities of Ministers and Heads of ministerial agencies

- The minister or Heads of ministerial agency shall establish an appraisal council which is participated by relevant organizations, units, experts, and scientists, If the circular contains regulations that directly affect the rights, obligations, interests of the people, enterprises, involve multiple fields or sectors, or drafted by a legal organization.

b. Responsibilities of Drafting Agency

- preparing of all necessary documents for appraising process

- To coordinate with other agencies to adopt a comments and suggestions for improvement draft of circulars.

c. Responsibilities of Legal Department

- The Legal Department (organization) affiliated to the Ministry or Ministerial agency shall appraise the draft circular before it is submitted to the minister or Heads of ministerial agency.

2.2.6. Procedures for considering promulgating a circular

a. Responsibilities of Draft Agency

- If the draft circular is still in dispute, the draft agency shall cooperate with legal department to reach a consensus with relevant units before submitting the draft circular to Minister or Head of ministerial agency.

- The drafting unit shall submit a report on the draft circular to Minister or Head of ministerial agency

b. Responsibilities of Minister or Head of ministerial agency

- The Minister or Head of ministerial Agency decides promulgating the Circular.

3. General conclusion of process of Law

Assessment and review of some new points of Law no. 80/2015/QH2013 compared to Law no. 17/2008/QH12

- Law no. 80/2015 combined two laws (Law on promulgation of legal documents 2008 of central agencies and Law on promulgation of legal documents of People's Councils and People's Committees 2004 (of local agencies). Law no. 80/2015/QH2013 regulates the uniform in development and promulgation of legal documents at central and local levels.

- Renew the procedures for development of ministerial and inter-ministerial circulars: (Section 4 (from 101 to 104 provisions) of Law no. 80). Specifically:

- During the formulation, the Minister and ministerial-level agencies need to consult objects that are directly affected by the Circular. Therefore, the Ministry needs to consult the contents to be appropriate with each consultation group and inform the address for receiving comments; Synthesise, study, reply to comments; assess the impacts of the document, assess administrative procedures in the Circular which regulates administrative procedures;

- If the Circular has direct impacts on legal rights and benefits of local people and enterprises or relates to several sectors and several thematic areas, the Minister, ministerial-level leaders need to establish an appraisal counselling committee with the participation of relevant organisations and agencies, experts

and scientists to appraise the draft Circular. Appraisal contents and dossiers are specifically regulated in provision 102.

4. Processing of Circulars development of MONRE

Base on Law No. 17/2008/QH12, MONRE promulgated Circular No. 46/2014/TT-BTNMT in 1st August, 2014 on promulgation of legislative documents, as follow the processing of circulars development which will be shown detail as below:

4.1. Processing of promulgation of Circulars.

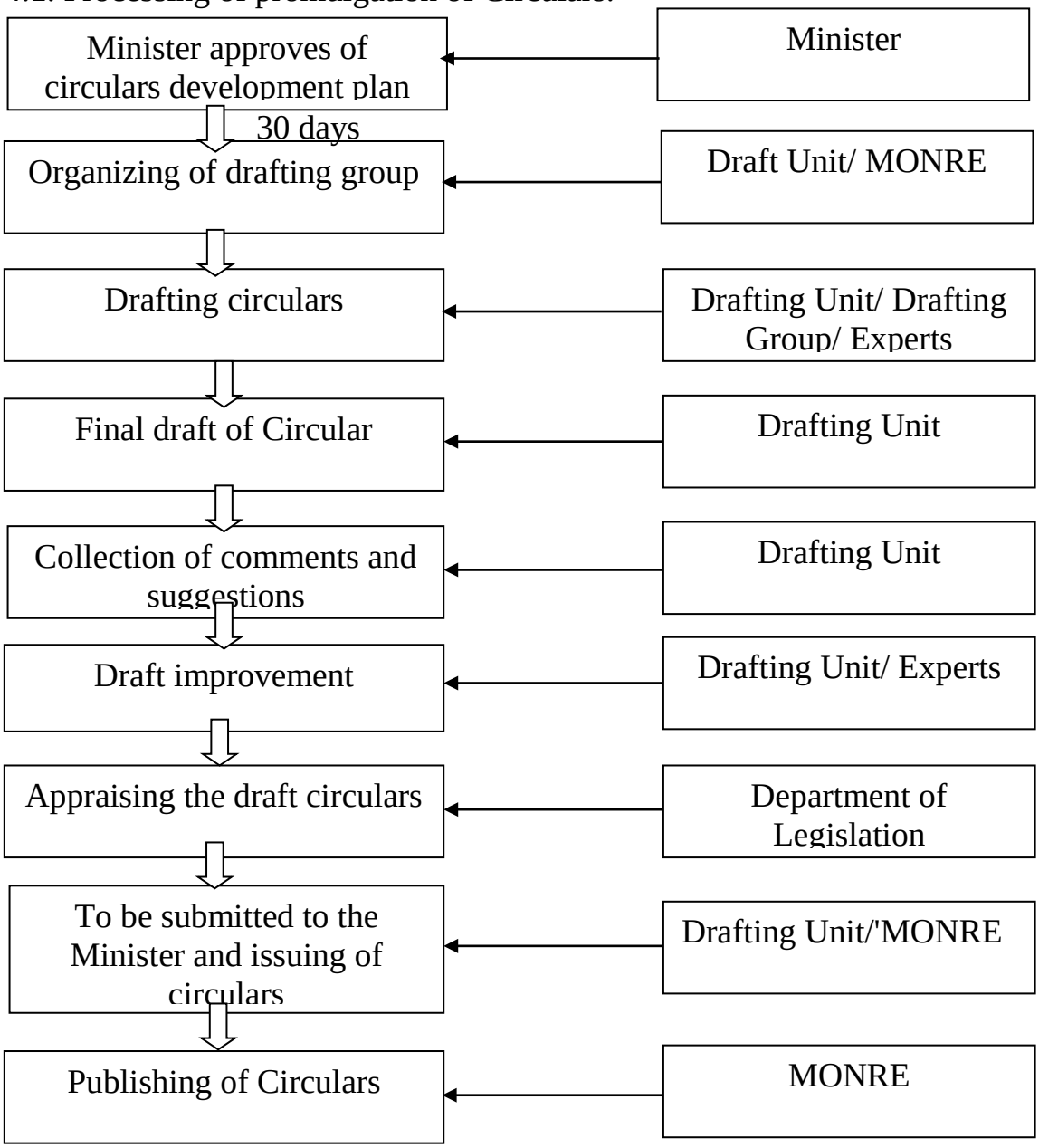

Figure 3: Procedures of MONRE circulars formulation and promulgation

4.2. **Processing of Circular development and responsibilities of relevant agencies**

4.2.1. **Circular development work program**

1. Departments within the Ministry based on their functions and mandates and suggestions and proposals from provincial Department of Natural Resources and Environment, relevant organisations and individuals and practical requirements, propose the development of circulars and inter-ministerial circulars to the Department of Legislation before 1st July of the year before the promulgation year.

For business-orientated agencies within the Ministry, the proposal of legal document list to be promulgated must have comments in writing by General Departments or Department that are assigned by the Ministry on state management of that area or sector before sending to the Department of Legislation for compilation.

Proposals clearly state: name, necessity, legal base, scope of adjustment, applicable objects, expected administrative procedure list (if any), expected promulgation time (in month), leading agency, collaborating agency, conditions for the document development and implementation.

2. Within 20 working days from the day of receiving the list of proposed circulars and inter-ministerial circulars, the Department of Legislation is responsible for synthesizing, collecting comments on the proposed list of circulars and inter-ministerial circulars to submit to the Ministry's Leaders and the Minister for the approval of the work program of circular and inter-ministerial circular development.

In case the proposal of circulars and inter-ministerial circulars does not meet the requirements of point 1 in this Provision, within three working days, the Department of Legislation requests supplementary information and additional justification from relevant agencies. If these agencies do not provide requested

information, the proposed list is not included in the legal document development work program of the Ministry.

3. In necessary cases, the Department of Legislation organizes a meeting to get comments for the Ministry's circular development work program and to request proposed agencies to provide justifications on necessary issues.

4.2.2. Organizing of Drafting Group (Drafting Board)

a. Member:

- Maximum is 11 persons

- Group leader is leader of the drafting agency, members are representative of relevant agencies that under MONRE and representative of legislation Department. In the case of drafting agencies is business units under the MONRE, sub-leader is leader of concerned Department that under MONRE. Representative of Department of Science and Technology, Department of Plan will be member of Drafting Group in the case of contents of circular which related to technical regulations, economic-technical norm.

b. Responsibilities of Drafting Group.

- Leader:

To identify the tasks purpose, scope, contents... of circular; to direct the drafting process, to control quality and progress of work

- Member:

To do all tasks that is assigned by group leader

To fully participate in meetings and activities of the drafting group

Recommendation of all ideas that related to the contents of circulars and processing of development (Drafting)

4.2.3. Drafting Circular

a. Responsibilities of Drafting Agency.

- Drafting Agency may cooperate with Institute, University, other relevant organizations, experts... to make a summary account, to evaluate the implementation of legislation; review and evaluation of the current legal documents; and other research which are related to contents of circulars.

- Report to deputy minister during drafting circulars.

b. Responsibilities of Drafting Group

- Reckon up the implementation of regulations of law, assess applicable legislative documents related to the request for circulars formulation (development); survey, assess social relationships relevant to the request for circulars formulation. Studying of information, documents…which is related to contents of circulars, preparation of proposal, drafting circular and improvement of draft circulars; collect all comments and suggestions from relevant agencies; submitting to Minister….

- Drafting Group collects all comments, suggestions, considering opinions and completed the draft circular.

c. Responsibilities of Legislation Department

Drafting circular, to make comments and suggestion to Drafting Agency and appraise the draft circular.

To coordinate with drafting agency to submit to the minister before the circular will be promulgated.

d. Responsibilities of relevant agency under MONRE

To participate in drafting group (if required), sending response (comments and suggestions) to drafting agency (if required)

đ. Organizing of meeting, seminar... during of draft circulars.

At least three (03) times during drafting circulars

4.2.4. Final draft of Circulars.

Drafting Agency have responsibility making final draft of circular and then send to relevant agencies to get comments and suggestions to improve final draft.

4.2.5. To collect comments and suggestions

a. Methods:

- To send official letter to relevant agencies to ask some key point of circular.

- To send draft circular to relevant agencies to make suggestions

- Organizing of meeting, seminar....

- Post the entire draft circular on the information portal of the MONRE for at least 60 days.

b. Responsibilities of Legislation Department.

- In the case of circular contents consist of administrative procedures regulations, Legislation department have to make comments and suggestions

c. Responsibilities of Justice, relevant Ministries and Vietnam Chamber of Commerce and Industry

- To make a comments and suggestions if the contents of circular consist of duties and rights of citizen, business, the contents of circulars related to other Ministries, local level or coordination issues.

4.2.6. Improvement of draft

a. Responsibilities of Drafting Agency

- The Drafting Agency shall consider all comments and suggestions from relevant agencies, experts...(in the case of do not agree with any comments or suggestion, the Drafting Agency must send all explanation by official letter) and then send to Legislation Department.

- Report to Deputy Minister during drafting circulars

- Reporting of processing, contents or other problems during drafting circular to Minister.

- Improvement of draft circular after reporting to Minister, the draft agency must seek more opinions from relevant agencies (if any)

4.2.7. Appraising the draft circular

a. Responsibilities of Legislation Department

- Drafting of appraisal group then submit to Minister

- Legislation Department affiliated to the Minister shall appraise the draft circular before it is submitted to the minister or heads of ministerial agency

(time to appraise is 7 working days and 15 working days if contents of circular consist of administrative procedures

b. Responsibilities of Science and Technology Department

- To appraise the draft circulars that it consists of technical regulations, technical criteria (The maximum time for appraise is 10 days, 15 days for complex of technical regulations, technical criteria)

c. Responsibilities of Plan Department

- To appraise the draft circulars that it consists of economic-technical norm (the maximum time for appraise is 10 days, 15 days for the complex of economic-technical norm)

c. Appraising Group

+ Member:

- Minimum is 7 persons and the member must be odd number.

- Leader is director of Legislation Department

- Member is representative of relevant departments, experts, scientists.

+ Responsibilities and activities

- Studying of draft circulars and expressing opinions at the meeting or in official writing opinions then send to Legislation Department.

- Operating under the principle of group, by majority vote.

4.2.8. To be submitted to the Minister

a. Responsibilities of Drafting Agency

- To be submitted to the Deputy Minister before send to the Minister.

- Preparing of all documents for Ministerial submit procedures (Drafting Agency must sign at the end of each page of draft circular and to bear the full responsible for the contents and feasibility of circulars). Leader of Plan Department must sign at the draft circular in the case of contents of circular consist of economic – technical norm regulations, Leader of Science and Technology Department must sign the draft circular in the case of contents of circular consist of technical regulations.

Department of Plan will be member of drafting group in the case of contents of circular which related to technical regulations, economic-technical norm.

b. Responsibilities of Legislation Department

- To sign a draft circulars and have responsibilities for the appropriateness and consistency of the draft circulars.

c. Responsibilities of Co-ordination Agencies (If any)

- To sign a draft circulars and to bear the full responsibility for the appropriateness and consistency of the draft circulars.

d. Responsibilities of MONRE office

To accept all relevant documents

4.2.9. To issue circular

- To issue circular

- Publishing legislative documents on Official Gazette

4.2.10. Budget for development of legal documents:

- State budget;
- Foreign support budget and other sources according to laws

The Department of Legislation is the focal point for synthesizing budget for the development of legal documents of the Ministry, forwarding to the Department of Finance to prepare allocation scenarios and submit to the Ministry for deciding budget allocations for implementing agencies.

5. Analysis and Recommendation

A. Analysis of the importance and difficulties, challenges during the development of circulars

5.1. Strengths:

- In 2015, the Ministry of Natural Resources and Environment has developed and promulgated 75 circulars and inter-ministerial circulars. These circulars adjust all thematic areas under the management of the Ministry. Of which, in terms of the environment, 30 Circulars and inter-ministerial circulars were developed and promulgated.

- Circulars have timely specified contents of Laws, Ordinances, Decrees promulgated by the National Assembly, National Assembly Standing Committee, and the Government. Circulars have played important roles in enhancing state management effectiveness in environmental protection

- Developed circulars have followed regulations, and got consultations and comments by relevant stakeholders; therefore, the quality of circulars is ensured.

5.2. Important points in the development of circulars

- One of key points in the development of circulars is to clearly identify the scope, applicable entity and basic content of the circular, to clearly identify the policy, principal perspective of the circular.

- Second key point is the consultation process of the draft circular; this is an important point as the consultation process will provide multi-viewpoints on different contents of the circular.

5.3. Difficulties and challenges during the development of circulars:

+ Approval of the circular development plan

- During the planning of the circular development, Drafting agencies propose a high number of circulars, some of which do not have legal basis or have unnecessary contents subject to management; therefore, it is necessary to study to select necessary contents to be regulated in circulars.

+ Drafting committee, agency in-charge of circular formulation

a. Difficulties, challenges

- Currently, circulars are developed mostly by state management agencies, and main tasks of these agencies are state management in environment therefore do not have a lot of time to study and conduct the survey, investigation and assessment of practical situations as well as ensure the effectiveness of circulars during its implementation in reality; consequently, contents of circulars are sometimes inappropriate with practice and delayed during their development.

- Draft Cicular agencies usually include viewpoints that are advantageous for those agencies, which leads to conflict of interests or are not subjective for applicable entities.

- Members of the drafting group are often seconded therefore they spend less time on circular development and they are also distracted by other tasks; consequently insufficient time is allocated for the circular formulation. In reality, the formulation is carried out by the leading agency; in other words, there will be limitations in viewpoints and not all contents are covered in the circular.

- If there are many circulars, resources (time and human) are not sufficient. Therefore, the circular is not practically feasible.

+ Difficulties and challenges in the consultation process

a. Consultation agencies

- Agency in-charge of circular formulation will seek for comments of relevant agencies. However, these agencies sometimes do not sufficiently study the draft and the comments, consequently, are general and ineffective.

b. Agency in-charge of legal document formulation

- Proposed contents sent for comments are not specific, clear and sometimes irrelevant to the contents of the proposed circular.

- During the consultation, subjective viewpoints still outweigh other comments and hence comments of consultation agencies are inadequately considered. At the same time, there is no response to why some comments are not taken.

+ Difficulties, challenges during the appraisal

- According to the Law on Promulgation of Legal Documents, the Legislation Department of the Ministry is responsible for the appraisal of the draft's contents, however in reality there are still shortcomings in the appraisal process, therefore newly promulgated legal documents have problems in implementation.

- During the appraisal, the agency in-charge will somehow make an impact on the appraisal agency therefore the appraisal agency will easily approve the appraisal content.

- The agency in-charge requests the appraisal late so the appraisal is not good, therefore the draft circular is not sufficiently reviewed.

+ Difficulty, challenges during public display and promulgation

- Agency in-charge of drafting legal documents sometimes does not sufficiently fulfil its responsibility in publishing the draft document to relevant agencies and in using appropriate propaganda and publication tools to each target group. Therefore, even after the document was signed and promulgated, contents of the document are still not heard or known.

B. Some recommendations

- Before submitting to the Minister for the approval of the circular development plan, it is necessary to establish a scientific committee to discuss the list of circulars to be developed and promulgated; therefore agencies that propose the formulation of the circular will have to report on the necessity of the circular, subjects, scope and contents of the circular. Based on that the committee will advise the Minister specific circulars to be included in the list as well as detail contents in each circular, in order to consider the necessity of the circular.

- To ensure scientific characteristics and overcome localised characteristics of the draft circular, in the upcoming months, research institutes, universities, experts, scientists and National Assembly delegates should take lead in formulation of circulars, state management agencies only propose contents to be regulated but do not take lead in the development of legal documents.

- It is necessary to clearly regulate the responsibility and sanction mechanism against organisations, individuals participating in circular development that leads to the promulgation of circulars causing conflict of interests and overlapping with other documents or having unrealistic implications.

- It is necessary to mobilise all resources and time for the development of circulars. Every year, the agency in-charge needs to allocate sufficient budget for the development of circulars, at the same time to mobilize the support of international organisations.

- Enhancing the consultation mechanism of entities that are directly affected by the regulations of the circular to ensure its effective implementation in reality after its promulgation.

- Enhancing the role, responsibility of the legal document appraisal committee; responsibility for commenting and criticising of non-state professional associations.

- Responsibility of the Legislation Department should be clear. It is necessary to strictly handle cases that lead to conflicts and overlapping with other documents.

- It is necessary to propagate and disseminate circulars to different stakeholders by appropriate and efficient ways and methods.

II. Some issues on compensation for environmental damages

1. Damages caused by environmental protection violation behaviours

According to Article 163 of the Law on Environmental Protection 2014: Damages caused by environmental pollution consist of two types.

- Loss of human life and health, properties and legal interests of organizations, individuals due to the deterioration. This could be loss of human life (environmental incidents cause death), health (toxic air causes illness, diseases; toxic substances cause deformity and malfunction children), properties (for example: properties taken by floods, properties damaged by acid rain, fish died because of polluted water, etc.). It could be the damages that victims are specifically identified (individual, individual group or an organization is affected: because life, health or properties are damaged).

- Damages caused by deterioration in environmental function and productivity. These are general environmental damages such as: damages for species and the living environment that need to be protected (any damages that cause negative impacts to the achievement or maintenance of favourable conservation status of the living environment or of that species); water damages (damages cause negative impacts to the ecological status, chemistry, quantity, ecological potentials); soil damages (soil pollution causes threats and risks to the health of human, microorganism, organisms living in or on the soil, etc.); damages on air, noise, vibration, radiation, temperature, lighting, odour.

Therefore, in terms of damage entities, damages caused by violations of environmental protection legislations can be divided into two main types: damages having specific victims and general environmental damages (in other words the community in general or public goods are damaged).

Generally, all violation behaviours of environmental protection legislations can cause these two types of damages. For example, the discharge of wastewater without treatment by Vedan caused damages on crops (damages on properties, economic benefits) for farmers in Ho Chi Minh City, Dong Nai province and Ba Ria – Vung Tau province, but also affected aquatic species in the river (general damages to the natural environment – public goods that it is difficult to identify specific victims).

Compensation for environmental damages has some typical features compared to other compensation types:

- Environmental legalislation violations are caused mostly by enterprises. In many cases, many subjects have the same environmental legislation violation behaviours; therefore, it is very difficult to identify specific compensation obligations for each subject.

- It is very difficult to prove the cause-effect relationship between environmental legislation violation behaviours and impacts caused by violation behaviours in reality.

- Compensation addressing agencies are very diverse: local meditation agencies, judges, courts, communal, district and provincial people's committee and the Ministry of Natural Resources and Environment.

- Environmental damages are very diverse: Damages caused by violations of environmental protection legislations have some typical features such as: in some special cases, damages caused by these behaviours can be clearly identified (for example damages on crops etc.), but for other damages, it is not easy to identify exact damages (for example, damages can only be detected many years after the environmental pollution behaviours take place, general environmental damages, changes in genetic resources, biodiversity, etc.). In other words, it is not easy to quantify environmental damages, particularly in terms of monetary valuation of environmental damages.

- Procedures for solving requests for environmental damage compensation are also very diverse

2. Regulations on compensation for damages

Compensation for environmental damages is regulated in following fundamental legal documents:

- Constitution of the Socialist Republic of Viet Nam 2013
- Civil Code 2005
- Law on Environmental Protection 2014
- Resolution no. 03/2006/NQ-HDTP by the Judicial Council of the Supreme People's Court dated 8th July 2006 on guiding the application of some regulations of the Civil Code 2005 on compensation for damages outside contracts
- Decree no. 03/2015/ND-CP by the Government dated 6th January 2015 on identifying environmental damages

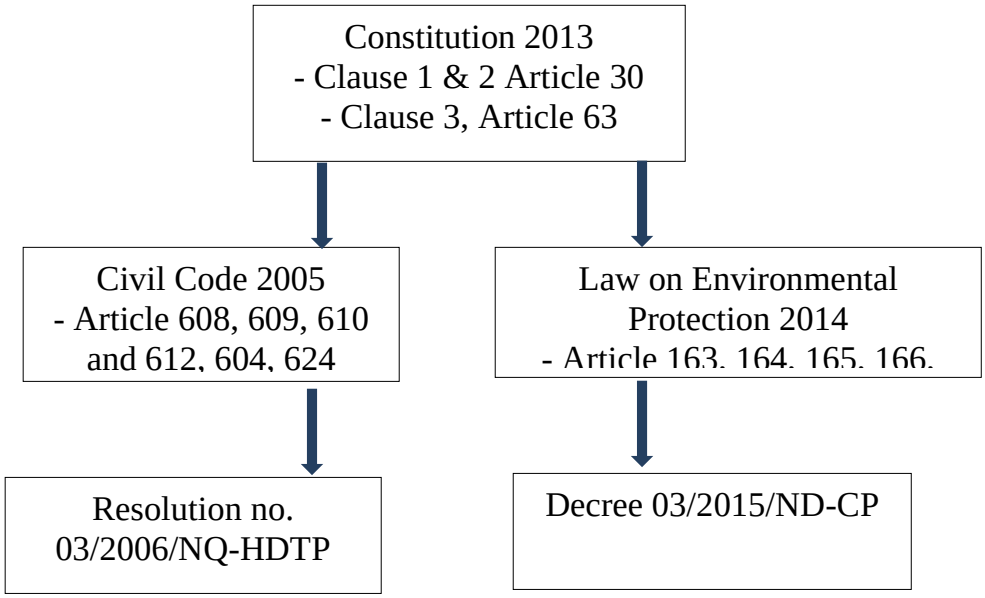

Figure 4. Diagram of legal documents on compensation for damages caused by violations of environmental protection legislations

The content relating to compensation for damages regulated at the highest legal document is the Constitution of the Socialist Republic of Viet Nam 2013 that was endorsed at the 6th Meeting of the National Assembly Tenure XIII, and takes effective from 1st January 2014. Of which, there are two Article 30 and Article 63 as below:

Article 30 (Clause 2): The relevant State bodies, organisations, and individuals must receive and handle the complaints and denunciations. The person who has suffered damages shall be entitled to material and psychological compensation and restoration of honour in accordance with law.

Article 63 (Clause 3): Organisations and individuals who cause environmental pollution, deplete natural resources and weaken biodiversity shall be strictly dealt with and must be responsible for remedy and compensation for damage.

Contents relating to compensation for general damages and compensation for environmental damages are specifically regulated at two Laws: Civil Code 2005 and Law on Environmental Protection 2014

According to the current legislations of Viet Nam, compensation for damages caused by violations of environmental protection legislations is firstly subject to regulations of the Civil Code 2005, regulated at below Article.

Article 624. Compensation for damage caused by environmental pollution, namely: "*Individuals, legal persons or other subjects who pollute the environment and thereby cause damage shall have to compensate as provided for by law, even in cases where the environment polluters are not at fault*".

Therefore, according to this regulation, entities have behaviours that cause environmental pollution that affects other entities must compensate for the damages, even in the case that the environmental polluters are not at fault.

Resolution no. 03/2006/NQ-HDTP of the Judicial Council of the Supreme People's Court dated 8th July 2006 guiding the application of some regulations of the Civil Code 2005 on compensation for damages outside contracts regulates some contents relating to damage compensation including two main contents:

- *General regulation, including:* Responsibility for compensation for damages; Principle of compensation for damages; Capacity for compensation for damages; Appropriate financial expenses: proof obligations of each party; Duration of lawsuit requesting compensation for damages:

- *Regulation on identification of compensation*, including contents relating to: damages due to health impacts; damages due to death impacts; damages due to impacts on honour, dignity and reputation

Law on Environmental Protection 2014 reaffirms the legal basis for compensation obligations for environmental pollution and degradation behaviours at Chapter XIX: Compensation for environmental damages (from Article 163 to Article 167), specifically:

Article 163: General regulation on damages caused by environmental pollution and degradation;

Article 164: Principles of handling responsibilities of organizations, individuals causing environmental pollution;

Article 165: Determination of damages caused by environmental pollution, degradation;

Article 166: Determination of damages caused by deterioration in environmental function and productivity;

Article 167: Liability insurance for environmental damages.

The determination of environmental damages is regulated at Article 165, Law on Environmental Protection, particularly:

1. Degrees of deterioration in environmental function and productivity are as below: a) Deterioration; b) Critical deterioration; c) Particularly critical deterioration

2. Determination of scope, area of the environment under deterioration in function and productivity includes:

a) Scope and area of zone and core zone under critical and particularly critical deterioration;

b) Scope, area of buffer zone under direct deterioration;

c) Scope, area of other areas under the impact of core zone and buffer zone.

3. Determination of environmental components under deterioration includes:

a) Determination of number of environmental components under deterioration, types of damaged ecosystem, species;

b) Degree of damage to each environmental component, ecosystem and species.

4. Calculation of environmental damages is defined as follows:

a) Initial and long-term damages due to deterioration in function and productivity of environmental components;

b) Cost for environmental treatment, reformation and restoration;

c) Cost for minimizing or eliminating damage-causing sources

d) Collection of comments from relevant entities;

đ) Depending on specific condition, one of the measures mentioned in Points a, b, c and d of this Clause may be applied to calculate environmental damages, and served as a foundation for compensation and compensation settlement for environmental damages.

5. Calculation of damages due to deterioration in environmental function and productivity is done independently or with coordination of the damage causing party and affected party.

In case either or both of the parties have requests, environmental protection agencies are responsible for instructing the calculation to determine the damages or witnessing the determination of damages.

6. Determination of damages to human life and health, properties and legal interests of organizations, individuals caused by environmental pollution and degradation is done in accordance with law.

Decree no. 03/2015/ND-CP by the Government dated 6th January 2015 "*Regulating the identification of environmental damages*". This Decree regulates the **identification of environmental damages** including: data collection, evidence for identification of environmental damages, calculation of environmental damages and identification of responsibilities for compensation for environmental damages due to pollution, degradation caused by impacts on fundamental environmental components (water, soil, ecosystem, species, etc.). In addition, this Decree also regulates procedures on requesting compensation for environmental damages (Article 9), principles of identification of environmental damages (Article 10), calculation of environmental damages

(total damage caused by pollution, degradation), accordingly, total damages caused by pollution, degradation in a geographical environmental unit is the sum of damages due to pollution, degradation caused for each environmental component (water environment, soil environment, ecosystem, species for protection priority) (Article 11). This Decree also regulates relatively specifically the calculation of damages due to pollution, degradation caused for each environmental component (Clause 2-5 Article 11 Decree 03/2015/ND-CP).

Therefore, legislations on damage compensation, in general, are relatively adequate and specific. However, regarding compensation for environmental damages (degradation of environment functions and productivity), there is only one legal document that is Decree no. 03/2015/ND-CP. Therefore, in the upcoming time, authorized agencies of Viet Nam need to timely study and promulgate legal documents to adjust compensation for damages due to deterioration of environment functions and productivity.

3. Procedures, sequences of requesting compensation for environmental damages on death, human health, properties and legal interests of organisations, individuals at the Court

According to the current legislation,[1] victims of environmental protection legislation violation that suffer specific damages on life, health, properties and other legal interests can sue at Courts according to Article 33, Article 35, Article 36, Article 159 and Article 164 by the Civil Procedure Code 2004 (revised in 2011) and guiding documents.

After the court processes the claim for damages, the court will carry out the settlement with the order and procedures prescribed in the Civil Procedure Code 2004. Accordingly, cases for damage compensation claim will go through many procedures such as pre-trial conciliation, trial court, and in almost cases, the case only ends after the appellate court. Many cases, even with the judgement of the appellate court, can be reviewed or solved following cassation or retrial procedures. When the judgement of the court takes effective, if the compensating party don’t voluntarily compensate, the compensation receiving party can seek the interference of civil judgement implementing agencies to

[1] Article 25 Civil Procedure Code 2004 (revised, supplemented in 2011).

implement necessary measures (including judgement implementation coercive measures).

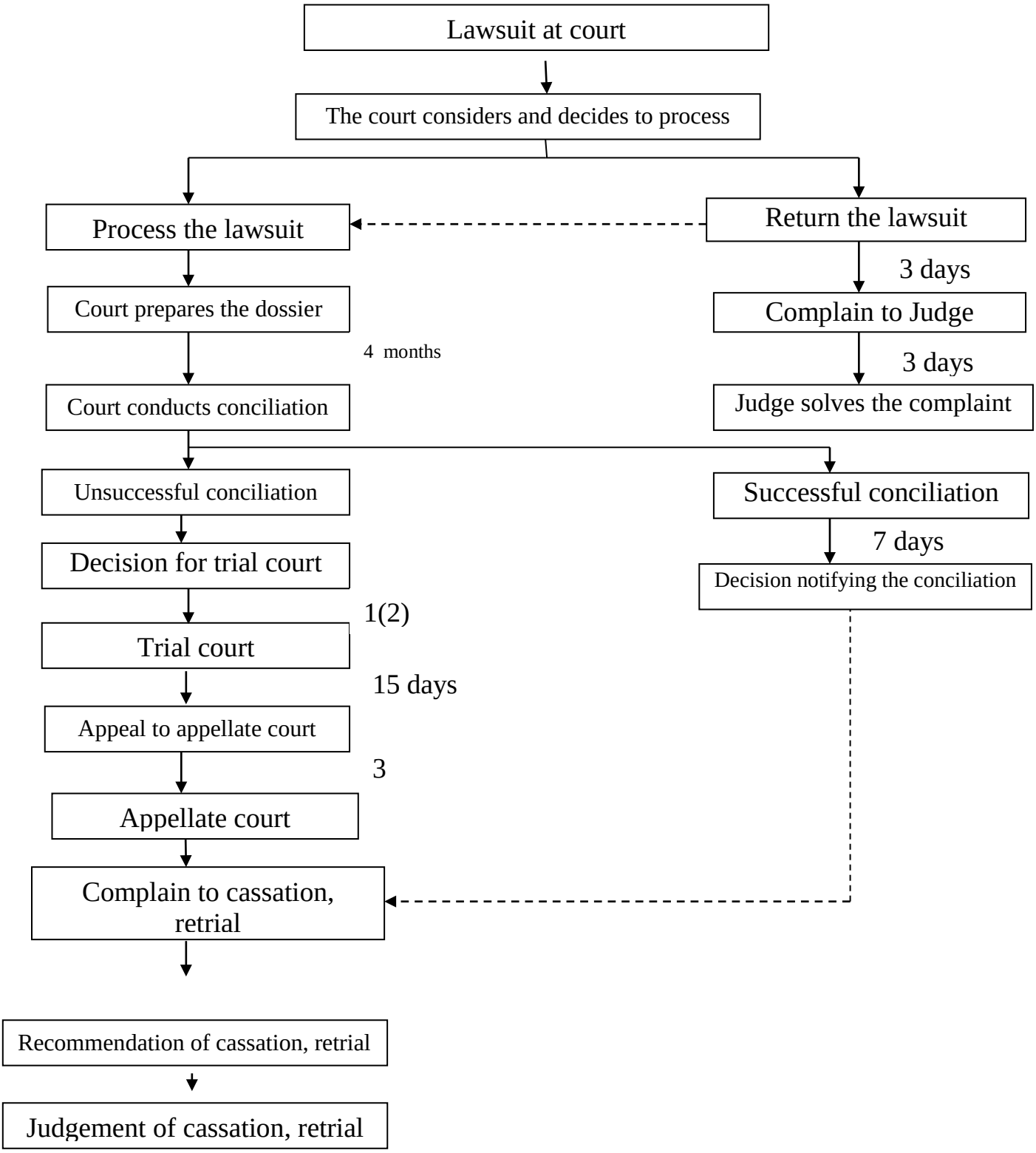

Figure 5. Procedures, steps of lawsuit at court

4. Procedures, sequences requesting compensation for damages due to the deterioration in function and productivity of the environment (proposed by Author of this report)

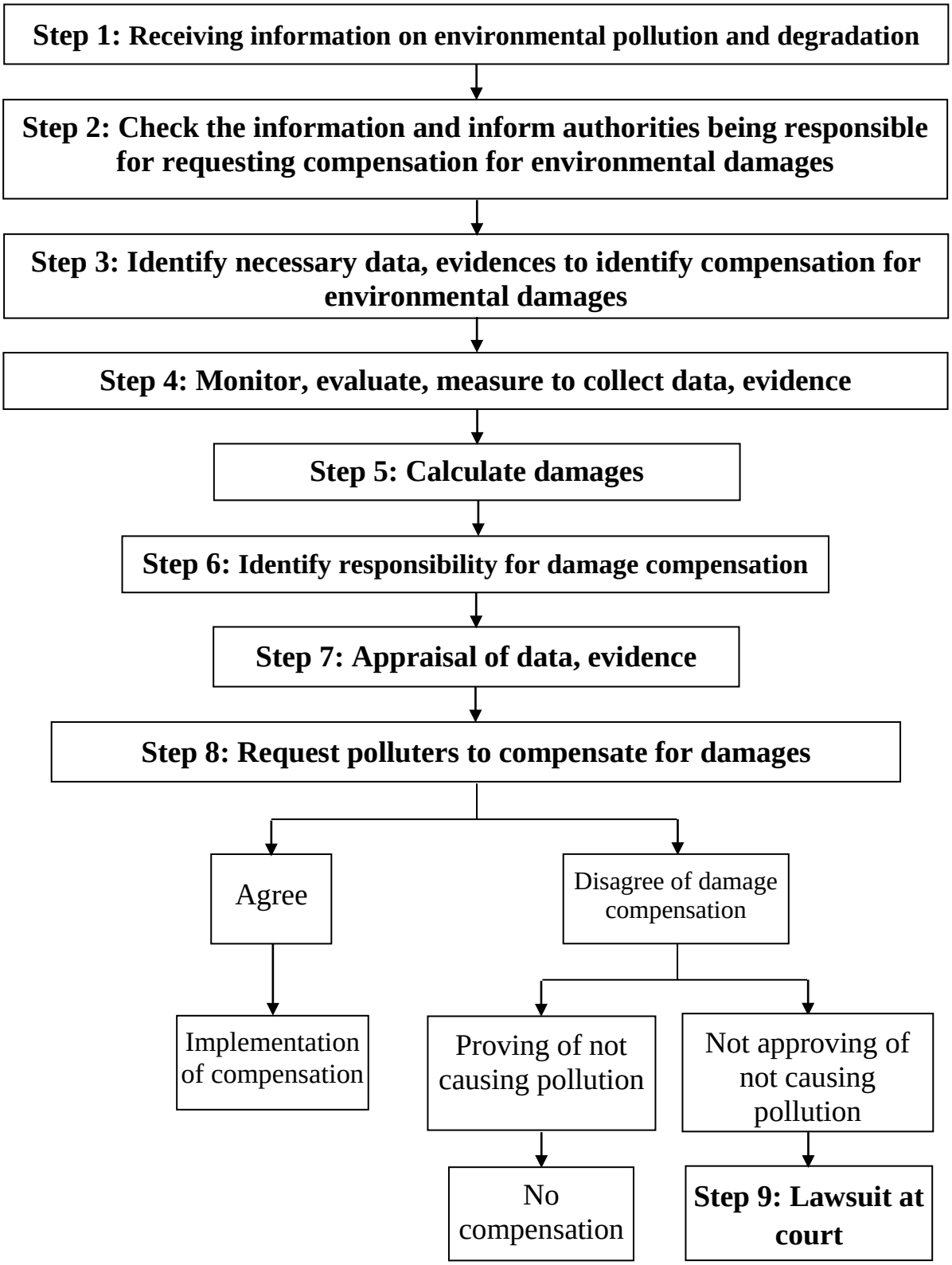

Figure 6. Procedures, sequences of requesting compensation for natural environmental damages

5. Some challenges, shortcomings of damage compensation

According to study cases of requesting for compensation for environmental damages (part III); The study of current legislations; Procedures, sequences to address suing cases requesting compensation for damages, we have some following comments

First, the procedures for requesting the compensation of natural environmental damages in Figure 6 have not been regulated. This is the procedures proposed by the research group. This procedure will be tentatively included in the draft circular on procedures for implementation of compensation for damages; dossiers requesting damage compensation

Second, victim (affected person) of violations of environmental protection legislations and damage-causing entity (culprit) usually have imbalanced access to legislations to protect their legal rights. This is because, in almost cases of compensation for damages due to violations of environmental protection legislations, culprits are mostly enterprises, while, victims are just normal citizen. The relative power comparison between “culprit” and “victim”, the “culprit” usually has higher capability of economic, technical qualification, and knows how to use lawyers, etc. in comparison to “victim” (mostly normal citizen). In addition, the number of victims in each case is very high, victims do not have a close linkage, although the total damages of all victims can be high but the damage caused for each victim is not sufficient enough for that person to have enough motivation to follow lawsuits.

Third, in environmental damages, in addition to damages that organisations, individuals are likely to suffer, there is always a damage that the public suffers, that is the damage affecting the common environment. This means that, the linkage and relationship between “public” and “private” interests to be protected in environmental protection legislation violation cases is a typical feature. Recently, most lawsuits are to protect “private” interests, but not any state management agency files a lawsuit to protect the “public” interests in terms of general environmental damages.

Forth, the proving of the cause-effect relationship between environmental protection legislation violations (behaviours cause environmental pollution and degradation, etc.) and effects on victims and the public and the environment is a very complicated and difficult task.

Fifth, many cases of environmental protection legislation violation show that behaviours causing environmental pollution and degradation that can cause impacts on a large-scale extent with a large number of victims, are under the authority, mandate and judgement of different state agencies and courts. Therefore, it is not easy to identify which agency is responsible for and which court is in charge of processing the case.

Sixth, the collection, identification of evidence proving damages, violation behaviours, the verification of environmental state, verification of damages in environmental cases are usually difficult, complicated, costly, and requires high scientific and technological qualifications.

Seventh, the entity that causes environmental damages in many cases is not just one enterprise or one factory but could be many enterprises, many factories, and many manufacturers operating in a location. The fact shows that the identification of the "proportion" that causes damages and impacts of each entity in order to identify just, fair, adequate responsibility is very difficult, requiring a complex monitoring system.

Eighth, specific regulations to address conflicts in compensation due to environmental pollution are not available. Although obligations of compensation for damages caused by individuals, legal entities and other subjects are clearly regulated in the Law on Environmental Protection 2014, Civil Code 2005 and other legal documents, these regulations only focus on general principles; the application to address environmental conflicts shows following shortcomings:

Specific regulations to identify the role of conflicting parties are not available; there are different understandings of the role of conflicting parties; there could be many entities (several damage-causing entities). On the other hand, there are many people affected by the polluted and degraded environment (several victims). It is difficult to identify the number of people that have the rights and responsibilities in the conflict case, whereas one basic requirement for

restoring the legal interests of affected people is to identify exact affected people (based on the ownership of that person for the damaged properties).

Ninth, it is difficult to identify entity that can file the requests for damage compensation in the situation that damages occur in different localities and victims are specific individuals and legal entities: the above Vedan case is a typical case. Particularly, in this case, the number of affected people is very high and in many provinces (Dong Nai, Ba Ria – Vung Tau, Ho Chi Minh City). The reality raises a big question "who should be the representative to request compensation for damages?" In case that affected people cannot reach consensus on requests for damage compensation (due to different viewpoints on damage extents and compensation rate, etc.), which mechanism should be applied so affected people can reach consensus? Similarly, in cases the affected geographical areas extend one commune, several communes, and several districts who should be the representative for the suing? In which way, affected people are on the same page in suing? In case the damage is the natural environment, according to Decree 03/2015, the Ministry of Natural Resources and Environment and the People's Committee at all levels are entities that can submit the compensation request for natural environmental damages within its territory but there is no regulations on which agencies to be responsible for assisting the Ministry of Natural Resources and Environment and the People's Committee to implement that task (whether it is a natural resources and environment agency, legislative agency or other agency?)

Tenth, difficulty due to limitations in citizen's understanding on suing procedures: in fact, understanding on the suing procedures is very limited. When there are damages caused by violations of environmental protection legislations, people normally come to the police or state administrative agencies but not file at court while in practice, only the court has full authority in addressing requests for damage compensation. In addition, people have little understanding of legislations, don't know how to protect their rights so when the damages occur, they don't know which agency they should go to and which procedures to follow. When they are instructed with procedures, long time has passed; the collection of evidence is very difficult as the evidence is no longer available. In addition, when damages occur, many people don't know the causes and do not have experience in collecting evidence for the suing process.

Eleventh, difficulty in collection of materials to prove violations of environmental legislations such as waste samples and conclusions of environmental inspection agencies; verification conclusions of authorised agency on violation behaviours; dialogue minutes among parties on conflict solving; dialogue minutes among relevant parties on conflict solving; violation minutes or administrative penalty decisions on environmental violation behaviours such as: discharge of wastewater, dust, smoke, noise beyond allowed standards, being requested to implement remedy measures such as no discharge of untreated wastewater into the environment; regarding above cases, if conflicting parties do not agree with the violation handling or compensation for damages, the verification or re-verification has to be conducted. However, the verification, damage appraisal, re-verification are very complex, requiring high technical knowledge, costly and it is hardly to ensure timely response to requests on compensation for damages.

Twelfth, difficulty in selection of methods for handling compensation for damages: According to regulation of Article 14, Decree 03/2015/ND-CP, when damages caused by violations of environmental protection legislations, damage-causing party and damage-affected party can reach consensus to select following handling options such as (1) self-agreement; (2) arbitrator; (3) lawsuit. However, in reality, parties usually "through local authority to reach an agreement with a representative compensation rate or conversion to an amount of money named as "environmental improvement support money". The option of arbitration is not practically feasible as when there is a conflict, parties can hardly achieve an agreement of selecting "arbitrator" to solve their case. The option of lawsuit at the court can lead to the fact that the defendant can at the same time participate in proceedings in different places, causing difficulties and wastes of money for identification of damages and evidence collection, etc.

Twelfth, regulations on the use of budget source to remedy environmental pollution and compensation for damages caused by environmental pollution (particularly for state own enterprises) is not clear and consistent.

Thirteenth, Decree 03/2015/ND-CP relatively regulates in details the identification of damages for the natural environment: water, soil, ecosystem, and species for prioritisation protection). However, regulations and specific

guidance on procedures and steps for requesting compensation for damages are not available; Dossiers on damage compensation requests; Criteria for selection and responsibilities of monitoring, assessment and measuring service providers for data and evidence collection; Foundation for establishment and operation of data, evidence appraisal committee; Expenses for damage identification and implementation of procedures requesting for damage compensation; Cost norm for treatment a unit or a volume or an amount of polluted water, land to meet environmental standards; Cost norm for restoration of a unit area of degraded ecosystem; cost norm for rescue, caring for restoration of a wounded prioritisation-for-protection species.

Fourteenth, the summary study of five case studies requesting for damage compensation in the last few years (Section III) shows that: legal basis for local people to file a lawsuit for damage compensation and legal basis for the court to process and solve the case is not sufficient. The quantification of damages by pollution levels; proof of direct source of pollution... is very difficult and not convincing; therefore, there is not a strong legal basis for the court to give judgement to force polluters to compensate. On the other hand, polluters avoid the compensation liability to affected peoples. This is the main reason for causing the frustration in the past few years.

6. Some solutions to enhance the efficiency of addressing requests for damage compensation due to violations of environmental protection legislations

6.1. Finalisation of legislations on environmental protection and relevant regulations

Recommendations on improvement of the legal framework on environmental protection and other relevant regulations are proposed to enhance the effectiveness of addressing compensations for environmental damages. Victims of environmental protection regulation violations are sometimes only normal citizens with limited understanding of technical knowledge and limited economic capacities. While damage-causing subjects, or referred to as lawbreakers are normally enterprises. In addition, in cases causing environmental damages, citizens also suffer general environmental damages in addition to specific damages. The collection and identification of evidence proving environmental damages and violation behaviours are considerably difficult, complicated, costly and beyond citizen’s capability. The

assurance of monitoring and the rights to be informed of the people against pollution and environmental degradation behaviours will help citizens to have more necessary legal bases and to be more active in filing lawsuits.

To ensure the monitoring and the rights to be informed of the citizens against pollution and environmental degradation behaviours, it is necessary to develop a Decree regulating relevant provisions in details for feasible compliance. In addition, it is necessary to develop circulars guiding in details the Decree no. 03/2015/ND-CP by the Government regulating the identification of environmental damages, to study mechanisms to support income expenses and to prove victim's damages …

- It is necessary to finalize the mechanism to ensure the monitoring right of people against enterprises that have behaviours causing environmental pollution and degradation, to ensure the right to be informed on the environment state and quality that enterprises are the polluters. At the same time, people must be informed of the status of handling of environmental protection legislation violations of each enterprise, have the right to access to the case profiles. To do this, the Ministry of Natural Resources and Environment should submit to the Government to develop a Decree regulating these contents for practical implementation. When the monitoring and informed rights of the people are ensured, people will have more bases and necessary foundations and will be more active in filing the lawsuits requesting enterprises and other entities that violate environmental protection legislations to compensate for caused damages.

- *The Ministry of Natural Resources and Environment needs to collaborate with* other relevant agencies to develop the Circular guiding the implementation of Decree 03/2015/ND-CP by the Government regulating the identification of environmental damages such as: Circular by the Ministry of Natural Resources and Environment guiding the procedures and documents to implement compensation for environmental damages; Circular by the Ministry of Natural Resources and Environment regulating selection criteria and responsibility of agencies providing monitoring, assessing and measuring services for the collection of data, evidence; guiding the establishment and performance of the data and evidence appraisal committee.

- Studying to apply the mechanism to support the costs to affected parties for collection and proof of damages due to violations of environmental protection legislations, in order to support affected parties to overcome the evidence burden to follow lawsuits of compensation for damages.

- Studying to apply the regulations that the environmental protection violation party not only compensates for damages but also covers adequate costs to affected people for legal processes in the court (including costs for lawyers, verification, evidence collection, etc.).

- Studying to promulgate regulations on environmental verification, developing training programs on environmental verification.

- Studying the possibility of collective lawsuit in Viet Nam to apply for damage compensations cases for violations of environmental protection legislations if the number of victims is high.

- Studying to develop the Environmental protection suing support fund (funded from the Viet Nam Environmental Protection Fund or sectoral or provincial environmental protection funds) to create financial source for the collection of evidence in lawsuits relating to environmental protection.

- Studying, allowing social organisations operating in environmental protection or social organisations that their members are affected parties in a specific environmental pollution case can on their behalf to file a lawsuit for compensation or request for compensation for damages of the general environment. This is also an important solution to support affected people from violations of environmental protection legislations to access to the justice in an easier way.

- Studying to allow customer protection associations, environmental protection associations to launch campaigns and disseminate information to customers on violation behaviours of enterprises on environmental protection legislations and call for customers to reject the consumption of goods and services provided by these enterprises to create positive social pressures for environmental protection activities.

6.2. Enhancing legislation dissemination and education for people, particularly disseminating the procedures, steps, methods to address requests on compensation for environmental damages to people. Based on that, people will be aware of and have better understanding of legal tools that they can use to protect their rights and legal interests**.**

6.3. Promoting the role of public representative organisations in monitoring, discovering environmental protection violation behaviours, allowing these organisations to have representative rights for organisations and

individuals that are affected by violations of environmental protection legislations to file the lawsuit at the court to force violating entities to be legally responsible for their behaviours.

6.4. Building capacity for authorised agencies on environmental protection and addressing compensation requests for damages caused by environmental protection legislation violations; enhancing investment on equipment, supporting qualification and budget for environmental protection staff at all levels to easily inspect the fields, identify violation behaviours, collect initial evidence relating to requests for damage compensation in environmental protection of the citizen.

III. Summary of some cases on requesting compensation for environmental damages

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
1	Lawsuit against Ba La Xanh Company (processed by Long An Provincial People's Court)	Suing Ba La Xanh Company for manufacturing fertilisers to compensate an individual (Mr. Truong) next door to the manufacturing facility of the Company, who suffered environmental damages. (2006 – 2007)	- Cause: wastewater of the company discharged to the paddy rice field of local people. - Damage: reduction in rice productivity. Rice land area is 3,382m^2. Autumn summer crop in 2007	- In 2006: the individual sued Ba La Xanh Company at Ben Luc district People's Court to request for compensation of damages and won the case. But the company did not implement compensation solutions. - In 2007: Mr. Truong continued to request for compensation of two million dong and the implementation of solutions to prevent wastewater discharge to his field. Conciliation was unsuccessful as the Company argued that: "*wastewater of the company only has positive impacts to rice and causes no harm. The rice productivity reduction of Mr. Truong is caused*	At judgement number 145/2007/DST dated 30/10/2007, Ben Luc district People's Court requested Ba La Xanh Company to compensate

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
			witnessed 50% reduction in productivity	*by many reasons such as rice seeds, weather, disease and cultivation techniques, which does not relate to the wastewater of the company...*" - Economic, natural resources and environment agencies of Ben Luc district and Tan Buu commune People's Court have inspected the situation and concluded that the wastewater of the company caused impacts to households' production including Mr. Truong (50% productivity reduction). - At the judgement number 145/2007/DSST dated 30/10/2007, Ben Luc district People's Court pronounced Ba La Xanh Company to compensate Mr. Truong an amount of 1,298,688 dong based on regulations of Article 604, 608 and 624 of the Civil Code. The case was brought up to the Appeals	Mr. Truong an amount of 1,298,688 dong based on regulations of Article 604, 608 and 624 of the Civil Code.

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
				Court but the Appeal Court remained the judgement of the trial judgement.	
2	**Compensation case for the field affected with acid sulphate in Ho**	Two plaintiffs were Ms. Le Thi Phong and Ms. Dinh Thi Thanh Van in Binh Chanh district (Ho Chi Minh City). In 1996, Ms. Phong was granted the land use certificate for an area of 8,290m^2 in	- Cause: Land clearance of Phi Long Joint Stock Company caused the flow of acid sulphate soils to the rice cultivation fields	- Individuals contacted Phi Long Company to request for compensation but were inadequately addressed. - Individuals complained to Phong Phu Commune People's Committee and the Communal People's Committee conducted three conciliation sessions; however the agreement was not achieved. - Individuals sued the company for the damages of	No compensation as unable to prove the causes of environmental damages

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
	Chi Minh City	Phong Phu commune, Binh Chanh district. In 2002, Ms. Van was granted the land use certificate for an area of 4,126m^2 right next to the land area of Ms. Phong. In 2002, Phi Long Joint Stock Company prepared the investment project covering the two land areas of Ms. Phong and Ms. Van without reaching consensus on land compensation for these	of Ms. Le Thi Phong and Ms. Dinh Thi Thanh Van. - Damage: cultivation fields were affected with acid sulphate soils – unable for cultivation	non-cultivation in three years (2005 to 2007) with the amount of 45 million dong for Ms. Phong and 30 million dong for Ms. Van. - In 2008, the trial court (Binh Chanh district People's Court) received the case and sentenced the company to compensate Ms. Phong 30 million dong and Ms. Van 10 million dong. However, Phi Long Company appealed with the reason that the trial court did not appropriately apply regulations of Article 604 of the Civil Code 2005 and Resolution no. 03/2006/NQ-HDTP. According to the defendant, the compensation responsibility of Phi Long Company only takes place when all four conditions are met: (1) damages occurred, (2) illegal behaviours, (3) cause-effect relationship between	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
		two people. Afterwards, the company cleared the land by sand containing acid sulphate but without any protective measures; therefore in 2005, after the floods, the sand flowed to the fields of Ms. Phong and Ms. Van. Since then, land areas of these two people contained acid sulphate and were unable for cultivation. These two people contacted Phi Long Company for		damages and illegal behaviours, (4) person who causes harm is at fault. The defendant informed that the trial court judgement did not approve all these four conditions and the plaintiffs also did not implement the **responsibility of presenting evidence on damages** to prove for their compensation requests. Therefore, the defendant requested the Appeals Court to reject the entire petition of the plaintiff. - Reviewing evidences at the court, the Appeals Court concluded that: the trial court was based on two appraisal minutes dated 5/9/2008 and 4/11/2008 to sentence Phi Long Company to compensate while the plaintiff did not conduct agriculture production in three years earlier and the trial court did not	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
		compensation but were inadequately addressed.		verify whether the plaintiffs implemented the farming and were affected in three years earlier. The appraisal minutes did not identify the causes of damages that the acid sulphate affected (polluted) rice field is due to Phi Long Company. The trial court did not conduct the verification of this matter. **The plaintiff did not prove their specific damages** so the court was based only on the determination of the Commune Farmer Association which was not adequate and could affect the interests of both parties. Therefore, the Appeals Court pronounced to abort the judgement of the trial court for re-judgement from the trial court.	
3	**Case of**	In 2008, in Thot Not	- Cause: on 28th	-23 households came to the manufacturing entity to	Only five

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
	compensation for fish death in Thot Not (Can Tho)	district, Can Tho City, there was an incident of mass fish mortality. Of which, more than 400 tonnes of cage fishes of 23 households were affected, estimated to be 6 billion dong. Some households sued at Thot Not district People's Court at the trial court dated 17/3/2011. However, the court judgement showed that plaintiffs were not adequately compensated	and 29th June 2008 in 22km long river section (in Trung Kien ward and Thot Not ward, Thot Not district), there were no environmental incidents except the Raw Alcohol Production Entity of Mr. Do Thanh Hung and	request for compensation of damages but were denied for compensation. - 12 households (out of 23 affected households) filed the lawsuit at the court (however three households withdrew afterwards). Thot Not district People's Court conducted conciliation as regulated, the defendant Ms. My, the owner of the raw alcohol manufacturing entity did not agree. The total request for compensation of households is 2 billion and 48 million dong. At the court, the Thot Not district Court analysed: "This incident occurred because Mr. Do Thanh Hung and Ms. Vo Thi Ut My, the entity owner, had a mistake in not inspecting the manufacturing chain. The sugar syrup tank has a high capacity but the	households were subject to damage compensation with the total amount of more than 751 million dong. The other four households were rejected as they could not provide evidence to

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
		against damages or were rejected due to the fish farming practise or the proceedings at the court, affected households did not prove their damages and did not meet all requirements in accordance with law.	Ms. Vo Thi Ut My, Thuan An ward, Thot Not district, discharged 30 tonnes of sugar syrup due to leaks in storage tanks. - Damages: fish of households in that river section died	design and construction was conducted by an unsuitable professional team and was not verified by the authorised agency before its usage. This violation and unintentional mistake caused the flow of sugar syrup to the river that caused environmental pollution. Water samples were taken 24 hours after the incident occurred. According to the natural flows of the river and the tidal regime, the sample was not accurate as this sample did not contain the same concentration of sugar syrup that caused fish deaths. Based on these arguments, the verification results were inadequate to give objective conclusions; other evidences should be comprehensively reviewed. Based on the textbook on environmental impacts, the increase in solvent	prove their damages.

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
				organic substances could cause the death of shrimp, fish and other aquatic species. Therefore, it is sufficient to conclude that the sugar syrup of Ms. My, Mr. Hung discharged to the river polluted the water that caused the death of cage fishes of plaintiffs therefore Ms. My and Mr. Hung are responsible for compensation for plaintiffs as regulated by the Civil Code. However, the production entity is a household family business and the unintentional mistake's **impacts well exceed the short-term and long-term economic capability.** In addition, cage fish households in Hau River **did not register for business as regulated** therefore 50% reduction of compensation rate according to regulations of Clause 2, Article 105 of the Civil	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
				Code is appropriate".	
4	**Case of Vedan Company**	Vedan Company designed the pumping system and technical pipelines to pump liquid wastes of Lysine manufacturing factory, monosodium glutamate from semi-underground tank with the capacity of 6,000 to 7,000 m^3 and a reservoir of 15,000 m^3 along the underground pipes flowing into two pumping	- Cause: Vedan Company illegally discharged wastewater without treatment to Thi Vai River - Damage: The total polluted production area was 2,123.6 ha; total number of	- In 2008 – 2009, local people requested direct negotiation with Vedan Company to solve compensation for damages but the Company refused, only agreed for negotiation through farmer *supporting* authorities. Under pressures of the community, on 19/03/2010 Vedan Company signed the meeting minutes with representatives of Dong Nai Farmer Union noting the willingness of Vedan Company to support farmers with maximum of 15 billion dong. - In 2010, thousands of farmers in three provinces: Dong Nai, Ho Chi Minh City, Ba Ria – Vung Tau simultaneously sued Vedan Company in courts in	Vedan Company compensated 218.8 billion to affected households.

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
		pipes at 8m depth in Thi Vai River. All wastewater discharged to Thi Vai River through these pipes. This behaviour seriously affected the living environment of the flora and fauna system in Thi Vai River and seriously affected the physical and spiritual living conditions of more than 5,000 households earning their livings based on fishing and aquaculture.	economically affected households was 839; total economic damage was 107,280,855,000 dong, of which the number of seriously affected households was 76 with the damage value of 13,432,704,000	three provinces to request for compensation for damages caused by environmental pollution by Vedan Company. + In Dong Nai, in 7/2010, Dong Nai Lawyer Association (with the approval of the provincial People's Committee) asked its members – lawyers to provide free legal support to people affected by environmental pollution. The Association central committee established a steering committee. Four missions came to 4 communes Phuoc Thai, Long Phuoc (Long Thanh district), Phuoc An, Long Tho (Nhon Trach district) to guide 5,000 households to implement procedures of lawsuits. Missions filed 5,000 petitions. Courts considered processing almost all petitions. At the same time, the mass	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
		In 2010, thousands of farmers in three provinces: Dong Nai, Ho Chi Minh City, Ba Ria – Vung Tau simultaneously sued Vedan Company to the local court for compensation of damages. After the compensation handling process from central to local levels, on 10/8/2010 the General Director of Vedan Company agreed to compensate 100% damage	dong; number of affected households was 763 with the total damage value of 93,848,151,000 dong (according to the appraisal damage of the Institute of Environment and Natural Resources (Ho Chi Minh City	media also supported the fight of farmers; supermarkets rejected products of Vedan. + In Ho Chi Minh City, the city farmer association central committee collaborated with the city lawyer association to guide farmers of Can Gio district on suing procedures, about 1,159 petitions with the total damage value of 325.74 billion dong. + Farmer Associations of Dong Nai province, Ho Chi Minh City and Ba Ria – Vung Tau province had many meetings with Vedan Company, but Vedan did not agree with the damage data proposed by the Associations, with the reason of having no subjective assessment of pollution levels by a scientific body. The company only agreed to	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
		levels appraised by the Institute of Environment and Natural Resources to local people of Can Gio district, Ho Chi Minh City at 45.7 billion dong, to people of Tan Thanh district (Ba Ria – Vung Tau province) at 53.6 billion dong.	National University)).	support 3 provinces with the amount of 25 billion dong. The company also showed the intention of waiting until the lawsuit expiration date. + The Ministry of Natural Resources and Environment advanced an amount of 2.6 billion dong from the Environmental Protection Fund to advance the lawsuit expenses for farmers. Poor families or policy-support families are applicable to court expense exemption or reduction. In Ba Ria – Vung Tau and Ho Chi Minh City, lawyer offices also voluntarily supported free-of-charge to farmers, supporting them to prepare files and sue Vedan in courts. + The Ministry of Natural Resources and	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
				Environment sent a request to Vedan Company to rapidly thoroughly solve the negotiation for compensation to affected people. The Institute of Environment and Natural Resources of Ho Chi Minh City National University officially handed over the map of pollution areas due to wastewater of Vedan Company in Thanh An commune, Can Gio district to the Can Gio District People's Committee as basis to identify damages incurred by petition households living in the wastewater pollution area of Vedan Company. Identified economic damages by farmers in the polluted production area were: * Total polluted producing area: 2,123.6 ha. * Total households suffering economic damage: 839	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
				households. * Total economic damage: 107,280,855,000 dong, of which: - Seriously polluted: 76 households, damage value of 13,432,704,000 dong. - Polluted: 763 households, damage value of 93,848,151,000 dong. - Dong Nai province: 104.3 billion dong + On 13/8/2010 General Director of Vedan Company agreed to compensate Can Gio district, Ho Chi Minh City an amount of 45.7 billion dong (50% transferred to the account of Can Gio district Farmer Union within 7 days of the signing, the	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
				remaining will be paid by 14/01/2011 at the latest), Ba Ria – Vung Tau province of 53.6 billion dong and Dong Nai of 119.5 billion dong. - In 2011, Vedan Company finished the compensation payment of 218.8 billion to affected households.	
	Case of Sabeco Song Lam Joint Stock Company	In 2008 – 2010, Sabeco Song Lam Packing Joint Stock Company discharged illegally. Wastewater from surface sewages of the factory discharged directly to irrigation channels of	- Cause: Untreated wastewater of Sabeco Song Lam Packing Joint Stock Company discharged	- Since 2008, when the Company was under construction, it had caused serious pollution to the water sources. Consequently, hundreds of households living surrounding Sabeco Song Lam Packing Joint Stock Company filed petitions to different authority levels, but not solved. - In 4/2009, Hung Dong commune authority worked with the Company to determine the state that was	Sabeco Song Lam Packing Joint Stock Company does not compensate affected people

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
		farming fields in Trung My village, Hung Dong commune (Vinh City – Nghe An). This caused serious environmental pollution, affecting human health and productivity of crops. Hundreds of households filed complaints to authorities and were not addressed. After the case's coverage in the mass media, the Ministry of Natural Resources and	directly to irrigation channels of Trung My village, Hung Dong commune (Vinh City, Nghe An). - Damage: Unable-for-cultivation polluted field, dust from company emissions, bad	reflected by the local people, but concluded that this was not wastewater but adhesion oils. - When the Company is under operation, the pollution is increasingly serious. In 8/2009, Nghe An Environmental Police inspected and concluded the cause of the above situation was due to problems and malfunction of the wastewater treatment system of Sabeco Song Lam Packing Joint Stock Company. - After this case is covered in the mass media, the Ministry of Natural Resources and Environment organized an inspection delegation and concluded: Sabeco Song Lam Joint Stock Company caused serious environmental pollution. The inspection delegation of the Ministry of Natural Resources and Environment took random wastewater samples in	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
		Environment organized an inspection delegation and concluded: **Sabeco Song Lam Joint Stock Company caused serious environmental pollution, of which some parameters surpassed 49 times the allowed regulations.** Nghe An Provincial People's Committee sent a document on addressing environmental pollution to relevant agencies to	odour from wastewater causing negative impacts on human health living nearby (infection with dermatological, intestinal, respiratory diseases), irrigation water was polluted with black colour, and fish	this Company. The wastewater quality analysis results showed that: 16/30 parameters surpassing the limitations of Viet Nam Regulation number 24:2009/BTNMT. Based on the inspection findings, the delegation recommended to Nghe An provincial People's Committee, Bac Vinh Industrial Zone to implement environmental protection measures, strictly handle the violation case and report the implementation results to the Ministry of Natural Resources and Environment before 31/12/2010. - Having the findings of the inter-sectoral inspection delegation of the Ministry of Natural Resources and Environment, on 4/10/2010, Nghe An Provincial People's Committee sent a document on addressing environmental pollution to relevant agencies to	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
		handle compensation requests for damages caused by Sabeco Song Lam Packing Joint Stock Company to people in Hung Dong commune. By 2011, the company confirmed not to compensate local people.	died.	address requests of compensation for damages caused by Sabeco Song Lam Packing Joint Stock Company to local people of Hung Dong commune. - Due to lacking of specific guidance on identification of damages to local people, communal staff, Sabeco Company and staff of the Natural Resources and Environment Division of Vinh City is very uncertain in identifying damages. In 2011, Sabeco Company confirmed not to compensate households living nearby. This company argued that the identification of environmental polluters by functional agencies is inappropriate. Sabeco Song Lam Packing Joint Stock Company caused serious environmental pollution and was penalized by the Inspectorate of the Ministry of	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases
				Natural Resources and Environment an amount of 47.250 million dong as 16/30 criteria surpassed the Viet Nam Regulation number 24:2009 and was recommended for operation suspension or prohibition. However, the company still requested for specific evidence. Clearly, Sabeco Song Lam Packing Joint Stock Company intentionally denied the inspection findings of authorized agencies and ignored the instruction of the provincial People's Committee on compensation for damages to households living surrounding the Company. Frustrated with lasting pollution, on the morning of 1/5/2011, people of Hung Dong commune blocked the sewage channels in front of the Sabeco Song Lam Packing Joint Stock Company.	

No.	Environmental damage compensation cases	General summary	Cause and damages of compensation cases	Compensation implementation procedure	Achievements in compensation cases

In summary, the practicality in addressing compensations for environmental damages in Viet Nam recently shows following issues:

- Awareness on environmental protection of organisations and individuals is not high. The compliance of relevant subjects is very weak and limited. Majority of enterprises lack awareness on environmental protection, avoidance and refusal to compensate for environmental damages. Most of enterprises think that there are still many limitations in addressing compensations for damages caused by environmental pollution, specifically: only some cases drawing public attention such as Vedan Company causing environmental pollution in Thi Vai River, Sonadezi Long Thanh causing environmental pollution in Ba Cheo channel, the compensation was only implemented after being exposed by the mass media and social groups. Other cases have not been seriously and effectively implemented. The reason is because functional authorities are passive and slow in addressing damage compensation cases. Functional agencies do not pay high attention to environmental pollution and degradation and cover, tolerate enterprises; they have not fully implemented their functions, therefore enterprises and individuals causing environmental pollution do not seriously comply with legal regulations on environmental protection and avoid the obligations of damage compensation for environmental pollution and degradation.

- Penalty sanctions are weak, environmental monitoring and protection system is scattered. Staffs are in shortage of numbers as well as qualifications. Functional agencies and authorities at all levels have not seriously implemented their tasks and confronted improper operations of enterprises and individuals violating environmental legislations. Current status shows that authorized state agencies take actions only in cases that are protested strongly by the mass media and citizen. Both state agencies and citizen are not fully aware of the importance and damages caused by environmental pollution and degradation causing for health, properties of the state and citizen. Damages caused by environmental pollution are clearly significant, but it is difficult to identify and determine specifically and clearly.

- Legal regulations on addressing compensation for damages caused by environmental pollution are not clear, specific and coherent, and not deterrent enough for which organizational and individual polluters easily break the law. Timeline for lawsuits is not appropriate with environmental pollution features; citizen lack knowledge and understanding on protecting their rights; environmental protection and management agencies are not diligently in implementing their functions and roles. Legal enforcement is not effective; penalty is not high enough for deterrence. Compensation request party does not have knowledge and understanding;

compensating party, on the other hand, considerably knows how to handle. Enterprises and individuals causing environmental pollution and degradation often ignore and find ways to avoid responsibilities, extend the timeline to implement compensation obligations or to reduce compensation expenses. Although they are aware of that their behaviours will cause environmental pollution but they intentionally implement because of profits.

- Civil society organisations and local communities play considerably important roles on addressing compensations for environmental damages.

The above-mentioned Vedan case is a typical example for these roles:

+ Role of the Farmers Association: regarding the information that farmers in Thanh An commune, Can Gio district sued Vedan Company to compensate for damages caused by environmental pollution in Thi Vai River, which affects aquaculture and local citizen, Mr. Nguyen Van Phung – Vice Chairman of the Farmers Association of Ho Chi Minh City informed: the City Farmers Association proposed to the Can Gio district people's committee to direct the Agriculture Division and the District Farmers Association to investigate the number of affected aquaculture households from 1995 to now to report to the Farmers Association. In addition, the City Farmers Association sent a request to the Department of Natural Resources and Environment and the Department of Agriculture and Rural Development to provide statistics on volumes, productivity of fishery and plantations, water quality (including water sources causing pollution), then to compare damages before and after water sources polluted. The objective is to prove the relevance of Vedan to the damages on aquaculture households in Thanh An commune. After having all data and assessing damages, the Farmers Association will transfer farmers' petitions associated with compensation requests to the Company. If Vedan refuses to compensate, the City Farmers Association will, on behalf of farmers, file a lawsuit against Vedan to request for compensation, according to the regulations[2].

With the aim to support affected farmers, in Ba Ria – Vung Tau, the provincial Farmer Association also sent a document to the Viet Nam Central Farmers Association to ask the Supreme Court to allow a delay in payment of court fees as the majority of affected farmers are poor.

+ Role of Lawyers Association: in the case requesting compensations from Vedan Company, the Ho Chi Minh City Lawyers Association helped poor and pro-poor people to fulfil procedures to have fee exemption and reduction during the

[2]http://m.tin247.com/hoi_nong_dan_se_giup_dan_kien_vedan_doi_boi_thuong-1-21324981.

lawsuit. According to the Ho Chi Minh City Lawyers Association, of 839 farmers suing Vedan Company, up to a third are poor and pro-poor people and the lawsuit fee exemption and reduction is around 2 billion dong. Two lawyers of the Ho Chi Minh City Lawyers Association and two staff of the Ho Chi Minh City Farmers Association are ready to involve in the prosecution process on behalf of the farmers.

In Ba Ria – Vung Tau, the provincial Lawyer delegation assigns 120 lawyers to provide legal services to 1255 affected citizen to prosecute Vedan. The Delegation receives 1255 files suing Vedan to study and guide citizen to implement the authorization procedures and filing at Tan Than district court[3].

+ Community role: Confronting the "delay" and avoidance in compensation for damages cause by Vedan Company, sellers and consumers cause pressures on this Company to implement its obligations by rejecting the Company's goods. After Co.op Mart officially announces to stop selling Vedan's products, other supermarkets such as BigC, Metro, Citimart also decide to "boycott" the company products… This decision by supermarkets is to support farmers of Ho Chi Minh City, Dong Nai and Ba Ria – Vung Tau which are in the process of suing Vedan Company for causing pollution in Thi Vai River. Representatives of supermarkets informed that the rejection of these products will be continued until Vedan Company overcome the incidents and compensate adequately to farmers. Rejection "campaign" against Vedan is not only carried by supermarkets but also by markets and grocery shops in Ho Chi Minh City, the company products are rejected or "suspended" by small business households, consumers "say no".

[3]://vov.vn/Phap-luat/Hoi-Luat-gia-TPHCM-ho-tro-839-nong-dan-kien-Vedan/151383.vov

PROJECT FOR STRENGTHENING CAPACITY OF WATER ENVIRONMENTAL MANAGEMENT OF RIVER BASIN

REPORT

STUDY, REVIEW OF LEGAL DOCUMENT ON COMPENSATION FOR DAMAGES

Pham Van Dung

Hanoi, 2016

TABLE OF CONTENT

ABBREVIATIONS

The Civil Code	CiC
The Civil Procedure Code	CPC
Compensation for Damage	CfD
Cassation procedure	CaP
Industrial cluster	IC
Industrial Park	IP
Law on Environmental Protection	LEP
Ministry of Natural Resources and Environment	MONRE
The People's Court	PCo
The People's Committee	PC
Reopening procedure	RoP
State compensation liability	SCL
Trial	Trial

PREMABLES

Environment is a hot issue not only in Vietnam but also many countries in the world, regardless of developed or developing countries. Environmental pollution, degradation and incidents are causing adverse changes in natural factors such as water, soil, air, fauna and flora system, and especially imposing direct impacts on human health. The main driver of this situation is the increasing negative human impacts on the environment. Various solutions, measures are proposed to protect the environment, prevent and restrict environmental pollution including legal measure on compensation liability for damages caused by environmental pollution and degradation. In term of legal scientific theory, any illegal actions that cause damages to other entities shall be subject to legal responsibility, which means adverse consequence resulting from such actions. The Vietnamese laws prescribe damage compensation responsibility of individuals, organizations causing environmental pollution, including the Civil Code (CiC), Law on Environmental Protection (LEP) and relevant legal documents. Law regulations have initially established important legal basis for individuals and organizations affected by environmental pollution to request compensation for damages resulted from the acts of causing environmental pollution in order to protect legitimate rights and interests of such individuals and organizations. In reality, regulations on compensation for damages caused by environmental pollution are general, formalistic leading to difficulties in settlement of claims for damages caused by environment-polluting behaviors.

The Report focuses on review and assessment of legal documents on compensation for damages caused by violations of laws on environmental protection contributing to improvement of laws on compensation for damages caused by environment-polluting acts in Vietnam.

CHAPTER I. OVERVIEW ABOUT COMPENSATION FOR DAMAGE

1.1 Definition of compensation for damage

Compensation for damage comprises compensation for physical damage, spiritual damage and decline in the functions and usefulness of the environment. Compensation for physical damage refers to the responsibility to compensate for actual physical losses, comprising loss of property, reasonable expenses to prevent, mitigate or restore damage, and the actual loss or reduction of income. A person causing damage to life, health of another person must pay reasonable costs for treating, nursing and rehabilitating health, and functional losses and impairment of the aggrieved person. A person causing mental damage to another person shall have to pay pecuniary compensation to the victim in addition to stopping the infringement, offering an apology and making public rectification.

Compensation for damage is an important and obligatory principle that is recognized in Article 585 of the Civil Code No. 91/2015/QH13 dated 24 November 2015. This principle is also affirmed in Clause 8, Article 4 of Law on Environmental Protection No. 55/2014/QH13 dated 23 June 2014. Accordingly, any organizations, households, or individuals causing environmental degradation and incidents shall be subject to implementation of the remedy and compensation for damage in term of other responsibilities in accordance with the law regulations.

1.2 Definition of damage compensation liability

Compensation institution has been set forth in the civil law of Vietnam for a long time; however, it is only improved to govern almost issues required to settle civil disputes in general and dispute related to damage compensation responsibility in particular. Damage compensation liability is a type of civil relation, in which the individuals or entities that infringe the legitimate rights and interests of other individuals or entities shall be subject to compensation for the damages.

In this relation, the actors may be citizen, legal entities, households, cooperative team. In some cases, state agencies, procedure-conducting agencies may become an obligee or obligor.

1.3 Damage compensation responsibility

Theoretically, study on compensation for damage requires review of definition and outstanding characteristics of damage compensation liability. In the aspect of legal science, everybody is required to respect the general principles of the society and not allowed to infringe legitimate rights and interests of other people for the sake of his/her interest. A person that breaches his/her legal obligations causing damages to other people or a person that infringes the public interests of the State such as causing environmental pollution shall be subject to adverse consequence resulted from such behavior. Taking responsibility for an adverse consequence via compensation for damages caused to other people (individual or entity) is understood as damage compensation.

Therefore, damage compensation liability can be perceived as a civil responsibility requiring a person that breaches his/her legal obligation causing damages to other persons to make compensation for such damages. The definition about damage compensation provides the contents for implementation of compensation, while definition about damage compensation liability specifies that this is a civil responsibility. Damage compensation liability can be perceived as a civil responsibility requiring a person that breaches his/her legal obligation causing damages to other persons to make compensation for such damages.

In addition to general characteristics of a legal liability such as being imposed on law violators by the state competent agencies, causing negative consequences to the subject, and being enforced by state coercion, etc., damage compensation liability has specific characteristics as follows:

- Legal basis: Damage compensation liability is interpreted as a civil responsibility governed by the Civil Law and other laws including laws on environment. A person that causes damage to other persons shall be required to make compensation for such damage, and damage compensation is actually a property relation.

- Condition of arising a damage compensation liability: Liability for damage compensation shall arise only when all of following factors are involved: there must be damage inflicted; there must be violation of civil obligation (contractual or non-

contractual); there must be cause-effect relation between the inflicted damage and the illegal act(s); there must be a fault committed by the damage inflictor (not mandatory). These are the most fundamental conditions to determine liability of a person that is required to make compensation for damages caused by him/her.

- Consequence: Damage compensation liability always brings an adverse property consequence to the damage-causing persons. When a person causes damage to other persons, such damage shall be calculated in form of money or a specific physical quantity; otherwise compensation can not be made. Spiritual damages and damages caused by decline in environmental function and usefulness, though unable to be calculated, shall be determined in accordance with the laws in order to make compensation for the sufferer. Therefore, performance of compensation liability shall help to restore damages for the sufferer

1. 4 Classification of damage compensation liability

Damage compensation liability is classified basing on specific criteria of classification such as the infringed interest, origin, damage, cause, relationship between rights and obligations of the actors, etc.

Basing on the infringed interests, damage compensation liability can be classified into physical damage compensation liability and spiritual damage compensation liability.

Physical damage compensation liability refers to the responsibility to compensate for actual physical losses, comprising loss of property, reasonable expenses to prevent, mitigate or restore damage, and the actual loss or reduction of income.

Spiritual damage compensation liability is understood that a person causing mental damage to another person by infringing upon the life, health, honor, dignity or prestige of such person shall have to pay pecuniary compensation to the victim in addition to stopping the infringement, offering an apology and making public rectification, etc.

Classification of these two types of compensation liability plays an important role in determination of damage proving and compensating responsibility. In principle, the sufferers are responsible to prove the damages caused to them, and the

compensation amount shall be equal to the damage level. However, this principle can only be applied to physical damage compensation but spiritual damage compensation. Spiritual damages are invisible damages that can not be calculated and proved. As a result, the laws need to prescribe a specific compensation level that the state competent agencies can apply in the cases of infringement of moral rights.

Basing on liable entities, damage compensation liability is classified into individual compensation liability, legal entity compensation liability and state compensation liability.

Individual compensation liability is interpreted as a civil liability that damage compensation falls under responsibility of the person causing damage or legal representative of such person including parents, guardians.

Damage compensation liability of legal entity and other organizations refers to a civil liability arisen to such legal entity or other organizations in cases they cause damages during performance of legal entity's duties or the duties assigned by the organizations.

The state compensation liability is understood that when a civil officer or state employee causes damage to other persons under compensation authority of the State, the State other that such civil officer or state employee shall be responsible to make compensation for the sufferer.

CHAPTER II. REVIEW, ASSESSMENT OF LEGAL DOCUMENT ON STATE COMPENSATION LIABILITY

2.1 Review of law regulations on state compensation liability

Before the Law on State Compensation Liability No.35/2009/QH12is promulgated, the State has enforced a law system that initially meet basic requirement of state management in all aspects of the social life including law on state compensation liability for damages caused by state officers, civil servants on duty. The Vietnam's Constitution prescribes "Any person who has been arrested, held in custody, prosecuted, brought to trial in violation of the law shall be entitled to compensation for any material damages, and reputation rehabilitation" (Article 72); "All acts violating the interests of the State, the rights and legitimate interests of collectives and citizens shall be settled strictly and timely. The person who has suffered damages shall be

entitled to material compensation and reputation rehabilitation" (Article 74). The Civil Code 1995 has articles 623 and 624 prescribing the compensation liability of state agencies that continue to be recognized in the Civil Code 2005 (Article 619 and 620).

However, before the promulgation of Law on State Compensation Liability, Vietnam promulgated various legal documents that only prescribe general regulations and principles. To detail the mentioned-above regulations, the State of Vietnam has promulgated various guiding documents such as Decree No. 47/CP dated 03 May 1997 of the Government on the settlement of compensation for damage caused by state officials, employees or competent persons of legal proceedings agencies (hereinafter called as Decree No. 47); Resolution No. 388/2003/NQ-UBTVQH11 dated 17 March 2003 of the National Assembly Standing Committee on compensation for damage caused to unjustly tried persons by competent persons in criminal proceedings (hereinafter called as Resolution No. 388). Relevant ministries and branches have already promulgated legal documents guiding settlement of compensation for damages caused by state officials, employees or competent persons of legal proceedings agencies (hereinafter called as official duty performers).

The National Assembly promulgated the Law on State Compensation Liability for the first time on 18 June 2009, which unifies regulations on compensation for individuals and organizations suffering from damage caused by official-duty performers. The law pays an important role in the social life; responds to essential need of a democratic, equal and civilized society originating from basic principles of the legally constituted socialist state; contributes to prevent corruption and bureaucracy found in some state administrative agencies and a proportion of public officials as well as to overcome weakness in qualification and technical capacity, raise responsibility and morals of state officials in order to reduce risks caused to people from official duty performance, encourage affected people, and express respects to legal rights and interests of the citizens.

Law No. 35/2009/QH12 dated 18 June 2009 promulgating Law on State Compensation Liability, which provides for the State's liability to pay compensation to individuals and organizations suffering from damage caused by official-duty performers in administrative management, legal proceedings and judgment

enforcement activities; compensation procedures; the rights and obligations of individuals and organizations suffering from damage; compensation funds and the reimbursement liability of official-duty performers who have caused the damage. Accordingly, people suffering material and spiritual damages shall be compensated by the State in accordance to the regulations. The Law governs scope of state compensation liability to organizations, individuals suffering from damage caused by official-duty performers in administrative management, legal proceedings and judgment enforcement activities; compensation procedures; the rights and obligations of individuals and organizations suffering from damage; compensation funds and the reimbursement liability of official-duty performers who have caused the damage.

The Law on State Compensation Liability provides regulations on compensation for each specific type of damage, including: damage caused by asset infringement (Article 45); damage due to loss of or decrease in actual incomes (Article 46); damage due to mental sufferings (Article 47); material loss due to the death of sufferers (Article 48); material loss due to health damage (Article 49); return of assets (Article 50); honor restoration for sufferers in criminal proceedings (Article 51). Regarding damage due to loss of or decrease in actual incomes, the Law stipulates basis to determine income of the sufferers. For individuals with unstable incomes which cannot be specifically identified due to the lack of grounds or with seasonal incomes, the average income level of local labor of the same type shall apply. If the average income level cannot be determined, the damages will be determined based on the common minimum wage applicable to state agencies at the time of compensation.

The Government promulgated Decree No. 16/2010/ND-CP on 03 March 2016 to detail and guide a number of articles of the Law on State Compensation Liability. This Decree details and guides a number of articles of the Law on State Compensation Liability regarding compensation settlement at compensation-liable agencies and reimbursement liability of public-duty performers in administrative management, legal proceedings and judgment enforcement; and state management of compensation work in administrative management and judgment enforcement.

The procedure of handling compensation for damages by compensation-liable agencies are prescribed in guiding circulars including the Joint Circular No.

18/2015/TTLT-BTP-BTC-TTCP dated 14 December 2015 by Ministry of Justice, Ministry of Finance, the Governmental Inspectorate of Vietnam guiding implementation of state compensation in administrative management; Joint Circular No.01/2012/TTLT-TANDTC-VKSNDTC-BTP dated 18 September 2012 of the Supreme People's Court, the Supreme People's Procuracy, and the Ministry of Justice guiding implementation of state compensation liability in civil and administrative proceedings; Joint Circular No.17/2015/TTLT-BTP-BQP dated 7 December 2015 of Ministry of Justice and Ministry of National Defense on state compensation liability during enforcement of civil.

In addition, Ministries, branches have coordinated in promulgation of joint-circulars stipulating the issues related to state compensation liabilities such as responsibility, estimation, management, use and final settlement of expenditures for implementation of state compensation liability, etc. These legal documents are summarized as follows:

1. Decree No. 47/CP dated May 03, 1997 of the Government on the settlement of compensation for damage caused by state officials, employees or competent persons of legal proceedings agencies (hereinafter called as Decree No. 47).

2. Circular No. 38/1998/TT-BTC dated March 30, 1998 guiding the estimate, use and final settlement of State Budget for compensation for damage caused by state officials, employees, or competent persons of the state bodies and litigating agencies (hereinafter called as Circular No. 38).

3. Circular No. 54/1998/TT-TCCP dated 04 June 1998 of the Governmental Organization Committee on guiding the implementation of some contents of Decree No. 47/CP dated May 03, 1997 of the Government on the settlement of compensation for damage caused by state officials, employees or competent persons of legal proceedings agencies (hereinafter called as Circular No. 54).

4. Resolution No. 388/2003/NQ-UBTVQH11 dated 17 March 2003 of the Standing Committee of the National Assembly on compensation for damage caused to unjustly condemned people by competent persons in criminal proceedings (hereinafter called as Resolution No. 388).

5. Joint-Circular No. 01/2004/TTLT-VKSNDTC-BCA-TANDTC-BTP-BQP-BTC dated 25 March 2004 guiding the implementation of a number of provisions of the Resolution No. 388/2003/NQ-UBTVQH11 dated 17 March 2003 on compensation for damage caused to unjustly condemned people by competent persons in criminal proceedings (hereinafter called as Circular No. 01).

6. Joint-Circular No. 04/2006/TTLT-VKSNDTC-TANDTC-BCA-BTP-BQP-BTC dated 22 November 2006 on guiding the implementation of some provisions of the Resolution No. 388/2003/NQ-UBTVQH11 dated 17 March 2003 on compensation for damage caused to unjustly condemned people by competent persons in criminal proceedings (in replacement of the mentioned-above Joint-Circular No. 01) (hereinafter called as Circular No. 04).

7. Joint-Circular No. 71/2012/TTLT-BTC-BTP dated 09 May 2012 of the Ministry of Finance and Ministry of Justice on defining the estimation, management, use and finalization of funds for performing the state compensation liability.

8. Circular No. 55/2012/TT-BCA dated 17 September 2012 Ministry of Public Security stipulating the state management responsibility for compensation in the People's Public Security.

9. Joint-Circular No. 05/2012/TTLT-TANDTC-VKSNDTC dated 02 November 2012 of the Supreme People's Procuracy, the Supreme People's Court, Ministry of Public Security, Ministry of Justice, Ministry of National Defense, and the Ministry of Finance on guiding the performance of the State Compensation Liability in criminal proceedings.

10. Circular No. 03/2013/TT-BTP dated 31 January 2013 of the Ministry of Justice on guiding the state management on compensation in administrative management sector.

11. Joint-Circular No. 04/2013/TTLT-BTP-BQP dated 01 January 2013 of Ministry of Justice and Ministry of National Defense on guiding the state management of compensation in civil judgment enforcement.

12. Joint-Circular No. 11/2013/TTLT-BCA-BQP-BTP-TANDTC-VKSNDTC dated 06 November 2013 of n Ministry of Public Security, Ministry of Justice, Ministry of National Defence, the Supreme People's Procuracy, the Supreme People's

Court on guiding the performance of the State Compensation Liability in civil judgement enforcement.

13. Joint-Circular No. 04/2014/TTLT-BTP-TANDTC-VKSNDTC dated 23 January 2014 of the Ministry of Justice, the Supreme People's Court, and the Supreme People's Procuracy guiding the implementation of return obligation of the persons who are performing their official duties.

14. Joint-Circular No. 06/2014/TTLT-BTP-TTCP-BQP dated 14 February 2014 of the Ministry of Justice, the Governmental Inspectorate, and Ministry of National Defense on providing guidelines for lodging and settling complaints about State's compensation in the administrative management and civil judgment enforcement.

15. Joint-Circular No. 22/2014/TTLT-BTP-TANDTC-VKSNDTC-BCA-BQP-BTC-BNN&PTNN of Ministry of Justice, The Supreme People's Court, The Supreme People's Procuracy, Ministry of Public Security, Ministry of Natural Defense, Ministry of Finance, Ministry of Agriculture and Rural Development on guiding state management of compensation in legal proceedings.

16. Circular No. 13/2015/TT-BTP dated 29 September 2015 of Ministry of Justice on amending, supplementing some articles of Circular No. 03/2013/TT-BTP dated 31 January 2013 of the Ministry of Justice on guiding the state management on compensation in administrative management sector.

17. Joint-Circular No. 16/2015/TTLT-BTP-BQP dated 19 November 2015 of Ministry of Justice, Ministry of Natural Defense on amending, supplementing some articles of Joint-Circular No. 04/2013/TTLT-BTP-BQP dated 01 January 2013 on guiding the state management of compensation in civil judgment enforcement.

Legal document system on state compensation liability is illustrated in figure 2.1 below.

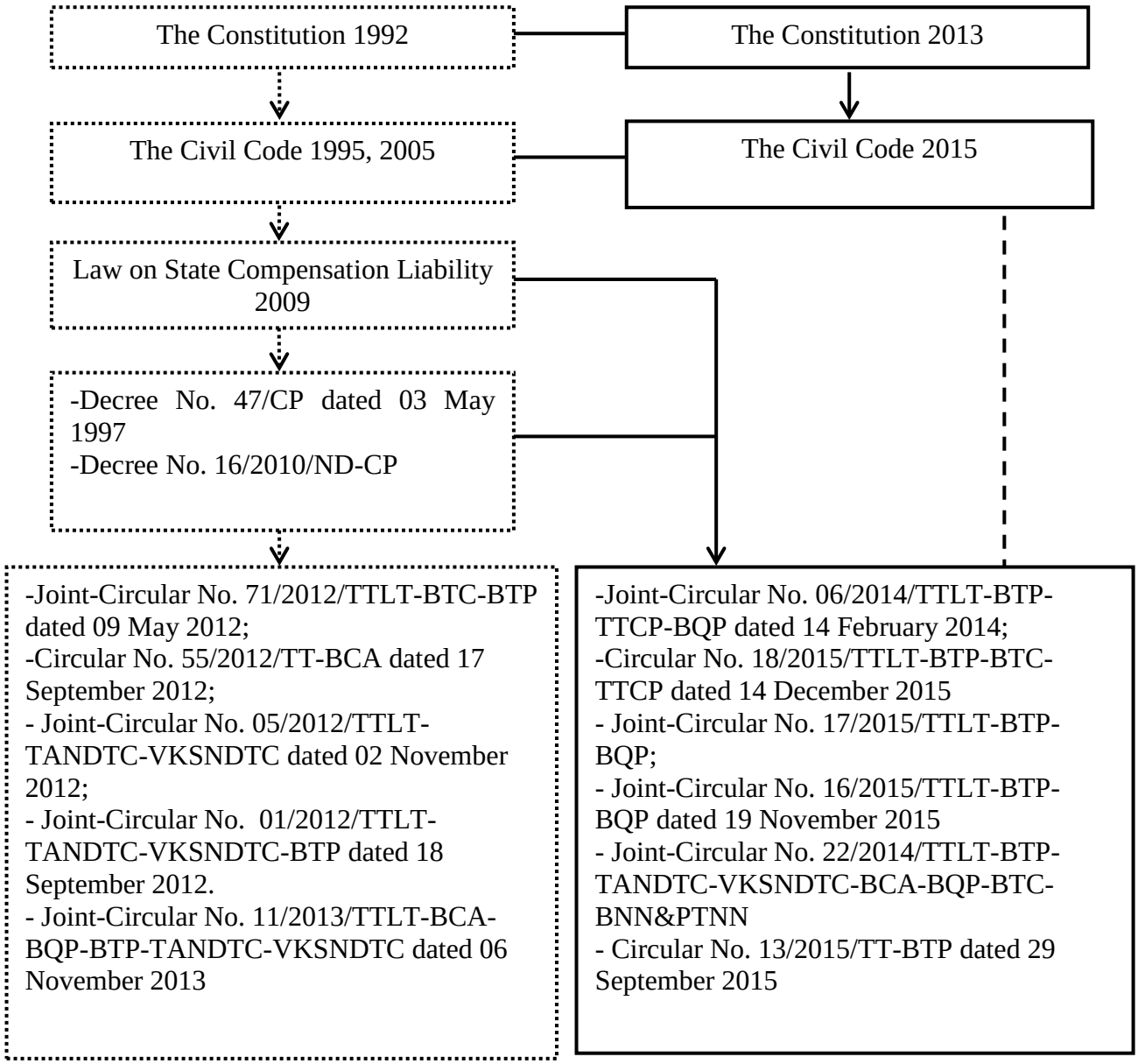

Figure 1: Legal documents on state compensation liability

: expired documents

: effective documents

2.2 Analysis and assessment of existing legal regulations on state compensation liability

The State promulgated a relatively complete law system with various legal documents guiding settlement and state management of compensation in the field of administrative management, proceedings, and judgment enforcement, which has

created legal basis for Ministries, branches and provinces to organize performance of state compensation. These legal documents have initially met the fundamental requirement of state management in all aspects of the social life including the State's liability to pay compensation to individuals and organizations suffering from damage caused by official-duty performers. According to the Civil Code No. 35/2005/QH11, “damage compensation” is only stipulated in some articles without specific implementation guideline for each sector and case leading to difficulties in handling each specific case. From the promulgation of the Law on State Compensation Liability, the settlement of state compensation liability has been implemented in accordance with a specific guideline.

Moreover, the promulgation of Law on State Compensation Liability on constituting the State’s liability for damages caused to individuals and organizations by official-duty performers is essential to meet requirement of a democratic institution State that has been constructed by us.

Legal documents on State Compensation Liability have been enforced effectively; affirmed proper policy of the Party and the Sate in establishing typical mechanism for individuals, organizations, and enterprises to implement the right to request state compensation for damages caused by official-duty performers. Development of legal documents guiding enforcement of the Law has been strengthened. Accordingly, competent authorities have promulgated sufficient guiding documents for the Law, meeting the needs for implementation of actual state compensation liability. Settlement of compensation is implemented more seriously, and request for compensation is handled timely if necessary grounds are collected. Some complicated and long-lasting cases have been settled definitively such as Mr. Nguyen Thanh Chan case (Bac Giang), Mr. Luong Ngoc Phi case (Thai Binh), Dang Thi Thong case (Binh Dinh), Mr. Phan Van La case (Long An), Mr. Nguyen Khac Cong case (Nam Dinh, etc.).

Moreover, state compensation liability has been stipulated in a relatively detailed and comprehensive manner by various legal documents.

To ensure feasibility of legal documents on state compensation, Law on State Compensation Liability has prescribed compensation liabilities through listing the cases that require compensation in the three sectors as follows:

+ Scope of compensation liabilities in the field of state administrative management.

+ Scope of compensation liabilities in the field of proceedings.

+ Scope of compensation liabilities in the field of civil and administrative proceedings.

+ Scope of compensation liabilities in the field of judgement enforcement.

Besides, Law on State Compensation Liability provides detailed stipulation on each type of damage to be compensated, including: damage caused by asset infringement (Article 45); damage due to loss of or decrease in actual incomes (Article 46); damage due to mental suffering (Article 47); material loss due to the death of sufferers (Article 48); material loss due to health damage (Article 49); return of assets (Article 50); honor restoration for sufferers in criminal proceedings (Article 51).

Regarding damage due to loss of or decrease in actual incomes, Law on State Compensation Liability provides detailed grounds to determine incomes of the sufferers. If the average income level cannot be determined, the damages will be determined based on the common minimum wage applicable to state agencies at the time of compensation.

Regarding the Spiritual Damage, the Law prescribes each type of damage, which contributes to determination of proper compensation level.

- Procedure of compensation settlement (Please refer Figure2)

Generally, the procedure to settle compensation claim by compensable-liable agencies is provided in details. Upon receipt of documents affirming the illegal acts of official-duty performers, the sufferers or their relatives shall file compensation claims with compensation-liable agencies. Compensation-liable agencies, after receiving compensation claim dossiers, shall check and determine the validity of the claims and enclosed document; and return compensation claims and guide suffers to file their claims to competent agencies, if the compensation claims do not fall under their responsibility for compensation settlement. Since the acceptance of the dossiers, the

compensation-liable agencies shall be responsible to verify the damages within the prescribed limit of time. In the termination of damage verification, compensation-liable agencies shall organize negotiations with sufferers on the settlement of compensation. It is noted that compensation-liable agencies must issue decision on compensation settlement (regardless of success or failure in negotiation). If the sufferers agree with the decision on compensation settlement and waive their right to initiate lawsuit petitions to the Court, the decision shall take legal effect as basis for compensation-liable agencies to carry out necessary compensation procedures to the sufferers. If the sufferers disagree with the decision, they are entitled to initiate lawsuits at competent courts to request the settlement of compensation within the prescribed time limit. Sufferers may not institute lawsuits requesting courts to settle compensation after the compensation settlement decisions have taken effect.

Decree No. 16/2010/ND-CP prescribes appointment of representatives to settle compensation, tasks and powers of the representative (Article 7 and 8), procedures for compensation settlement at compensation-liable agencies (Article 9) with time limits for each specific procedure of compensation settlement; establishment of council to consider reimbursement liability comprising various representatives from relevant organizations, tasks, powers and working method of the Council (Article 13,14,15); determination of the reimbursed amount, issuance of reimbursement decisions, and determination of the reimbursement liability of public-duty performers subject to penal liability examination (Article 16,17,18); handling of public-duty performers who deliberately fail to perform the reimbursement liability (Article 20). The Decree provides relatively comprehensive regulation on state management of compensation, responsibility of Ministry of Justice, other ministries and branches, People's Committees of all level as well as financial assurance in compensation and settlement of compensation, which has contributed to overcome the situation of shifting responsibility to each other by competent authorities leading to prolonged settlement duration and exhaustion for the suffered entities. The Law and Decree shall gradually reduce the situation of spreading and surpassing complaints to various agencies not relevant to compensation settlement.

Compensation-liable agencies: before the promulgation of Law on State Compensation Liability, the implementation of regulations on compensation for damages caused by official-duty performers faced various difficulties, especially the situation of shifting responsibility to each other by state agencies related to damage. Law on State Compensation Liability has detailed the determination of the compensation-liable agencies (Article 14, Article 33 and Article 40). Administrative agencies directly managing official-duty performers who commit damage-causing illegal acts are liable to pay compensation.

According to Decree No. 47/CP, compensation settlement is implemented by a compensation settlement council, of which the working mechanism is unfavorable to the sufferers. (i.e. if the Council can not organize the meeting as prescribed, compensation shall not be settled; the organizational mechanism does not create favorable conditions for specializing compensation settlement, etc.). To overcome the mentioned-above shortcomings, Law on State Compensation Liability has defined that compensation can be settled through legal representative.

Law regulation system on state compensation has some shortcomings and limitations as follows:

The conditions to constitute state compensation case are prescribed in Law on the State Compensation Liability that is so complicated that some compensation cases can not follow. According to Law on State Compensation Liability, state compensation case is only constituted when the sufferers send claims to compensation-liable agencies, followed by a series of conditions for determining validity of the claims including whether they are submitted to the right competent agencies or availability of evidences to determine damages and level of damage for requesting compensation, etc. Normally, state administrative agencies shall not issue “decision on handling of complaint, denouncement” but official correspondence in response to such complaint or denouncement. The decision on handling of complaint, denouncement shall, if issued, only determine whether administrative behaviors or decisions made by the state agencies are right or wrong other than identify which party to be blamed for the faults. As a result, people can not determine the state agencies that they should lodge the claims to. In respect to compensation in proceedings activities, the procedure-

conducting agencies shall provide judgment, if any, that identify faults of the state agencies. Moreover, the actual damages requiring compensation shall also be mentioned in the judgments; while compensation procedures shall follow law regulations on judgment enforcement other than state compensation procedures.

Determination of faults of the state agencies to identify compensation-liable agencies is a difficult issue in the context of current state management activities. According to Law on State Compensation Liability, there is no organization specialized in implementation of state compensation on behalf of all state agencies, and compensation shall be implemented directly by the state agencies causing damages to the people. Moreover, the Law requires determination of faults of individuals for making reimbursement. The fact is that state agencies do not coordinate closely in performance of tasks resulting in difficult determination of agencies that shall take responsibilities for the problems or individuals that make the mistake. Failure in identification of fault-making organizations and individuals means inability to identify the subjects that shall implement state compensation in accordance with the Law.

Determination of damages and compensation level as prescribed by the law show various shortcomings. The Law only prescribes determination of material damages directly caused by fault behaviors of the state agencies other than grounds for determining spiritual damages and other damages arising by such behaviors. Therefore, state compensations are, if requested, not high and people are afraid to confront with the state agencies.

Law on State Compensation Liability stipulates various agencies responsible for state management and handling of compensation other than content, power and responsibility of state management, coordination mechanism, complaint inspection, checking and handling mechanism, implementation of reimbursement liability, etc., reducing validity and efficiency of state management of compensation. The Law does not prescribe the mechanism on inspection, check and monitoring of compensation settlement and implementation of reimbursement liability in the context of various agencies responsible for handling of compensation leading to untimely detection of

mistakes, shortcomings in settlement of compensations in the field of administrative management, proceedings and judgment enforcement.

Practical enforcement of Law on State Compensation Liability shows that many actual damages occurred to sufferers are not considered for compensation due to lack of specific regulations such as costs related to preparation of documents as evidences to request compensation, contract penalty caused to sufferers by illegal decisions, behaviors of the state agencies; loss of interests incurred from the amount that the sufferers should have received in accordance with laws; damages from inability to conduct civil, economic transactions caused by illegal decisions, behaviours of the state agencies; spiritual loss resulting from unlawful dismissal of civil servants; damages related to restoration of legitimate rights and interests other than the compensation amount that sufferers have received.

According to the Civil Code 1995 and now as the Civil Code 2005, the scope of state compensation liability is defined to cover all operational sectors of the State (Legislation, Law Enforcement and Judiciary (Article 619). However, legal documents on the state compensation liability only prescribe state compensation liability in the field of administrative management and judiciary. Accordingly, damages caused by law development activities have not been entitled to compensation by the State. State compensation in the three sectors including administrative management, legal proceedings, and judgment enforcement is implemented in similar procedures; however, the contents of each step may be different in line with characteristics of each specific case.

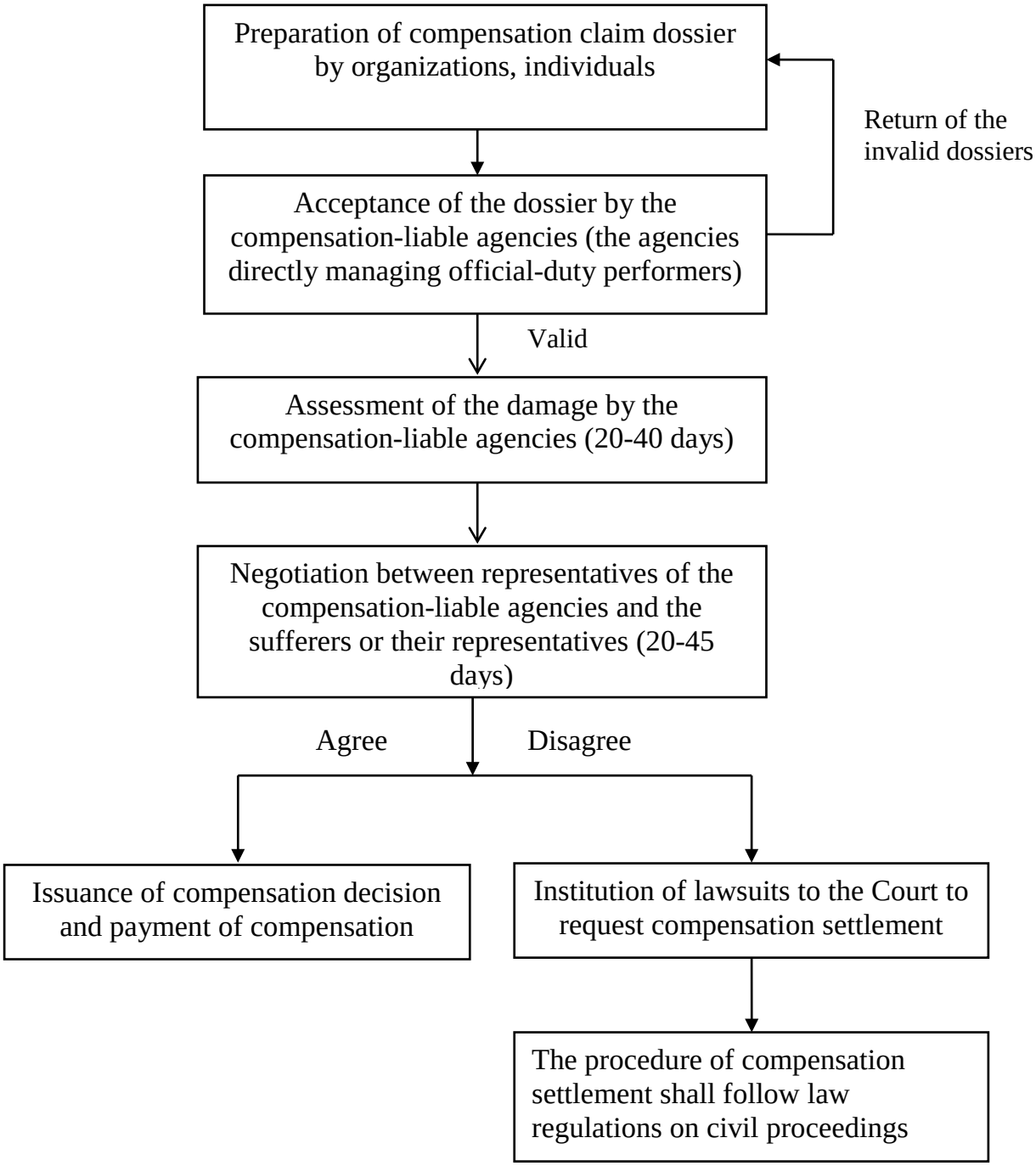

Figure 2: The procedure of state compensation liability settlement

Article 14 of Law on State Compensation Liability provides that administrative agencies directly managing official-duty performers who commit damage-causing illegal acts are liable to pay compensation.

Step 1: Preparation of compensation claim dossier: A compensation claim in the field of civil judgment enforcement shall contain the following principal details:

a) Full name and address of the compensation claimant;

b) Reasons for compensation claim;

c) The extent of damage and the claimed compensation amount

d) A compensation claim must be enclosed with a competent state agency's document affirming the illegal act of the official-duty performer and documents and evidence related to the compensation claim.

Step 2: Handling of compensation claims

- Upon receiving compensation claim dossiers, compensation-liable agencies shall check and determine the validity of the claims and enclosed papers; if the dossiers are incomplete, they shall instruct the sufferers to supplement them.

- Within 5 working days after the receipt of valid compensation claims and papers. If determining that the claims fall under their handling responsibility, dossier-receiving agencies shall handle them and notify sufferers thereof in writing; if the compensation claims do not fall under their handling responsibility, they shall return them and guide sufferers to file their claims with competent agencies for compensation settlement

Step 3: Consideration and handling of compensation claim

- Within 20 days after accepting compensation claims, compensation-liable agencies shall completely verify the damage for use as a ground for determination of compensation amounts. For matters involving many complicated circumstances or to be verified at different places, the verification time limit may prolong but must not exceed 40 days

- Based on the nature and contents of matters, compensation-liable agencies may organize the valuation of property, examination of property damage, examination of health damage or acquire opinions of relevant agencies on the settlement of

compensation. Expenses for such valuation and examination shall be covered by the state budget

- If sufferers disagree with valuation or examination results and request re-valuation or re-examination, which is agreed upon by compensation-liable agencies, re-valuation or re-examination costs shall be paid by sufferers, unless valuation or examination results prove that re-evaluation or re-examination requests are grounded.

Step 4: Negotiations on compensation

- Within 30 days after the end of damage verification, compensation-liable agencies shall organize negotiations with sufferers on the settlement of compensation. If matters or cases involve many complicated circumstances, the negotiation time limit may prolong but must not exceed 45 days

-Participants in negotiations will be representatives of compensation-liable agencies and sufferers or their lawful representatives. When necessary, damage-causing official-duty performers will be invited to participate in negotiations.

Representatives of compensation-liable agencies must be persons competent to reach compensation agreement with sufferers and take responsibility before their agencies.

- Negotiation results must be recorded in written minute with signatures of the involved parties.

Step 5: Institution of lawsuits to the Court

Upon disagreement with the compensation settlement decisions, the sufferers shall be entitled to initiate lawsuits at competent courts. In this case, the lawsuit petition shall contain following contents:

a)Request for affirmation of the illegal act of the official-duty performer concerned;

b) Details of the compensation claim;

c) The damage and compensation amount;

d) Documents and evidence related to the compensation claim.

The procedures for settlement of compensation claims in the course of settlement of administrative cases comply with the law on procedures for settlement of administrative cases.

2.3 Study on procedure of settling some specific cases on state compensation liability

According to synthesized reports of ministries, branches and provinces, compensation-liable agencies have processed 258 compensation request cases since 31 December 2015, of which 204 cases have been handled (79%) with the total compensation amount of VND 111,149,416 thousand. In addition to settlement of compensation by compensation-liable agencies, the People's Courts at all levels have received 51 civil lawsuits on state compensation (the cases that sufferers disagree with compensation settlement decision by compensation-liable agencies and initiate lawsuits at competent courts to request the settlement of compensation as prescribed in Article 22 of Law on State Compensation Liability) including 39 completed cases with the compensation amount of VND 32,529,484 thousands and 12 on-going cases. The details on request for compensation and settlement of compensation in each sector are described as follows:

a) Administrative management

Administrative management agencies have handled 57 compensation request cases including 45 cases that compensation is applied (78.9%) with the total state compensation amount of VND 12,742,442 thousand and 12 on-going cases. The sectors occurring high number of compensation cases comprise tax, land, settlement of administrative violation[1].

b) Legal proceedings

Legal proceedings agencies have received and handled 163 cases including 133 resolved cases (81.5%) with the total state compensation amount of VND 56,759,384 thousand and 30 on-going cases.

- In criminal proceedings: the courts at all levels have processed, handled 38 cases including 32 closed cases with the total compensation amount of VND 37,772,742 thousand (including VND 7,272,247 thousand paid to Mr. Nguyen Thanh Chan (Bac Giang); VND 22,977,183 thousands paid to Mr. Luong Ngoc Phi (Thai Binh)) and 06 on-going cases. The Procuracies at all levels have processed and

[1] Some state compensation cases in the field of state management of land were initiated in Binh Duong, Ca Mau, Ninh Thuan, Nghe An; in the field of settlement of administrative violations in Ho Chi Minh, Dac Lak; in the field of tax in Ho Chi Minh, Dong Thap, Phu Yen, Binh Duong and Quang Nam

handled 113 compensation request cases including 93 closed cases with the total compensation amount of VND 16,415,005 thousand and 20 on-going cases. These figures are 11 cases including 07 closed cases with total compensation amount of VND 2,221,637 thousand and 04 on-going cases for the Public Security Sector; 01 case with compensation amount of VND 350 million for Ministry of National Defense (Military Zone III).

c) Judgment enforcement

Settlement of compensation in judgment enforcement activities comprises of criminal judgment and civil judgment. According to statistics by relevant ministries and judgment enforcement management sector, request for compensation is only constituted in the field of civil judgment enforcement, most of which fall in responsibility of judgment enforcement agencies under management of Ministry of Justice. Up to now, the total number of the processed compensation request cases in the field of civil judgment enforcement are 38 cases including 26 closed cases (68.4%) with the state compensation amount of VND 9,118,106 thousand and 12 on-going cases.[2]

Some typical cases on state compensation liability

Procedure in settlement of state compensation to individuals is generally implemented in accordance with the law regulations from establishment of dossiers, acceptance of the dossiers, negotiation, and damage compensation or initiation of lawsuits at courts. Typical cases on state compensation liability are described as follows:

Compensation for Mr. Nguyen Thanh Chan in Bac Giang Province is one of typical cases. To complete procedures to claim compensation for wrongful conviction of Mr. Chan for more than 10 years (the wrongfully convicted person), representatives of his family were required to fill in more than 100 relevant documents. After processing of the dossiers and conclusion of wrong conviction in Mr. Chan case by the People's Court, the Supreme People's Court agreed to conduct negotiation on the

[2] Ministry of Justice, the Summary Report on Six Year of Enforcement of the Law on State Compensation Liability.

compensation amount to be paid to Mr. Chan. The negotiation and settlement of damage compensation were stressful to Mr. Chan and his family.

For example, his family claimed VND 2 billion as compensation for mental damages for Mr. Chan, which was rejected by the Court. After various negotiations, the compensation amount was reduced to VND 1.5 billion; however, the final amount decided by the Court was approximately VND 600 million.

Mr. Chan was compensated of VND 1.5 billion by the Court for the loss of actual incomes during 10 years, which was calculated as 3,699 days (10 days) x VND 410,000. Regarding visitation cost during 10 years, Mr. Chan's family claimed VND 500 million; however, Vinh Quang Prison provided that the actual visitation amount was VND 13,000 VND during 10 years. In comparison with the data provided by the Prison, the Court decided to pay compensation of additional VND 30,000,000 as travelling expenses for Mr. Chan's family, etc. After negotiations between the family of the wrongfully convicted person as Mr. Nguyen Thanh Chan and the Supreme People's Court, the final total compensation amount paid to Mr. Chan was VND 7.2 billion.

Compensation claim for Mr. Nguyen Van Them: According to the legal record, in August 1990, Mr. Them was sentenced to one year in prison, and forced to return 5,000 m^2 of agricultural land for his violation of regulation on land management and protection by the People's Court of Hong Ngu District, Dong Thap Province. One month later, the People's Court of Dong Thap Province canceled the first-instance judgment and transferred the dossiers to the first-instance court level for investigation and re-trial. It is not until early 2020, after the request to review of the case by the Justice Committee of the National Assembly, did the District Public Security issue decision on re-investigation of the case and suspension of investigation against the accused to Mr. Them because "The time limit for extended investigation is expired but it is impossible to prove the accused to have committed the offenses".

Mr. Them claimed compensation for wrongful conviction. The District People's Procuracy affirmed that they were not at fault and the District Public Security claimed compensation for wrongful judgment resulting cancellation of the case by the District People's Court. The complaint became acrimonious; however, the Supreme People's

Procuracy finally issued the document affirming that the Public Security of Hong Ngu District was liable to make compensation for Mr. Them.

Mr. Them filed the lawsuit petition against the Public Security of Hong Ngu District to the People's Court (jurisdiction as selected by the plaintiff). The Court invited two parties for conciliation that was unsuccessfully. The Court based on Clause 2 of Article 192, Point i Clause 1 of Article 168, Clause 4 of Article 193, Article 194 and Article 245 of the Criminal Procedure Code; Clause 1 of Article 4, Article 23, Article 26, Article 64 of the Law on State Compensation Liability to issue decision on suspension of settlement process because of insufficient conditions for institution of the lawsuit for the reason that the lawsuit petition filed by Mr. Them did not comprise legal documents of the state competent authorities affirming illegal acts of the official-duty performers. Upon disagreement with this decision, Mr. Them applied the appeal petition.

Wrongful case of Mr. Luong Ngoc Phi in Thai Binh Province: On 27 November 2015, the People's Court of Thai Binh Provincce issued the decision to suspend appellate trial of the wrongful case in Thai Binh Province for Mr. Luong Ngoc Phi (68 years old, residing at No. 463 Ly Thai To, Group 16, Quang Trung Ward, Thai Binh City) as the former director of Hoa Binh Agriculture and Seafood Import and Export Company. Mr. Phi was prosecuted for appropriation of public property and tax evasion in April 1998, and sentenced to 17 years in prison by the People's Court of Thai Binh Province.

Until 2001, the People's Procuracy of Thai Binh Province officially recognized his wrongful conviction and released Mr. Phi. The People's Court of Thai Binh Province openly apologized Mr. Phi at his residence. Then Mr. Phi sued the agencies that make wrongful conviction, which was tried in various trial sessions and at various levels.

In 10 August 2015, the People's Court of Thai Binh Province had to pay an amount of more than VND 22.9 billion to Mr. Phi. Although two parties filed appeal, the appeal petitions were then withdrawn. Mr. Luong Ngoc Phi was officially proved of his innocence after 17 years in prison and 15 years of claiming the ever highest compensation amount.

Through analysis of some typical cases mentioned above, it is possible to draw some conclusions as follows:

- The state compensation liability cases arise in three sectors including administrative management, legal proceedings and judgment enforcement.

- The wrongfully convicted persons request the competent authorities to make compensation for spiritual, physical, life and property damages. In many cases, the state management agencies have to pay a high compensation amount to the sufferers.

- Calculation of damage level as well as determination of compensation amount is based on the spirit of negotiation, despite difficulties in reaching consensus and agreement between the sufferers and the compensation-liable agencies.

Conclusion

State compensation refers to the state's liability to pay compensation to individuals and organizations suffering from damage caused by official-duty performers during their implementation of functions, tasks assigned by the State. The State compensation liability is an alternative legal responsibility, in which the State is liable to pay compensation if the governmental officers, public servants commit violation of the laws during their performance of official duties causing damages to legitimate rights and interests of the citizens and organizations.

Basically, the state compensation mechanism is stipulated in the principle of non-contractual damage compensation by the civil laws (the sufferers may or may not claim compensation and the claimed compensation amount must not be higher than the actual damage). Determination of damage and compensation level is characterized by civil relation, which means equality and accuracy, basing on negotiation and agreement between the damage-causing people and the sufferers. In the state compensation relation, the State is no longer the public power holder in the "command-obedience" relationship but takes a role as an involved party of a private relation. In this connection, the State shall not have administrative power but be a civil actor that have equal position with the sufferers in settlement of damage compensation.

Comparing with other sectors, laws stipulating the state compensation liability were developed later with the promulgation of Decree No. 47/CP on 03 May 1997 that is an important institution expressing the democracy, transparency and accountability

in activities performed by the state agencies. Accordingly, the state agencies shall, if violating the laws and causing damages, be liable to pay compensation.

Cases in the field of judicial proceedings are settled by 04 agencies including investigation agencies, control agencies, the courts and judgement enforcement agencies. As a result, it is difficult to determine responsibilities of each agency in the event of wrongful cases, which is a big challenge of the state compensation sector. Ministry of Justice is the state management agency in charge of compensation liability; however, it does not have competence to impose sanctions on delayed settlement of damage compensation.

CHAPTER III. REVIEW, ASESSMENT OF LEGAL DOCUMENTS ON COMPENSATION FOR DAMAGES TO PROPERITES, LIFE AND HEALTH CAUSED BY VIOLATIONS OF LAW ON ENVIRONMENTAL PROTECTION

3.1 Review of legal documents on compensation for damages to properties, life and health

3.1.1. Legal documents stipulating compensation for damages to properties

Properties are infringed by various subjective and objective causes. Before the promulgation of the Civil Code, Circular No. 173/TANDTC dated 23 March 1972 of the Supreme People's Court guiding the trial related to non-contractual damage compensation stipulates that determination of damages caused by infringement of properties shall consider the depreciation of properties from their brand new status to the time of damage. Article 612 of the Civil Code 1995 and Article 608 of the Civil Code 2005 prescribe the assessment of damage caused to properties of organizations, individuals by environmental degradation and pollution as follows: "In the event of an infringement of property, the compensable damage shall comprise: (i) property which was lost; (ii) property which was destroyed or damaged; (iii) Interests associated with the use and exploitation of the property was lost or declined; (iv) reasonable costs for the prevention, mitigation and remedy of the damage".

Interests associated with the use and exploitation of the property are understood as loss of material interests, decline in reasonable incomes caused by degradation of environmental functions and usefulness. They are damages caused to the persons who are allowed to make legal exploitation and use of environmental components, which

are too polluted/degraded to be exploited, used continuously resulting in loss of material interests of the sufferers. In other words, damages to properties and legal interests of organizations, individuals are described as damages to cultivated plants, livestock, expenses related to repair, replacement, prevention and rehabilitation of properties damaged by environmental pollution, degradation; legal interests from exploitation and use of environmental components that should have been entitled to such organizations, individuals if they are not polluted and degraded.

Article 163 of Law on Environmental Protection 2014 (the last Article 130 of Law on Environmental Protection 2004) stipulate damages caused by environmental pollution and degradation including: (i) Deterioration in environmental function and productivity; (ii) Loss of human life and health, properties and legal interests of the organizations, individuals due to the deterioration. Determination of damages caused to human health, life, properties and legal interests of organizations and individuals by environmental pollution and degradation is prescribed in Article 165 of Law on Environmental Protection 2014, which is general other than specific.

3.1.2. Legal documents on compensation for damages to life and health

Infringement to people's life and health is not only subject to penal liability examination in accordance with the Criminal Code but also compensation for damages caused by the acts of violation. If the damages caused to properties can be repaired, replaced by other properties, people's life is invaluable. All citizens are protected of rights to health, which are assured by the State by various legal documents such as the Constitution 1992, Constitution 2013, Law on People's Health, Ordinance on Private Medical and Pharmaceutical Practice …

Before the effect of the Civil Code 1995, the Courts conducted trial of people's life and health infringement cases in accordance with Circular No. 173/UBTP dated 23 March 1997 of the Judge's Committee of the People's Supreme Court in term of handling compensation for damages. Since 01 July 1996, Courts are required to follow the Civil Code 1995. Accordingly, compensation for damages caused by infringement to people's life and health is considered as non-contractual damage compensation responsibility. Article 32 of the Civil Code prescribes rights to ensure safety of life, health and body.

Regarding damages to life, health caused by environmental pollution, the Civil Code 2005 provides ground to identify responsibilities and level of compensation for damages caused by environmental pollution including damages caused by infringement of properties (Article 608), damages caused by infringement of health (Article 609), damages caused by infringement of life (Article 610). However, these regulations are general and difficult to be applied effectively.

To implement this compensation liability, Article 613 of the Civil Code 1995 and Article 609 of the Civil Code 2005 should be based. The damages caused by infringement of health shall cover following expenses and costs:

- Reasonable expenses for treatment, nursing and the rehabilitation of health and/or lost or impaired functions of the victims;

- The loss or reduction of the victims' actual incomes; if the victims' actual incomes are not stable, thus being unable to be determined, the average income earned for the same type of work shall be applied;

- Reasonable expenses and the loss of actual incomes of the persons who take care of the victims during the time of treatment; if the victims lose their working capacity and need people to care for them permanently, the damage shall also cover the reasonable expenses for caring for the victims.

- Depending on the circumstances, the Courts shall determine that the persons who infringe upon the health of others must compensate for damage and pay another sum of money as compensation for their mental sufferings.

Article 614 of the Civil Code1995 and Article 610 of the Civil Code 2005 prescribe the damages caused by infringement upon life including:

- Reasonable expenses for the treatment, nursing and taking care of the victims before they die;

- Reasonable expenses for funeral;

- Support allowances for persons whom the victims have the obligation to support;

- Depending on the circumstances, the Courts shall determine that the persons who infringe upon the lives of others shall have to make compensation for the mental sufferings of the victims' relatives. Differently with the Civil Code 1995, which

prescribes that mental damages are not required to be determined but may be assessed conditionally, Clause 2 of Article 609 and Clause 2 of Article 610 of the Civil Code 2005 consider mental damages as mandatory for being determined. Resolution No. 03/2006/NQ-HDTP dated 08 July 2006 of the Judges' Council of the People's Supreme Court guiding application of a number of provisions of the Civil Code on non-contractual damage compensation provides specific guidance on compensation for spiritual damages. Section II of this Resolution prescribes determination of damages as grounds for determining compensation for damages caused by environmental polluting behaviors. In respect to damages to health, life, and properties caused by environmental pollution, it is necessary to clarify the cause-effect relation between environmental pollution causing behaviors and damages in order to ensure rights for sufferers.

Among these damages, damages caused by infringement upon health and life are divided into direct damages and indirect damages. As guided by the Supreme People's Court, upon the claim of compensation for damages to the life and health, law regulations on determination of damages shall be based for settlement, and the Court shall not distinguish direct or indirect damages during the trial process. In term of principles for damage compensation, damage must be compensated in full, which means that such damage must be calculated concretely. According to this law provision, damage caused by infringement upon health shall cover 04 types of expenses; therefore, it is necessary to determine scope and level of damage, etc. Damages are necessary to be determined in all cases. Settlement of damage compensation shall base on each specific case, condition to determine the proper compensation amount.

The Civil Procedure Code provides fundamental principles in civil proceedings, procedure and process of initiation of civil cases for the Court to settle civil dispute cases including compensation for damages caused by environmental pollution, degradation and incidents. According to the Civil Procedure Code 2004, dispute related to compensation for damages caused by environmental pollution, degradation and incidents are non-contractual cases. Agencies, organizations shall, within their duties and powers, be entitled to institute a civil case to request the Court to protect the public interests and/or the State's interests in the sector of their mandate.

The Courts shall only accept the civil cases if the lawsuit petitions or claims are filed, and perform settlement within the scope of such petitions and claims. Individuals, organizations instituting lawsuits to protect or request the Court to protect the public interests and/or the State's interests and interests of other people are required to provide evidences proving that their petitions are well-grounded and legitimate. The institution of lawsuits at court to claim compensation for damages caused by environmental pollution, degradation can be implemented at two trial levels including the first-instance court and the appellate court. The Civil Procedure Code details jurisdiction of the courts at all levels as well as procedures to settle lawsuit cases at first-instance and appellate level.

Legal documents on compensation for damages to properties, life and health are summarized as follows:

- The Constitution 1992, 2013
- The Criminal Code 1995, 2005
- The Civil Procedure Code 2004, 2015
- Law on Environmental Protection 1993,2005, 2014
- Resolution No. 03/2006/ND-HDTP dated 08 July 2006 of the Judges' Council of the People's Supreme Court guiding application of a number of provisions of the Civil Code on non-contractual damage compensation
- Circular No. 173/TANDTC dated 23 March 1972 of the Supreme People's Court guiding the trial on non-contractual compensation.

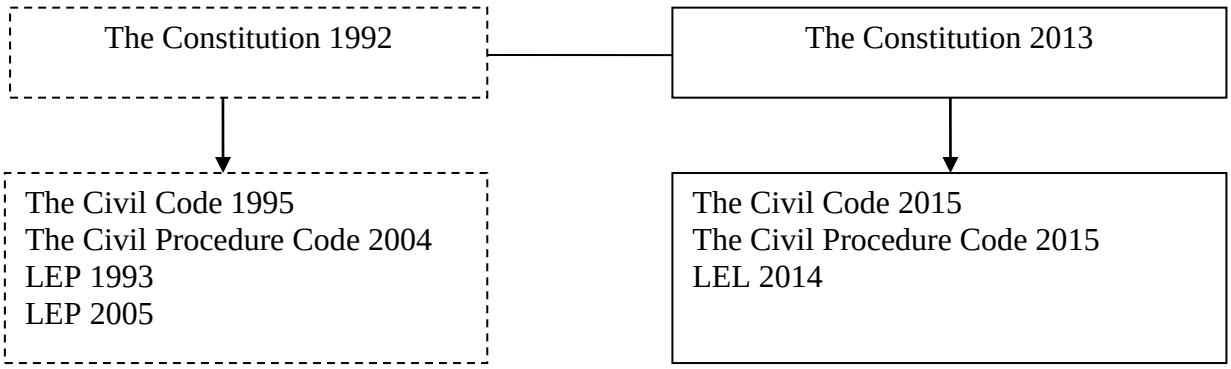

Figure 3. Legal documents on compensation for damages to properties, life and health caused by violations of law on environmental protection

: expired documents

: effective documents

Procedure to settle, claim compensation for damages to properties, life and health caused by violations of law on environmental protection is prescribed in the Civil Procedure Code 2015 (the last Civil Procedure Code 2004). The procedure is illustrated in the following Figure.

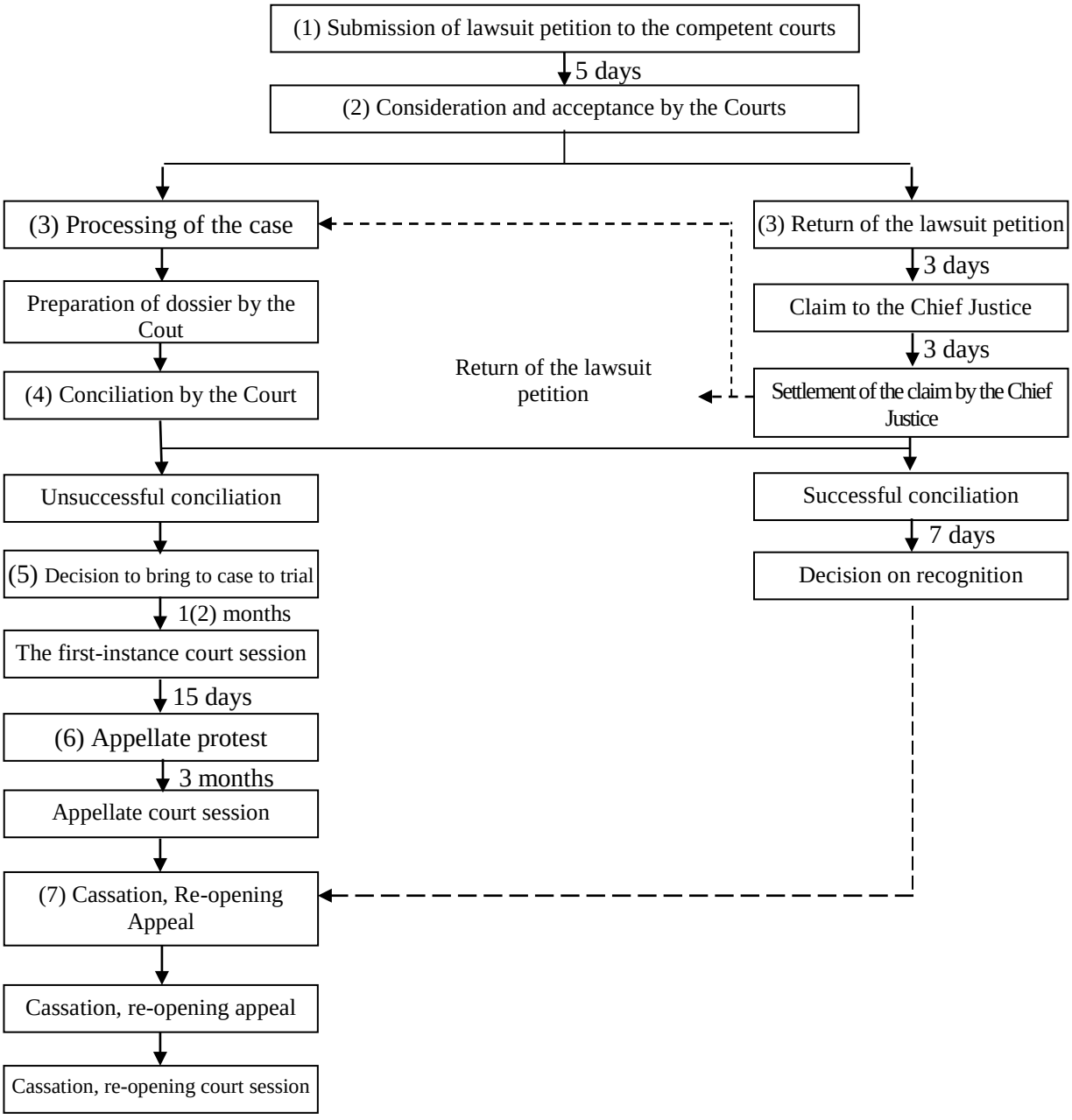

Figure 4: Procedure, process of settlement of compensation for damages to properties, life and health at Court

3.2 Analysis, assessment of legal documents on compensation for damages caused to properties, life and health

With promulgation of the Civil Code, the Civil Procedure Code, regulations on compensation liability for damages to life, health and properties in general and compensation for damage to life, health and properties caused by acts of environmental violation are relatively comprehensive, synchronous and specific against compensation for natural environment damage. These legal documents have created legal basis for the Courts in settlement of disputes related to compensation liability for damages to life, health and properties contributing to protection of legitimate rights and interests of the actors in civil activities.

In reality, some lawsuits on requesting compensation for damages to life, health and properties caused by acts of environmental violation have been tried successfully by the Courts, which act as deterrent, preventive measures to environmental violations causing damages to life, health and properties of organizations, individuals.

However, these regulations have some shortcomings as follows:

Firstly, according to the law, the determination of compensation for damages to health, life and properties is based on 04 factors, including: (i) there must be damage inflicted; (ii) there must be violation of the law; (iii) there must be a fault committed by the damage inflictor and (iv) there must be cause-effect relation between the inflicted damage and the illegal act(s). However, it is extremely difficult to prove the cause-effect relation between damage and illegal acts causing environment.

Secondly, the current law regulations prescribe that people themselves have to collect evidences about violations causing environmental pollution of damage-causing persons, and determine their damage level to file lawsuit petitions requesting damage compensation. However, it is extremely difficult for people to collect data and evidences because of limited resources in term of time, finance as well as capacity resulting in the fact that people can never initiate lawsuits.

Thirdly, determination and calculation of compensation amount for damages to life, properties are difficult, especially compensation for spiritual damage caused by infringement upon health, life resulted from environment-polluting acts. Point b, Clause 1.1, Section 1 in Part 1 of Resolution No. 03/2006/NQ-HDTP dated 08 July 2006 of the Judges' Council of the People's Supreme Court guiding application of a

number of provisions of the Civil Code on non-contractual damage compensation guides determination of level of spiritual damages of the sufferers provides guidance on determination of spiritual damage level. Accordingly, compensation amount for spiritual damage for mental sufferings caused by infringement of health resulted from environmental pollution shall not exceed 30 months' minimum salary set by the State at the time of compensation for the victim, and not exceed 60 month's minimum salary set the State for the family members of the victims. The victims are not only injured but also subject to serious health damages resulting in physical and spiritual suffering (negative impacts in term of aesthetics, social relationship, occupation, etc.). Spiritual damage is also dependent on social conditions, age, job position, appearance, etc.; therefore, this type of damage is difficult to be quantified.

Fourthly, damages are caused by violation of environmental laws that is committed on the wide scale and affects various sufferers. However, the current law regulations provide that people are not allowed to initiate class action lawsuits to protect their rights. Besides, there are too many lawsuit petitions for competent authorities to process.

Fifthly, damages to life, health and properties of people caused by violations of environmental laws are diversified and complicated; therefore, it is hard to determine damages and damage value. Moreover, regulations on determination of damages and compensation level provided in the Civil Code are general and principal leading to different understanding and application, non-unified settlement between different Judges. As a result, interests of the involved parties are not assured and the damage-causing persons do not make satisfactory damage compensation for the sufferers as judged by the Court.

Sixthly, the Judge's knowledge in environmental field is limited to protect legitimate rights and interests of the involved parties.

Seventhly, regulations on compensation for damages to life, health and properties caused by violations of environmental laws as provided in the Civil Code have various gaps and fail to cover all the requirements incurred in practice. For example, legal regulations that create legal basis for settlement of compensation claims for damages to invisible properties, especially intellectual properties have not been prescribed in the Civil Code, and regulations related to determination of damages caused by damage-

causing individuals, organizations are rarely provided. This situation results in difficulties for the Judges in trial activities, especially the cases related to violations of environmental laws.

3.3 Study on procedures to settle some specific cases on compensation for damages to properties, life and health

- Case of compensation for damage caused by acid sulfate contaminated field in Ho Chi Minh City

The case on claiming compensation for damage caused by acid sulfate contaminated field lasting from 2005 to 2008 between two plaintiffs including Ms. Le Thi Phong and Ms. Dinh Thi Thanh Van residing in Binh Chanh District, Ho Chi Minh City and defendant as Phi Long Company. The details are described below:

- In 1996, Ms. Phong was granted with land use right certificate for the land plot of 8,290 m^2 in Phong Phu Commune of Binh Chanh District.

- In 2002, Ms. Van was granted with land use right certificate for the land plot of 4,126m^2 adjacent to the land plot owned by Ms. Phong.

- In 2002, Phi Long Investment Joint stock Company launched an investment project with the project site located on a part of the two land plots owned by Ms. Phong and Ms. Van without any agreement on compensation paid to them. Then the Company carried out site leveling by acid sulfate contaminated sand without any protective measures. In 2005, a rain flood washed the sand to the fields of Ms. Phong and Ms. Van resulted in acid sulfate contaminated field that could not be cultivated.

- In 2005, Ms. Phong and Ms. Van contacted directly Phi Long Company to request damage compensation; however, the request was not handled properly.

- The plaintiffs (Ms. Phong and Ms. Van) filed petitions to the People's Committee of Phong Phu Commune that then conducted conciliation three times but failed to reach agreement;

- The two plaintiffs initiated lawsuit petitions to claim damage compensation for three years of unable cultivation (from 2005 to 2007) with the total compensation amount of 45 million VND for Mr. Phong and 30 million VND for Ms. Van.

- In 2008, the first-instance court (the People's Court of Binh Chanh District) processed the lawsuit and required Phi Long Company to pay compensation of 30 million VND for Ms. Phong and 10 million VND for Ms. Van;

- The defendant as Phi Long Company applied appeal for the reason that the first-instance court did not make proper application of Article 604 of the Civil Code 2005 and Resolution No. 03/2006/NQ-HDTP. According to the defendant, compensation responsibility of Phi Long Company only incurred when 04 conditions were met: (1) there must be damage inflicted; (2) there must be violation of the law; (3) there must be a fault committed by the damage inflictor and (4) there must be cause-effect relation between the inflicted damage and the illegal act(s). The defendant argued that the first-instance judgment did not prove these four conditions and the plaintiffs failed to fulfill their obligations to provide evidences of damages in order to support their compensation claim. As a result, the defendant requested the Appellate Court to reject the petitions of the plaintiffs;

- The Appellate Court reviewed the evidences provided at the court sessions and pronounced to cancel the first-instance judgment for re-trial in accordance with the first-instance procedures. The reasons were:

First, the first-instance court based on two verification minutes dated 05 September 2008 and 04 November 2008 to require Phi Long Company to pay compensation, while the plaintiffs had stopped agricultural production since three years ago. Moreover, the first-instance court did not verify whether they carried out cultivation and suffered from damages in the previous three years.

Second, the Verification Minutes did not determine that damages resulted from acid sulfate contamination of the rice field were caused by Phi Long Company.

Third, the first-instance court did not request assessment of this issue.

Forth, the plaintiffs could not prove their level of damage and the court only based on certification of the communal Farmer Union for judgment, which was inaccurate and possibly harmed legitimate interests of the two involved parties.

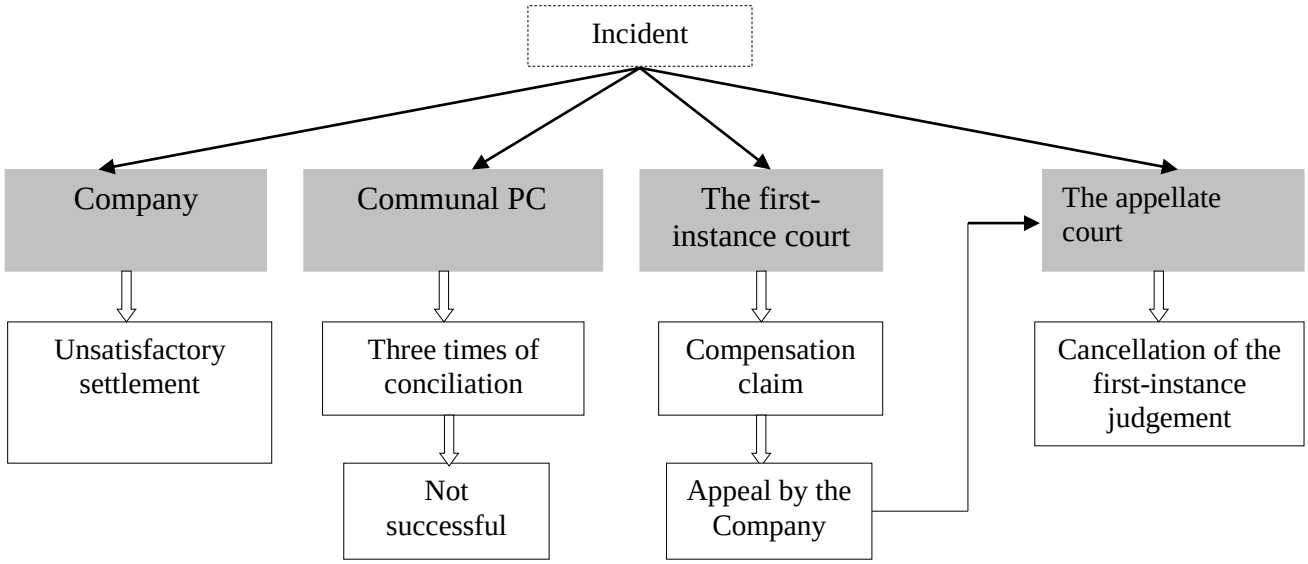

Figure 5: The Procedure on settlement of some specific cases on compensation for damages to properties, life and health including Ms. Phong and Ms. Van case

- Damage compensation case of raw alcohol production facility of Mr. Do Thanh Hung and Ms. Vo Thi Ut My residing in Thuan An Ward, Thot Not District, Can Tho Province

In 2008, Thot Not District of Can Tho Province was fermented by mass fish death including 400 tons of cage fishes farmed by 23 households with the estimated damage value of 6 billion VND. In 2011, damage compensation liability for fish farming households was determined at the first-instance court session on 17 March 2011 by the People's Court of Thot Not District. However, the petitioners did not receive proper compensation or were rejected of compensation claims because the fish farming process and institution of lawsuits at court did not follow fully the law regulations.

On 28 and 29 June 2008, the river section of 22 km length (located in Trung Kien Ward and Thot Not Ward of Thot Not District) was not affected by any environmental incidents other than discharge of 30 tons of sugar molasses to the river resulted from leakage of storage tanks of the Crude Alcohol Production Facility of Mr. Do Thanh Hung and Ms. Vo Thi Ut My located in Thuan An Ward of Thot Not District. Also on those two days, fishes farmed by households in such river section died in mass. The affected fish farming households requested the alcohol facility to make compensation but were rejected. As a result, the affected households filed the lawsuit petitions to the

court. The reason for prolonged litigation was the criminal sign of the case. After collection of evidences and data, the police agency did not have sufficient legal grounds to initiate criminal prosecution and transferred the lawsuit to the court for criminal trial.

The People's Court of Thot Not District conducted conciliation in accordance with the law regulations, which was rejected by Ms. Vo Thi Ut My, the owner of the crude alcohol facility. 12/23 affected households claimed compensation; however, three of them then withdrew the petition. The total compensation amount claimed by the nine remaining households reached more than 2,048,000,000 VND. At the court session, Judge Hoang Ngoc Hanh – the Vice Chief Justice of the People's Court of Thot Not District analyzed that "the incident was caused by poor inspection of production line by Mr. Do Thanh Hung and Ms. Vo Thi Ut My. The high-capacity sugar molasses tanks were designed and constructed by unprofessional people, which were then put in operation without verification and approval of the competent agencies. Illegal acts and unintentional fault in causing leakage of sugar molasses tank led to discharge of sugar molasses to the river causing environmental pollution. Water samples were taken at 24 hours after the occurrence of the incident. According to the natural rules, the water samples did not have original quality as in the time of fish death because of the tide effects. The mentioned-above arguments show that assessment results did not provide proper grounds for subjective conclusion of the cases that required comprehensive consideration of other evidences. The environmental impact system handbook states that increase in organic matters dissolved in water may result in death of fishes, shrimps and other aquatic species. The above grounds and evidences were adequate to conclude that sugar molasses discharged into the river from the production facility of Mr. Hung and Ms. My led to mass death of cage fish; therefore, they were responsible to pay compensation to the plaintiffs in accordance with the Civil Code. However, the production facility of Mr. Do Thanh Hung was small-size business households that cause serious consequences comparing with the short-term and long-term economic capacity at unintentional fault. Moreover, fish cage farmers on Hau River did not make registration as prescribed by the laws, it is necessary to consider the reduction of 50% of the compensation level as stipulated by Clause 2, Article 105 of the Civil Code".

At the court sessions, only five households were entitled to damage compensation with the total amount of more than 751 million VND, while the claims of other four households were rejected because of inability to provide proper evidences and proofs of the damage.

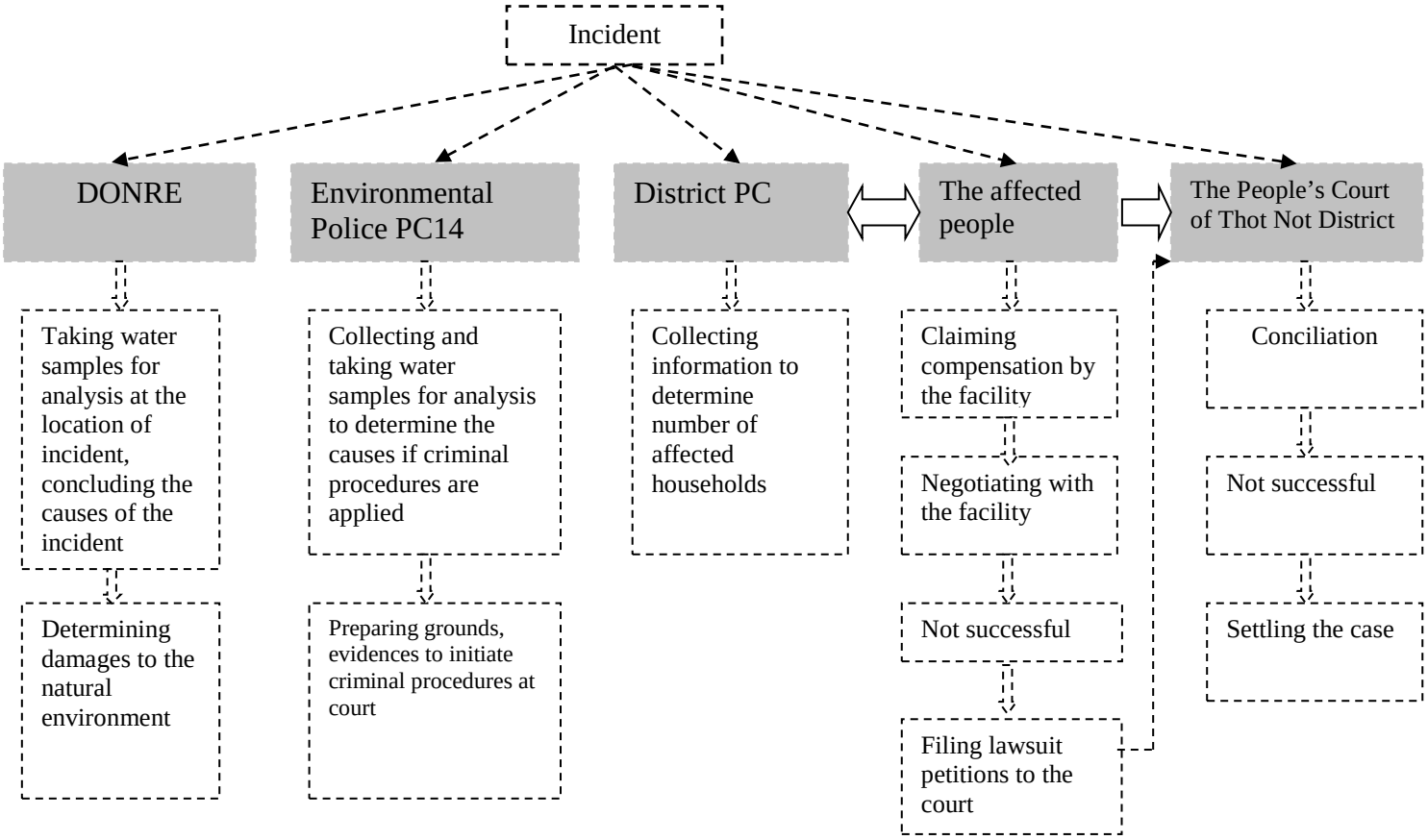

Figure 6: Procedures to settle case of compensation for damages to properties, life and health through Mr. Hung and Ms. My case

Conclusion

The compensation for damage to life, health and property caused by violations of environmental law has been recently related to property damage such as damages to crops and cultivation. To prove the level of damage, the affected people are required to collect data and evidence by themselves, which is the most difficult issue because these people do not afford themselves or hire lawyers to collect data and evidence.

The study on the recent cases settled by the courts show that court agencies have tried to make the trial and judgements on damage compensation; however, the judgements are not reasonable resulting in appeal lodged by the involved parties. The reason is that the relevant parties have not collected sufficient evidences to protect their legitimate rights and interests.

The preservation of evidences for compensation settlement, sampling of pollutants for analysis require expenditure and modern instruments, which is also a difficulty limiting the right to initiate lawsuits of people.

Damages to human health caused by exhaust emission pollution has not been prescribed in detail by the law. As a result, this is also a difficulty and short-coming of the law.

It is difficult to prove relationship between violations of environmental protection laws and consequences of such violations. In reality, there are various subjects committing violations as well as various types of damages.

CHAPTER IV. REVIEW, ASSESSMENT OF LEGAL DOCUMENTS STIPULATING COMPENSATION FOR NATURAL ENVIRONMENT DAMAGE

4.1. Review of legal documents stipulating compensation for natural environment damage

The review of more than 50 legal documents in various sector promulgated from 1945 until now shows that regulations on compensation for damages to the natural environment were initially recognized since 1992 in the following documents:

1. The Constitution 1992, the Constitution 2013
2. Law on Environmental Protection 1993, 2005, 2014
3. Law on Petroleum 1993
4. The Civil Code 1995, 2005, 2015
5. The Civil Procedure Code 2004, 2015
6. The Mineral Law 1996, 2010
7. Law on Water Resource 1998, 2012
8. The Fisheries Law 2003
9. Biodiversity Law 2008
10. Resolution No. 04/2005/NQ-HDTP dated 17 September 2005 of the Supreme People's Court on guiding the implementation of number of provisions of the Civil Procedure Code on "proofs and evidences"
11. Decree No. 175/CP dated 18 October 1994 on guiding the implementation of the Law on Environmental Protection 1993
12. Decree No. 113/2010/ND-CP dated 03 December 2010 of the Government on determination of environmental damages
13. Decree No. 03/2015/ND-CP dated 06 January 2015 of the Government on determination of environmental damages

The Constitution 1992 recognizes environmental protection as constitutional obligation. The Constitution is the foundation of other legal documents. Article 17 and Article 29 of the Constitution 1992 create constitutional grounds for stipulation of environmental protection obligation in other sectors of the economic life. Article 17 of the Constitution 1992 prescribes that "The land, forests, rivers and lakes, water supplies, wealth lying underground or coming from the sea, the continental shelf and the air, the funds and property invested by the State in enterprises and works in all

branches and fields - the economy, culture, society, science, technology, external relations, national defence, security - and all other property determined by law as belonging to the State, come under ownership by all people". Article 29 of the Constitution says: "The State agencies, units of the armed forces, economic and social bodies, and all individuals must abide by State regulations on the rational use of natural wealth and on environmental protection. All acts likely to bring about exhaustion of natural wealth and to cause damage to the environment are strictly forbidden". Moreover, Article 74 of the Constitution 1992 provides: "All acts violating the interests of the State, the rights and legitimate interests of collectives and citizens shall be dealt with severely in time. The person who has suffered loss and injury shall be entitled to compensation for physical damage and reputation rehabilitation".

Basing on the Constitution 1992, a series of other legal documents are promulgated to provide detailed regulations on environmental protection.

The promulgation of the Civil Code 1995 represented a development step in the civil life of people, which prescribes that people have right to live in a healthy environment and are entitled to compensation for damage causing by environment polluting acts. Concretely, Article 628 stipulates that "Individuals, legal persons or other subjects who pollute the environment and thereby cause damage shall have to compensate as provided for by law, except for the fault of the sufferers".

In the Law on Environmental Protection (LEP) 1993, the State of Vietnam has one again affirmed the concern about environmental protection through Article 7 "The organizations and individuals using environment components for production, business purposes are obliged to pay fee of environment use in accordance with legal regulation"; Article 30 "Organizations individuals causing environment degradation, pollution in their production, business activities, are obliged to take overcoming measures in accordance with regulations of the local People's Committee and State management agency on environment protection; and subject to damage compensation liability as prescribed by the law"; Article 52 "Organizations, individuals who are involved in violation of the Law on Environment Protection, who cause damage to the State, other organizations and individuals are obliged to, apart from decisions mentioned in article 51 and 52 of this Law, recover the damages, overcome consequences in accordance with the laws".

According to Article 44 of the Law on Petroleum 1993, “Organizations and individuals conducting petroleum activities, if causing damage to petroleum resources or other natural resources, environment or properties of the State, organizations and/or individuals, shall have to pay compensations therefor according to the provisions of Vietnamese laws”.

In the Law on Minerals, Articles 23, 27, 33 and 46 provide that organizations, individuals licensed to prospect for, exploration, mining, processing, collection of minerals are obliged to make compensation for damages caused by such respective activities.

In respect to the Law on Water Resource 1998, Article 19 and Article 23 prescribe that organizations, individuals licensed to discharge wastewater have obligations to “ carry out wastewater treatment to meet the permissible standard before discharging into the water source, and shall be liable for compensation for damages caused by wastewater discharge”; organizations, individuals licensed to exploitation and use of water resources are responsible to “make compensation for damages caused by the exploitation and use of water resource as prescribed by law regulations”.

Article 26 of Law on Fisheries defines that organizations and individuals engaged in aquaculture activities are obliged to “implement the law provisions on environmental protection”.

As prescribed by Article 75 of the Law on Biodiversity 2008, “Organizations or individuals that infringe upon conservation zones or biodiversity conservation facilities, endemic and valuable crop plant varieties, domestic animal breeds, microorganisms and fungi, species on the list of endangered precious and rare species prioritized for protection or biodiversity corridors shall pay damages in accordance with law”.

LEP 2005 in replacement of LEP 1993 contains many issues related to environmental protection that have been amended, supplemented to meet requirement of environmental protection in the new socio-economic development conditions and the common trend of the world. Besides general stipulations mentioned in Article 4, Article 61, Article 93, Article 127 provides “Any organization and individual who violates the law on environmental protection causing pollution and degradation to the environment shall be responsible for remedying the consequences, restoring the

environment, compensating for the damages in accordance with the laws". Regarding environmental protection in river basin, "the People's Committees of provinces upstream of rivers where such damages occur shall be responsible for collaborating with concerned agencies in organizing the investigation, assessing the extent of damages, and requesting objects that cause such damages to pay compensation therefor, "People's Committees of provinces where waste sources are identified, shall be responsible for taking measures to enforce objects that cause local environmental pollution to fulfill their obligations to remedy and compensate for damages in accordance with the provisions of the law". The organizations, individuals causing environmental pollution shall be responsible to "make compensation for damages as prescribed by the Law and other relevant laws"; "those who commit violations against the law on environmental protection shall, depending on the nature and extent of the infringement, be dealt with administratively, or becriminally prosecuted; and must remedy pollution, rehabilitate the environment and compensate for damages if committed acts of causing environmental pollution, degradation, incidents and damages to other organizations and individuals, in accordance with the provisions of this Law and the other provisions of the relevant laws". Compensation for damage to the natural environment is detailed in Section 2, Chapter XIV: Compensation for damages caused by environmental pollution, degradation.

The Civil Code 2005 in replacement of the Civil Code 1995 shows a development step in assuring the citizen's rights in the field of environmental protection, which prescribes the responsibilities of organizations, individuals committing acts damaging the environment in Article 624: "Individuals, legal persons or other subjects who pollute the environment and thereby cause damage shall have to compensate as provided for by law, even in cases where the environment polluters are not at fault". Article 607 of the same Code states "The statute of limitations for initiating lawsuits to demand for damage compensation shall be two years counting from the date the legitimate rights and interests of individuals, legal persons or other subjects are infringed upon".

The Law on Mineral 2010 continues to prescribe compensation liability for damages caused by mineral exploration and mining activities of mineral exploration and mining organizations, individuals in Articles 42 and 55.

The Law on Water Resource 2012 stipulates compensation liability for damages caused by water resource exploitation, use and illegal wastewater discharge by organizations, individuals in Article 38 and Article 43.

Damage compensation liability is also detailed in Clause 3, Article 63 of the Constitution 2013 "Organizations and individuals that cause environmental pollution, natural resource exhaustion or biodiversity depletion shall be strictly punished and shall rectify and compensate for damage"

LEP 2014 affirms the legal basis for claiming compensation liability for damages caused by the acts causing environmental pollution and degradation in Clause 8 of Article 4: *"Any organization, family household or individual, who causes environmental pollution, emergencies and degradation, is responsible to find remedial solutions, pay damages and assumes other responsibilities as stipulated by law"*, and details regulations on damage compensation in field of environmental protection in Articles from 163 to 167.

The Civil Code 2015 Article 602 continues to provide that "Any entity polluting the environment, thereby causing damage, must compensate in accordance with the law, including when the entity polluting the environment was not at fault". A new provision of the Civil Code 2015 against the Civil Code 2005 is that "The limitation period for initiating legal action claiming compensation for damage shall be two years from the date on which the legal rights or interests of an individual, legal entity or other subject were infringed". According to Article 588 of the Civil Code, this time limit is three years.

Similar to the Civil Procedure Code 2004, the Civil Procedure Code 2015 provides basic principles in civil proceedings, the suing process and procedure for the Court to settle civil cases with dispute on compensation for damages caused by environmental pollution, degradation and incidents. The institution of lawsuits at court to claim compensation for damages caused by environmental pollution, degradation can be implemented at two trial levels including the first-instance court and the appellate court. The Civil Procedure Code 2015 details jurisdiction of the courts at all

levels as well as procedures to settle lawsuit cases at first-instance and appellate level. Agencies, organizations shall, within their tasks and powers, be entitled to institution of civil lawsuits to request the Courts to protect the interests of the public and the State in their management sector, and responsible to collect, provide and submit documents and evidences to the Courts in order to prove that their petitions are well-grounded and legitimate.

Another new provision of the Civil Procedure Code 2015 is the detailing of format and content of the lawsuit petition; supplementation of online submission of lawsuit petition to the electronic portal of the Courts; demarcation of lawsuit petition receipt and handling; clarification and addition of return of lawsuit petitions; detailing of request for amendment and supplementation of the lawsuit petitions; prolonged time limit for submission of petitions and institution of lawsuits, etc. In summary, the suing procedure and process related to civil dispute cases have been amended and supplemented in line with the actual situation, and remedy of shortcomings in application of the Civil Procedure Code 2004.

Decree No. 175/CP dated 18 October 1994 on guiding the implementation of LEP stipulates “Production organizations and businesses are obliged to make compensation or any losses caused by environment damaging acts as stipulated by law”.

Resolution No. 04/2005/NQ-HDTP dated 17 September 2005 of the Supreme People’s Court on guiding implementation of some provisions of the Civil Procedure Code on “proofs and evidences” states “upon request by the Court protecting their legitimate rights, interests, or objection of other people’s request, or protection of the public, the state’s interests or other people’s legitimate interests, the involved parties, litigating individuals, agencies and organizations are required to provide evidences to prove that their requests are groundful and legitimate”

Resolution No. 02/2006/NQ-HDTP dated 12 May 2006 of the Supreme People’s Court on guiding the implementation of the Part II “Procedures for settling cases at first-instance courts” of the Civil Procedure Code prescribes that “bodies, organizations shall be entitled to institute civil cases to protect legitimate rights and interests of other persons, public interests and/or the State's interests” as prescribed in

Clause 3, Article 162 of the Civil Procedure Code when following conditions are fulfilled:

a) The agencies, organizations must have duties and powers in performing functions of state management and social management in a certain field;

b) Public interests and the State's interests must be under the field managed by such agencies and organizations.

For example 1: Natural resources and environmental agencies shall be entitled to institute civil cases to request the Courts to force individuals, agencies, organizations committing environmental polluting acts to make compensation for damages and remedy for incidents causing public environmental pollution".

Decree No. 113/2010/ND-CP dated 03 December 2010 of the Government on determination of environmental damage. *This Decree prescribes the responsibility to claim damage compensation and determination of environmental damage*, covering the collection of data and proof for determining environmental damage, computation of environmental damage, and identification of the liability to compensate for environmental damage caused by pollution or degradation in the cases: Water environment for conservation, daily life, entertainment, production and other purposes is polluted, severely polluted or exceptionally severely polluted; Soil environment for conservation, production and other purposes is polluted severely polluted or exceptionally severely polluted; Natural ecosystems within or without nature reserves are degraded; Species prioritized for protection under law are dead or injured.

Decree No. 03/2015/ND-CP dated 06 January 2015 of the Government on determination of environmental damage continues to provide for responsibility for claiming compensation and assessing environmental damage including: collection of evidence for environmental damage assessment, calculation of environmental damage and compensation amount for environmental damage caused by pollution or degradation. One of the new provisions of Decree No. 03/2015/ND-CP against Decree No. 113/2010/ND-CP is the regulation that "The Ministry of Natural Resources and Environment take charge and cooperate with the People's Committees of provinces in collection and assessment of the evidence for environmental damage assessment caused by the pollution or degradation in the administrative division consisting of at

least two provinces" and supplementation of regulation on members of the Council to assess data, evidence for determination of environmental damage.

The review of legal document system related to compensation for natural environment damages shows that compensation for damages to the natural environment is prescribed in various legal documents from the Constitution, Laws, Decrees, Circulars, and Resolutions of the Judge Committee. Except for Decree No. 03/2015/ND-CP of the Government that stipulates compensation for damages to the natural resources, other legal documents only provide general principles. The mentioned-above legal documents can be illustrated as below:

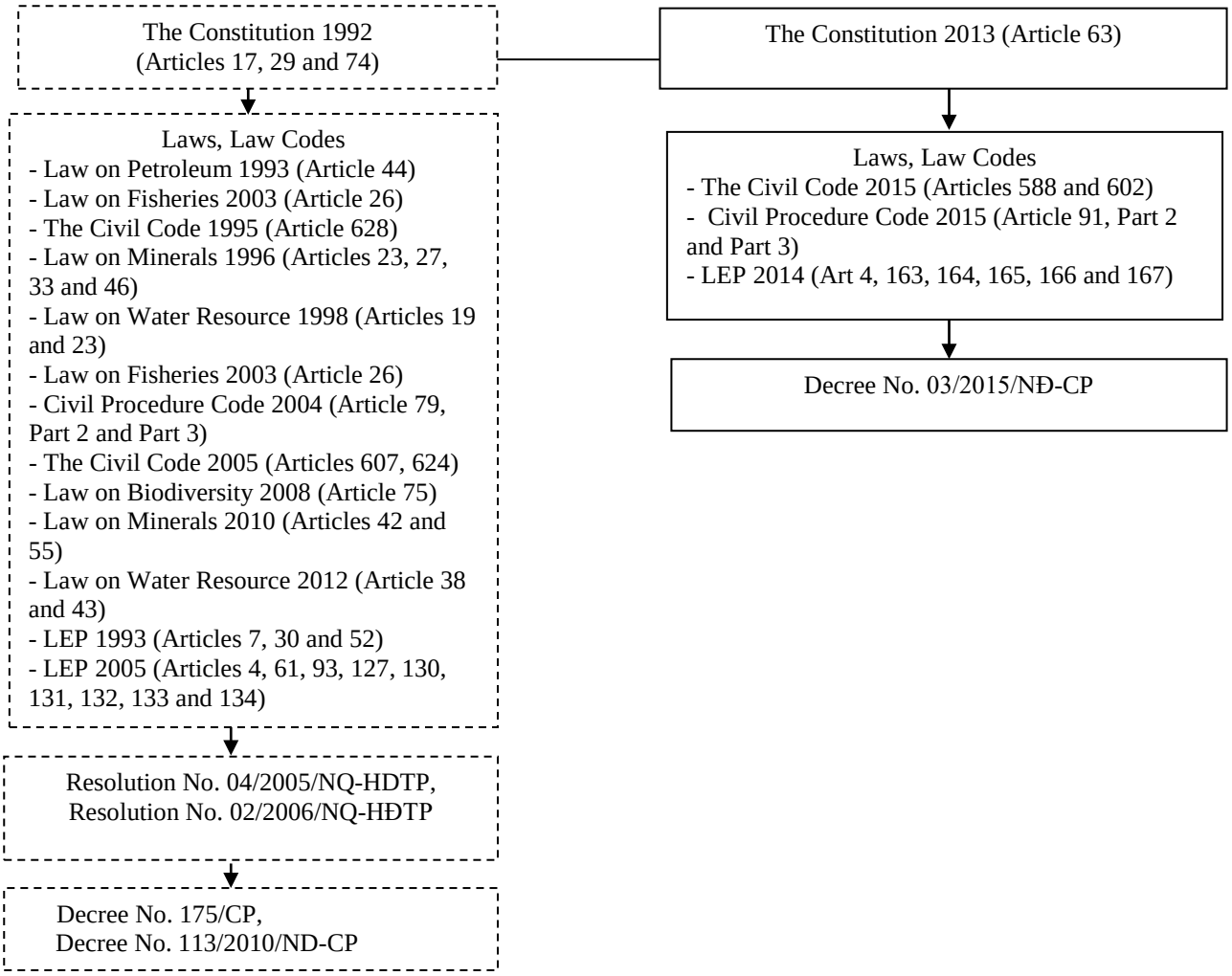

Figure 8: Legal documents on compensation for damages to the natural environment

: expired documents

: effective documents

Legal documents listed in the same block have the equal legal effect. The Vietnamese legal documents are arranged by legal effect as follows: (1) the Constitution; (2) Laws

and Codes; (3) Resolution; (4) Ordinance; (5) Decree; (6) Decision; (7) Circular; (8) Joint-Circular.

4.2. Analysis, assessment of legal regulations on compensation for damage to the natural environment

Compensation may be implemented in three basic methods as follows:

Method 1: Agreement on compensation with the damage-causing person. In legal science, this method is also called as "negotiation". Accordingly, the plaintiff (the sufferer) may file his claim directly to the defendant (damage causing party) and both parties may meet and discuss directly with each other to find out the solution.

Method 2: "Request of arbitration settlement". In this method, the obligee and obligor may ask a third party as arbitration organizations to settle the case.

Method 3: "Initiation of lawsuit at Court". Although Decree No. 03/2015/ND-CP does not prescribe the proceedings procedure for claiming damage compensation; it can be combined with the Civil Code 2005 and the Civil Procedure Code 2004 (amended, supplemented in 2011) to determine civil procedures to be applied for lawsuits on compensation for damages caused by violations of environmental protection laws.

In general, claim for damage compensation for the natural environment caused by violations of environmental protection laws is classified as non-contractual damage compensation. In accordance with the current law regulations,[3] the environmental state management agencies of all levels may negotiate with the damage-causing party to agree on the compensation amount, request arbitration, or initiate lawsuit petitions to the competent courts to protect the legitimate public interests, the interests of the state in the sector under their management mandate; and are responsible to collect and submit documents and evidences to the Court to determine that their claims are groundful and legitimate. The Courts shall settle damage compensation in accordance with the Civil Procedure Code 2004 (amended, supplemented in 2011) and guiding documents (Resolution No. 02/2006/NQ-HDTP dated 12 May 2006 of the Supreme People's Court on guiding the implementation of the Part II "Procedures for settling cases at first-instance courts" of the Civil Procedure Code 2004; Point I.5 of Resolution No. 03/2006/NQ-HDTP dated 08 July 2006 of the Judges' Council of the

[3] Article 25 of the Civil Procedure Code 2004 (amended and supplemented in 2011).

People's Supreme Court guiding application of a number of provisions of the Civil Code on non-contractual damage compensation, Resolution No. 04/2005/NQ-HDTP dated 17 September 2005 of the Supreme People's Court on guiding the implementation of number of provisions of the Civil Procedure Code 2004 on "proofs and evidences").

When the petition for damage compensation is processed by the courts, the Courts shall perform the settlement in accordance with the proceedings procedure and process prescribed in the Civil Procedure Code 2004 (amended, supplemented in 2011) and the Civil Procedure Code 2015 from 01 July 2016. Accordingly, damage compensation cases shall experience various procedures such as pre-trial conciliation, first-instance trial. However, most of the cases are only completed after appellate trial. Many cases may, regardless of appellate trial, be reviewed and settled in accordance with cassation and re-opening procedures. In the cases the obligors are not voluntary to pay compensation after the effect of the courts' judgment, the obligees may request intervention of the civil judgment enforcement agencies to adopt necessary measures (including coercive enforcement measures).

Until now, there is no court specialized in settlement of environmental damage compensation as well as specific procedure on handling of environmental compensation in Vietnam. Some proceedings procedures applicable in some other countries such as class action, proceedings by civil social organizations in the field of environment have not been prescribed by Vietnamese laws.

Some achievements

In the recent years, competent authorities of Vietnam have promulgated many legal documents governing damage compensation in general and damage compensation for the natural environment in particular. In accordance with the current law regulations, compensation for damages caused by violations of environmental protection is classified as non-contractual damage compensation.[4] This concept is used in Vietnam and stipulated in the Civil Code. Therefore, claims of damage compensation caused by violations of environmental protection laws are firstly settled in accordance with regulations on non-contractual damage compensation of the Civil Code 2005 (Articles 604, 624) and then the Civil Code 2015 (Article 584 and Article

[4] PhD. Vu Thu Hanh and co-workers, *Rights to initiate lawsuit petitions on compensation for damage caused by violations of environmental laws in Vietnam: legal grounds and procedures* (The PanNature, 2011) page. 3.

602) from 01 January 2017. The procedures, process of initiation of lawsuits at court for settlement of compensation claims for damages caused by violations of environmental protection laws are implemented in accordance with the Civil Procedure Code 2004 and shall be implemented in accordance with the Civil Procedure Code 2015 from 01 July 2016. The procedure and process of data and evidence assessment for requesting damage compensation at Court are prescribed in LEP 2014 and Decree No. 03/2015/ND-CP. This issue is stipulated in Article 624 of the Civil Law 2005, Article No. 602 by the Civil Code 2015 and Clause 2, Article 13 of Decree No. 03/2015/ND-CP. In accordance with this regulation, the actors causing environmental pollution shall pay compensation for all damages to the environment, and reimburse all the expenditures of damage determination and implementation of procedures related to damage compensation claim to the advancing agencies, even if the environment-causing persons are not at fault. The agencies responsible for damage compensation claim are composed of two agencies including the people's committees of all levels (communal level, district level, and provincial level) and MONRE. The organizations responsible for evidence collection and assessment comprise the district and provincial people's committees, and MONRE, depending on the scale, and location of environmental pollution and degradation. In cases that the communal people's committees claim damage compensation, they shall be responsible to request the district people's committees to perform data, evidence collection and assessment.

These legal documents have created sound legal grounds for settlement of compensation for damages to the natural environment; prevention, termination and punishment of violations of laws on environmental pollution and degradation.

The new regulations represent the policies of the Party and the State in resolute protection of the interests against environmental violations, especially common interests of the State, which have never been prescribed before.

Some shortcomings and limitations:

Regulations on compensation for damages to the natural environment are prescribed in various legal documents with different legal effects resulting in difficulties for implementation and application by organizations and individuals. Some legal documents only provide general principles, which require specific guidelines for enforcement.

Environmental pollution, degradation and damage may be caused by multiple entities with wide scale of impact and pollution (a river, a field, a lake, a river basin, a sea area, etc.); therefore, determination process of damage-causing entity for requesting compensation is complicated. On other words, it is difficult to prove the cause-effect relationship between the acts of law violation and the consequences.

Damages caused by violations of laws on the natural environment are diverse resulting in diverse consequences. Determination of damage level, collection of evidences and data for damage determination are difficult, while data, evidence collecting devices must be operated by persons with high capacity and knowledge. Moreover, samples should be taken and analyzed properly to remain their original characteristics. These issues have not been detailed by any law regulations.

The current laws stipulate that the state agencies are entitled to hire professional enterprises to collect data and evidences for the sake of damage compensation. However, it is necessary to clarify whether these enterprises are capable enough to render the contract, how they are paid, and whether they are provided with favorable conditions for collection of data and evidence by the compensation-liable entities. The laws stipulate that provincial and district people's committees are responsible for data, evidence collection and assessment; however, it is not detailed by the law that DONREs, District DONREs or any other units under the provincial, district people's committees shall be assigned with this task.

Damage calculation is complicated because there is no regulation on cost norm for treatment of an area, volume, quantity unit of the polluted water or soil to meet the environmental technical regulation; cost norm for restoration of an area unit of the degraded ecology; cost norm for restoration, replacement of a dead individual of the species prioritized for protection; cost norm for rescue, care of an injured individual of the species prioritized for protection.

If the enterprises disagree with the compensation level requested by the compensation-claiming agencies, they shall be responsible to prove that they do not cause environmental pollution or cause less severe environmental pollution. However, the laws have not prescribed the proving method, process and procedure.

In the environmental field of Vietnam, there is no base information and data database; therefore, it is difficult to calculate damage level against the initial environmental status.

Conclusion:

The study and review of legal documents on compensation for natural environmental damages show that:

Recently, competent authorities have been continuously trying to improve the effectiveness of settlement of compensation for damages caused by violations of environmental protection laws through development of law regulations on damage compensation principles, damage compensation responsibility, proving obligations of the involved parties, time limit of initiation of lawsuits to request damage compensation, agency responsible to request compensation for damages to the natural environment, etc.

Besides positive achievements, there are some limitations, shortcomings in settlement of damage compensation since the current laws on damage compensation in this field only provide general principles that are difficult to be applied in reality. Regarding compensation for damages to the natural environment, there is only one legal document that is Decree No.03/2015/ND-CP; however, this document has not been detailed resulting in the fact natural environmental damages occur in almost provinces and cities of the country but are only subject to administrative sanctions other than damage compensation.

To enforce this Decree in practice, the competent authorities of Vietnam need to develop and promulgate the guiding documents such as circular on guiding procedure for implementation of compensation for environmental damages; circular on stipulating selecting criteria and responsibilities of agency providing environmental monitoring and assessment service to collect evidences compensation and environmental damage, and guiding the setting up and operation of councils for data and proof appraisal; circular on stipulating procedure and process to prove that organizations, individuals do not cause environmental pollution, circular on guiding determination of eco-system degradation level; circular on stipulating expenditure for treatment of an area, volume or weight unit of polluted water, soil to meet the technical environmental standards, etc.

The agencies competent to request damage compensation (MONRE, PPC, district PC, communal PC) have not initiated any lawsuits to request damage compensation, which shows that they have not fulfilled their obligations and duties. Therefore, it is necessary to supplement regulation on responsibilities of relevant agencies in requesting compensation for damages of the natural environment. Accordingly, they shall take full responsibility to the law for their failure to implement their obligations and duties.

4.3. Procedure, process to handle compensation for damages caused to the natural environment

About the compensation in environmental field, the Law on State Compensation Liability and related legal documents can be applied. Especially, compensation of damage to human health and life was handled and some experiences exist. Through the analysis of past case, we confirmed possibility and difficulties. Compensation of damage to natural resources can be considered as above mentioned legal theory. And this consideration has sufficient legitimacy in Vietnamese legal system. Of course, this matter has still some difficulties. In new circular, it should take care of these difficulties. For example, about difficulties of identification of cause-effect for handling this matter more easily, there is one idea that narrow the target of next circular. This circular can be applied only in the case of critical violation case.

“According to the Civil Procedure Code 2015 and Decree No. 03/2015/ND-CP, the procedures and process of handling damage compensation for the natural environment are as follows:” because these procedures are prescribed by the current law regulations and can not be put in the proposal section.

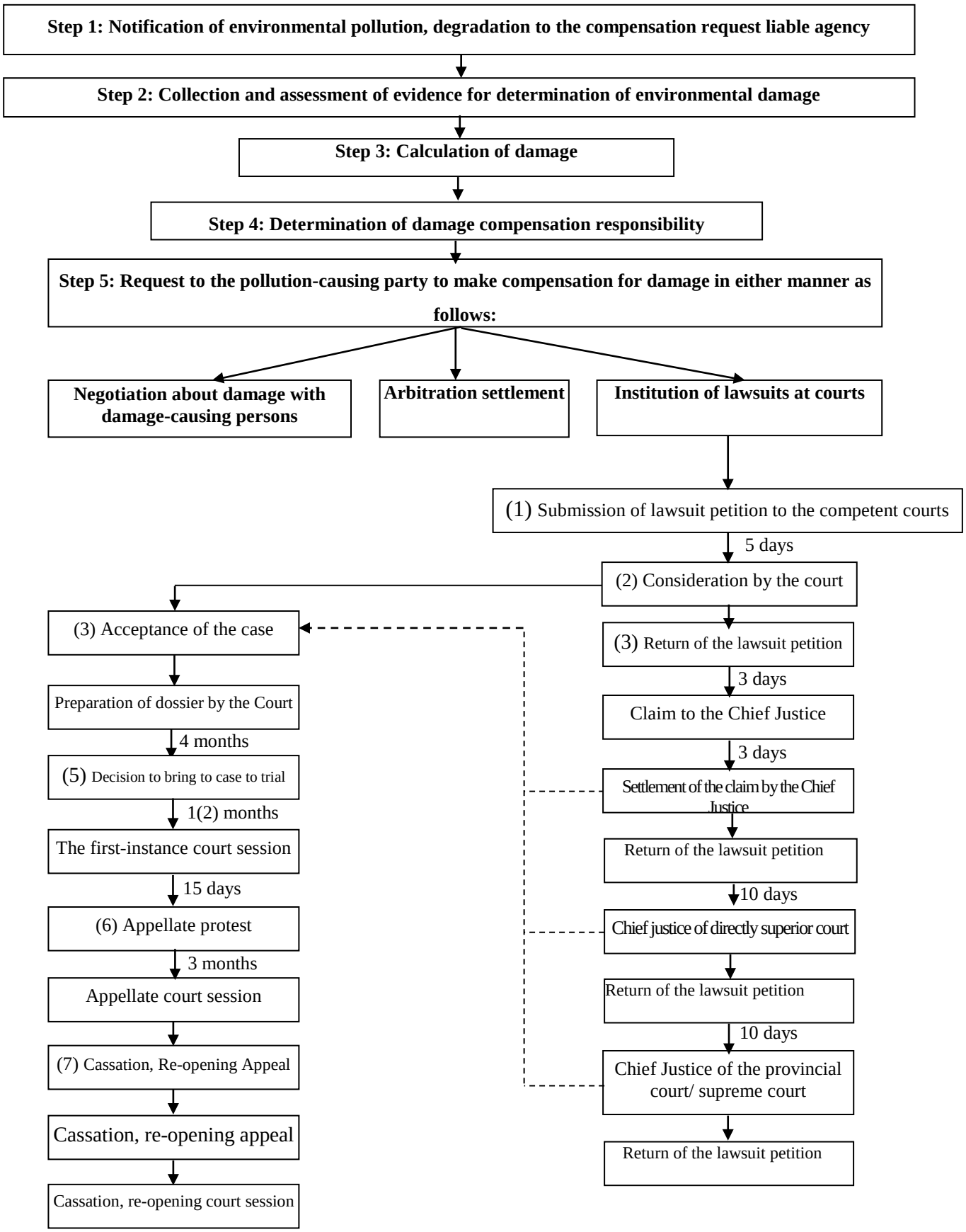

Figure 9: Procedures to settle compensation for damages caused to the natural environment

Step 1: Notification of environmental damages

As prescribed in Clause 1, Article 3 of Decree No. 03/2015/ND-CP, the People's Committees, organizations or individuals detecting signs of environmental pollution and degradation shall notify the authority in charge of claiming environmental compensation.

Step 2: Collection and assessment of evidence for determination of environmental damage

As prescribed in Clause 3, Article 3 of Decree No. 03/2015/ND-CP, the state agencies competent to collect, assess data and evidence for determination of damages comprise:

The District People's Committee shall collect and verify the data, evidence for environmental damage assessment caused by the pollution or degradation in the district, except for the cases under authority of the People's Committee of Province;

The provincial People's Committee shall collect and verify the evidence for environmental damage assessment caused by the pollution or degradation in the administrative division consisting of at least two districts, except for the cases under authority of Ministry of Natural Resources and Environment (MONRE);

The Ministry of Natural Resources and Environment (MONRE) shall lead and cooperate with the People's Committees of provinces in collection and assessment of the evidence for environmental damage assessment caused by the pollution or degradation in the administrative division consisting of at least two provinces and cities under central management.

In respect to damages caused by environmental incidents, the provincial People's Committee (PPC) shall organize investigation, determination of scope of pollution and damage caused by the environmental incidents in the province. MONRE shall instruct PPCs to organize investigation, determination of scope of pollution and damage caused by the inter-provincial environmental incidents.

The procedures for collection and assessment of evidence for determination of environmental damage are as follows:

- Determine the necessary evidence to assess environmental damage and claim environmental compensation;

- Select the organization providing monitoring, assessment, measure services to collect the evidence; These companies are surely professional companies that must meet all the selecting criteria provided by the law regulations

- Establish the Assessment council for the collected evidence

Step 3: Calculation of environmental damage

Agency, as provided in Decree No. 03/2015/ND-CP, refers to the District People's Committee, Provincial People's Committee, MONRE; however, there is no specific instruction that these agencies shall handle the compensation claim by themselves or hire experts, professional companies to do that.

The agencies responsible to collect and assess data and evidence for determination of damages shall, after having collected and assessed data, calculate damages in accordance with the regulation prescribed in Article 11 of Decree No. 03/2015/ND-CP.

Step 4: Determination of damage compensation responsibility

Basing on the collected data and evidences to identify organizations, individuals causing environmental pollution and degradation, agencies responsible for data and evidence collection and assessment shall determine damage compensation responsibility of relevant organizations, individuals, and transfer all the dossiers including data, evidences, conclusions of the data and evidence assessment council, damage calculation results, detailed costs related to determination of damage to compensation-liable agencies.

Step 5: Request to the pollution-causing party to make damage compensation

Compensation-requesting agency shall request individuals, organizations causing environmental pollution, degradation to make compensation for damages in either manner as follows:

- Negotiation on damage compensation with damage-causing party:

The compensation-requesting agency shall send written notice on the damage resulted from the acts of causing environmental damage together with necessary documents, evidences to determine damages, written conclusions of the council for appraising data and evidence, results of damage calculation and determination of damage compensation liability, the detailed expenditure sheet for determination of

environmental damage and request to individuals, organizations causing environmental pollution, degradation to make compensation.

Individuals, organizations that comply with laws on environmental protection, have qualified waste treatment system, and can prove that they do not cause environmental pollution or degradation shall not be subject to compensation for environmental damage or relevant expenditures related to determination of damage and implementation of procedures to request compensation for damage.

- Arbitration settlement

The compensation-requesting agency and the pollution-causing individual/organization may agree on settlement by a third party as arbitration organizations. The arbitration decision shall be the ground to settle the case, if agreed by both parties. In case either or both parties disagree with the arbitration decision, the case shall be filed to the court for settlement

- Institution of lawsuits at courts

Compensation-request agency shall prepare dossier to request compensation for damage (data, evidence to determine damages, Minute on Conclusion of the Council for Appraising Data, Evidence to determine damage and damage compensation liability, detailed expenditure sheet for determining environmental damage) and lawsuit petition in the form provided by the court to claim compensation for damages caused to the natural environment.

(1) Submission of lawsuit petition to competent courts

- Lawsuit petition

Agencies representing the natural environment damaged by environmental violations shall be responsible to prepare the lawsuit petition. Legal representatives of such agencies shall insert their signatures and stamps at the end of the lawsuit petitions. A lawsuit petition must contain main contents including date of preparation; the competent courts handing the lawsuit; name, address and working place of litigators; name and address of the person who is sued; the persons having rights and obligations related to the lawsuit; specific matters requested to be settled by the court; arguments to prove that the lawsuit petition is well-grounded: lawsuit petition to request compensation for damages or termination of violations on environmental laws, legal basis and supporting documents and evidences. The lawsuit petition should be attached

with documents and evidences to prove that the lawsuit petition is well-grounded and lawful.

- Determination of competent courts for submission of lawsuit:

+ The courts of the localities where the defendants are headquartered, if the defendants are agencies or organizations shall settle the case. If disputes arise from operations of their branches, the plaintiffs can request the courts of the localities where such organizations or their branches are located to implement the settlement.

+ The courts of the localities where the defendants reside or work or are headquartered or locations occurring the damages shall have jurisdiction to handle the lawsuit petitions.

- Submission of lawsuit petition:

Persons who institute cases shall forward their lawsuit petitions and the accompanying documents and/or evidences to courts competent to settle their cases directly or by post or through the electronic portal of the Court (if any). The date of initiating a lawsuit shall be the date on which the lawsuit petition is filed at court or the postmarked date of sending the petition or the date of electronic submission. However, litigators are recommended to file the lawsuit petition directly or through electronic portal, or by certified mails.

(2) Consideration of lawsuit acceptance by the Court

- The courts to consider the conditions for lawsuit processing

As receiving lawsuit petitions lodged by natural resource and environment agencies directly or via post, the courts must record them in the petition registers. Within eight working days as from the date of receiving the petitions and attached documents, the courts must consider and decide whether the lawsuit petitions are eligible for processing. The Courts shall consider the documents to determine whether the litigators have legal status to perform right of case institution, whether all necessary conditions are satisfied for filing lawsuit petitions to courts, or whether dispute case has been settled in form of effected judgment or decision by the Court, or whether the time limit of case initiation is valid.

+ *Litigators must have legal status for exercising the suing rights:* the People's Committees of all levels, MONRE are entitled and responsible to litigate civil cases to request the Court to force the individuals, bodies, organizations causing environmental

pollution to make compensation for damage and overcome environmental incidents on the base of the polluted location.

+ *The cases have not been settled by an effected judgment and decision by the Court.* In the lawsuit petition, the litigator must specify that the case has not been settled by any courts. However, it is noted that if the litigators filed lawsuit petition to the Court requesting settlement of compensation for environmental damages or termination of violations, and the Court issued decision on suspension of settlement of the civil case for the reason of "withdrawal of lawsuit petition by the litigator" or "absence of the plaintiff even being summoned officially for the second time", they shall be entitled to re-initiate such civil case[5].

+ The time limit for initiating lawsuits has not expired. In accordance with the current law, the time limit for initiating lawsuits to demand for damage compensation shall be three years counting from the date the legitimate rights and interests of individuals, legal persons or other subjects are infringed upon. Therefore, rights of the sufferers damaged by environmental pollution shall not be considered by the Court upon the expiry of such time limit.

- Receipt and request for amendment and/or supplementation of lawsuit petitions by courts

If the lawsuit petitions are legitimate and litigators have provided all necessary documents and evidences, the Courts shall proceed the further steps for processing of disputes. In cases where a lawsuit petition does not fully contain the details as prescribed by relevant regulations, the court shall notify such to the litigator for amendment and/or supplementation within a time limit set by the court, which, however, must not exceed thirty days; for special cases, the court may extend that time limit but for not more than fifteen days. In cases where the litigators have amended and/or supplemented their lawsuit petitions strictly according to regulation, the courts shall continue processing the cases; if they fail to amend and/or supplement their lawsuit petitions as requested by courts, the courts shall return the petitions as well as documents and evidences to the litigators.

(3) Return of lawsuit petitions

[5] In accordance to Resolution No. 02/2006/NQ-HDTP dated 12/5/2006, the plaintiff is entitled to initiation of lawsuits within the stipulated time limit. However, the Law on amending and supplementing some articles of the Civil Procedure Code 2011 does not consider time limit as a condition of lawsuit initiation. Therefore, this issue is pending specific instruction from the competent agencies.

According to Article 192 of the Civil Procedure Code 2015, the Courts shall return the lawsuit petitions in the following cases:

- The petitioners have no right to initiate a lawsuit or do not have full civil procedure act capacity.
- The matters have been resolved by effective judgments or decisions of courts or legally binding decisions of competent State agencies, except for exceptions.
- There are not sufficient conditions to initiate lawsuits.
- The cases do not fall under the courts' jurisdiction.
- The time limit for court fee payment is expired (7 days from the date on which the litigators receive not official notice on payment of court fees) but the litigators do not submit court fee payment receipts to the Courts, provided that the litigators are exempt from, or not required to pay, court fee advances or court fees or can not pay the fees due to objective obstables or force of majeure.

In accordance with the Ordinance on Court Costs and Fees dated 27 February 2009 and effected from 01 July 2009, agencies and organizations which file civil lawsuits to protect rights and legitimate interests of other persons, public or state interests are not required to pay court cost advances and court costs (clause 2, Article 10); therefore, civil lawsuits requesting compensation for natural environmental damages are exempted of court costs.

The Court can only return the lawsuit petitions with grounds prescribed by law regulations. To reduce misuse of authority by civil proceedings officers, clause 2 of Article 192 of the Civil Procedure Code 2015 prescribes that “when returning lawsuit petitions, the judges shall make written documents enclosed therewith, clearly stating the reasons therefor and send to procuracies of the same level. The lawsuit petitions and supporting documents, evidences returned to the litigators by the Judges must be duplicated and filed at the Courts as the ground to settle complaints and petitions as requested.

Within ten working days as from the date of receiving the lawsuit petitions and accompanying documents as well as evidences, which are returned by courts, the litigators may file their complaints, and the Procuracy may lodge petitions to the court which have returned the lawsuit petitions. After receiving complaints on return of

lawsuit petitions, the Tribunal presidents are responsible to assign another judge to consider and settle the claims and complaints.

Within 04 working days from the assigned date, the Judge shall open the meeting session to consider and handle the claims. The session shall be participated by representatives of the Procuracies at the same levels and the involved parties. In cases the involved parties are absent from the session, the Judge shall proceed the session.

Basing on the documents and proofs related to return of lawsuit petitions, comments of representatives of the Procuracies and the involved parties attending at the meeting session, the Judge shall issue one of the following decisions:

- To uphold the return of the lawsuit petitions and notify to the involved persons and the Procuracies of the same level;
- To receive back the lawsuit petitions and accompanying documents as well as evidences in order to process the cases.

Within ten days as from the date of receiving decision on response to the complaints about the return of lawsuit petitions, the litigators shall be entities to lodge complaints, and the Procuracies entitled to request the Chief Justice of the immediate superior court to carry out the settlement.

Within ten days as from the date of receiving the complaints about the return of lawsuit petitions, the Chief Justice of the immediate superior court must issue one of following decisions:

- To uphold the return of the lawsuit petitions
- To request the first-instance courts to receive back the lawsuit petitions and accompanying documents as well as evidences in order to process the cases.

The decision on settlement of complaints by the Chief Justice of the immediate superior court shall become valid for enforcement and be sent immediately to the litigators, the Procuracies of same level, the Procuracy making the petition and the Court issuing the decision on return of lawsuit petitions.

In cases there are grounds to determine decisions made by the Chief Justice of the immediate superior court as prescribed in clause 6 of this Article violate the laws, within 10 days as from the date of receiving decisions, the involved parties are entitled to lodge a complaint and the Procuracy entitled to file petition to Chief Justice of the People’s Senior Court, if complained decisions are issued by the Chief Justice of

Provincial People's Court, or the Chief Justice of the People's Supreme Court, if complained decisions are issued by the Chief Justice of the People's Senior Court.

Within ten days as from the date of receiving complaints of the involved parties and petition of the Procuracy, the Chief Justice shall be responsible to settle the case. The decision issued by the Chief Justice shall be the final decision.

(4) Acceptance of the lawsuit cases

After receiving lawsuit petitions and accompanying documents and/or evidences, if deeming that the cases fall within their jurisdiction, the judges of such courts shall process the cases.

With 03 working days from the acceptance of the case, the Judge is responsible to send written document notifying that the lawsuits have been processed by the courts to the plaintiffs, defendants, organizations, agencies, individuals have rights and obligations related to the settlement of the lawsuits, and the Procuracies of the same level.

- Some remarks to litigators as the lawsuits are accepted by the courts

Time limits for preparation for trial of non-contract compensation cases in general and compensation for natural environment damage is four (04) months from the date of acceptance of the cases. In this case, litigators are required to carry out specific activities as follows:

- *Supplementation of evidences, documents.* If the involved parties could not submit sufficient documents and evidences for objective reasons, they shall be required to supplement such documents and evidences to prove that their lawsuit petitions are well-grounded and lawful. Other documents shall be supplemented by litigators as requested by the Courts. In this case, litigators must submit written documents to explain the reasons for their inability to submit necessary evidences and documents timely to the Courts. The courts may adopt one or some measures to collect evidences as prescribed by the laws, including: 1) Taking testimonies of the involved parties, witnesses; 2) Conducting confrontations between involved parties and witnesses; 3) Calling expertise; 4) Valuating the properties; 5) Making on-site inspection, appraisal; 6) Authorizing the collection of evidences; 7) Requesting individuals, agencies or organizations to supply readable, audible and/or visible materials, or other exhibits related to the resolution of civil cases.

- *Preparation of arguments to reject counter-claims of the defendants.* Within three working days as from the date of receiving the cases, the courts must send written notices to defendants, individuals, agencies, and organizations with rights and obligations related to the settlement of the cases, to the procuracies of the same level on their acceptances of the cases. Within fifteen days as from the date of receiving the notices, the notified persons must submit to courts their written opinions on the litigators' claims and the accompanying documents and/or evidences. Therefore, litigators should go to the Court to copy the counter-claims lodged by the defendants as well as supporting evidences and documents used by defendants against their petitions. Basing on these documents, litigators shall consolidate their arguments and supplement evidences and documents to reject arguments made by the defendants.

(5) Organization of meeting session to check the submission, access and disclosure of evidence and conciliation

The Judges shall organize meeting session to check the submission, access, and disclosure of evidences. Prior to the meeting, the Judge should notify of about the time, venue and content of the meeting session to the involved parties, their legal representatives, the counsels that protect legitimate rights and interests of the involved parties. During checking the submission, access to and disclosure of evidences, the Judges shall disclose the documents, evidences contained in the case dossiers, and inquire the involved parties about following issues: 1) Requirement and scope of initiation of lawsuits, amendment, supplementation, change and withdrawal of lawsuit petitions; the issues that have been agreed or those disagreed requiring settlement by the Courts; 2) documents, evidences submitted to the Courts and submission of documents and evidences to other involved parties; 3) supplementation of documents and evidences; request to the courts to summon other involved parties, witnesses, and other litigators at the court session; 4) other issues deemed as necessary by the involved parties.

After presentation by the involved parties, the Judges shall consider arguments and settle requests of the involved parties as prescribed in clause 2 of this Article. If the summoned parties are absent from the meeting session, the Courts shall notify them of the meeting results.

(6) Decisions to bring cases to first instance trial

The Courts shall issue decision to bring the cases to first instance trial. The Courts are required to open the first instance trial sessions within 01 (one) month as from the date of decision to bring the cases to trial, or 02 (two) months in the case of legitimate reasons. During this time, litigators should study documents, evidences and testimonies of the defendants carefully to prepare grounds for protecting their rights during argument process at the first instance court session or ask counsels to protect their rights at the Court. Normally, protective arguments shall concentrate on four factors as grounds for requesting damage compensation including the actual damages, violations on environmental laws by the defendants, defendants' fault in causing damages, cause-effect relationship between violation on environmental laws and damages suffered by the litigators. Civil procedure-conducting persons may, if have any sign of impartiality, be replaced, which requires preparation of documents and evidences as grounds for requesting such replacement at the Courts.

(7) Appeal against appellate trial and appellate court session

- Appeal

In principle of two-level trial, after trial and issuance of the judgment by the First Instance Court, the involved parties shall have the right to lodge their appeals against judgments or decisions of the first-instance courts to suspend or stop the resolution of cases in order to request the immediate superior courts to conduct re-trials according to the appellate procedures. Application for an appeal must have following contents: date of application; full name, address of appellant; the section of judgment or decision of the first-instance court, which has not yet taken legal effect and is appealed; the reason(s) for appealing and the appellant's claims; signature or fingerprint of the appellant.

The appeal application must be accompanied with additional documents and/or evidences, if any, to prove that their appeals are well grounded and lawful. The time limit for an appeal against the first-instance court's judgment is fifteen days as from the date of judgment pronouncement; for the involved parties being absent from the court sessions, the time limit for an appeal shall be counted from the date the judgment is handed to them or publicly posted up. The appeal application must be filed with the first-instance court which rendered the first-instance-judgment or decision being

appealed against. In cases where the appeal application is sent by post, the appeal date shall be calculated on the basis of the sending postmark date printed on the envelope.

After accepting the valid appeal applications the first-instance courts must notify the appellants thereof so that they pay the appeal court fee advances as required by law, if they do not fall cases of being exempt from, or having not to pay, the appeal court fee advances or appeal court fees. Within ten days as from the date of receiving the courts' notifications of payment of the appeal court fee advances, the appellants must pay the court fee advances and submit to the first-instance courts the receipts of the payment of court fee advances. If past this time limit the appellants fail to pay the appeal fee court advances, they shall be deemed to have given up their appeals, unless they have plausible reasons therefor.

- Time limit for appellate trial preparation and rights of appellate trial panel

The time of preparation for appellate trial is two months from the date of case acceptance. For complicated cases or due to objective obstacles, the Chief Justice of the appeal court may decide to prolong the trial preparation time limit but for not more than one month. Within one month as from the date of issuance of the decision to bring the case to trial, the court must open an appeal court session; in case of plausible reasons, this time limit shall be two months.

The appellate trial panels shall have the rights to: uphold the first-instance judgments; revise the first-instance judgments; repeal the first-instance judgments and transfer the case files to the first-instance courts for retrial of the cases; abrogate the first-instance judgments and stop the resolution of the cases.

(8) Complaints, protests in accordance with cassation and reopening procedures; cassation and reopening court sessions

If the judgments and decisions made by the Court have taken legal effects, the involved parties are not entitled to request the Cassation and Reopening Courts to re-consider the cases but conduct their rights to make protest in accordance with cassation and reopening procedures.

- Complaint

The complaints must describe grounds for protest according to cassation or reopening procedures. The grounds for cassation procedures are: conclusions in the judgments or decisions are incompatible with the objective details of the cases; serious

violations are committed in legal proceedings; serious errors are made in the application of laws.

Grounds for protest according to reopening procedures include: important details of the case were newly discovered which the involved parties could not have known in the course of resolving the case; there are grounds to prove that the conclusions of the expert witnesses and translations of interpreters were untruthful or evidences were falsified; judges, people's jurors or procurators intentionally diverted the case files or deliberately made unlawful conclusions; the criminal, administrative, civil, marriage and family, business, commercial or labor decisions of courts or decisions of State agencies on which the courts based themselves to resolve the cases had already been annulled.

- Persons entitled to settlement of complaints

The complaints must be sent to persons entitled to protest in accordance with cassation, reopening procedures including the Chief Justice of the Supreme People's Court and the Chairman of the Supreme People's Procuracy, the Chief Justices of the provincial-level People's Courts and the chairmen of the provincial-level People's Procuracies.

- Time limit for lodging the complaints by the involved parties

The time limit for protest according to cassation procedures is three years as from the date the court judgments or decisions take legal effect; while this time limit for reopening procedure is one year since the persons entitled to protest know grounds for protests in accordance with reopening procedures. To ensure that the complaints are considered by the Courts, the involved parties are required to submit the lawsuit petitions as soon as the court judgments or decisions take legal effect. The time limit of protest according to cassation procedures is two years as from the expiry of time limit for protest, if following conditions are met:

+ *Firstly,* the involved parties have submitted protest according to cassation procedures for one year as from the date the court judgments or decisions take legal effect, and continue to lodge application for protest in accordance with cassation procedures after expiry of time limit for protest process;

+ *Secondly,* the effected court judgments or decisions violate the laws and infringe seriously legal rights and interests of the involved parties, the third parties as

well as benefits of the State, which must be protested to overcome the mistake of such judgments or decisions.

In summary, the procedures and process to settle environmental damage compensation cases are prescribed concretely from the acceptance of lawsuit dossiers to trial (first-instance, appellate, cassation, re-opening). The procedures and processes determined by administrative agencies (in accordance with Decree No. 03/2015/ND-CP) have not been detailed from receipt of information about environmental pollution and degradation, collection and assessment of data and evidences for damage calculation and verification, determination of damage compensation liability to the natural environment as basis for claiming damage compensation. The items to be clarified in detail include damage notification method, what level of damage requiring collection of evidences and proofs for claiming compensation, how to select units providing service on data and evidence collection, what criteria to be applied, members as well as working method of the assessment council, etc. As a result, effective implementation of damage compensation requires development of Circular on guiding format and procedure of requesting damage compensation for natural environment.

4.4 Study on process of settling specific cases on compensation for damages to the natural environment

Violation cases of laws on environmental pollution are increasing in term of quantity and severity, which can be detected through regular and unexpected inspections and checks by MONRE as well as local departments and branches. The inspection results of MONRE Inspectorate from 2005 to 2015 are described in Table 1.

Table 1. Environmental inspection results of MONRE in period of 2005-2015[6]

No.	Number of inspection teams	Results	Number of violators	Handling
2005	- 04 inspection teams - Checking the implementation of Decision No. 64/QD-TTg in 12	Check and inspection of 45 facilities	More than 95% of the inspected enterprises violating LEP	Penalty of more than 400 million VND

[6] ISPONRE. Evaluation on implementation of the National Strategy on Environmental Protection Until 2010 and orientation up to 2020. Hanoi, 2011 and updates by author

	provinces and cities.			
2007	- Regular inspection: 04 teams - Unexpected inspection: 07 inspection teams	Check and inspection of 134 facilities	100% of the inspected enterprises violating LEP	Penalty of 1.5 billion VND
2008	- Organizing 03 inspection teams, 09 wide-scale inspections - 08 inspection teams, unexpected inspection	Check and inspection of 397 facilities	100% of the inspected enterprises violating LEP	Penalty of 5.6 billion VND, arrears collection of 127 billion VND
2009	- Conducting 18 inspections and checks - Conducting unexpected inspection of 03 investment projects, 05 facilities in term of overcoming environmental pollution, 06 facilities in term of environmental protection	Check and inspection of 793 facilities	More than 90% of the inspected enterprises violating LEP	Penalty of more than 10 billion VND, arrears collection of 1 billion VND
2010	- 15 check and inspection teams to check compliance with law regulations on environmental protection by projects, facilities, production, business and service zones	Check of 400 and industrial parks, industrial clusters	285/400 industrial parks/clusters on violation of LEP	Penalty of 18,362 million VND
2011	-Conducting 05 inspections and checks in 32 provinces/ cities -Coordinating with Ministries, branches to check 66 facilities causing serious environmental pollution requiring thorough handling in accordance with Decision No. 64/2003/QD-TTg	Check of 375 facilities and industrial parks, 66 facilities causing serious environmental pollution	154/375 facilities and industrial parks violating LEP, 35/66 facilities causing serious environmental pollution violation LEP	Penalty of more than 22 billion VND, Penalty of 35 facilities causing serious environmental pollution 6 billion VND

2012	-Conducting 05 inspections and checks of environmental protection in the country	Check of 50 facilities and 25 industrial parks,	311 violating organizations	Penalty of more than 2 billion VND
2013	- Conducting inspection, check of 636 facilities located in industrial parks, clusters in 19 provinces/cities of the country	Check of 636 facilities	335 violating facilities	Penalty of 46,68 billion VND
2014	Conducting 24 inspections and checks including 10 inspections of environmental protection by 606 organizations in 34 provinces, cities and 14 checks of environmental protection, biodiversity conservation and enforcement of environmental protection regulations by production and service facilities located in craft villages and craft village clusters	Check of 606 organizations	184 violating facilities	Penalty of more than 37 billion VND
2015	Conducting 09 regular and unexpected inspections of environmental protection to organizations located in 29 provinces and cities	Check of 1.076 facilities	426 violating facilities	Penalty of more than 50 billion VND

According to Vietnamese regulations, the companies that violate law regulations on environment causing environmental pollution shall, depending on the level of violation, be subject to administrative or criminal sanctions (if causing serious consequence), and payment of compensation for damages to human properties and

health as well as the natural environment; and collection of environmental projection fees for the incorrect declaration.

Inspection results mentioned in the above table show that the environment is polluted and degraded in many provinces and cities. However, since the promulgation of regulations on compensation for natural environment damages (Decree No. 113/2010/ND-CP), no case related to damage compensation for the natural environment has been initiated. Even serious environmental polluting cases of public opinion concussion have not been claimed for compensation for natural environmental damages such as the case of Vedan Vietnam Limited Liability Joint-Stock Company discharging untreated wastewater to Thi Van River with capacity of 44,800m^3 per month imposing serious impacts on the environment of Thi Vai River leading to damages caused to thousands of local people dependent on this river; the case of the Long Thanh Industrial Park's Centralized Wastewater Treatment Plant of Sonadezi Long Thanh Joint stock Company (Sonadezi Long Thanh) discharging unsatisfactorily treated wastewater to the basin of Ba Cheo Canal causing serious pollution and damages to the aquatic resources of hundreds of the surrounding households; the case of Hao Duong Company discharging untreated leathering wastewater to Dong Dien River causing serious pollution of a large zone; Sabeco Song Lam Package Joint stock Company discharging wastewater directly to the irrigational ditch of Trung My Field of Hung Dong Commune in Vinh City of Nghe An Province causing serious pollution of the domestic water source; the case of Nicotex Thanh Thai Company manufacturing pesticide and burying expired plant protection chemicals causing serious air and soil environmental pollution and adversely affecting life of local people in Cam Van Commune and Cam Tam Commune of Cam Thuy District in Thanh Hoa; the case of seafood processing facilities located in Tan Hai Commune, Tan Thanh District of Ba Ria Vung Tau directly discharging wastewater to Cha Va River leading to mass fish death; the break of wastewater reservoir of San Miguel Pure Foods VN Company on 25 July 2009 making more than 233,000m^3 wastewater flood over local houses, rubber gardens, crops, rice and bamboo cultivating areas. The river with the length of tens of kilometers from An Dien Commune to Lai Hung Commune is buckling under pollution. Wastewater was then discharged to Sai Gon River "attacking" water source of millions of people residing in Ho Chi Minh City and Binh Duong. Although

agencies empowered with environmental management by the state recognize the environmental pollution and degradation, they mainly exercise the power to impose administrative sanction or adopt consequence overcoming measures such as noise, vibration reduction, waste treatment; request environmental rehabilitation; suspend illegal activities and restore the initial status changed by environmental violations. However, they have not claimed compensation for damages resulted from the acts of causing environmental pollution, degradation. In the event of environmental pollution, degradation, the state agencies only support the people to make calculation and determination of damages for requesting compensation for the affected people other than claim compensation for the natural environment. This situation is is identical even for the cases in which experts are contracted to determine scope of environmental pollution such as Vedan case or Sonadeliz Long Thanh case. It can be said that the agencies responsible to request compensation have not fulfilled their obligations and responsibilities. In fact, administrative penalties are not deterrent enough, and the revenue source from administrative sanctions are insufficient to overcome damages of the natural environment, even when organizations, individuals causing damages to properties, health agree to make compensation voluntarily or by court judgment for the people. Pollution-causing organizations, individuals are also subject to compensation for another damage called environmental damage. This principle is familiar and detailed in the effected regulations of Vietnam. As a result, initiation of lawsuits on civil compensation to overcome damages to the natural environment is necessary, and can create revenue for rehabilitation and restoration of the polluted and degraded environment.

Natural environmental damage compensation cases have not been performed in practice. According to this study on the procedures to request compensation for damages to the natural environment, some steps of the procedures to request compensation have been conducted to support people in claiming compensation for property, health damages such as receipt of information about environmental pollution, degradation; collection of data, evidences about environmental pollution, degradation; assessment of data and evidences; organization of meetings to negotiate the compensation amount. For example in Vedan case, to request compensation for people, MONRE hired Ho Chi Minh Institute for Environment and Resources to determine

violation, the level of impact caused by violations of Vedan Vietnam Company in the form of an assignment, of which results were checked and accepted by an acceptance check council. Also in Sonadezi Long Thanh case, Dong Nai Province contracted hired Ho Chi Minh Institute for Environment and Resources to determine causes, scope and level of environmental impacts in the basin of Ba Cheo Canal in the form of an official task, of which results were also checked and accepted by an acceptance check council. In these two cases, the local authorities organized meetings with environment polluters to negotiate compensation for people's properties. To request compensations for properties of the people, Binh Duong DONRE had a working session with San Migual Company; requested DONRE of Ben Cat districts and relevant communes to conduct site survey and statistics of impacts, damages from the break of wastewater reservoir of the Company; and required the Company to adopt remedy to overcome water pollution in the river section affected by the incident.

Regarding the sugar molasses tank leakage in Can Tho, to have ground to settle compensation for death of fish, Can Tho DONRE took water sample in the location of incident for analysis. The analysis results showed that the waste content in the location of sugar molasses spill is 5,100 times higher than the permissible limits. This figure was 340 times for SS and more than 15,500 times for COD. Comparing with the standards on surface water for domestic purpose, the SS exceeds by 856 times and COD by 77,800 times against the limit. After generation of analysis results and consideration of other factors (such as possibility of other incidents or abnormal phenomena other than the current incident), Can Tho DONRE concluded that the contaminants spilling to the river got rid of oxygen resulting in mass death of cage fishes. The DONRE issued official correspondence to relevant branches and sectors requesting coordination in settlement of the case.

CHAPTER V. COMMENTS AND RECOMMENDATIONS

5.1 Some comments about damage compensation regulations in three sectors including state compensation liability, compensation for damages to properties, health and life; compensation for damages the natural environment.

Review of legal documents governing the three mentioned-above sectors and actual settlement of damage compensation cases result in some comments as follows:

- There are various legal documents governing the three sectors; however, regulations on damage compensation are prescribed the most thoroughly and comprehensively in 04 following documents:

+ Law on State Compensation Liability 2009

+ The Civil Code 2015

+ The Civil Procedure Code 2015

+ Law on Environmental Protection 2014

+ Decree No. 03/ND-CP in 2014

- Currently, the laws prohibit the sufferers from class action. Permission of class action shall create favorable conditions for the sufferers to make better protection of their legitimate interests and reduce pressure for the courts in the settlement of lawsuits. Class action lawsuit allows one individual or a group of to represent the suffered community to file lawsuits at courts without any official authorization document of the sufferers. The courts' judgments shall be valid for all the individuals involved in the class action lawsuit.

- The time limit for application of damage compensation liability in the environmental field is one of the controversial issues. Damage must be compensated in full and timely as prescribed by the laws, which is hardly enforceable because of high value and difficult determination of environmental damage.

- The cases where many persons jointly cause environmental damages are popular. According to LEP 2005, if environmental pollution is caused by multiple entities without responsibility attributed, the environment authority shall cooperate with relevant entities to attribute responsibility for pollution reduction and environmental remediation of each entity. However, it is difficult to determine the level of damage to the environment of each entity. In these cases, equally attributed damage compensation is a solution that has been considered by the civil laws.

- It is necessary to specify which units under people's committees of all level and MONRE are responsible to claim damage compensation as well as to collect and assess data, evidences for calculation of damages to the natural environment. Moreover, regulations on arbitration settlement method should be supplemented and detailed.

- Comparing with compensation for damage to properties, life and health caused by violation of environmental protection law in particular and compensation for

environmental damage in general (usefulness of the environment), law system on state compensation liability is relatively comprehensive and synchronous.

- The number of lawsuit cases on damage compensation in the field of state compensation liability is higher and settled more effectively than damage compensation for properties, life and health. Until now, there is no lawsuit case on damage compensation for the natural environment.

- The agencies responsible for state management and settlement of damage compensation in the field of state compensation liability are organized properly and assigned with clear functions and tasks, especially the Department of State Compensation under Ministry of Justice (Decision No. 767/QD-TTg dated 23 May 2011) and divisions under Departments of Justice of the provinces and cities. People's committees of all levels and MONRE are compensation-claiming agencies in the field of environment; however, the laws have not prescribed which units under such agencies are responsible to claim compensation for damages to the natural environment as well as their functions and tasks. There is no agency specialized in monitoring and management of regulations on compensation for property, life and health damage.

- Procedures, process of settling compensation claims for properties, life and health damages in the field of state compensation liability are prescribed comprehensively and clearly. However, such procedures related to compensation for natural environment damages have not been stipulated, which is an extremely negative gap.

- The most important shortcoming in settlement of damage compensation in the three mentioned-above sectors is determination of damage-causing entity and calculation of damage compensation amount.

5.2. Proposals and recommendations

From the above analysis and review of difficulties in implementing the compensation off environmental damage, the research team proposes the following recommendations and solutions to amend and supplement the content shown in section 5.1:

- Environmental damage compensation responsibility has a relatively close relation with responsibility to restore the polluted environment. Normally, in the other legal relation concerning damage compensation, damage-causing persons are required to pay compensation for the damages caused by their acts and released from the relation with the victims. However, environment polluters are responsible to

implement two measures simultaneously including: i) compensation for environmental damages and ii) restoration of the polluted environment. Compensation is active of monetary compensation for the damages occurred to the environment. Environmental restoration is amendment, restoration of the original state of the natural environment.

- Ministry of Justice and the relevant bodies are conducting researches to revise and amend Law on State Compensation Liability. It is recommended that Ministry of Justice shall revise and supplement the shortcomings analyzed in the section 5.1 of this report.

- Calculation of damages to properties, life and health caused by violations of environmental protection laws is a difficult and complicated problem, which requires concerns and researches by the competent agencies. The State should have a specialized unit to manage, monitor and supervise cases in this sector; revise, supplement limitations of the laws as analyzed in section 5.1.

- The State has promulgated LEP and other legal documents guiding compensation claims for damages caused by environment pollution, degradation. However, these documents shall only become effective, deterrent tools to prevent and handle violations of environmental law when general regulations are concretized, especially Decree No. 03/2015/ND-CP, regulation on compensation claiming responsibility of the state management agencies and legal consequence for non-compliance with the law.

- Laws should be revised in the direction that allows class action lawsuit against environment-polluting acts (one individual or organization may represent all the sufferers at courts).

- The laws should contain more flexible regulations. For example, environmental damage causing persons may pay compensation for one time or on installment within a certain number of years at maximum from the application of damage compensation liability. Therefore, it is necessary to prolong the time limit for initiation of lawsuits (longer than 03 years as prescribed by the current laws) to ensure legitimate rights and interests of the sufferers damaged from environment-polluting acts.

Similar with the procedures on state compensation liability and compensation for damages caused to properties, life, health, the research team shall hereby propose the procedure to implement compensation for damages caused to the natural damage at courts as follows:

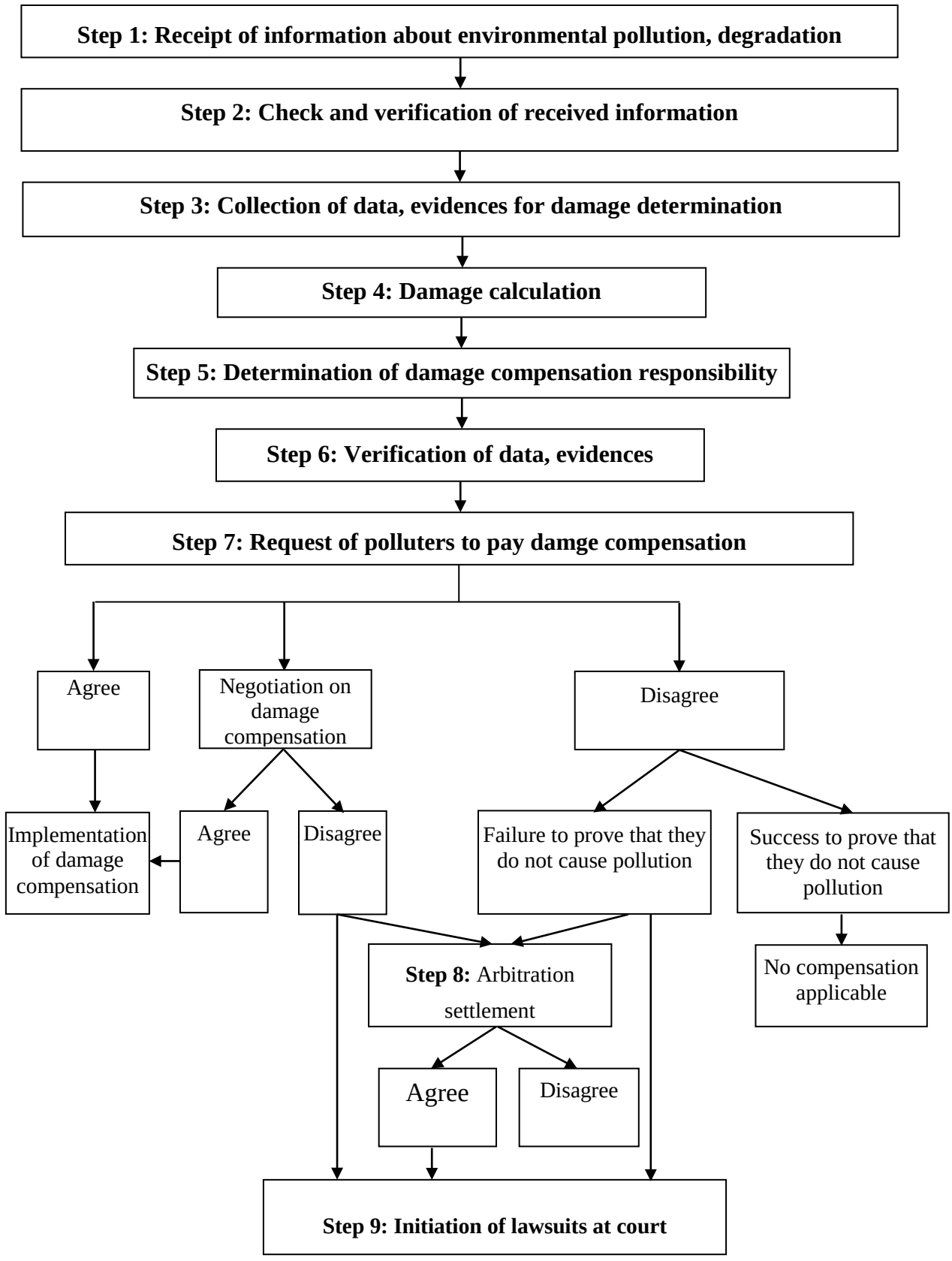

Figure 11: The proposed procedure in settlement of compensation for damages to the natural environment

The procedures to implement compensation for damages caused to the natural environment refer to the steps that must be conducted by the state management agency to collect data, evidence for calculation of damage and determination of damage compensation responsibility in order to prepare legal dossiers to request pollution-causing party to make compensation prior to institution of lawsuits at courts. The details of each step shall be studied in the future for the sake of development of circular on guiding procedures to request compensation for damage.

This Circular stipulates compensation for damages caused to the natural environment; therefore, the targets are People's Committees at all levels, Ministry of Natural Resource and Environment, organizations, individuals causing environmental pollution and degradation.

It is expected that the circular shall ensure the following principles:

- Because of difficult and complicated collection of data and evidence, calculation of damage, determination of damage compensation liability, the request for damage compensation in respect to the natural environment should focus on serious environmental pollution cases, of which pollution causing party has been identified. The promulgation of this principle aims at preventing misuse of uncontrolled request for damage compensation. It is the policy of Vietnam that compensation for damage is only claimed against the organizations, individuals causing serious environmental pollution in accordance with Clause 6, Article 165 of LEP 2014 and Circular No. 04/2012/TT-BTNMT dated 08 May 2012 of Ministry of Natural Resources and Environment specifying criteria to determine the facility causing environmental pollution, severe environmental pollution. The subjects causing non-serious environmental pollution shall be subject to administrative sanctions in accordance with Decree No. 179/2013/ND-CP dated 14 November 2013. Moreover, other actual environmental pollution cases in Vietnam are also considered such as Vedan case, Formosa case, etc.

- During the process of requesting damage compensation, negotiation and mutual agreement method should be prioritized. Arbitration settlement and institution of lawsuit at court should be utilized as the last resort when the mentioned-above method does not work due to their time-consuming process and busy working schedule of the state management agencies. This stipulation is based on other regulations of Vietnamese laws including Article 133 of LEP 2005; Clause 3, Article 161 of LEP 2014; and Chapter XIII of the Civil Procedure Code 2015 on reconciliation process and preparation for trial.

- The steps to implement compensation for damages caused to the natural environment must be clearly-stipulated and easy to implement. After consideration and study, we would like to recommend the implementation steps as follows:

1.Notification of environmental damage

2. Process of receiving notification about environmental damage

3. Responsibilities of the compensation-request agencies

4. Selection of service provider to carry out data, evidence collection, calculation and determination of compensation responsibility

5. Determination of necessary data, evidence for calculation of environmental damage

6. Damage calculation methods

7. Establishment of the Council for appraisal of Data and Evidence

8. Responsibilities to provide, study and consider information, data and evidence of the compensation-request-liable agencies and the appraisal council

9. Organization of the appraisal council meetings

10. Request for damage compensation

11. Negotiation on compensation for damage

12. Decision on compensation for damage or institution of lawsuits to request courts to settle compensation

13. Settlement of compensation proceeds

- Provisions on data, evidence collection for calculation of environmental damage and determination of compensation liability must be accurate and transparent. The regulation aims at heightening the liabilities of the agencies responsible for data, evidence collection, assessment, appraisal and determination of compensation liability. These agencies must be impartial; base on scientific grounds; and utilize modern scientific method and means. Moreover, this regulation can facilitate organizations, individuals to supervise, check the process of data, evidence collection and damage calculation, etc.

- To ensure the feasibility of the circular, it is necessary to organize workshops, seminars to take expert comments on the targets of the Circular in order to improve the quality and effectiveness of the Circular. The research team proposes to organize some scientific workshops and seminars with the participations of the targets under direct effect of the Circular such as the enterprises, ministries, people’s committees at all levels, environmental management agencies at all levels.

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Project for Strengthening Capacity of
Water Environmental Management in River Basin

THE SITE SURVEY REPORT
FOR DEVELOPMENT OF THE CIRCULAR ON PROCEDURE TO IMPLEMENT COMPENSATION FOR ENVIRONMNETAL DAMAGE

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HANOI, 2016

ANNEX

During the study and review of legal documents on compensation for damage, the research team proposed various solutions and recommendations including the proposal on procedure to implement compensation for natural environmental damage. Basing on this procedure, the research team has developed the draft Circular on stipulating the procedure to implement compensation for environmental damage. To improve the quality and actual enforcement of the Circular, the research team proposed to conduct site survey to obtain more information related to the Circular.

I. NECESSITY OF THE SITE SURVEY

As proposed to provide the procedure to implement compensation for environmental damages by the Report on Study, Review of Legal Documents on Compensation for damages, the consultant team has developed the draft Circular on compensation for environmental damage. During the process of circular development, the Consultant Team face with some difficulties as follows:

Step 1. Receipt of information about environmental pollution, degradation.

Decree No. 03 stipulates that People's Committees (PC) at all levels, organizations and individuals that detect signs of environmental pollution or degradation shall notify such to agencies responsible for claiming compensation for environmental damage. However, we do not know exactly what units under the PCs and MONRE are the most suitable to receive such information. Moreover, the question is whether full-time or part-time officers are necessary to handle this issue.

In principle, the time to process information on environmental pollution should be as short as possible, especially for the acts of illegal discharge and environmental incidents; however, the time limit has not been stipulated by law regulations. Short time limit for information processing may lead to difficulties faced by local authorities because their specialized officers have to deal with other works.

Step 3, 4, 5. Collection of data and evidence; calculation of damage; and determination of responsibility to make compensation for damage

According to Decree No. 03, the organizations responsible for data collection and assessment shall collect data, calculate damage, and determine damage-compensation liability; however, the question is whether the PCs at

district level (DPC) are capable of implementing these activities or they can hire consultants to calculate damages and determine damage-compensation liability. DPCs shall cooperates with the organizations responsible for data collection and assessment to identify the type of data and evidence to be collected as the grounds to select the service providers to conduct environmental parameter monitoring and analysis in order to collect data, evidence deemed to be necessary for calculation of damage and determination of damage-compensation liability.

Another problem is related to the advanced fund to hire experts to carry out calculation of damage and determination of damage-compensation liability, and the service providers to monitor and analyse environmental parameter. Shall this fund be advanced from the Vietnam Environmental Protection Fund, local environmental protection fund or the service provider? This expenditure shall be reimbursed when the pollution-causing organizations pay compensation.

The same question is raised in respect to the advanced fund for the council to appraise data and evidence? Is this expenditure advanced from the Environmental Protection Fund or the state budget? This expenditure shall be reimbursed when the pollution-causing enterprises pay compensation.

What are the rights and responsibilities of the organizations providing environmental monitoring and analysis services that sign contract with the state agencies? Are the rights and responsibilities of the service providers proposed in the draft circular by the consultant team feasible? What are the possible difficulties to be faced during the implementation process?

Step 6. Assessment of data and evidence

Regarding the council for appraising the data and evidence, it is necessary to collect more opinions and comments including how the council is established? Shall the Director of DONRE or chairman of PPC at the provincial level, the Minister of MONRE or Director General of VEA at the central level issue the establishment decision?

What is the suitable time limit for assessment of the collected data and evidence? Is the time duration proposed in the draft Circular long or short? And is it feasible for implementation?

The forms proposed by the consultant team are suitable. However, the question is whether they are easy to be implemented.

For the mentioned-above reason, it is necessary to conduct site survey to collect comments from the implementing agencies to ensure the feasibility and practicability of the Circular.

II. OBJECTIVE OF THE SITE SURVEY

a. General objective: To ensure that the content of the Circular on stipulating procedure to implement compensation for environmental damage is feasible and practical.

b. Specific objectives:

1. Study and access information about the occurred cases that have been handled by provinces in order to finalize the procedures stipulated in the Circular.

2. Assess the applicability and difficulties, shortcomings in application of the draft procedures to handle compensation for environmental damages in some specific cases in order to finalize the procedures to handle compensation for damages (the procedures under development) caused to the natural environment.

3. Collect data to compare the applicability of the draft circular with the actual situation of the provinces.

III. LOCATION, TARGET AND TIME

+ Location: Thanh Hoa, Dong Thap, Ba Ria – Vung Tau and Ho Chi Minh City

+ Target:

- Institute for Environment and Resource: Through three cases show that two property damage cases (fish), and one case related to damage of salt, fisheries, fishing.

- Management agencies: (1) Department of Natural Resource and Environment (DONRE), (2) People's Committee at all levels (province/city, district, commune/ward).

- Organizations, associations, enterprises and local people.

+ Time:

From 3rd to 10th June 2016.

IV. METHOD AND CONTENT

1. Site survey method

- Direct interview:

The local people residing surrounding the polluted areas with mass fish death incidents (Cha Va River in the South and Buoi River in Thanh Hoa Province)

- Group meeting with organizations, individuals related to compensation for environmental damage such as DONRE, PCs at all levels, relevant organizations, associations and enterprises to get comments about the difficulties and shortcomings during the development of the Circular.

- Site survey:

Ho Chi Minh Institute for Environment and Resource (HCM IER), Thach Thanh District (the polluted section of Buoi River), Thanh Hoa Province; Cha Va River in Ba Ria Vung Tau.

2. Target and content of the site survey

a. The working contents with Ho Chi Minh Institute for Environment and Resource:

HCM IER is the organization that assessed pollution in 02 cases including case that Vedan discharged wastewater to cause pollution in Thi Vai River and mass fish death case into Cha Va River. With experience in handing the above-mentioned cases, the research team organized a working session with the representatives of HCM IER about the relevant issues.

b. The working contents at the provinces/cities

- Experience in determining scope, level of pollution; settling compensation for damages resulted from the acts causing environmental pollution

- Getting the comments about difficulties in the development of the draft Circular, concretely:

+ The agencies under management of PCs at all levels that shall receive information about pollution and implement the compensation for damage; the level of readiness to accept this task.

+ The time limit for processing the information about environmental pollution and degradation; collecting necessary data and evidence to request the compensation.

+ The sources of advanced fund to hire the service providers to monitor, assess, measure environmental parameters and the experts to calculate damages and determine damage compensation liabilities; organize the meeting of the council for appraising the data and evidence? What agencies to implement the damage compensation procedure (the local environmental protection fund or the service providers that collect the data and evidence)?

+ Whether the rights and responsibilities of the service providers prescribed in the draft Circular are suitable and appropriate?

+ Who to make decision on establishment of the council for appraising data and evidence at the central and local level.

+ Comments about contents and forms of the forms provided in the draft Circular.

+ The applicability of the draft procedure to settle compensation for environmental damage in the specific cases at local levels; predict difficulties, shortcomings encountered during the application of this procedure

- The conditions to ensure the implementation of the damage compensation procedure to settle compensation for environmental damage at local level

- The members of the site survey team:

1. Le Tuan Son- Consultant

2. Nguyen Mai Hanh- Consultant

3. Tran Thanh Huong- Consultant

4. Pham Van Loi- Environmental Science Institute (ESI)

5. Tran Mai Phuong- Environmental Science Institute (ESI)

6. Nguyen Hoang Phuong Lan- Environmental Science Institute (ESI)

7. Le Thanh Nga- Environmental Science Institute (ESI)

8. Duong Xuan Diep- Environmental Science Institute (ESI)

V. RESULTS OF THE SITE SURVEY

PART I. EXPERIENCE FROM THE SPECIFIC CASES

1.1. Mass death of fishes in Buoi River, Thach Thanh District, Thanh Hoa Province

From the morning of 04 May 2016, the water in the section of Buoi River from An Nghia Commune (Lac Son District, Hoa Binh Province) to Thach Lam Commune of Thach Thanh District turned black, sparkling with stink and dead fishes (cage fish and natural fish). Until 10h00 of 07 May 2016, the total weight of dead fishes in Thach Thanh District were 17,385 kg that were found in 73/109 cages of 32/49 fish farmers (excluding the natural dead fishes). The polluted water flow continued to move forwards in Buoi River (to the point of 45-50 km from the initial point); however, the pollution level seemed to reduce as assessed by Thanh Hoa DONRE.

Settlement by Thanh Hoa PPC

Direct Thanh Hoa DONRE to organize the sampling, monitoring of water quality in the location with sign of pollution and fish death in Buoi River;

Direct Thanh Hoa DONRE to coordinate with Hoa Binh DONRE to organize working session with Hoa Binh SugarCrane and Sugar Joint-stock Company (Hoa Binh Sugar Company) and Cassava Starch Factory of Tan Hieu Hung Co., Ltd.;

Direct Thanh Hoa DONRE to coordinate with Thach Thanh District PC to relocate the fish cages from the polluted area; review the damaged households to propose timely supports in order to alleviate the spirit and stabilize life for the local people; organize collection and destroy of dead fishes to ensure the environmental sanitation in accordance with regulations; direct the PCs of the communes located along Buoi River to restrict the use of river water in this period, and adopt measures to reduce damages caused by water environmental pollution in Buoi River.

Assign the provincial public security to lead the coordination with DONRE, Department of Agriculture and Rural Development (DARD), Department of Science and Technology (DoST), PC of Thach Thanh District to conduct investigation about the case causing serious pollution of Buoi River water environment; handle the violations in accordance with law regulation; propose termination of operations of Hoa Binh Sugar Factory.

Propose that "MARD shall support Thanh Hoa Province to determine the causes of environmental pollution, pollution level; adopt measures to remedy the water environmental pollution in Buoi River; impose penalty on Hoa Binh Sugar Company as the base to claim the Company to make compensation for economic damages to the local people; support Thanh Hoa to monitor the sediment of Buoi River to determine the river sediment pollution problem''.

Through the dossier study and site survey of the above case, the research team summarizes the steps to collect documents and evidences for determination of violation and pollution level in Buoi River as follows:

1. *Monitoring and sampling of water environment in the area of mass fish death in Buoi River*

On 7th and 8th May 2016, Thanh Hoa Center for Environmental Monitoring and Protection conducted the sampling and monitoring of 15 points in the areas with sign of pollution and fish death of Buoi River.

Thanh Hoa DARD carried out the sampling and analysis of the water samples collected from the river sections where mass fish death occured. Thanh Hoa Public Security established a investigation team to investigate and determine the causes of fish death incident; collected wastewater samples, death fish samples and sent them to the Criminal Science Institute of Ministry of Public Security for assessment.

2. *Identification of discharge sources causing pollution to Buoi River water*

To identify the discharge sources causing pollution to Buoi River water, Thanh Hoa DONRE coordinated with Hoa Binh DONRE to organise a working session with Hoa Binh Sugar Company and Cassva Starch Factory.

Then Thanh Hoa Province coordinated with Hoa Binh Province and Vietnam Environment Administration (VEA) to identify the main discharge sources in the Buoi River area including three main sources named Hoa Binh Sugar Company, Cassava Starch Factory of Tan Hieu Hung Co., Ltd., and the pig farm of Mr. Nguyen Ngoc Sang. However, at the time of the incident, only the pig farm discharged the untreated wastewater into the environment; while the other two factories temporarily paused their production activities (this time was not the production season of the two factories). Before their temporary break, the two factories cleaned the factories, equipment and discharged the wastewater into the environment. At the time of inspection and check, the

cassava starch factory was detected to have underground discharge pipe with the diameter of 16 cm connected directly to the environment; while Hoa Binh Sugar Company was at the test operation period without wastewater treatment system resulting in the fact that all the wastewater was discharged directly to the environment.

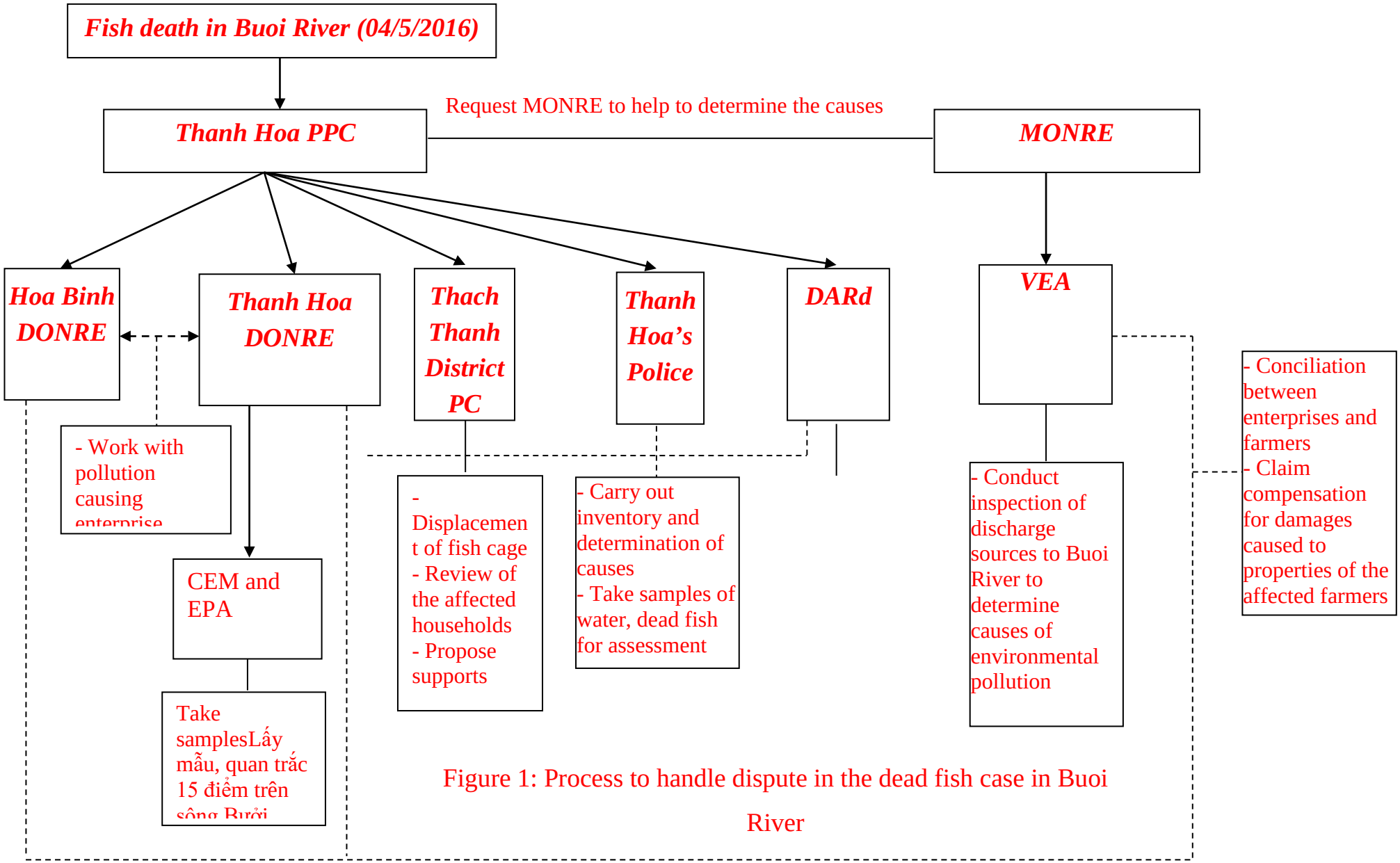

Figure 1: Process to handle dispute in the dead fish case in Buoi River

3. Relocation of fish cages out of the polluted area; supports provided to the affected households in collection and disposal of dead fishes

In implementation of guidance given by Thanh Hoa PPC, Thanh Hoa DONRE coordinated with PC of Thach Thanh District to move the fish cages out of the polluted areas; review the affected households to propose supports (by cash and rice: 2,000,000 VND and 20 kg of rice per household); organized the collection and disposal of the dead cage and natural fishes; directed the PCs of the communes located along Buoi River to restrict use of river water during the period of incident; adopted measures to reduce the damages caused by river water environmental pollution; timely informed Kim Tan Water Supply Factory of Thanh Hoa Water Supply One Member Co., Ltd., and relevant localities for information and active use of Buoi River water for production.

4. Damage compensation claim

The polluting wastewater stream causing fish death formed a block that flowed through Buoi River for 02 days and nights and then ran to the downstream. At the time of inspection and site survey, the river was already released from the pollution; therefore, the claim for compensation was limited to compensation for damages caused to properties as the dead fishes of the farmers (1.4 billion VND that has been compensated to the farmers by Hoa Binh Sugar Company) other than compensation for natural environmental damages. Moreover, the competent authorities imposed administrative sanctions on the violators; terminated the operations of the cassava starch factory and Hoa Binh Sugar Factory; required the violating companies to install the environmental protection system, wastewater treatment system in accordance with the approved design before allowing them to resume operations.

Difficulties in determining causes and handling disputes in the dead fish case in Buoi River were as follows:

- The wastewater flow causing fish death ran fast (two days and nights); therefore, it was impossible to collect data and evidence if water samples are not taken timely.

- This flow caused fish death anywhere it touched; therefore, the damage would be great if the functional authorities did not provide timely instruction to the affected farmers.

- At the time of inspection, 2/3 the relevant factories stopped their operation leading to difficulty in collecting evidence of their wastewater discharge.

- Although these factories caused environmental pollution, the short time of causing environmental pollution made it impossible to establish grounds to request compensation for environmental damage (the ground to determine damages is based on the environmental restoration costs)

1.2. The mass fish death case in Cha Va River

As reported by the local people, at 22h on 05 September 2015 to 2h on 06 September 2015, cage fishes in Zone 1, 2, 3 of Cha Va River located in Long Son Commune of Vung Tau City were dead in mass with the death ratio of 30-50%. At the time of the incident, the water source was reported to turn black and have nasty smell, which was followed by rapid death of fishes of all species (Cobia, pomfret, Barramundi, etc.) and at all ages.

The steps that were implemented to determine the causes of fish death

In implementation of the guidance provided by Ba Ria Vung Tau PPC on settlement of the environmental pollution incident causing damages to the fish farmers in Cha Va River dated 06 September 2015, Ba Ria Vung Tau DONRE coordinated with the Institute for Environment and Resource (IER) and the relevant agencies to collect data for determining the causes of the cage fish death in the river basing on the legal, practical and scientific grounds; identifying the subjects responsible for compensation to the damaged fish farmers. From 08th to 14th September 2015, Ba Ria Vung Tau DONRE closely coordinated with IER, Ba Ria Vung Tau DARD, the Department of Environmental Crime Prevention and the relevant organizations to organize site survey, take wastewater samples, collect the data and databases from the seafood processing facilities located in Tan Hai Commune as well as from Cha Ra River.

The Chairman of Ba Ria Vung Tau PPC issued decision on inspection of the compliance with laws on environmental, soil protection and construction by 22 organizations, individuals operating in the field of seafood and fish powder processing in Tan Hai Commune, Tan Thanh District from 14th to 25th September 2015.

The collection of data and evidences coordinated between IER and DONRE is as follows:

1.

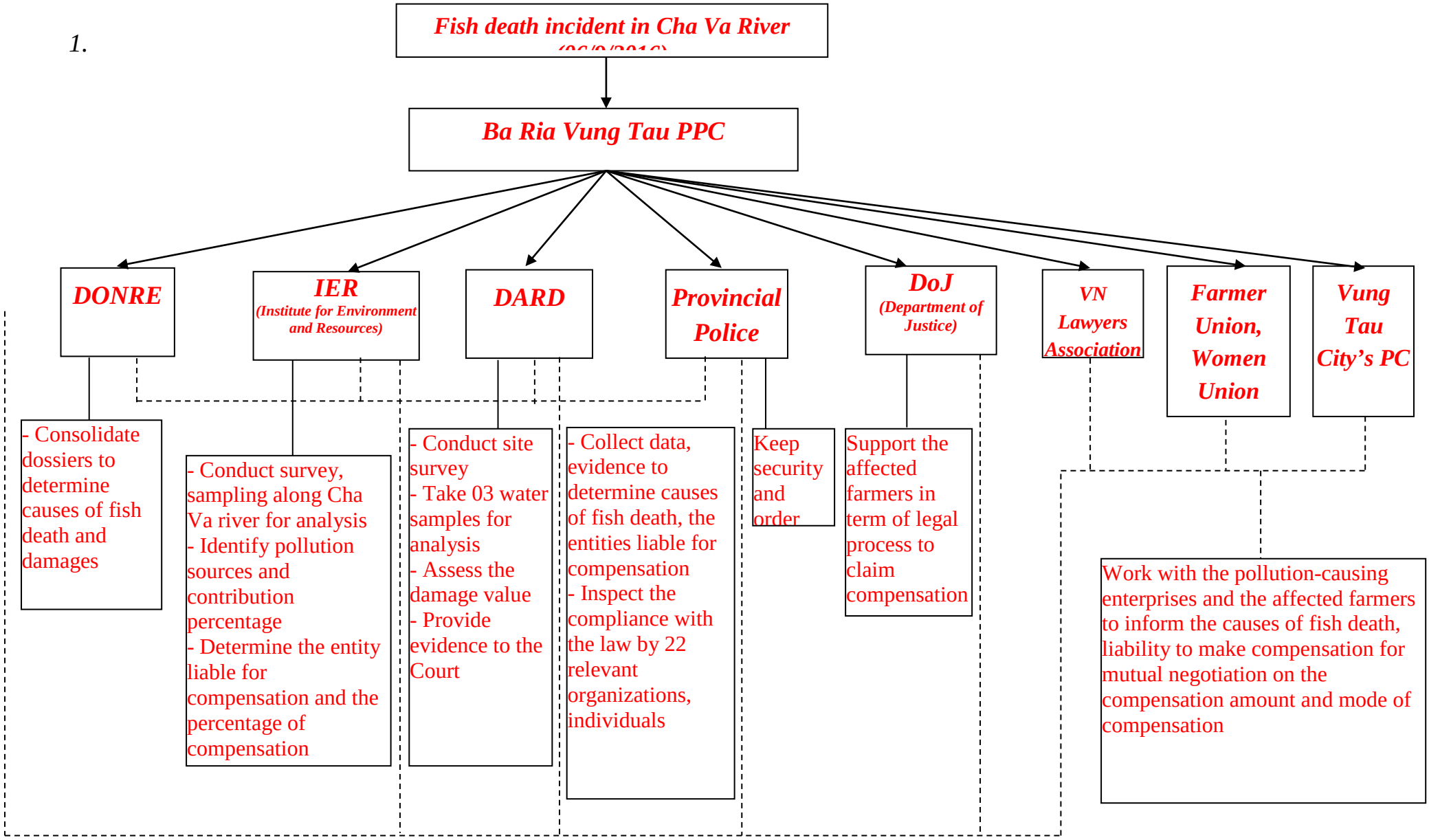

Figure 2: Diagram on process to handle fish death case in Cha Va River

1. *Identification of socio-economic activities causing pollution to Cha Va River.*

Currently, there are some main socio-economic activities carried out in the polluted area of Cha Va River as follows:

- Cage fish and oyster farming in the river
- Pond/lagoon aquaculture activities
- Industrial production activities
- Salt production activities
- Residential areas discharging domestic wastewater to Cha Va River

2. *Measurement of water quality in Cha Va River*

The Veterinary Medicine Department under DARD conducted site survey and collected 03 water samples for testing. The quick site measurement results showed low dissolved oxygen contents of 0.5 mg/l (much lower than

QCVN on the surface water quality with DO ≥ 4 mg/l). The water sample analysis results indicated that Mn parameter exceeded the permissible limit by 21 times; while Cu (contained in sample F02 and F03) by 4-7 times and NH_3 (contained in sample F01 and F02) by 3 times.

To assess the water quality change of Cha Va River, on 14th May 2015 IER conducted site survey and collected water samples from 09 points along Cha Va River from Cha Va Bridge to the front of Culvert No. 6 and No. 9 under the supervision of the Environmental Protection Agency (EPA), the Fisheries Inspectorate, PC49 and some press agencies for analysis and assessment (the samples were marked as M1 to M9). According to the analysis of the 09 water samples, IER assessed the following parameters:

a, Change in DO concentration

b) Change in Ammonium (NH_4^+) concentration

c) Change in Nitrite concentration

Table 1: The results of river water quality survey on 14th September 2015

Sampling location	Temperature (°C)	pH	DO (mg/l)	TSS (mg/l)	NH_4^+ (mg/l)	NO_2^- (mg/l)
M1 (Cha Va Bridge area)	27.9	7.45	2.85	54	KPH	0.07
M2 (cage farm areas)	27.9	7.68	2.70	28	KPH	0.09
M3 (cage farm areas)	28.1	7.73	3.12	41	KPH	0.08
M4 (3.5 km from Culvert No. 6)	28.1	7.50	3.93	45	KPH	0.10
M5 (between culvert No. 6 and the cage farm area)	28.1	7.45	3.71	45	0.22	0.15
M6 (1.37 km from Culvert No. 6)	28.0	7.49	1.88	54	0.34	0.15
M7 (Behind culvert No. 6)	28.1	7.79	0.00	56	1.23	0.30
M8 (Behind culvert No. 6)	28.1	7.72	0.00	34	4.48	KPH
M9 (In front of Culvert No. 6)	28.0	7.68	0.00	127	28.00	KPH
QCVN 38:2011/BTNMT		6.5-8.5	≥4	100	1.00	0.02

To simulate the change in water quality of Cha Va River at the time of fish death on 5th to 6th September 2015, the IER utilized Model MIKE 21, in which two input data groups of the model were updated closely to the situation on the two days including (1) change of water level in Vung Tau Hydrology Station and (2) the discharge regime at Culvert No. 6.

3. Identification of the pollution sources and the contribution ratio of each pollution source to the pollution of Cha Va River causing mass cagefish death:

By site survey, investigation and scientific calculation, the IER identified 04 pollution sources causing water pollution of Cha Va River including:

- Pollution spreading from the Culvert No. 6 by the tide.
- Pollution caused by activities of the fish cages
- Wastewater discharged from aquaculture ponds/lagoons in the river (low pollution level because of extensive farming)
- Domestic wastewater from Long Son commune (insignificant)

Basing on the practical and scientific data in combination with the water level monitoring data from Vung Tau Hydrology Station, the IER determined that the cagefish death in Cha Va River from 6th to 14th September 2015 were caused by water source pollution (mainly by insufficient DO and toxic nitrite), of which the main pollution source was the discharge from Culvert No. 6. Based on the survey result and the simulation results of Model MIKE 21, the IER assessed the contribution ratio of the pollution sources by estimating the percentage of pollution load carried by each pollution source, mainly BOD_5, because the primary cause of fish death was determined to be the shortage of DO that was caused by consumption of DO for decomposing BOD_5. Accordingly, Culvert No. 6 contributed approximately 76.64% of BOD_5; while this figure was 15.39% by the cagefish farming activity.

Table 2: The contribution ratio of the main discharge sources in term of BOD5

No.	Discharge source	Discharge coefficient	Size of the discharge source	Pollution load kg/day	Percentage (%)
1	Culvert No. 6	250 g/m^3	51,300 m^3/day	12,825	76.64
2	Cagefish culturing	117.5	21.92 h	2,576	15.39

	activities	kg/ha/day			
3	Pond/lagoon aquaculture activity (extensive farming)	1.2 kg/ha/day	810.6 ha	973	5.81
4	Domestic wastewater	30 g/person/day	12,000 person	360	2.15
	Total			16,734	100.00

4. Investigation, statistics of damage

According to the initial data of damage statistics and calculation performed by Ba Ria Vung Tau DARD, the total damage value reached 6,358,330,000 VND in the first stage and 10,927,295,000 VND in the second stage.

The total damage value that were calculated initially by DARD was 17,285,625,000 VND in the two stages (equivalent to about 121.34 tons of dead fishes)

5. Determination of the subject responsible for damage compensation

The primary cause of fish death in Cha Va River was the spreading pollution from the Culvert No. 6; therefore, the main actors discharging wastewater to the Culvert No. 6 should be responsible for damage compensation.

There were 14 facilities discharging wastewater to the Culvert No. 6 including one facility that has stopped operation from early 2015; however, the pollution of water source in the wastewater pond in front of Culvert No. 6 was caused and accumulated by a long process resulting in the conclusion that these 14 facilities should have responsibility to make compensation for the damage equivalent with the contribution ratio to the pollution in Cha Va River of 76.64%.

To establish the grounds for claiming compensation by the discharge source owners in accordance with the law, the IER calculated the contribution ratio to the BOD_5 load by each discharge source basing on the highest result of wastewater sample analysis (as stipulated in Clause 2, Article 5 of Decree No. 03/2015/ND-CP)

The results of BOD_5 load contribution ratio by each discharge source to the water pond in front of the Culvert No. 6

No.	Name of the facility	BOD5 concentration (mg/l)	Wastewater flow (m^3/day)	BOD5 load (kg/day)	Percentate of causing pollution (%)
1	Hoa Thang Fisheries Co., Ltd.	800	333	266.40	14.15
2	Thinh An Co., Ltd.	800	305	244.00	12.96
3	Phuoc An Co., Ltd.	1,100	218	239.80	12.74
4	Trong Duc Seafood Processing Private Enterprise	780	632	492.96	26.18
5	Dai Quang Private Enterprise	340	44	14.96	0.79
6	Trung Son Private Enterprise	860	54	46.44	2.47
7	Thuong Thuong Private Enterprise	164	33	5.41	0.29
8	Dong Hai Private Enterprise	850	172	146.20	7.77
9	Tan Thanh Private Enterprise	2,850	87	247.95	13.17
10	Nghe Huynh Co., Ltd.	343	86	29.50	1.57
11	Phuc Loc Fish Powder Processing Private Enterprise	570	128	72.96	3.88
12	Gia Hoa Private Enterprise	580	98.00	56.84	3.02
13	Branch of Thanh Dat Private Enterprise	1,090	15.00	16.35	0.87
14	My Suong Private Enterprise	576	5.00	2.88	0.15
	Total		2,210.00	1882.65	100.00

6. Proposal of the procedure to request compensation for damage

The primary cause of water source pollution in Cha Va River resulting in material damage to cagefish farmers was discharge activities by 14 seafood processing facilities located in Tan Hai Commune, Tan Thanh District; therefore, claim for compensation was based on the Civil Code 2005 (Chapter XXI on the non-contractual compensation liability) and Resolution No. 03/2006/ND_HDTP. Accordingly, the claim for damage compensation was implemented in two steps:

First, negotiation about the amount and manner of compensation should be conducted between the affected cagefish farmers and the damage-causing seafood processing facilities. In this case, relevant branches, localities shall support the cagefish farmers to prove the damage to the damage-causing facilities, and organize meetings with these facilities to negotiate and agree in the compensation for damage.

Second, if the involved parties fail to reach agreement by negotiations, the dispute shall be settled at Court in accordance with the Civil Procedure Code 2004. In this case, relevant branches, localities shall support the cagefish farmers to initiate the case at court and prepare all dossiers, evidences (scientific and legal) to submit to the Court.

7. Assignment of specific responsibilities for the functional units: DONRE, DARD, the Department of Justice, the Department of Public Security, PC of Vung Tau City, the Lawyer Association, the Farmer Union, the Women Union in supporting the farmers to claim compensation for damage.

Difficulties in determination of causes and handling of dispute of the fish death case in Cha Va River

- Damages were caused by various subjects (14 discharging factories) and the aquaculture farmers (21%).

- Although the collection of data and evidence and calculation of damage were implemented well with participation of all local functional authorities, the claim for compensation was not a simple task. The relevant enterprises did not agree to make compensation for damage. After more than one year of the incident, there is only one enterprise that has fulfilled its liability through providing supports other than compensation to the affected farmers.

1.3. Vedan case

In September 2008, Vedan Joint-stock Company was caught in violation of law on environmental protection through discharging wastewater that were not treated satisfactorily to Thi Vai River with the capacity of 44,800m^3 per month. The harmful substances were discharged directly to Thi Vai River running through Ho Chi Minh City, Dong Nai Province and Ba Ria – Vung Tau causing serious impacts on the environment and damages to thousands of local people that relied on the water source of this river.

On 13rd September 2008, the functional authorities made minute on the act of illegal discharge of untreated wastewater to Thi Vai River by Vedan Company. The conclusions of the interdisciplinary inspection team indicated that: *the installation of the exhaust liquid and wastewater treatment system of Vedan Company does not comply with the wastewater treatment procedure, the approved environmental impact assessment report (EIA) and the legal regulations on environmental protection.* The above act imposed severe impacts on the habitats of the flora and fauna system in Thi Vai River Basin as well as material and spiritual life of more than 5,000 households that earn their living by fishing and aquaculture.

However, during 2008-2009, Vedan Company refused direct negotiation with the farmers that claimed for compensation. Vedan only agreed on negotiation through the competent authorities on *supporting* the farmers.

To obtain legal grounds to claim compensation for economic damage for the local people, MONRE assigned the Institute for Environment and Resource (IER, under the National University of Ho Chi Minh City) to determine the pollution level in Thi Van River caused by Vedan Company.

The activities implemented by IER to determine economic damages caused to the local people by Vedan Company:

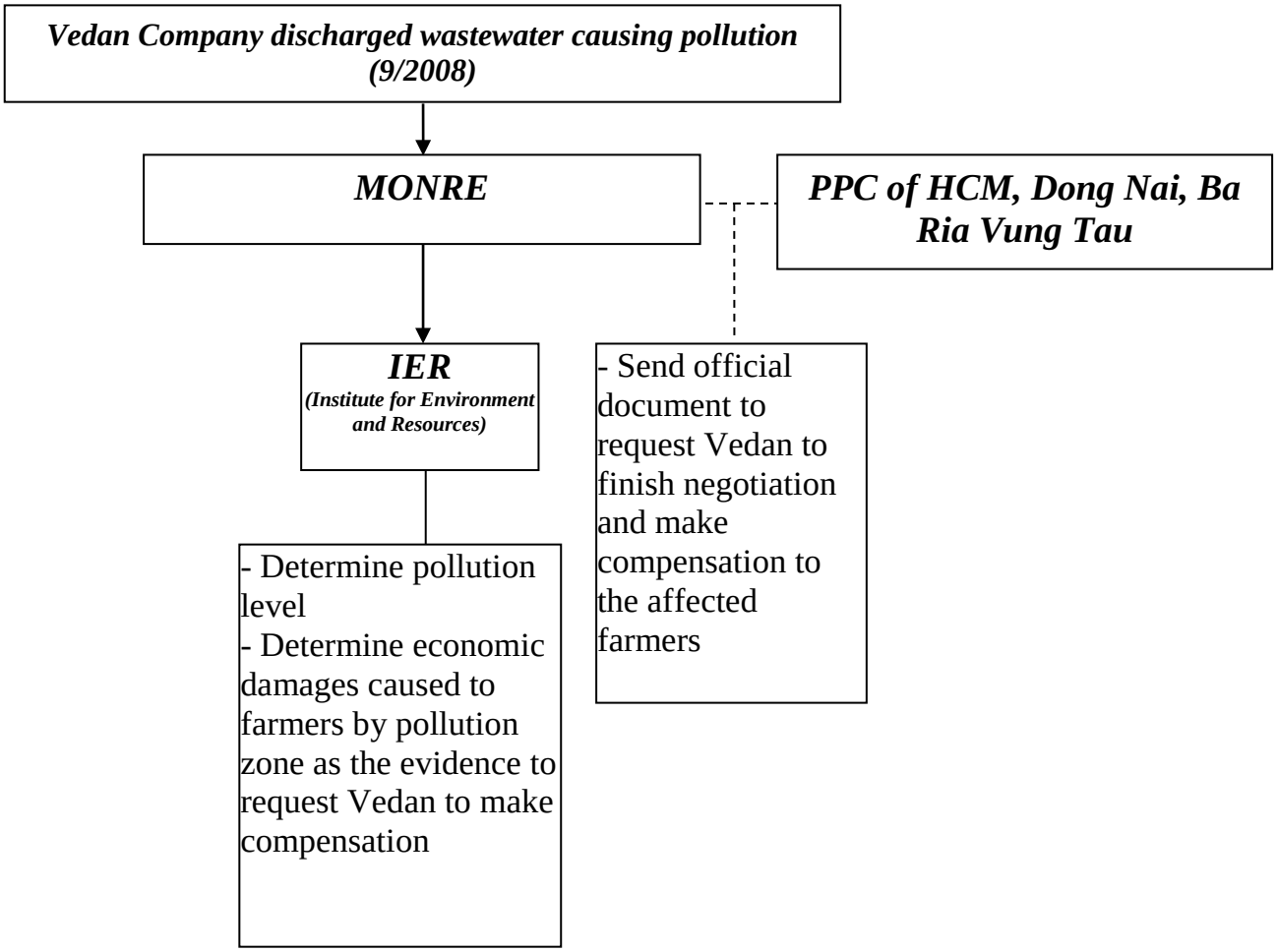

Figure 3: Diagram on process to handle dispute in Vedan case

1. *Conduct statistics, calculation of the scale of the discharge sources including discharge capacity, discharge regime, pollution characteristics of the discharge source, concentration of pollutants, pollution load, etc.)*
2. *Collect data and conduct additional site survey about characteristics of the receiving source: topography, hydrography, hydraulic power of the flow, water quality, aquatic system, the bottom structure before and after the incident.*
3. *Calculate and determine the scope of pollution using the tools such as the hydrographical and water quality calculation models (MIKE 11, MIKE 21, etc.); water quality monitoring data in many years by management agencies and scientific organization; high-resolution satellite images taken at various times including before, during and after the incident.*

The calculation results of pollution spreading in Thi Vai River (using MIKE 21) indicate that:

The range of impact on the main stream of Thi Vai River was about 25 km including 12 km of critical pollution.

The range of impact was expanded to small canals and ditches, aquaculture and fishing areas.

The monitoring results of various national and provincial monitoring programs during 1999 to 2008 showed that the total length of the main stream of Thi Vai River (31.5 km) was polluted at various levels including 12-15 km passing the area of Vedan company was subject to critically serious pollution. The range of pollution spread to Go Gia River, Ba Gioi River and other tributaries of Thi Vai River.

4. *Create the pollution zoning map with various pollution levels (polluted, serious, critically serious).*

Basing on the collected monitoring data set in combination with topographical, hydrographical regime analysis, and the simulation result of model MIKE 21, the area affected by pollution of Thi Vai River can be divided into three zones including critically serious pollution, serious pollution and pollution.

5. *Overlay the pollution zoning map with the cadastral map and land use map to make preliminary identification of the subjects possible vulnerable to pollution.*
6. *Conduct investigation to determine the damaged subjects in the polluted zones (aquaculture, fishing, salt production, etc.)*
7. *Evaluate the level of damage of each production type corresponding to pollution levels in each zone.*
8. *Calculate the damage value for each damaged subject type basing on the statistical data collected from the direct damage declaration sheets that have been verified in order to calculate the average damage level for each hectare of cultivated land in each zone multiplied by the total area (ha) of the damaged land to get the total damage value for each damaged subject type in each zone (suitable for aquaculture, salt production or agricultural cultivation); assess the total yield of the lost fish flocks basing on the ecological productivity conversion formula.*
9. *Summarize the damage calculation results of each subject type by zone*
10. *Determine the pollution-causing ratio (%) of each discharge source owner to each affected zone for determining the compensation liability*
11. *Value the compensation amount basing on the damage calculation results of each zone multiplied by the pollution-causing ratio.*

Results:

In Ba Ria Vung Tau Province

Damage to aquaculture	: 36,362,027,000 VND
Damage to fishing	: 16,203,238,000 VND
Damage to salt production	: 1,054,373,000 VND
Total	: 53,619,640,000 VND

In Ho Chi Minh City

Damage to aquaculture	: 17,695,077,000 VND
Damage to fishing	: 28,053,122,000 VND
Total damage	: 45,748,200,000 VND

In Dong Nai Province:

Damage to aquaculture	: 104,348,983 thousand VND
Damage to fishing	: 15,232,220 thousand VND
Total damage	: 119,581,203 thousand VND

Total economic damage in the three provinces/cities:

Dong Nai Province	: 119,581,203,000 VND
Ba Ria Vung Tau Province	: 53,619,640,000 VND
Ho Chi Minh City	: 45,748,200,000 VND
Total	: 218,949,043,000 VND (Two hundred and eighteen billion, nine hundred and forty-nine million, and forty-three thousand Vietnamese dongs)

Difficulties in collection of evidence and data:

- Few data about environment and natural resources: geological condition, hydrography, marginal condition, etc. leading to time-consuming and cost-consuming collection of evidence and data to determine damage
- Complicated terrain with small rivers, canals not delimited on the map
- Expensive software
- Lack of data about the base environment
- Inaccurate information about the economic damages provided by the affected farmers
- Inadequate grounds to determine environmental damage

Comments:

Through study of some specific cases, the research team draws some comments as follows:

1. The mass fish death incidents in various cases were caused by discharge of untreated waste or wastewater that has not been treated satisfactorily by factories and enterprises.
2. The acts of wastewater discharge in these cases caused large-scale serious consequence in various localities and areas.
3. The discharging activities caused damages to properties, legitimate rights of the people as well as the function and effectiveness of the environment.
4. In all the studied cases, compensation was only claimed for damage caused to people's properties other than to the natural environment. Most enterprises causing environmental pollution were not self-conscious to make compensation for the damage caused by their violations, even when the competent authorities provided specific evidences. In Cha Va River case and Vedan case, for example, various negotiations were conducted but failed to agree on the compensation for damage. Vedan Company only agreed to make compensation for damages caused to the properties of the local people when the market voice was raised; while institution of case at court was required for Cha Va River incident.
5. By study of the three cases, we can see that the competent authorities implemented the following steps:
   - Sampling for analysis and determination of cause
   - Identification of discharge sources, pollution-causing activities
   - Recommendation to the enterprises to stop discharging activities
   - Collection, and remedy of pollution consequences (disposal of dead fishes, displacement of fish cages, provision of rice to the affected farmers)
   - Determination of pollution-causing range
   - Identification of damage-causing actors as well as the percentage of compensation covered by each actor
   - Collection of data, evidence; statistical survey, calculation of damage; negotiation with enterprises and claim for compensation
6. These above cases indicate important role and responsibility of the state agencies, especially the people's committees of all level.

7. The three cases were involved by the political system including the state agencies, various sectors (DONRE, DARD, Department of Justice, Department of Public Security, People's Committee at provincial level, district level and communal level, etc.), organizations (the Fisheries Association, Lawyer Association, and the Fatherland Front), and the mass media.
8. Only few competent authorities are capable of collecting the data and evidence, calculating the damage, and determining damage compensation liability. In two of the mentioned case (exclusive of Thanh Hoa case), Institute for Environment and Resources was assigned as the organization to implement these activities. If there are some cases occur simultaneously, it is difficult for the competent authorities to handle all. As a result, it is necessary to work on a mechanism so that various organizations can conduct the collection of data and evidence.
9. In environmental cases, sampling and analysis is an essential need requiring sufficient capacity, equipment, devices. Modern facilities and equipment are a decisive factor determining the quality of the collected data and evidence. Moreover, human resource also plays an important role in determination of data and evidence to the collected, the method to calculate damage and determine damage compensation liability, overlaying of maps to identify the affected areas, etc.
10. Possibly due to the sanctions or other causes, the pollution-causing facilities do not abide by the environmental laws and try to avoid their responsibilities when they are proven to commit pollution-causing acts by the state agencies.
11. The unsmooth coordination mechanism in collection of data and evidence, sampling for analysis between various agencies has adverse impacts on the quality and progress of the work.
12. From the three study cases, it is possible to recognize unavailability of the base environmental information (few, scattered, unorthodox); scarcity of relevant databases and documents resulting in difficult collection of evidence and calculation of damage. If the calculation of damage requires reference to the base data, the competent authorities have to review the dossiers, conduct additional analysis of various parameters, which is hard and time-consuming.

PART II. COMMENTS ABOUT THE DEVELOPMENT OF DRAFT CIRCULAR:

To collect comments and opinions about the development of draft Circular, the research team organized the group meetings in Thanh Hoa, Dong Thap, Ba Ria – Vung Tau and Ho Chi Minh City with the participation of representatives from the management agencies, enterprises, organizations, etc. The comments were related to the development of draft Circular as well as the contents of the draft Circular, which can be summarized into the topics as follows:

- ***Name of the Circular:***

According to the title of the Circular, we can understand that this Circular is applied to the cases, in which the decision on compensation has been issued. However, the content of the Circular goes from the beginning. As a result, the title of the Circular should be amended to “Circular on stipulating procedure to claim compensation for environmental damage". The draft Circular only guides Clause 5 of Article 3 and Clause 2 of Article 7 of Decree No. 03; however, the name of the Circular does not reflect the scope of content of the Circular.

- ***Subject and scope of regulation of the Circular:***

- Article 1: the scope of regulation should be re-considered. The scope of regulation is wide, while the content of the Circular is limited to severe cases and critically severe cases.

- The scope of regulation of the Circular should be rewritten to: This Circular stipulates procedure, process, expenditure to implement compensation for environmental damages applied to the water, soil environment that is polluted severely; the ecosystem that is degraded; and the species prioritized for protection that are injured or dead by the state management agencies.

- ***Interpretation glossary:***

- The “Interpretation” article should be added with term “Environmental damage”, “Compensation for environmental damage” to facilitate actual enforcement.

- ***Grounds to implement the procedure:***

- According to Article 5 of the draft Circular, there must be violation of laws by organizations, individuals causing environmental pollution, degradation to implement compensation requesting procedures; however, it is necessary to specify the type of violations?

- The sentence “There must be environmental damage…” is very general. It is necessary to mention clearly what legal documents are based to claim compensation for damage.

- ***Notification, receipt, and handling of information about environmental pollution and degradation***

- Is it necessary to use the notification form because the notification should be quick and simple? The use of the Form may be inconvenient for the notifying person; therefore, it is necessary to provide simple regulation to facilitate the implementation.

- The compensation-request agencies are the state management agencies that can be aware of the environmental pollution through their inspection; therefore, it is not necessary for them to get notification from the organizations or individuals. Moreover, the manner of notification should be diversified such as direct notification to the ward/communal PC, email, phone, etc., other than limited to the Form stipulated in the Circular. The most important thing is how the information is processed by the recipients.

- This Circular is applied to the cases, in which the environmental polluters have been identified and compensation for damage is imposed. It is possible to delete Article 6, 7, and 8 of the Circular. The state management agencies are aware of damages through regular, annual environmental report and inspection results; therefore, they should be active to request compensation other than wait for notification and information provided by the people.

- Damage report: the damage report dossier is unsuitable with individuals because the citizens can only report the damage without dossiers, documents, evidences. It is recommended that the information receiving agency should be natural resource and environmental organizations that shall be responsible to report to the compensation-request agencies.

- All levels including communal level can receive information about environmental damages.

- Requirements should be provided for the officers that conduct site visit including years of experience, whether they have education about environment, the certificates held by them.

- Article 8 should prescribe what the necessary cases are to facilitate implementation.

- According to Clause a, Article 8 of the Circular, …the receiving environment is able to self-purify or self-cleanse to meet the Vietnamese technical regulations on environment – QCVN. It is necessary to specify what QCVN to be applied; whether the violators adopt measures to treat the

pollutant parameters to meet QCVN, if requested; and what sanctions to be applied if they do not adopt such measures.

- ***Selection of service providers to collect data and evidence***

- Regarding the selection of the service providers to collect data and evidence, what legal basis should be based? What should the competent authorities decide if the competent authorities hire Vietnamese companies that then sub-contract U.S companies or Australian companies and these companies produce different results?

- The selection of service providers should be based on any specific criteria? A service provider does not enough licensed for all indicators of monitoring and analysis, so these indicators without legal basis are recognized? The criteria should cover all the capable enterprises or units. In case of damages caused to soil, water environment, the eco-system and species, it is necessary to select two or three companies at parallel because of their own strength.

- ***The time limit***

- The time limit for processing information about environmental pollution is at least 05 days.

- To determine this time limit, it is necessary to carry out proper, scientific consideration, calculation, and explain the reason why 30 days is suitable.

- The time limit for data, evidence collection is 30 to 40 days, which is not enough for complicated cases requiring use of software to calculate damage because of the need to calculate tide, cross section, etc. Therefore, the time of sampling and sample collection maybe 30 to 40 days but the time limit for calculating damage or determining compensation liability should be longer depending on the complexity of specific cases.

- It is necessary to stipulate the time limit of negotiation about compensation for damage, and issuance of decision on compensation. Regarding the court procedure, the Court has 07 days for issuance of decision on compensation for damages; however, it is recommended to stipulate the time limit for implementation of the decision.

- Regarding the proof of not causing pollution, it is required to provide specific regulation on the time limit to prevent the enterprises, factories from alleging that they are on the process of proving in order to delay the compensation for damage.

- The time limit to implement the decision on compensation should be based on the compensation amount. Large damage can be compensated on installments, while small damage compensated at one time.

- Article 21. Institution of lawsuits to request courts to settle compensation: it is necessary to specify how long the time limit of compensation settlement has expired (21 days for the court)

➢ ***Appraisal council***

- Clause 1, Article 14 of the draft Circular stipulates that head of the compensation-request agency is responsible to sign the Decision on establishment of the appraisal council. According to Clause 3, Article 2, the compensation-request agencies can be PCs at communal level, district level, provincial level, and MONRE. The regulation that PCs at communal level are required to establish the appraisal council is improper. As a result, it is necessary to specify that PCs at district levels or higher levels are required to establish the appraisal council.

- The appraisal council at local level does not have sufficient members as prescribed by the laws. The stipulated members of the council are normally suitable with provincial level or higher levels; while the communal and district level can only request compensation for damage other than appraise the data and evidence. It is recommended to not stipulate appraisal council for district and communal level since they do not have adequate expertise and capacity to carry out appraisal. Appraisal council should only be established at provincial level or higher (DONRE or PPC)

- The meetings of the appraisal council should be participated by organizations, individuals causing environmental pollution for confrontation and explanation. The meetings of the appraisal council should be attended by pollution-causing organizations because they can provide opponent comments. The time limit for complaint by the polluters after the appraisal council draws conclusion. If the polluters do not complain upon expiry of such time limit, they shall be deemed to agree with the conclusions. This regulation should be provided to prevent the violators from alleging that they are not informed of the information and the appraisal council is unbiased.

- It is recommended to guide the establishment of the national and provincial appraisal councils with participation of specific members, branches and sectors so that the councils can work immediately in the occurrence of any incidents. It is not necessary to establish a council for each case.

➢ ***Advanced fund for collection of data and evidence***

- The compensation-request agencies other than the service providers shall advance the funds for implementation. However, the localities do not have budget for this activity. It is recommended to propose the reserve funds. The

advanced funds are difficult to be mobilized. If the provincial environmental budget is mobilized, it is required to obtain approval from the PPC.

- It is proposed to utilize advances from the Vietnam Environmental Protection Fund or the Environmental Protection Fund of the provinces where environmental pollution and degradation occur to carry out monitoring, assessment, measurement, collection of data and evidence, determination and calculation of environmental damage, and implementation of compensation request procedure.

- The fund for data and evidence collection is very important, which is proposed to be advanced from the environmental protection fund. Which organization shall reimburse the advances if the compensation-request agencies lose at court?

- Clause 4 of Article 4: Option 1 should be selected for its advantage. The compensation-request agency should provide the advances. If the environmental protection fund advances the expenditure, the Fund shall be an involved party.

- The advanced funds, if mobilized from the budget of DONRE, must be based on the Plan submitted from the previous year. It is necessary to promulgate proper mechanism because collection of data and evidence must be implemented rapidly.

➢ ***Forms***

- Form No. 1 attached to the Circular on Notification of Environmental Damage is used for all environmental components including water, soil, eco-system, the species prioritized for protection that are injured or dead. According to this Form, after receiving the notice, it is necessary to carry out measurements to verify the fact. The question is how the competent authorities can arrange sufficient personnel for this activity because there shall be a lot of notifications including the tiny or small cases. It is recommended to reconsider this Form. In case the Form is kept, it is necessary to consider whether the functional agencies are able to implement it.

- Form 11: Decision does not specify the organization, individual responsible to pay compensation leading to difficulties in implementation; therefore, Article 1 should be amended as follows:

Decision

Article 1. (Name of organizations, individuals causing environmental pollution) is responsible to make compensation for damage to (compensation-request-liable agency)

- ***Applicability of the draft Circular to specific environmental pollution cases at local level***

- To implement this Circular, the State should provide clear and innovative mechanism

+ The Circular:

- The Circular on compensation for damage is a difficult issue for the central and provincial level. In the event of damage, it is necessary to select and hire scientific organizations to collect data and evidence, which is time-consuming. When the service providers are selected after a long process, the time of the highest pollution level may possibly pass.

- Pollution is normally contributed by various sources causing difficulties in identifying the pollution-causing ratio (%) of the polluters. Normally, the polluters declare their contribution ratio less than calculation results by the scientists.

- It is suggested to review the damage compensation procedure to facilitate actual implementation. This procedure is a pre-civil proceeding process and must be clear, precise.

- Article 21: If the enterprise selects arbitration method to prolong the time of settlement, the enforceability of this procedure is not high. Therefore, it is necessary to re-consider this article to improve the enforceability. It is recommended to institute the case at court directly other than arbitration as provided in this Article. The term “Law” on page 5 should be replaced by “civil procedure".

Environmental restoration should be researched carefully in term of duration, method. After successful claim of damage compensation and collection of compensation proceeds, is it possible for the competent authorities to restore the natural environment? And for how long, if possible?

+ Technical issues: there are three difficult issues encountered by compensation for environmental damage:

a. Collection of data and evidence

b. Calculation of damage

c. Determination of subjects

- Data, evidence collection and damage calculation require expertise and quick implementation process, which are very difficult for district and communal levels because of their insufficient capacity. Moreover, the communal level is not entitled to hire the service providers. The process that the communal level reports to the district level for reporting to the provincial

level takes 10 to 15 working days. After this time, pollution has reduced or moved to another location.

The communal level does not have human resource and capacity to collect and appraise data, evidence. Currently, each commune only has 01 part-time environmental officer that simultaneously holds the position of cadastral officer; therefore, such officer does not have environmental expertise and other necessary knowledge to collect and appraise data, evidence. The district level has the similar difficulty including employment of consulting unit. The collection and appraisal of data, evidence should be implemented by the provincial level with supports and cooperation from the district and communal levels.

- Full-time officer: In term of technical point-of-view, there should have technical agencies to implement activities related to compensation for damage, they shall not work regularly because of irregular occurrence of environmental incident. In term of state management point-of-view, part-time officers should be assigned; however, part-time officers can not ensure good implementation of technical issues.

- If pollution level is not determined timely, the pollution shall reduce or move to another location. In this case, which organization shall be the arbitrator of this issue? It is necessary to have cooperation of the environmental police.

- Calculation: the calculation formulas should be able to estimate following factors:

a. Current situation of the background environment

b. Self-cleansing capacity of the environment

c. Environmental restorability

Calculation formulas should be simplified to facilitate the implementation process. If the formula provided in the draft Circular is used, it is necessary to collect initial data; for example, Cij: the concentration of pollutant j of organization i, which means collection of the initial samples by inspection and monitoring.

During the investigation of Vung Ang case, the relevant organizations and experts recognize some shortcomings of Vietnamese standards, which stipulate that discharging activity at small capacity shall be ignored and discharge at high capacity shall be considered as serious.

- Calculation council: the district level is not capable of establishing the appraisal, calculation councils

- As prescribed by environmental laws, the district levels shall handle small issues (production households, small-size enterprise). Therefore, they can not handle compensation for damages applied for severe and critically severe environmental pollution cases.

- According to Decree No. 03, damage is calculated basing on the expenditure to treat 01 unit of environmental volume that is temporarily applied. There are various tools to calculate environmental damage; however, this method is dependent much on treatment technologies, and technically infeasible. It is possible to pump out water from rivers for treatment, especially big rivers.

- The calculation method using the pollution-causing percentage: there are many discharge sources that discharge small amount of waste but cause serious pollution and vice versa. The question is that whether a factory is subject to compensation for damage if it releases high discharge load to the river and contributes high pollution-causing percentage but produces less serious pollution? It is recommended to determine pollution level by primary parameters and contribution ratio accordingly or weight of toxicity and some parameters including pH, alkaline, acid, which can not apply this formula.

- It is necessary to specify the source of advanced expenditure. The district DONRE is only allocated with 100 million VND/per covering various issues including compensation for damage. If this source is selected, it is required to allocate sufficient budget for implementation. If environmental protection fund is selected, it is required to obtain approval from Ministry of Finance and other relevant ministries and branches.

- Assessment of damage is a complicated issue, which takes about 01 week for experienced organizations to conduct survey, prepare the to-do-list outline and cost estimation. The collected samples must be processed by software and cross sections, while Vietnam does not have sufficient database. In this case, it is necessary to measure most of parameters, which may take several months to produce accurate results.

- The contract appendices should be sometimes supplemented because the processing of data to produce pollution level results requires use of software. The experienced service providers shall foresee the parameters to be collected.

- Evidences can only be established with conclusions in the meeting minutes of the appraisal council. In Cha Va River case, for example, reports on investigation results and causes of mass fish death were specific and detailed; however, they were not initially accepted as evidences by the Courts because

of their improper formats. As a result, it is necessary to provide stipulation on the document formats to be recognized as evidences.

- According to Article 14 of the draft Circular, head of the compensation-request agency is responsible to sign the decision on establishment of the appraisal council; while Article 2 stipulates that the compensation-request agency may be PCs of district and communal level. So, PCs of district and communal level shall be responsible to establish the appraisal council. Basing on Article 9 on selection of the service providers, we can understand that the service providers are deemed to calculate the damage and compensation amount and that the results are deemed to be generated. What is the objective of establishing the appraisal council? What shall they do if the results have been produced? According to this Circular, the appraisal councils take an important and significant role but they are established to do nothing. In the meanwhile, the service provider is selected to be the implementing unit. As a result, establishment of the appraisal council is not rational.

+ Law enforcement:

This draft Circular does not have high legal enforceability for the below reasons:

- The Circular does not mention solution for the case that the enterprises do not pay compensation for damage when they are identified to cause damage and issued with decision on compensation. Also according to this Circular, the compensation for damage is fully dependent on the enterprises; however, it is necessary to stipulate institution of the case at courts in the failure of Decision on compensation.

- The consulting units carry out contract-based activities in accordance with the contract cost estimate. However, it is recommended to prescribe the implementation of the further request by the appraisal council, i.e., additional sampling (who shall take additional sample and sampling method).

- At court (in the event of dispute), the appraisal council shall act as the involved party to participate in the settlement process; while the Circular stipulates that the service providers shall collect data and evidence to produce the grounds. If the service providers collude with the enterprises causing environmental damage to provide evidences for the sake of the enterprises, which (the data and evidence) will be then proved to be inaccurate by a third party, the appraisal council other than the service providers shall take responsibility to the Court. This is improper and unfair.

- As a result, it is suggested to provide commitment, sanction in the Circular. For example, if compensation is not implemented by the damage-

causing enterprises upon issuance of decision, their business license shall be revoked.

- Assessment of damage basing on the treatment to meet QCVN is technologically difficult because no individual, organization is able to pump river water out for treatment. If the natural conditions are used for cleansing the river, the process may last for 10 to 20 years. Therefore, it is difficult to estimate expenditures to restore the river. In reality, there are various factors affecting the treatment process and estimation of treatment expenditure including rainwater dilution, treatment methods (Polluted soils can be treated by chemical or biological methods. Biological methods are time-consuming and expensive). If there is no specific regulation, it is difficult to select the expenditure level to claim compensation for damage. If the cost is estimated for restoring the whole river, the expenditure shall be huge because of high capacity of the river.

➢ ***Other issues:***

- The Circular development process complies with the administrative procedure that is time-consuming; therefore, it is necessary to consider the development of the draft Circular in a rapid, precise, timely and accessible manner.

- The process and procedure comprise various steps that should only be applied to the serious environmental pollution cases, while the small or simple cases can neglect the step of data and evidence appraisal.

- It is necessary to add the overall introduction about the steps to be implemented in the procedure to request compensation for environmental damage in the beginning of Chapter 2.

- The state agency is both the management agency and the compensation-request-liable agency, which is not proper. It is recommended to allow relevant associations, organizations to act as the compensation-request agency.

- Decree No. 03 stipulates that PCs of all levels shall claim compensation for environmental damages because environment is the national property that has been assigned to the provinces for management. The Circular details Decree No. 03; therefore, it should specify clearly agencies under PCs other than commonly PCs at all level. Moreover, other ministries are also assigned to manage the environment, so it is necessary to supplement responsibilities of other ministries and branches.

- Decree No. 179 on the sanction of administrative violations in the domain of environmental protection prescribes the remedial measure of “Forcible restoration of the original environment state already altered by

administrative violations”; while Decree No. 03 stipulates the calculation of damage basing on the expenditure of environmental pollution and degradation remedy and environmental restoration. As a result, it is recommended to consider whether this Circular is in conformity with Decree No. 179. The question is whether a violator is claimed for compensation if he has been subject to administrative sanction together with measure to restore the original environment state.

- It is necessary for the Circular to stipulate the organizations to monitor the state of the restored environment after receiving the compensation proceeds?

- It is possible to request the factories to make compensation for damage when they have been licensed for wastewater discharge? It is a great burden for the factories when they are subject to administrative penalty, environmental protection fees, and expenditures of pollution remedy and environmental restoration.

- Regarding restoration of the polluted environment, it is necessary to stipulate the method to restore the environment; whether the competent authorities can restore the environment and for how long after successful claim for compensation and collection of compensation proceeds. The method of environmental restoration should be considered carefully to ensure enforceability after promulgation of the Circular.

- In the implementation of damage compensation procedure, it is necessary to stipulate the time limit for organization, individuals causing environmental pollution to fulfill their responsibilities (cooperation, response to interview) because some enterprises, factories do not cooperate with the competent authorities when they visit for data collection. This causes difficulty for the data collecting organizations; therefore, it is required to prescribe the sanction to facilitate smooth implementation of the Circular.

- According to the circular, the violators may be subject to environmental restoration, which requires implementation the environmental restoration plan. The question is which organization shall implement this restoration plan and which organization shall appraise the environmental restoration.

During the site survey, the research team collected some important comments that should be considered to improve the Circular as follows:

+ Name of the Circular should be changed into “Circular on stipulating procedure to implement compensation for environmental damage "
+ The scope of regulation of the Circular should be rewritten to: This Circular stipulates procedure, process, expenditure to implement

compensation for environmental damages applied to the water, soil environment that is polluted severely; the ecosystem that is degraded; and the species prioritized for protection that are injured or dead by the state management agencies.

+ The ground to enforce the Circular should the stipulated that the subject has been punished for administrative violation on environmental protection
+ The notification about the damage should be made in a simple, quick manner with more forms of notification.
+ Regarding the selection of service providers, it is necessary to establish selection criteria in order to choose capable enterprises. In the case of damages caused to the soil, water environment, the eco-system and the species, two or three companies should be selected and hired simultaneously since each company has its own strength.
+ The time limit for data and evidence collection: the time for collecting samples may range 30-40 days; however, the time for calculating damages and determining damage compensation liability may be longer depending the complication level of each specific case.
+ In respect to the appraisal council, it is necessary to clearly stipulate that the agencies establishing the appraisal council are the People's Committee of district level, provincial level and MONRE depending on the location of the incident in order to prevent misunderstanding that the PC of communal level is also responsible to establish the appraisal council. In the meeting of the appraisal council, it is necessary to involve participation of the pollution-causing entities so that they can make explanation.
+ The cost should be studied further in order to propose a suitable solution.
+ The comments about the forms should be also considered in order to make adjustment.

CONCLUSION

By study of the specific cases, site survey, interview to relevant organizations and individuals, the research team draws some conclusions as follows:

- The three mentioned cases were mainly to claim compensation for damages of properties, of which the state agencies did not claim compensation for damage caused to the natural environment. This

indicates that the state agencies did not fulfil their obligations and responsibilities stipulated by the laws. Therefore, it is necessary to develop legal documents and institute lawsuits to claim compensation for damages caused to the natural environment in accordance with Decree No. 03.

- All the cases were mainly involved by the state agencies in respect to collection of data and evidence and handling of violations on environmental laws. It is necessary to promote roles of non-state organizations and individuals in data and evidence collection to reduce workload for the state management agencies.
- It is an essential need that the Circular or Decree on stipulating the process, procedure to implement compensation for environmental damage should be promulgated. Currently, localities are handling environmental disputes based on their experience due to the lack of a unified regulation on compensation for environmental damage.
- Only Ho Chi Minh Institute for Environment and Resources participated in collection of data and evidence, calculation of damage, and determination of compensation liability; therefore, it is required to strengthen capacity of Institute for Environment and Resources as well as other research institutes including Environmental Science Institute, Institute of Environmental Technology, etc.; mobilize non-state scientific organizations to join this sector to form a qualified service provider group to meet the need of data and evidence collection to determine environmental damages.
- It will be very complicated if the environmental damage causing actors do not agree with the damage calculated by the compensation-requesting agency. As a result, national environmental assessment institutes should be formed.
- The important issues to be focused in the near future are facilities, equipment and human resources with understanding and experience in data and evidence collection; therefore, it is necessary to equip modern facilities and machine as well as strengthen capacity of the service provider.
- Normally, enterprises have low self-awareness, environmental ethnics, and sense of law observation; therefore, it is recommended to reinforce

propaganda and utilization of strong measures to change behaviours of the enterprises.

- Regarding the comments about the draft Circular, we find that most comments and opinions are focused on the main content of the draft Circular, many of which are practical and originated from the reality. Generally, the participants agree with the draft Circular and confirm the necessity of the development of promulgation of the Circular. Moreover, some participants raise difficulties in implementation of the Circular; some suggest that the research team should continue study and finalization of the draft Circular; some say that the draft Circular is not suitable with the current regulations. These comments shall be considered by the Circular Drafting Unit in order to ensure feasibility of the Circular when it is promulgated. It is recommended to focus on the following issues:

  - Adjustment of the name of the draft Circular to match the content of the Circular
  - Adjustment of the scope of governance of the draft Circular to specify what contents of Decree No. 03 are detailed by the Circular.
  - Supplementation of an article in the beginning of Chapter 2 that provide overall introduction about the procedure to claim compensation for environmental damage.
  - Review of time limit for consideration and implementation of the comments and opinions.
  - Supplementation of right of pollution-causing organizations and individuals to participate in the meeting of the Council for appraisal of data and evidence.
  - Adjustment of some forms and tables in accordance with the comments provided by the participants, etc.

ANNEX 1. The content and target of the site survey

No.	The shortcomings	The content of works to address the shortcomings		
		Province/City	Ho Chi Minh Institute for Environment and Resource (IER)	
			Vedan case	Cha Va case
	Step 1. Receipt of information about environmental pollution, degradation Decree No. 03 stipulates that People's Committees (PC) at all levels, organizations and individuals that detect signs of environmental pollution or degradation shall notify such to agencies responsible for claiming compensation for environmental damage. However, we do not know exactly what units under the PCs and MONRE are the most suitable to receive such information. Moreover, the question is whether full-time or part-time officers are necessary to handle this issue. In principle, the time to process information on environmental pollution should be as short as possible, especially for the acts of illegal discharge and environmental incidents; however, the time limit has not been stipulated by law regulations. Short time limit for	- Consultation about what units under PCs at all levels to receive information about environmental pollution and to implement compensation for damage, and the willingness to receive such kind of cases - Consultation about the time limit for processing information about environmental pollution, degradation to ensure feasibility.	---	---

	information processing may lead to difficulties faced by local authorities because their specialized officers have to deal with other works.			
	Step 3, 4, 5. Collection of data and evidence; calculation of damage; and determination of responsibility to make compensation for damage According to Decree No. 03, the organizations responsible for data collection and assessment shall collect data, calculate damage, and determine damage-compensation liability; however, the question is whether the PCs at district level (DPC) are capable of implementing these activities or they can hire consultants to calculate damages and determine damage-compensation liability. DPCs shall cooperates with the organizations responsible for data collection and assessment to identify the type of data and evidence to be collected as the grounds to select the service providers to conduct environmental parameter monitoring and analysis in order to collect data, evidence deemed to be necessary for calculation of damage and determination of damage-compensation liability. - What is the suitable time limit for assessment of the	- The steps to collect data, evidence for determination of violation, level of pollution at local level in the past period ***(in case the provinces have handled the similar cases)*** - The method to determine the level of violation, the contribution to pollution (%), damage-compensation responsibility of the enterprises in the cases handled by the provinces ***(in case the such provinces have handled the similar cases)*** - Collection of opinions whether the calculation of damage and determination of damage-compensation liability shall be implemented by the agency responsible for collection and assessment of data, evidence or the outsourced experts, organizations.	- Steps to collect data and evidence for determination of violation, the level of impact caused by the pollution-causing act of Vedan Vietnam JSC - The method to determine the contribution to the pollution (%) causing damages in Thi Vai river basin by Vedan Company.	- Steps to collect data and evidence for determination of violation, the level of pollution causing fish death incident in Cha Va River - The method to determine the contribution to the pollution (%), damage-compensation liability of the involved enterprises (14 relevant enterprises)

	collected data and evidence? Is the time duration proposed in the draft Circular long or short? And is it feasible for implementation?	- Collection of opinions about the suitable time duration for data and evidence collection		
	- The advanced fund to hire experts to carry out calculation of damage and determination of damage-compensation liability, and the service providers to monitor and analyze environmental parameter shall be advanced from the Vietnam Environmental Protection Fund, local environmental protection fund or by the service provider? This expenditure shall be reimbursed when the pollution-causing organizations pay compensation. The same question is raised in respect to the advanced fund for the council to appraise data and evidence? Is this expenditure advanced from the Environmental Protection Fund or the state budget? This expenditure shall be reimbursed when the pollution-causing enterprises pay compensation.	- Collection of opinion whether the funds to hire the organizations that provide environmental parameter monitoring, assessment and measurement services; the experts to calculate damage and determine damage-compensation liability; the fund for organizing meetings of the appraisal council area advanced from the environmental protection fund or by the agencies that implement the damage-compensation procedure or the service providers.	- The expenditures to conduct environmental monitoring, analysis, measurement in order to collect evidence, calculate damage and determine damage-compensation liability in this case.	- The expenditures to conduct environmental monitoring, analysis, measurement in order to collect evidence, calculate damage and determine damage-compensation liability in this case.
	- What are the rights and responsibilities of the organizations providing environmental monitoring and analysis services that sign contract with the state agencies? Are the rights and responsibilities of the service providers proposed in the draft circular by the	- Collection of opinions whether the rights and responsibilities of the organizations providing data and evidence collection services proposed in the draft circular suitable and		

	consultant team feasible? What are the possible difficulties to be faced during the implementation process?	appropriate.		
	Step 6. Assessment of data and evidence - Regarding the council for appraising the data and evidence, it is necessary to collect more opinions and comments including how the council is established. Shall the Director of DONRE or chairman of PPC at the provincial level, the Minister of MONRE or Director General of VEA at the central level issue the establishment decision? - The forms proposed by the consultant team are suitable. However, the question is whether they are easy to be implemented.	- Collection of opinions and information about the agencies that establish the council for appraising the collected data and evidence, the members of the council, the structure and operation of the council, the appraisal minute - Collection of comments and opinions to adjust the forms stipulated in the circular to ensure suitability and practicality	- Members of the council for appraising the collected data and evidence; structure and operation of the council, the appraisal minute. - Collection of comments and opinions about the steps of the procedure to implement compensation for environmental damage;	- Members of the council for appraising the collected data and evidence; structure and operation of the council, the appraisal minute. - Collection of comments and opinions about the steps of the procedure to implement compensation for environmental damage;
	Procedure to make compensation for damage	- Collection of opinions and comments about the applicability of the draft procedure to handle compensation for	- Collection of opinions about the conditions the	- Collection of opinions about the conditions the

		environmental damages for the specific environmental pollution cases in the surveyed provinces, the difficulties and shortcomings during the implementation of this procedure - Collection of opinions about the conditions to ensure the applicability of this procedure to handling of compensation for environmental damage in the surveyed provinces	applicability of the draft Circular in reality	applicability of the draft Circular in reality
	Survey by questionnaires	The site survey is also conducted through using questionnaires to interview the local people residing around the areas of environmental pollution and damages causing mass fish death (in Cha Va river in the South and Buoi river in Thanh Hoa).		

*** Note:** **Remark:** IER is the organization that calculated and determined damages in the Vedan case and Cha Va case. In these two case, data, evidence were collected and appraised; however, the compensation for damages caused to the natural environment was not implemented due to the insufficient legal basis and lack of guideline. Therefore, the site survey is conducted to collect necessary information in order to determine damages caused to the natural environmental when sufficient legal basis is promulgated.

ANNEX 2. DETAILED SITE SURVEY SCHEDULE

No	Time	Itinerary	The working target	Member of the site survey	Overnight stay	Remarks
I	**THE CENTRAL REGION**	Location of the site survey: Thanh Hoa City and Thach Thanh District of Thanh Hoa Province				
	Morning 02 June 2016 (6h30)	Ha Noi - Thach Thanh	Site survey of polluted area of Buoi River and relevant factories	- The team leader + the Assistant 1 - 03 officers of ESI		
	Afternoon 02 June 2016 (16:00)	Thach Thanh - Thanh Hoa City	Travelling from Thach Thanh to Thanh Hoa City		**Thanh Hoa City**	
	Morning 03 June 2016	7h:45 Guest reception	The morning (8: 30): Working with Thanh Hoa DONRE, PC of Thach Thanh District, PC of relevant levels, relevant branches, organizations, associations, enterprises and local people	Ditto		Hiring a meeting room to organize meeting
	Afternoon 14:00	Travelling from Thanh Hoa to Ha Noi				

II	**THE SITE SURVEY IN THE SOUTH: Duration: from 06 June 2016 to 10 June 2016**			- The team leader + the Assistant 2 - 03 officers of ESI - LET		
No	**Time**	**Itinerary**	**The working target**	**Member of the site survey**	**Overnigh stay**	**Remarks**
	Afternoon 06 June 2016	Hanoi - HCM				
	Morning 07 June 2016	8h:00 Guest reception	Morning: 8h30 Meeting with HCM DONRE, PPC of all levels, relevant branches, organizations, associations, enterprises and local people	- The team leader + the Assistant 2 - 03 officers of ESI - LET	HCMC	Hiring a meeting room
	Afternoon 07 June 2016	13h:30 Guest reception	14:00: Working with Institute for Natural Resources and Environment 18h:00: Travelling from HCM City to Ba Ria Vung Tau	- The team leader + the Assistant 2 - 03 officers of ESI - LET	Vung Tau City	
	Morning 08 June 2016	8h:00 Departure from the hotel	Morning: 8h30 Meeting with BR-VT DONRE, PPC of all levels, relevant branches, organizations, associations, enterprises and local people	- The team leader + the Assistant 2 - 03 officers of ESI LET	Vung Tau City	Hiring a meeting room
	Afternoon 08 June 2016		Afternoon: Site survey of Cha Va River area and some enterprises			

	Morning 09 June 2016	8h:00 Departure from BRVT to DONG THAP	Travelling from BRVT to DONG THAP	- The team leader + the Assistant 2 - 03 officers of ESI - LET	Cao Lanh City of Dong Thap Province	
	Morning 10 June 2016	7h:30 Departure from hotel	Morning: Meeting with Dong Thap DONRE, An Giang DONRE, PPCs of all levels, relevant branches, organizations, associations, enterprises and local people Afternoon: Dong Thap – HCM - HN	- The team leader + the Assistant 2 - 03 officers of ESI LET		Hiring a meeting room (Inviting Dong Thap Province and An Giang Province since the two provinces are related to mass fish death)

ANNEX 3. DISCUSSION POINTS

During the development of the Circular, ESI finds out some issues that require further study and collection of opinions from the provinces as follows:

Experience in collection of data and evidence in the specific cases:

- The steps to collect data, evidence for determination of violation, level of pollution in the provinces in the past period.
- Members of the council for appraising the collected data and evidence; structure and operation of the appraisal council; the appraisal minute.
- The method to determine the level of violation, the contribution to pollution (%), damage-compensation responsibility of the enterprises in the cases handled by the provinces.
- In the event that there is no environmental compensation case in the province, it is necessary to specify the reasons why compensation for environmental damages have not been implemented. What are the difficulties, short-comings in addressing environmental pollution, degradation occurred in the province?

Comments and opinions about the draft Circular:

- Are the basic steps provided in the draft Circular suitable? Is it necessary to add or remove any steps?
- This circular stipulates procedure to claim compensation for environmental damage when the subjects causing environmental pollution and degradation are identified. Is it necessary to stipulate the step to receive notification about environmental pollution and degradation (Articles 6, 7, 8 of the draft Circular)?
- Is it possible to apply the draft procedures to implement compensation for environmental damage to the specific environmental pollution cases of the province? Are there any difficulties and shortcomings?
- What are the most suitable units under PCs at all levels, MONRE to receive information, collect and assess the data and evidence, determine damage and damage-compensation liability (environmental and natural resource agencies, inspection agency or other)? Is it necessary to have full-time or part-time officers in charge of this issue? If full-time officers are required, how can we get the pay-roll for them? Is it required to specify the specific organization under PCs at all levels or MONRE or general information provided in Decree No. 03 can be applied?

- The time to process information on environmental pollution should be as short as possible, especially for the acts of illegal discharge and environmental incidents; however, the time limit has not been stipulated by law regulations. Is the time limit proposed in the draft circular (5-10 days) enough for MONRE and provinces? Normally, these organizations do not specialized officers and they have to deal with many other issues.
- Similarly, comments should be collected for the time limit to collect data and evidence (30-40 days). Is it necessary to lengthen or shorten such time limit?
- Is the time duration for issuing decision on establishment of the appraisal council (7 days) suitable and adequate?
- According to Decree No. 03, the organizations responsible for data collection and assessment shall collect data, calculate damage, and determine damage-compensation liability; however, the question is whether the PCs at district level (DPC) are capable of implementing these activities or they can hire consultants to calculate damages and determine damage-compensation liability. DPCs shall cooperates with the organizations responsible for data collection and assessment to identify the type of data and evidence to be collected as the grounds to select the service providers to conduct environmental parameter monitoring and analysis in order to collect data, evidence deemed to be necessary for calculation of damage and determination of damage-compensation liability.
- The advanced fund to hire experts to carry out calculation of damage and determination of damage-compensation liability, and the service providers to monitor and analyse environmental parameter shall be advanced from the Vietnam Environmental Protection Fund, local environmental protection fund or by the service provider? This expenditure shall be reimbursed when the pollution-causing organizations pay compensation. What should be done if the claim for compensation fails?
- Regarding the establishment of the appraisal council, shall the Director of DONRE or chairman of PPC at the provincial level, the Minister of MONRE or Director General of VEA at the central level issue the establishment decision?
- What are the conditions required to ensure the implementation of the Circular at provincial level?

ANNEX 4. MINUTE OF MEETING

a. Thanh Hoa

1. Summary:

The site survey conducted in Thanh Hoa resulted in the information about the compensation for environmental damage in the province as follows:

a. The incidents

There were some fish death incidents in Buoi River. Under instruction of Thanh Hoa PPC, the relevant functional agencies including VEA, Thanh Hoa DONRE, DARD, People's Committees of the district where the incidents occurred and the relevant enterprises cooperated to make investigation and determine the cause of the incidents. The relevant parties negotiated and agreed on the settlement; the relevant enterprises provided supports and compensation to the affected farmers. The appraisal of data was involved by experts, technical officers of Hoa Binh, Thanh Hoa and VEA. The appraisal council was not established.

b. Comments about the draft Circular:

a. About the draft Circular

The scope of regular should be revised. The scope of regulation is wide (Article 1 of the draft Circular), while the content of the Circular is limited to severe cases and critically severe cases.

It is not necessary to stipulate responsibility of the service providers in the drat Circular.

According to the title of the Circular, we can understand that this Circular is applied to the cases, in which the decision on compensation has been issued. However, the content of the Circular goes from the beginning.

b. Content of the draft Circular

There are three difficult issues encountered by compensation for environmental damage including (1). Collection of data and evidence; (2) calculation of damage; (3). Determination of subjects. Data, evidence collection and damage calculation require expertise and quick implementation process, which are very difficult for district and communal levels because of their insufficient capacity. Moreover, the communal level is not entitled to hire the service providers. As a result, implementation of compensation should be conducted by the provincial level or higher.

The time limit stipulated by the draft Circular is 5-10 days for processing information about environmental pollution and 30 to 40 days for collecting evidence and data should be re-considered. The time limits should be calculated basing on the scientific grounds and data.

c. Regarding the appraisal council, it is necessary to review Article 9 and Article 14 of the draft Circular. Article 14 stipulates the establishment of the appraisal council, while Article 9 stipulates the selection of the service providers to collect evidence and calculate damage… According to this Article, the service provider can calculate the damage, so why we need to establish the appraisal council. Moreover, the appraisal council is assigned with great responsibility but does not determine the damage, which means that they have to be responsible for the activities carried out by other organizations (service providers).

d. Law enforcement

According the participants, the legal enforceability of this draft Circular is low since it does not contain any clause stipulating the handling of the damage-causing entities if they do not make compensation for damage.

- As stipulated by the draft Circular, the consulting units carry out contract-based activities in accordance with the provided cost estimate. However, it is recommended to prescribe the implementation of the further request by the appraisal council, i.e., additional sampling (who shall take additional sample and sampling method).

- Further researches are necessary to ensure high efficiency and enforceability of the Circular. It is recommended to provide sanctions for implementation.

e. Punishment jurisdiction

f. Funding source:

This issue is not clarified clearly in the draft Circular. The compensation-request agencies other than the service providers shall advance the funds for implementation. However, the localities do not have budget for this activity. Therefore, the drafting unit should pay more attention to this issue.

2. The meeting minute

b. Ho Chi Minh City

1. Summary

It is proposed to utilize advances from the Vietnam Environmental Protection Fund or the Environmental Protection Fund; however, further researches should be conducted to find out the most suitable solution.

The time for collecting samples may be 30-40 days; however, the time for calculating damages and determining damage compensation liability may be longer depending the complication level of each specific case.

It is necessary to study regulations related to administrative violation sanction, collection of fine to avoid duplication.

It is necessary to establish selection criteria to select the service provider to collect evidence and data.

The name of the draft Circular should be revised to match the content of the Circular.

The draft Circular should provide the ground to implement compensation procedure that there must be acts subject to administrative sanction.

The notification about the damage should be made in a simple, quick manner. More forms of notification should be provided.

Multiple-step procedure is time-consuming; therefore, this procedure should be only applied to critical or extremely critical pollution. In the smaple and simple case, the step of data and evidence appraisal may be obmitted.

2. The meeting minute

c. Ba Ria Vung Tau

1. Summary

a. Specific cases in the province

In Ba Ria Vung Tau, there was an incident that was dead fish case in Cha Va River. To determine the cause, the PPC instructed DONRE to cooperated with the Institute for Environment and Resources (IER) and relevant agencies (DARD, the provincial police of environmental crime prevention, etc.) to promptly collect data, evidence to determine causes of fish death case in Cha Va River basing on the legal, actual and scientific as well as identify the entities liable to make compensation for the affected farmers. The PPC assigned specific responsibility to each functional agencies including DONRE, DARD, Department of Justice, the Provincial Police, PC of Vung Tau City, the Layers Association, the Farmer Union, the Women Union to

support the affected farmers to claim compensation for damage. The province has prepared the project on restoring the environmental of Cha Va river with the fund of VND 10 billion.

b. Comments about the draft Circular:

The procedure should be simple to ensure the most rapid settlement process.

Notification should be made in various manners. We should consider whether notification form is required since it may be inconvenient for the reporter.

It is required to define critical or extremely critical pollution.

Time limit for issuing decision on compensation must be stipulated to bind responsibility of the involved parties.

Time limit for evidence collection: the time should be extended for complicated cases to ensure sufficient and scientific collection of evidence.

It is necessary to stipulate the time for implementation of compensation, possibly one time for small damage and multiple times for great damage.

Form 11 should be revised: Decision ((Name of organizations, individuals causing environmental pollution) is responsible to make compensation for damage to (compensation-request-liable agency) located at the address…. with the amount of….

The appraisal council should involve the scientists and the affected people.

2.The meeting minute

d. Dong Thap

1. Summary

a. Specific cases in the province

Five days before Lunar New Year 2016, a fish death case occurred in Dong Thap Province. Right after receiving information, the District PC, and District DONRE cooperated with An Giang DONRE to take samples of the water for analysis that indicated low DO concentration. The PPC assigned DONRE to determine the cause of the fish death incident. Investigation showed that the fishes died because of low water level, non-running water flow, and high density of fishes leading to local oxygen deficiency. According to local people, production facilities discharging wastewater also contributed to the fish death. The investigation by the competent authorities found a rice mill factory but it did not operate at that time. The collected water samples contained low

oxygen content; however, no further finding was detected. Three to four days after the incidents, the competent authorities concluded that the water quality changed and dead fishes caused pollution to the river.

b. Comments about the draft Circular:

The classification of collected information should be considered. The collection of information may require 05 days; however, the collected information should be processed immediately to ensure the accuracy. The total time for data collection stipulated by the Circular is 40 days, which is reasonable comparing with other legal documents.

It is required to stipulate the relevant members of the councils. It is not necessary if the appraisal council is established to vote on the assessment results.

The functions and members of the appraisal council should be considered to ensure equality, effectiveness. It is necessary to allow the organizations, individuals causing environmental pollution be participate in the appraisal council and stipulate the time limit for complaint in the event of disagreement with the conclusions by the council

It is necessary to stipulate capacity of the officers that carry out assessment of the site and appraisal of evidence.

The appraisal council should be established by DONRE or PPC other than PCs at communal and district levels.

The term “damage caused to the natural environment” should be defined. Article 8 should clarify what the necessary cases are.

The appraisal council: the organizations, individuals that are requested to make compensation should involve in the appraisal council. It is necessary to stipulate the time limit for raising complaints such organizations and individuals if they do not agree with the conclusions by the appraisal council.

Article 22: it is necessary to stipulate the agencies that can use the compensation amount used for environmental restoration and pollution mitigation.

2. The meeting minute

MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

THE JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT

FOR

STRENGTHENING CAPACITY OF WATER ENVIRONMENTAL MANAGEMENT IN RIVER BASIN

REPORT ON

REVIEW, ANALYSIS OF LEGAL DOCUMENTS ON THE BIDDING PROCEDURES TO PROPOSE THE OPTIONS FOR SELECTING THE ORGANIZATIONS AND INVIDUALS THAT PROVIDE MONITORING, ASSESSMENT, MEASUREMENT SERVICES IN ORDER TO COLLECT DATA AND EVIDENCES FOR DETERMINATION OF ENVIRONMENTAL DAMAGES

Reporter: Nguyen Mai Hanh

Hanoi, March 2017

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PREAMBLES

On 3rd December 2010, the Governmental promulgated the Decree No. 113/2010/ND-CP on stipulating the determination of environmental damages. That is an important legal basis for determination and implementation of compensation for damages caused to the environment.

On 23rd June 2014, the Law on Environmental Protection No. 55/2014/QH13 was passed by the National Assembly to replace the Law on Environmental Protection 2005. In order to ensure the comprehensiveness of the Law on Environmental Protection (LEP) 2014, a series of legal normative documents have been amended and supplemented including Decree No. 03/2015/ND-CP dated 6th January 2015 on stipulating the determination of environmental damages. However, the post-promulgation application of this legal document faces up to various difficulties and challenges, which results in the development of its guiding documents by Ministry of Natural Resources and Environment (MONRE). One of the difficulties is how to make accurate and adequate calculation of damages as well as identify the damage compensation responsibility. The state management agencies are not allowed to calculate the damages caused by their environmental pollution causing activities; therefore, the laws empower them to select the other institutions, organizations, individuals that can help them to make calculation of damages. However, the selection of institutions, organizations, individuals capable of undertaking the monitoring and measurement serving data, evidence collection and determination of damages is not a simple task. Which selection criteria to be applied and how to select the service providers (the selection process and procedures) must be studied carefully, the selection for the most suitable service providers for calculation and determination of damages among various qualified and capable organizations is a civilized manner of competition in the market economy in order to select the organizations and/or individuals that can meet the technical and economic requirements. The birth and existence of bidding aim at ensuring the competitiveness, equality, transparency in selection of the most suitable bidders and the economic efficiency of a package/.

Bidding activities take a role in ensuring four criteria including Effectiveness – Competitiveness - Equality – Transparency. Effectiveness is obtained possibly in term of finance, time or any other criteria depending on the purposes of the activities. The

achievement of activity effectiveness requires the favorable conditions for bidders to make open competition to the largest extent possible in order to generate equality and benefits for all the stakeholders.

In the circumstance and context of data, evidence collection and determination of environmental damages in Vietnam, the research team has conducted initial study of the relevant legal normative documents, the manner and procedures identified in the bidding law as the base to propose the appropriate form(s) of bidding (process) in selection of service providers related to the collection of data and evidence for environmental damage compensation.

PART I. REVIEW OF LEGAL DOCUMENT RELATED TO SELECTION OF THE SERVICE PROVIDERS

The review of legal normative documents relating to the selection of the service providers in general leads to the findings as below:

a. The procedure to select the service providers in general and the institutions/organizations in the field of consultancy, procurement, engineering, commodities, etc., follows the regulations specified in the Bidding Law No. 43/2013/QH13.

b. The different ministries, sectors also apply the procedures stipulated in the Bidding Law for selecting the general service providers; however, they shall refer to the specific criteria of each sector for evaluating the tender document technically and financially. In the construction sector, for example, the selection of the bidders shall adopt the procedures provided in the Bidding Law; however, the technical and financial criteria for awarding the bid must ensure observation with the Law on Construction.

The bidding activities aim at ensuring the competitiveness, equality and transparency; therefore, bidding activities can operate effectively in a real competitive environment in order to select the most appropriate bidders and ensure the economic efficiency. The Bidding Law as the most important tool for the State to manage and control the bidding activities was first promulgated in 2005. However, due to many shortcomings in enforcement, it was replaced by the Bidding Law 2013 (endorsed by the National Assembly in its sixth meeting session held on 26th November 2013). The amended Bidding Law consists of 13 chapters, 96 articles and took effect on 1st July 2014.

Bidding is the most optimum activities to address the resource and technical issues as well as the transparency of two parties including the procuring agency (the project owner) and the bidder in order to make the most effective implementation of the project. In this connection, the Vietnamese Government has promulgated various legal normative documents on bidding in general and bidding by relevant ministries and sectors, in particular.

The Bidding Law is a key legal document relating to bidding activities and selection of the contractors for implementation of the assigned activities such as service provision, consultancy, public shopping, construction, etc., which is promulgated by the

National Assembly to codify the contents specified in other legal normative documents stipulating the bidding activities, remedy the conflicts and duplication between different legal documents in the same sector while guaranteeing the unification and transparency of the law system. The Bidding Law provides specific regulations on procedures to select the contractor, investors for each specific case; details the method to evaluate the tender documents by specific sector including selection of the consultancy, non-consultancy, goods, engineering contractors, etc.

To implement the Bidding Law, on 26th June 2014, the Government promulgated the Decree No. 63/2014/ND-CP on detailing the implementation of several provisions of the Bidding Law regarding the selection of contractors, which takes effect from 15th August 2014.

Base on the bidding principles stipulated in the Biding Law No. 43/2013 and the Decree No. 63/2014/ND-CP, the relevant Ministries and sectors promulgated the circulars that detail the bidding activities for the specific fields under management of such Ministries and sectors such as Ministry of Planning and Investment (MPI), Ministry of Finance (MOF), Ministry of Construction (MOC), Ministry of Health (MOH), MONRE (the detailed relevant documents are provided in the appendices of this Report). These circulars aim at detailing the activities related to bidding in the specific fields of the leading Ministries and sectors in alignment with their specific characteristics.

Base on the Bidding Law and the Decree detailing the implementation of the Bidding Law, MONRE promulgated the Decision No. 88/QD-BTNMT on promulgation of the bidding regulation, order of the public service using the state budget in MONRE. The list of the public services related to natural resource and environment using the state budget is endorsed by Minister of MONRE in the Decision No. 2370/QD-BTNMT that specify the activities using the state budget for making order or organizing the bidding.

For the mentioned-above reasons, the research team shall focus on the review of legal normative documents relating to biddings promulgated by the Government and those provided by the relevant ministries, sectors to serve the selection of the service providers in particular and the bidding process in general (the detailed relevant documents are provided in the appendices of this Report).

Legal normative documents on bidding promulgated by the competent authorities

Laws:

- Bidding Law No. 43/2013/QH13 that was promulgated on 26th November 2014 and took effect on 1st July 2014;

- Law No. 38/2009/QH12 promulgated by the National Assembly as the Law on amending and supplementing a number of articles of the Laws concerning Capital Construction Investment, which is still in effect except for Article 2.

Decrees:

- Decree No. 63/2014/ND-CP of the Government on detailing the Bidding Law regarding the selection of contractors;

- Decree No. 155/2013/ND-CP of the Government on stipulating the sanction of administrative violations in planning and investment;

- Decree No. 130/2013/ND-CP on the production provision of public-utility products services;

- Decree No. 68/2012/ND-CP on amending and supplementing a number of articles of the Decree No. 85/2009/ND-CP dated 15th October 2009 on guiding the Bidding Law and the selection of construction contractors under the Law on Construction;

- Decree No. 22/2012/ND-CP of the Government on the auction of the mineral exploitation right;

- Decree No. 24/2011/ND-CP on amending some articles of the Decree No. 108/2009/ND-CP on investment in the form of build-operate-transfer contract, build-transfer-operate contract, build-transfer contract;

- Decree No. 85/2009/ND-CP on guiding the implementation of the Bidding Law and selection of construction contractors under the Law on Construction.

Circulars

- Circular No. 14/2016/TT-BKHDT on detailing the preparation of bidding dossiers for non-consultancy services;

- Circular No. 11/2016/TT-BKHDT on detailing the preparation of bidding documents for engineering-procurement of goods-construction (EPC);

- Circular No. 10/2016/TT-BKHDT on guidelines for supervision and inspection of bidding;

- Circular No. 07/2016/TT-BKHDT on guidelines for bidding documents and requests for proposals on online procurement of goods via online procurement network;

- Circular No. 11/2016/TT-BYT on stipulating the bidding for supply of drugs for public health facilities;

- Circular No. 23/2015/TT-BKHDT on detailing the preparation of the evaluation report in the selection of contractor;

- Circular No. 19/2015/TT-BKHDT on stipulating the preparation of the evaluation report in the contractor selection process;

- Circular No. 11/2015/TT-BKHDT on guidelines for making request for proposals in case of direct contracting and competitive offering;

- Circular No. 10/2015/TT-BKHDT on detailing contractor selection plan;

- Circular No. 05/2015/TT-BKHDT on detailing the preparation of bidding documents for procurement of goods;

- Circular No. 03/2015/TT-BKHDT on detailing the preparation of construction and installation bidding documents;

- Circular No. 01/2015/TT-BKHDT on making of requests for expression of interest invitation to bid, request for proposals for consulting services;

- Circular No. 65/2011/TT-BCA on stipulating the management of investment projects, construction work bidding in the field of people's public security;

- Circular No. 21/2010/TT-BKHĐT on detailing the appraisal of bidding dossiers of requirement;

- The Joint-Circular No. 20/2010/TTLT-BKHDT-BTC providing specific provisions on online supply and posting of procurement information and online contractor selection;

- Circular No. 17/2010/TT-BKHDT on providing in detail online bidding;

- Circular No. 15/2010/TT-BKHDT on detailing the preparation of reports on evaluation of the bid dossiers applicable to consultancy service bid packages;

- Circular No. 11/2010/TT-BKHDT on detailing the competitive offering;

- Circular No. 06/2010/TT-BKHDT on stipulating the preparation of the consultancy service bidding dossiers;

- Circular No. 03/2010/TT-BKHDT on detailing the dossiers of invitation for construction and installation prequalification;

- Circular No. 211/2009/TT-BTC on providing the bidding for procurement of state reserve commodities by the state reserves management unit;

- Circular No. 63/2007/TT-BTC on guiding the bidding for procurement of assets with state capital for maintaining regular operations of the state agencies;

- Circular No. 04/2000/TT-BKHDT on guiding the implementation of the bidding regulation;

In the environmental field, MONRE promulgated the Decision No. 88/QĐ-BTNMT on promulgation of the regulation on bidding, order of public services using the state budget. The methods of bidding are: open and limited.

For detailing implementation, MONRE promulgated the Decision No. 2370/QĐ-BTNMT on promulgation of the list of public uses of natural resources and environment, they are:

- Activities in the field of information technology: construction of the database, software to support the development of the sector database;

- Activities in the field of land;

- Activities in the field of water resources including: planning and adjustment of the planning; investigation and assessment of the current status of exploitation and use; investigation and assessment of the current status of wastewater discharge and wastewater receiving capacity; development of the inter-lake operation procedures in river basins, monitoring, etc., of water resources;

- Activities in the field of environment, including: environmental monitoring and analysis (surface water, underground water, rain water, sea water, exhaustion gas, radioactivity, soil); creation of environmental maps (air, surface water, sea water);

- Activities in the field of meteorology, hydrology and climate change;

- Activities in the field of the sea and islands;

- Activities in the field of Geology and Minerals.

Therefore, in relation to the bidding issues, the competent authorities of Vietnam have promulgated relatively sufficient legal documents at various levels, including law, decree, circular of the relevant ministries and sectors.

The documents provide comprehensive regulation on the bidding contents from bidding dossier, the contractor selection plan, tender document appraisal, modes of

bidding, specific requirements of each bidding mode, rights, responsibilities and obligations of the stakeholders in the bidding process.

The implementation of these documents is relatively effective in the practical context of Vietnam. Therefore, the bidding is managed strictly with selection of the qualified contractors for rendering of the desired services.

In the field of environment, the Ministry of Natural Resources and Environment issued regulations on bidding rules, order, and provision of public services using Governmental budget. Activities require bidding include environmental monitoring and analysis [MONRE promulgated the Decision No.88/QĐ-BTNMT and No. 2370/QĐ-BTNMT. Activities in the field of environment, including: environmental monitoring and analysis (surface water, underground water, rain water, sea water, exhaustion gas, radioactivity, soil); creation of environmental maps (air, surface water, sea water)]. These activities occur periodically, no need of emergency responses, such as severe environmental incidents or degradation.

For urgent cases, MONRE has no legal documents or guidelines for response of environmental incidents. Therefore, in order to contribute to the improvement of the legal document system in providing guidelines to select agencies that provide services on monitoring, measuring, assessing, calculating and determining environmental damage, MONRE should consider and study to develop legal documents concerning these activities

PART II. PROCEDURES TO SELECT CONTRACTOR (BIDDING PROCESS)

Currently, the selection of service providers in Vietnam are mainly based on the provisions, procedures of one among 7 contractor/services provider selection manners without any specific bidding process provided by any ministries, sectors. Taking in to account the Bidding Law and the characteristics (size, value of the package, etc.,) of each sector, the state management agencies can decide the form of bidding (the forms of bidding are listed in the section "Manner of Contractor Selection" – Overview about Bidding).

During the selection of contractor/service provider, the selection procedure shall follow the regulations specified in the Bidding Law, while the selection criteria may comply with either the Bidding Law or the specific criteria of the sector.

II.1. Overview about bidding

Current types of bidding

Base on the field of operation, bidding may be classified into various types as follows:

- ***Bidding for selection of consultant***: is a bidding process to select a consulting company or an individual consultant with technical experience to perform the relevant works in preparation of investment and implementation of bidding.

- ***Bidding for shopping of materials and equipment***: is a process of selecting the contractors to provide suitable materials and equipment in order to meet the requirements of the project.

- ***Bidding for construction and installation:*** is a process to select the suitable contractor(s) to perform the construction and installation works that meet the project requirements.

- ***Project bidding:*** is a process to select the suitable partners that are capable for organizing the implementation of all the works related to the project from preparation of investment to installation and arrangement of resources, etc.

Base on the manners of contractor selection, bidding is classified into following forms:

- ***Open bidding***: the number of bidders shall be unrestricted[1]. Prior to issuing the bidding documents, the bid solicitor must publish an invitation-to-bid notice in

[1] Article 20, item 1. Chapter II, Law on Bidding

accordance with Article 5 of the Bidding Law so that bidders will have information about participation. The bid solicitor must supply bidding documents to any bidder who wishes to participate in the bidding. The bidding documents must not include any term or condition aiming at restriction of participation of bidders or favoring one or more bidders thereby causing unfair competition.

- ***Limited bidding:*** means the restricted number of bidders

Limited bidding shall apply in the following cases:

Where a donor providing the financing source for the bid package requests

Where the bid package has highly technical requirements or technical peculiarities. Actually, there is currently no legal normative document that clearly defines high technology in Vietnam; or in the case of bid packages of a research or experimental nature for which only a limited number of bidders are capable of satisfying the requirements of the bid package[2].

When limited bidding is held, a minimum of five bidders considered to have the capability and experience to participate in the bidding must be invited; if in fact there are less than five bidders, the investor must make a submission to the authorized person for his consideration and decision on permission to continue to hold limited bidding or to apply another form of selection of contractor.

- ***Direct appointment of contractor[3]***: Direct appointment of a contractor shall apply in the following cases:

In the case of an event of force majeure due to a natural disaster, war or a breakdown, which should be immediately dealt with. The procuring agency or the body responsible for managing the building works or assets affected shall be permitted to immediately appoint a contractor to carry out the work. Within a time-limit not to exceed fifteen (15) days as from the date of making a direct appointment, the procuring agency or the body responsible for management of the building works or assets affected must, together with the appointed contractor, carry out the stipulated procedures for appointment of a contractor

Bid packages in which the foreign donor stipulates that there shall be direct appointment of a contractor

[2] Article 21, Chapter II, Law on Bidding
[3] Article 22, Chapter II, Law on Bidding

Bid packages belonging to national confidential projects; and urgent projects in the national interest or for the safety and security of energy as decided by the Prime Minister.

Bid packages for the procurement of any type of materials and equipment in order to restore, maintain or expand the capacity of equipment and technological production lines which were previously purchased from the one supplier, and in order to ensure compatibility of facilities and technology it is not possible to purchase such materials and equipment from other supply bidders.

Bid packages for consultancy services with a bid package price of less than five hundred million dong, bid packages for the procurement of goods or for construction and installation with a bid package price of less than one billion dong belonging to projects for investment and development; bid packages for the procurement of goods with a bid package price of less than one hundred million dong belonging to a project or estimated budget for recurrent procurement[4].

Direct procurement: direct procurement shall apply when a contract was signed for a bid package with similar contents within the previous six (6) months.

When conducting direct procurement, it shall be permitted to invite the bidder who was selected via bidding to implement the earlier bid package with similar contents. The unit price of the items of a bid package for which the form of direct procurement is applied shall not exceed the unit price of the corresponding items of the previous bid package for which a contract was signed.

- ***Competitive offering in procurement of goods[5]:*** shall apply in cases which satisfy all the following conditions:

The bid package price is less than two billion dong;

The items to be purchased are commonly used goods which are readily available on the market, which have standardized technical features and which are similar to each other in quality.

When conducting competitive quotation, a request to provide a quotation must be sent to bidders. Bidders may send their quotation directly to the bid solicitor, by fax

[4] Article 23, Chapter II, Law on Bidding
[5] Article 23, Chapter II, Law on Bidding

or via the post office. Each bid package must have a minimum of three quotations from three different bidders

- ***Self-implementation***[6]: shall apply where the investor is also a contractor with sufficient capability and experience to implement the bid package belonging to the project which such investor manages and uses.

- ***Selection of contractor in special cases***[7]

In the case of a bid package with particular requirements for which the forms of selection of contractor stipulated in articles 20, 21, 22, 23, 24 and 25 of the Bidding Law cannot be applied, the procuring agency shall prepare a plan for selection of contractor which ensures competitiveness and economic effectiveness and submit same to the Prime Minister of the Government for his consideration and decision

- ***Community's participation in performance***[8]

Population communities, organizations, teams, groups of workers in localities where have procurements may be assigned to perform entire or part of such procurement in the following cases:

Procurements under the national objective programs, support programs of hunger elimination, poverty reduction for districts, communes in mountainous, deep-lying and remote areas, islands, areas with special difficulty-stricken economic-social conditions;

Procurements with small scale which the local population communities, organizations, teams, groups of workers may undertake.

II.2. Method of bidding

Currently, the bidding activities in Vietnam are performed in either method as follows:

- ***The single envelope method of bidding***[9]

Applying this method, the bidder shall submit his tender in one envelope (including his technical and financial proposals), which is applied to bid packages for the **procurement of goods and for construction and installation**.

[6] Article 25, Chapter II, Law on Bidding
[7] Article 26, Chapter II, Law on Bidding
[8] Article 27, Chapter II, Law on Bidding
[9] Item 1, Chapter II, Decree No. 63/2014/NĐ-CP of the Gov on Detailing the Law on Bidding

- ***The two-envelope method of bidding***[10]

A bidder shall submit his technical proposals and financial proposals in two separate envelopes at the same time. There shall be two openings of tenders: first the technical proposals shall be opened for assessment, and then the financial proposals of all bidders whose technical proposals have been assessed as satisfying the requirements shall be opened in order to make an overall assessment. This method is only applied to bidding for ***selection of consultancy services***.

- ***The two-stage and one-envelope method*** [11]

This method comprises of two phases, in which the bidder shall prepare 01 dossier bag (including technical proposal and financial proposal). The details are as follows:

In the first phase, bidders shall submit their technical and financial proposals without a tender price

In second phase, bidders participated in first phase shall be invited for submission of tender documents including technical proposals, financial proposals at the request of bidding dossier and bid security

The two-phase method with one dossier bag shall apply in cases of open bidding, limited bidding for procurement of goods, construction and installation, mixture content with big scale and complex nature

- ***The two-stage and two-envelop method***[12]

This method comprises of two phases, in which the bidder shall prepare 02 dossier bags (including technical proposal and financial proposal). In first phase, bidders shall submit concurrently both dossier of technical proposals and dossier of financial proposals in a separate form at the request of bidding dossier. Dossiers of technical proposals shall be opened as soon as bid closure, followed by financial proposals.

In second phase, bidders satisfying requirements in first phase shall be invited for submission of bid dossiers, including technical proposals and financial proposals at the request of bidding dossier for second phase.

[10] Item 2, Chapter II, Decree No. 63/2014/NĐ-CP of the Gov on Detailing the Law on Bidding
[11] Item 1, Chapter IV, Decree No. 63/2014/NĐ-CP of the Gov on Detailing the Law on Bidding
[12] Item 2, Chapter IV, Decree No. 63/2014/NĐ-CP of the Gov on Detailing the Law on Bidding

This method shall apply in cases of open bidding, limited bidding for procurement of goods procurement, construction and installation, mixture content with new, complex and particular techniques and technologies.

II.3. Responsibility of stakeholders in the implementation of bidding process

State management in the field of bidding – the Governmental agencies, ministries, sectors and localities

The State is responsible to manage the information systems and databases on bidding nationwide, monitor, check, inspect, and deal with the recommendations, complaints, and denouncements in bidding; and handle breaches of the laws on bidding in accordance with the Bidding Law and other relevant regulations.

1. Responsibilities of Government and the Prime Minister

Make decisions on the bidding issues under his competence (see Article 73, Law on Bidding);

Approve plan on selection of contractors, investors in special cases;

Direct the inspections; resolve complaints, denunciation; and deal with breaches of the Bidding Law and other relevant law regulations.

2. Ministry of Planning and Investment

To be responsible to the Government for the exercise of unified state management of bidding activities nationwide

To evaluate plans on selection of contractor, investor in projects under the consideration and decision competence of the Prime Minister.

To build up, manage, guide use of the national bidding website and bidding newspaper

To perform other tasks on bidding as assigned by Government and the Prime Minister.

3. Responsibilities of ministries, ministerial equivalent bodies, and all level people's committees

- Ministries, ministerial equivalent bodies, and all level people's committees shall, within their tasks and powers, have the following responsibilities:

To exercise administration of bidding work;

To summarize, assess and report on the status of implementation of bidding activities;

To resolve protests regarding bidding;

To conduct checks and inspections, resolve complaints, denunciation, and with breaches of the law on bidding;

To organize the capacity building of bidding knowledge for cadres, civil servants and public employees engaged in bidding work;

In cases where a minister, head of a ministerial equivalent body or chairman of a people's committee at any level is concurrently the authorized person, then such minister, head or chairman must also discharge the responsibilities stipulated in article 73 of the Bidding Law; if being investment owner, he must also discharge the responsibilities stipulated in article 74 of the Bidding Law.

4. Responsibilities of the organization operating the national bidding network system

To manage and operate the national bidding network system.

To maintain confidentiality of documents and data throughout the process of bidding through net work in accordance with regulations.

To supply services to guide investment owners, the bid solicitor, bidders, investors in bidding through network, and registering, publishing information on the national bidding network system.

To save information in serve of searching, monitoring, supervising, checking, inspecting and auditing.

To publicize conditions on information technology infrastructure of users when participating in bidding through network.

Responsibilities of stakeholders in selection of contractors, investors

1. Competent person:

The competent persons are the organizations, units that sign contracts with the investors. They may possibly be a state agency and other organizations, etc.

To approve the plan on selection of contractor, investor, except for case defined at point a, Clause 1, Article 74 of the Bidding Law.

To resolve complaints during selection of contractor, investor

To deal with breaches of bidding in accordance with this Law and other relevant laws.

To cancel bid as prescribed by the regulation

To suspend bid, to refuse recognition of result of selecting bidder, investor

2. The Owner (the State, organization, enterprises, etc.)

To approve documents during contractor selection, including: a) Plan on selection of contractors in case the procurement is performed prior to decision on approving the project; b) Dossier of invitation for expression of interest, dossier of invitation for pre-qualification, short list; c) Bidding dossier, dossier of requirements; d) List of ranked contractors; f) Result of selection of contractors.

To sign or authorize for signing and manage the contract performance with contractor

To decide on establishment of the bid solicitor

To deal with the circumstances

To resolve complaint during selection of contractors

To maintain confidentiality of relevant documents during selection of contractors

To archive relevant information

To report the annual bidding work.

To pay compensation for loss and damage to relevant parties pursuant to this Law if such loss and damage was caused by him.

To cancel bid as prescribed at Clause 1, Article 17 of the Bidding Law.

To be legally liable before law and competent person for the process of selection of contractor.

To provide information, relevant documents and make explanations on observance with provisions in this Article at the request of superior agencies, inspection agencies, state management agencies on bidding activities.

If the owner currently being the bid solicitor, the investment owner must take responsibilities specified in Article 75 of the Bidding Law.

To perform other tasks as prescribed in this Law.

3. Bid solicitor

The Bid Solicitation Board is established by the Investor for big projects normally in the field of construction, regular shopping. In the normal projects, the expert team and the owner shall act as the Bid Solicitation Board. Bid solicitor is an entity that is established or selected by the Owner. The Owner shall decide the establishment of the Bid solicitor, select a professional bidding organization to make implementation in case he does not have enough human resource. The Bid solicitor shall be responsible:

Project packages	**Regular procurement**
To conduct preparations for contractor selection; to organize contractor selection, and to assess dossiers of expression of interest, dossiers of pre-qualification participation, bid dossiers, dossiers of proposals; To decide on establishment of expert group; To request bidders to clarify their dossiers of expression of interest, dossiers of pre-qualification participation, bid dossiers and dossiers of proposals during the process of dossier assessment; To submit for approval of the result of short list selection and result of contractor selection; To negotiate and finalize contract with bidder;	To conduct preparations for contractor selection; to organize contractor selection, and to assess dossiers of expression of interest, dossiers of pre-qualification participation, bid dossiers, dossiers of proposals; To decide on establishment of expert group; To request bidders to clarify their dossiers of expression of interest, dossiers of pre-qualification participation, bid dossiers and dossiers of proposals during the process of dossier assessment; To submit for approval of the result of short list selection and result of contractor selection; To negotiate and finalize contract with bidder; To pay compensation for loss and damage to relevant parties pursuant to the law if such loss and damage was caused by the bid solicitor’s fault; To maintain confidentiality of relevant documents during selection of contractors; To ensure honesty, objectivity and impartiality throughout the process of contractor selection;

To pay compensation for loss and damage to relevant parties pursuant to the law if such loss and damage was caused by the bid solicitor's fault; To maintain confidentiality of relevant documents during selection of contractors; To ensure honesty, objectivity and impartiality throughout the process of contractor selection; To provide information to the bidding newspaper and to the national bidding website; to provide information and relevant documents and make explanations on observance with provisions in this Clause at the request of competent person, investment owner, inspection agencies, state management agencies on bidding activities; To be legally liable before law and the owner for the process of selection of contractor.	To approve the bidding dossier, dossier of requirements; To approve the result of contractor selection; To sign and manage the contract performance with contractor; To make a decision dealing with any exceptional situation; To resolve protests during selection of contractors; To cancel bid as prescribed at Clause 1 Article 17 of the Bidding Law; To be legally liable before law and competent person for the process of selection of contractor; To archive relevant information during selection of contractors as prescribed by law on archival and regulations of Government; To provide information to the bidding newspaper and to the national bidding website; to provide information and relevant documents and make explanations on observance with provisions in this Clause at the request of competent person, investment owner, inspection agencies, state management agencies on bidding activities; To report on the annual bidding activity.

Expert group

The expert groups are decided to establish by the Procuring Agency or selected from an external independent group to support the Procuring Agency in implementation of the bidding invitation process. The expert groups have following responsibilities:

To be honest, unbiased, and impartial throughout the process of implementation of tasks.

To conduct assessments of dossiers of expression of interest, dossiers of pre-qualification participation, bid dossiers, dossiers of proposals correctly in accordance with the requirements.

To report the bid solicitor about result of assessing dossiers of expression of interest, dossiers of pre-qualification participation, bid dossiers, dossiers of proposals and list of the ranked bidders, investors.

To maintain confidentiality of relevant documents during selection of contractors, investors.

To reserve their own opinions.

To pay compensation for loss and damage to relevant parties pursuant to the laws if such loss and damage was caused by the expert group's fault.

To provide information, relevant documents, and make explanations on implementation of provisions on bidding activities in reference to request of competent person, the bid solicitor, inspection agencies, state management agencies.

To perform other tasks as prescribed in the Bidding Law

Evaluating/appraisal organization

The evaluation/appraisal team is a group that performs the evaluation of the dossiers submitted by the contractors. The evaluation team is established or invited to implement the tasks by a decision of the Owner.

To act independently and to comply with the provisions of this Bidding Law and other relevant laws when conducting evaluations.

To request the investment owner and the bid solicitor to provide all relevant documents and data.

To maintain confidentiality of documents and data throughout the process of evaluation.

To be honest, unbiased, and impartial throughout the process of evaluation.

To reserve their own opinion and to bear liability for their evaluation report.

To pay compensation for loss and damage to relevant parties pursuant to this Law if such loss and damage was caused by their fault.

To provide information, relevant documents and make explanations on observance with provisions in this Article at the request of competent person, the investment owner, the bid solicitor for regular procurement, concentrated procurement, inspection agencies, state management agencies on bidding activities.

To perform other tasks as prescribed in the Bidding Law.

II.4. The general bidding procedure

The Bidding Law does not stipulate the basis to determine the bidding form of the bid procurements; however, the Circular No. 10/2015/TT-BKHDT details the bidder selection plan as follows:

- Open bidding is applied to the procurements regulated by the Law on Bidding No. 43/2013/QH13, except for the other specified cases.

- Limited bidding is applied to procurements with high or special technical requirements that are met by few contractors

- Direct appointment of contractor is applied in the cases mentioned in Clause 1, Article 22 of the Law on Bidding No. 43/2013/QH13 and Article 54 of Decree No. 63/2014/NĐ-CP provided requirements in Clause 2, Article 22 of the Law on Bidding are satisfied.

II.4.1. The procedure to select contractors

In the bidding process, the procedure to select the contractors/ investors is the most important, aiming at the technical and cost effectiveness, transparency, and optimization. Upon study and review, the research team has illustrated the bidding implementation process as the base to propose the appropriate procedure to select the contractors that provide the services related to calculation and determination of environmental damage.

- ***The procedure of dossier preparation by the bid solicitor and the bidder***

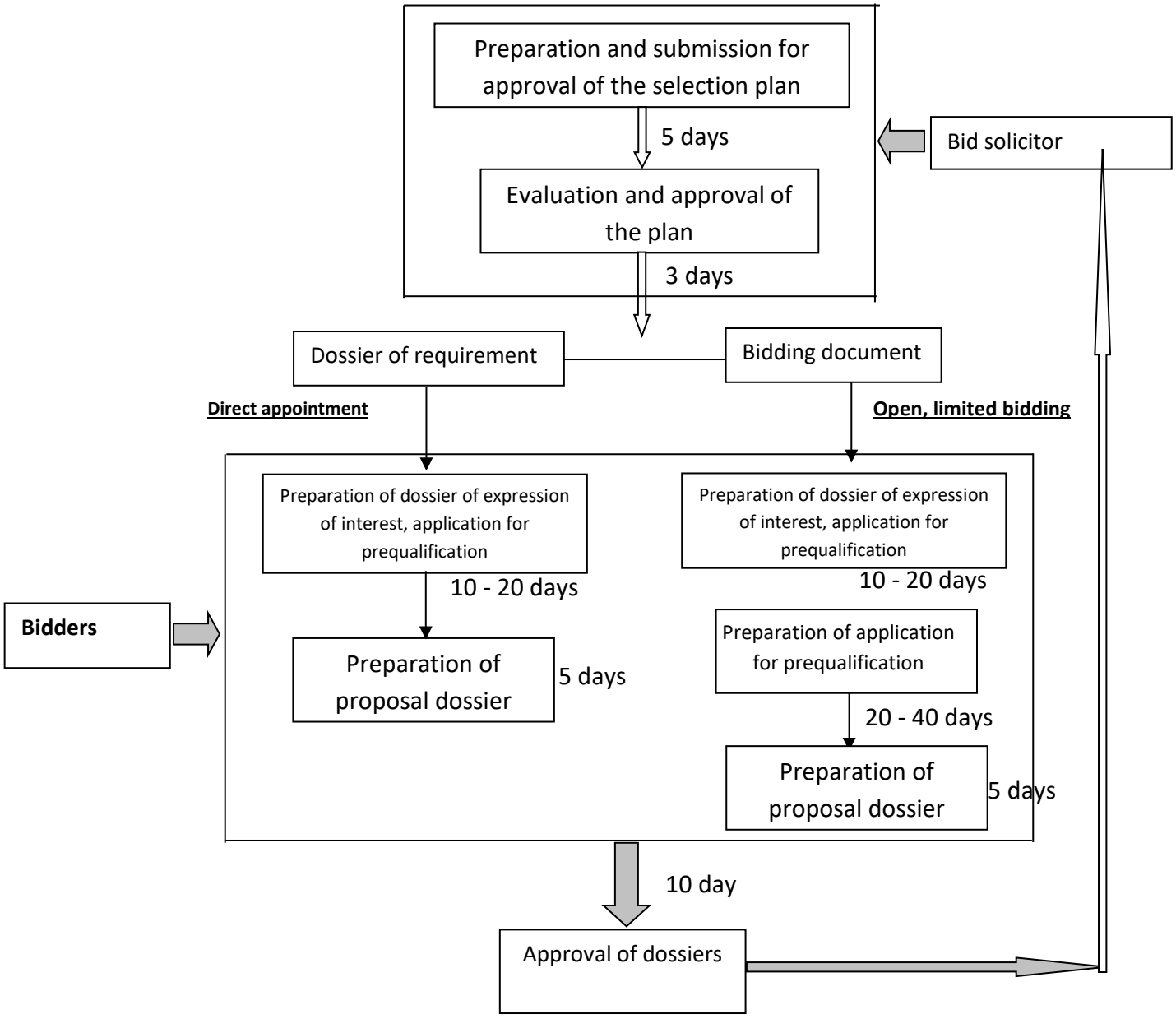


Figure1. Procedures and time limitation for preparation of dossiers by the bidders and bid solicitor

- ***The general bidding procedures***

While the open and limited bidding shall follow the Bidding Law No. 43, the general procedures shall be performed as follows:

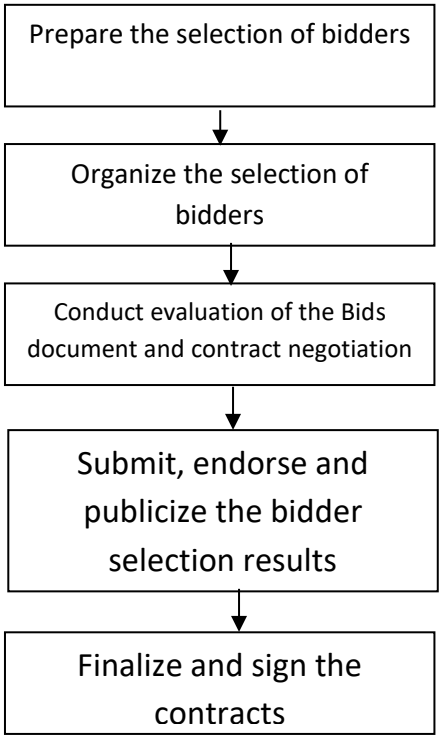


Figure 2. The general procedure of bidder selection in open and limited bidding (in accordance with Law No. 43)

The normal procedure of direct appointment

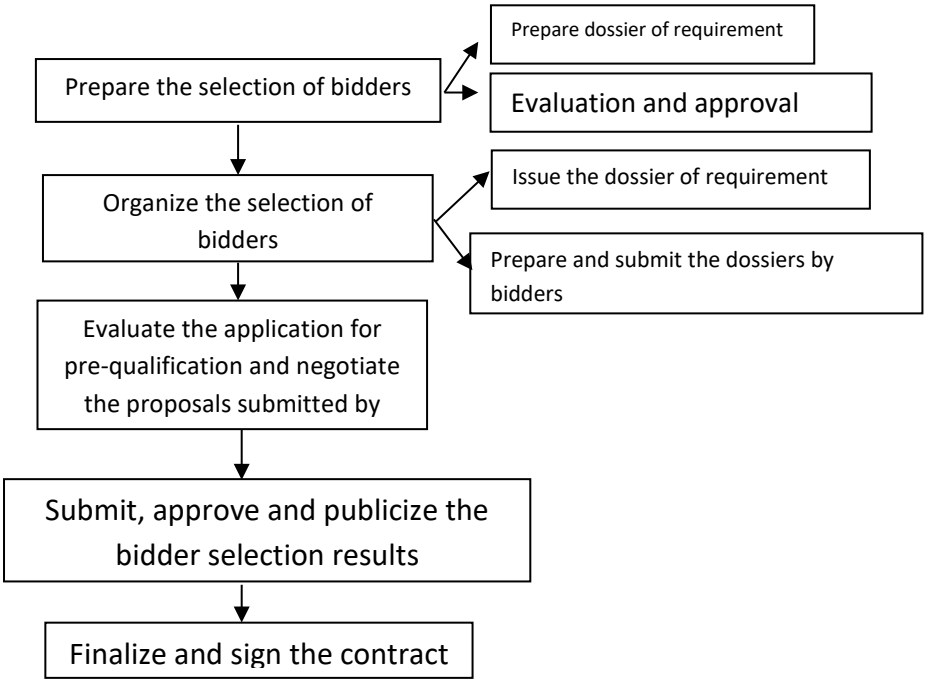


Figure 3. Normal procedure of direct appointment

Procedure of simplified direct appointment

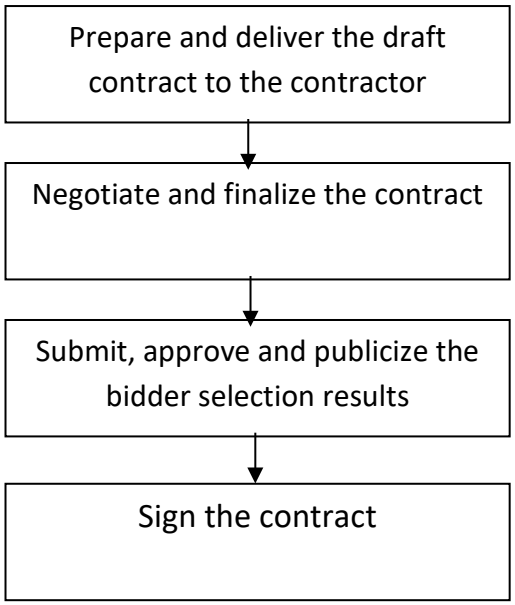


Figure 4. Simplified procedure of direct appointment

Direct appointment

Limit of direct appointment: the bid package with the value in the stipulated limit shall be entitled to direct appointment as prescribed in Point e, Clause 1, Article 22 of the Bidding Law, including:

- Not exceeding VND 500 million for the consultancy service, non-consultancy service, and public service packages; not exceeding VND 01 billion for packages for the procurement of goods or for construction and installation, mixed, procurement of drugs, medical materials, public products;

- Not exceeding one hundred million dong belonging to a project or estimated budget for recurrent procurement.

Simplified direct appointment

The investor or the body responsible for managing the package shall identify and award the contracts to the capable bidder. Within 15 days from the contract awarding date, the relevant parties are required to finalize the procedure of direct appointment.

Base on the results of contract negotiation, the procuring agency (the Owner) or the body directly managing the bid package must approve the direct appointment results and sign the contract with the appointed contractor.

- Time limit applicable to the selection of contractors

Table 1. Time limit applicable during the selection of contractors

(Article 12, the Bidding Law No. 43/2013/QH13 dated 26th November 2013 of the National Assembly, Term XIII)

No.	Content	Owner	Competent level	Minimum level	Maximum level	Note
1	Plan on contractor selection	Submission for evaluation	Approval	Since the date of receiving the evaluation report (of the evaluating organization)	*05 working* days	
2	Dossiers of invitation for expression of interest, dossiers of invitation for pre-qualification, bidding dossiers, dossier of requirements issued	Issuance		After *03 working days*		From the first day of publishing notice of invitation for submission of dossiers of expression of interest, notice of pre-qualification invitation, notice of bid invitation, notice of quotation invitation, sending of letters inviting submission of bidding before time of bid closure
3	Time limit for preparation of dossiers	Dossiers prepared by the contractors		*10 days* for domestic bidding, and *20 days* for international bidding		From the first day when dossiers of invitation for expression of interest are issued until day of bid closure time

	of invitation for expression of interest					
4	Duration for preparing dossiers of pre-qualification participation	Dossiers prepared by the Contractors		*10 days* for domestic bidding, and *20 days* for international bidding		From the first day when dossiers of invitation for pre-qualification are issued until day of bid closure time
5	Duration for preparing dossiers of proposals	Dossiers prepared by the Contractors		*05 working days*		From the first day when bidding dossiers are issued until day of bid closure time
6	Duration for preparing the bid dossiers	Dossiers prepared by the Contractors		*20 days* for domestic bidding, and *40 days* for international bidding		From the first day when bidding dossiers are issued until day of bid closure time
7	Duration for assessment of dossiers of expression of interest, dossiers of pre-qualification participation	Implement ation			*20 days*	from the date of bid closure time until the date the bid solicitor submits to investment owner for approving the results of contractor selection. If necessary, the time for evaluation of the dossiers of pre-qualification participation can be extended but not exceeding 20 days with assurance of the project implementation progress.

8	Duration for evaluation of the dossiers of proposal	Implement ation			*30 days*	Ditto
9	Duration for evaluation of the bid dossiers	Implement ation			*45 days*	Ditto
10	Time for appraisal	Implement ation			*20 days*	for each content of appraisal: plan on selection of contractor, dossiers of invitation for expression of interest, dossiers of invitation for pre-qualification, bidding dossiers, dossier of requirements, result of selection of contractor after receiving all the the submitted documents.
11	time for approving dossiers of invitation for expression of interest, dossiers of invitation for pre-qualification, dossier of requirements, bidding dossiers	Implement ation			*10 days*	from the date of receiving the written request for approving dossiers of invitation for expression of interest, dossiers of invitation for pre-qualification, dossier of requirements, bidding dossiers of the bid solicitor or the appraisal report in case of having appraisal requirement

12	The maximum time for approving or giving the handling opinion on result of contractor selection	Implement ation			*10 days*	From the date of receiving the written request for approving the result of contractor selection of the bid solicitor or the appraisal report in case of having appraisal requirement
13	The maximum period of validity of a bid dossier, dossier of proposals	Stipulated in the dossier			*180 days*	
14	Time for sending a document to modify a bidding dossier to bidders	Implement ation		*10 days*		
15	Time for sending a document to modify dossier of invitation for expression of interest, dossier of invitation for pre-qualification, dossier of requirements	Implement ation		*03 days*		

- Functions and obligations of the relevant parties

No.	Relevant parties	Functions	Obligations
1	**The bidder**	To participate in the bidding in the capacity of an independent bidder or a partnership bidder. To request the bid solicitor to clarify the bidding documents. To lodge protests, to make complaints and denunciations against the detected breaches of regulations on bidder selection. Other rights as prescribed by the law.	To prepare the honest, accurate tender document ensuring the requirements of the bidding document. To be liable to the law for his breach of regulations such as using the legal entity capacity of other organization to apply for prequalification; arranging, buying and selling the bids; influencing the bidding results or submitting the tenders with the price lower than the work construction cost. To pay compensation for the losses and damages resulted from the bidding extension or re-bidding due to his violations. To adopt bid security in accordance with the regulations. Other obligations as prescribed by the law regulations. The Bidding Law stipulates rights and obligations of the bidders as follows: - To participate in bidding in the capacity of an independent bidder or a partnership bidder. - To request the bid solicitor to clarify the invitation-to-bid. - To fulfil the contractual undertakings provided to the investor and to sub-contractors (if any).

			- To lodge protests, to make complaints and denunciations regarding bidding. - To comply with the provisions of the law on bidding. - To be honest and accurate during the process of participation in bidding and whilst lodging protests or making complaints and denunciations regarding bidding. - To pay compensation pursuant to law for loss and damage to relevant parties, if such loss and damage was caused by the fault of the bidder. Aside from the responsibilities of the competent person, rights and obligations of the bid solicitor and bidder, the Bidding Law stipulates rights and obligations of the bidding expert team, the procuring agency, the evaluating agency/organization.
2	**The procuring agency (the Owner)**	To decide the contents relating to pre-qualification of the bidders. To approve the list of bidders. To establish the bidding expert team; select a consultancy organization or a professional bidding organization in accordance with the Bidding Law to act on behalf of him as the bid solicitor. To approve the list of bidders who have satisfied the technical requirements, and the list ranking the bidders.	

		To approve the results of direct appointment of contractor in the cases stipulated in sub-clauses (a) and (dd) of clause 1 of article 20 of the Bidding Law. To be responsible to formulate the requirements applicable to a direct appointment bid package. To be liable for the contents of contracts, for signing a contract with the selected contractor, and for fulfilling undertakings set out in the contract signed with the contractor. To be legally liable for the process of selection of contractor pursuant to this Law. To pay compensation for loss and damage to related parties pursuant to this Law if such loss and damage Bidding Newsletter and to the bidding website. To resolve protests regarding bidding. To maintain confidentiality of documents on bidding pursuant to the provisions of this Law
3	**Expert team**	To conduct assessments of tender document correctly in accordance with the requirements and assessment criteria set out in the bidding documents. To maintain confidentiality of documents regarding bidding pursuant to this Law throughout the process of implementation of their duties. To reserve their own opinions. To be honest, unbiased, and impartial throughout the process of assessment of tenders and reporting on the results of assessment.

		To pay compensation for loss and damage to relevant parties pursuant to this Law if such loss and damage was caused by the fault of the expert bidding group. To exercise other rights and to discharge other obligations in accordance with law.
4	**Evaluation agency/organization**	To act independently and to comply with the provisions of this Law and other relevant laws when conducting evaluations. To request the procuring agency and the bid solicitor to provide all relevant documents and data. To maintain confidentiality of documents and data throughout the process of evaluation. To be honest, unbiased, and impartial throughout the process of evaluation. To reserve their own opinion and to bear liability for their evaluation report. To exercise other rights and to discharge other obligations in accordance with laws.

II.5. Detailed bidding procedure

II.5.1. Two-Stage and Two-Envelope Bidding

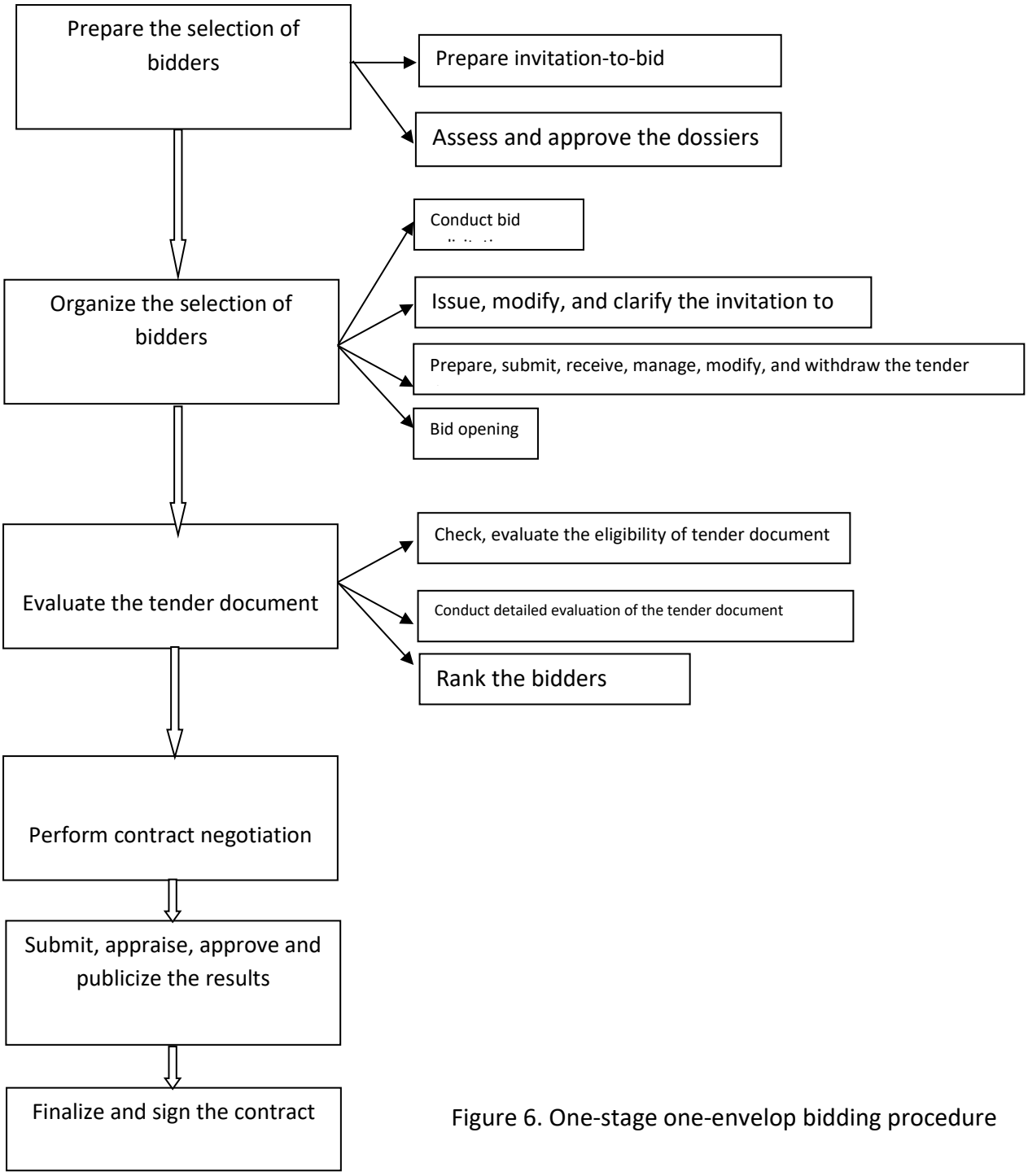


Figure 6. One-stage one-envelop bidding procedure

Upon application of the one-stage and one-envelop bidding, the bidders shall prepare the technical proposals and financial proposal separately. These two proposals shall be opened simultaneously and considered in one state.

Bid solicitor

Implementation: Prepare and organize the selections of bidders (details referred to Figure 1. Procedures and time limit for preparation of dossiers by the bidders and bid solicitor)

Implementation: The bid solicitor is a unit/organization that is established by the procuring agency or the state management (in event of sufficient personnel) or appointed by him. Normally, bid solicitor is established by the procuring agency/state agency.

Responsibility:

The bid solicitor/procuring agency, the state management agency

In the need of performing a bid package, the procuring agency or the state agency shall establish the bid solicitation unit (if having sufficient personnel) or employ a professional bid solicitor. However, in most cases, this unit is established by the procuring agency/the state agency.

The bid solicitor shall, after being established by the procuring agency/the state agency, be responsible to prepare the bid invitation dossier; appraise and approve the dossiers in accordance with the regulations and criteria specified in the Bidding Law. After being prepared, appraised and approved, the invitation document shall be assessed in accordance with regulation prescribed in the Article 105 of the Decree No. 63/2013/ND-CP prior to written approval on the base of the statement for approval and assessment report.

Expert team

The expert team may be established by the procuring agency/the state management agency if they have sufficient personnel with satisfactory conditions and technical capacity. In other case, the expert team may be selected from the consultancy institutions or professional bidding organizations with adequate capacity and experience.

Implementation: Evaluation of the tender document: the expert team and the bid solicitor shall evaluate the tender documents including technical proposals and financial proposals.

The bid solicitor and the expert team:

Cooperate together to carry out negotiation about the contract with the contractor in order to achieve the optimum results for the bid package.

Submit, appraise, approve and publicize the results

Procuring agency/state agency, bid solicitor, and expert team

To finalize the dossiers and sign the contracts with the contractors

2. Two-envelop, one-phase bidding method

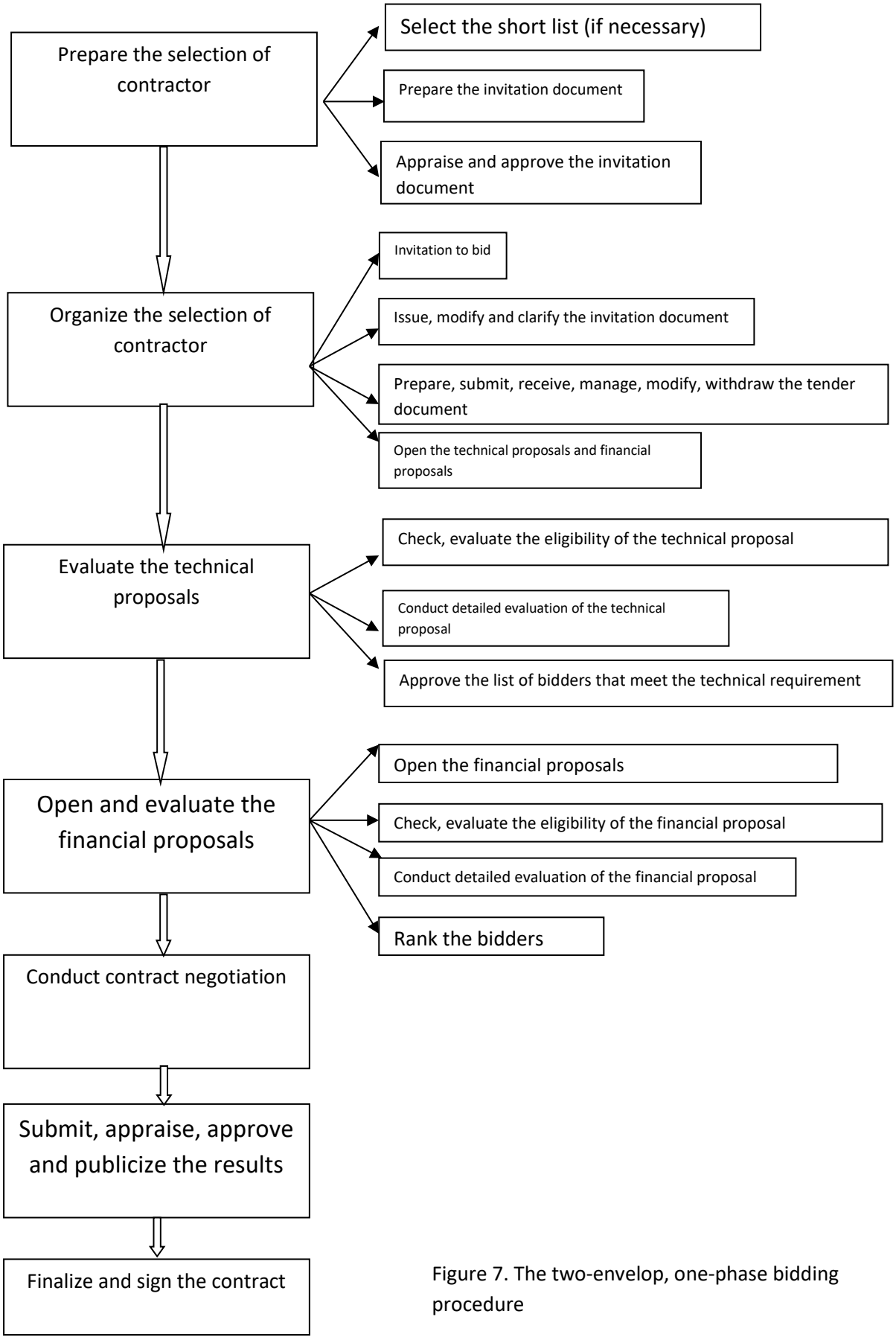


Figure 7. The two-envelop, one-phase bidding procedure

The procedure and implementation steps of the one-stage and two-envelop bidding methods are similar with those of the one-envelop and one-stage methods. The responsibilities and activities of these two methods have some differences as follows:

One-stage and two-envelop methods:

The bidders are required to prepare 02 proposals including one technical proposal and one financial proposal. After receiving these two proposals, the bid solicitor shall open them in two separate times. The technical proposal envelop shall be opened first, followed by the financial proposal.

The expert team and the bid solicitor shall evaluate the technical proposal and financial proposal separately. The technical proposal shall be checked, evaluated, and considered firstly. Only the financial proposals of the bidders that have qualified technical proposals shall be opened and assessed. Therefore, in this process, the expert team and the bid solicitor shall evaluate two dossiers (technical proposal and financial proposal).

Selection of the short-list:

Based on the size and nature of the contract, the short-listing can be applied to select the bidder who prove their proper competence and experience as required for participation in the bidding. The application of the short-listing process shall be decided by competent persons as well as clarified in the plan for the selection of contractors.

The open bidding does not adopt restricted number of bidders; however, the short list for this bidding form shall only contain 6 bidders at maximum. This figure is 03 bidders for the limited bidding. The bid solicitor is required to publicize this short list and the listed bidders are not allowed to establish joint-venture to participate in the bidding.

Two-stage bidding method

This bidding method comprises two stages including stage 1 when the bidders are prequalified basing on the evaluation criteria related to technical capacity, financial capacity and experience of the bidders; and stage 2 as the bidding stage including product, service supply capacity, the performance progress, bidding price and some other conditions of the bidders in order to achieve the effective investment target. The following cases shall adopt two-stage bidding method:

Procurement of goods (shopping), construction and installation packages with the value of at least VND 500 billion;

The shopping packages with complicated technologies and techniques or the extremely complicated construction and installation packages;

The Project that is performed in form of turnkey contract:

Method: two-stage and one envelop

Form of bidding: Open, limited

Stage 1

Based on the size and nature of the contract, the short-listing can be applied to select the bidder who prove their proper competence and experience as required for participation in the bidding.

The opening of bid must be implemented publicly within 01 hour from the bid closure.

Base on the requirements specified in the invitation document and the proposals of the bidders in the stage-one tender document, the bid solicitor shall discuss with each bidder to correct the technical and financial requirements of the package for finalization of the stage-two invitation document. The Bid solicitor must maintain the confidentiality of the information contained in the stage-one tender document.

Stage 2

Bid solicitor shall invite the bidders that submitted the stage-one dossiers to receive the stage-two bidding document.

The signed contracts between the parties must be aligned with the decision on approval of the bidder selection results, the contract negotiation minute, the tender document, the bidding document and other relevant documents.

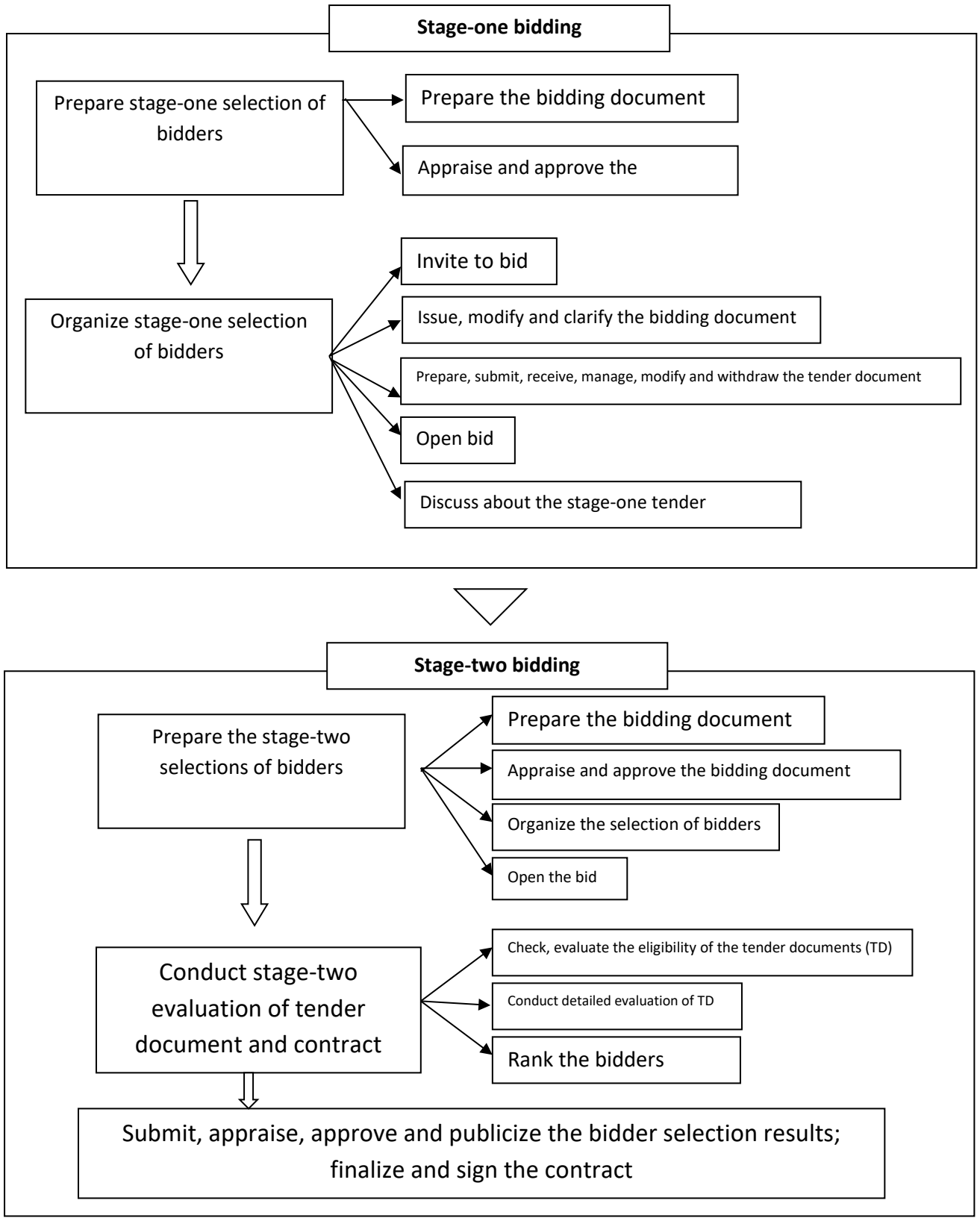


Figure 8. Two-stage and one-envelop bidding procedure

Method: Two-stage and two-envelop method

Form of bidding: Open, limited

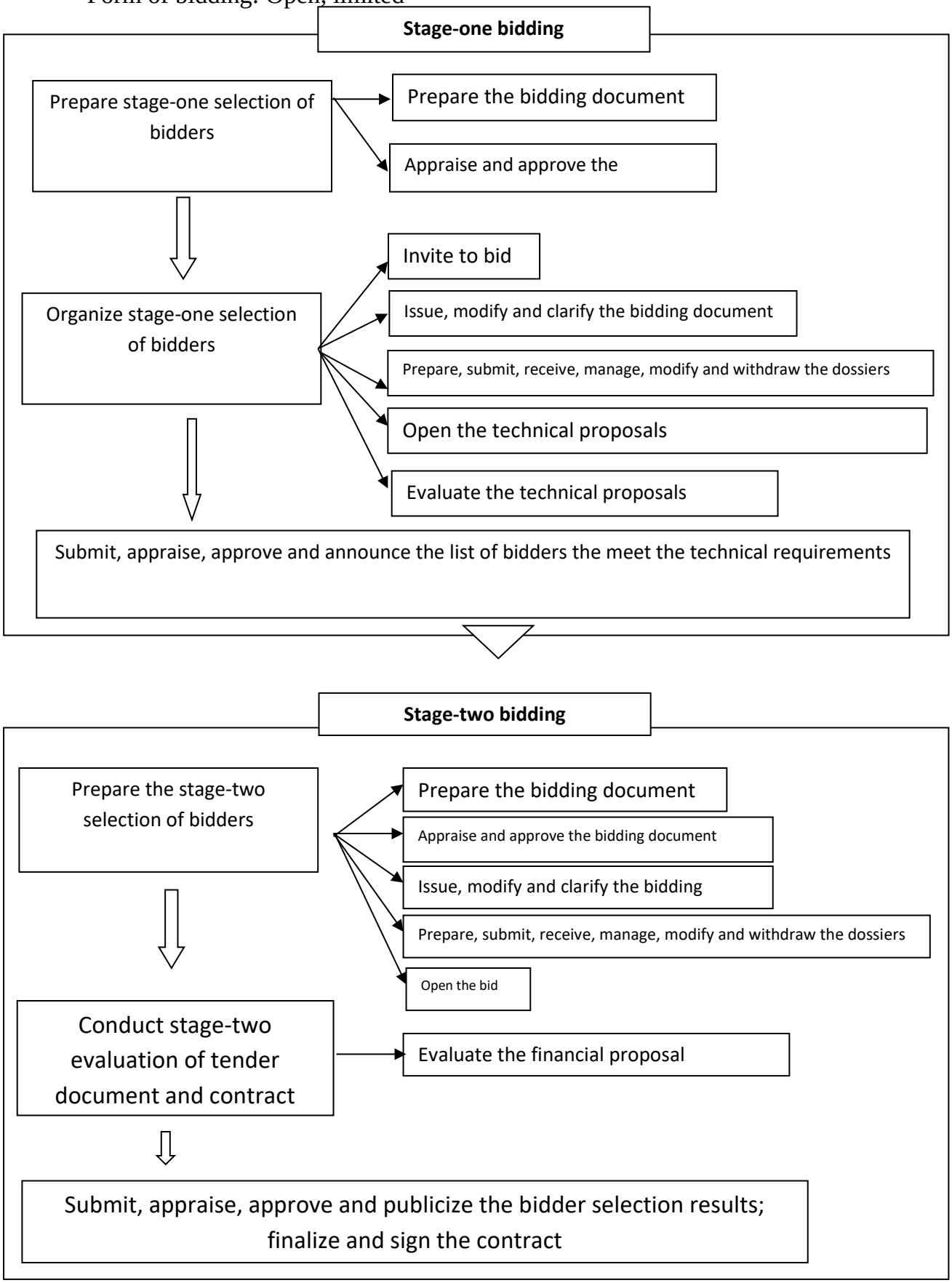


Figure 9. The two-envelop, two-stage bidding procedure

The two-envelop, two-phase bidding method shall apply in cases of open bidding, limited bidding for procurement of goods, construction and installation, mixture content with new, complex and particular techniques and technologies.

In first stage, bidders shall submit concurrently both dossier of technical proposals and dossier of financial proposals in a separate form at the request of bidding dossier. Dossiers of technical proposals shall be opened as soon as bid closure. On the basis of assessment on technical proposals of bidders in this stage, to determine contents corrected in techniques in comparison with bidding dossier and list of tenders satisfying requirements and being invited for bidding in second stage. Dossier of financial proposals shall be opened in second stage.

In second stage, bidders satisfying requirements in first stage shall be invited for submission of bid dossiers. Bid dossiers include technical proposals and financial proposals at the request of bidding dossier for second stage corresponding to content corrected in techniques. In this stage, dossiers of financial proposals submitted in first stage shall be opened concurrently with bid dossiers in second stage for assessment.

Procedure to select the contractors for the consultancy service package

+ Form of bidding: Open, limited

- Type of bidders: organization

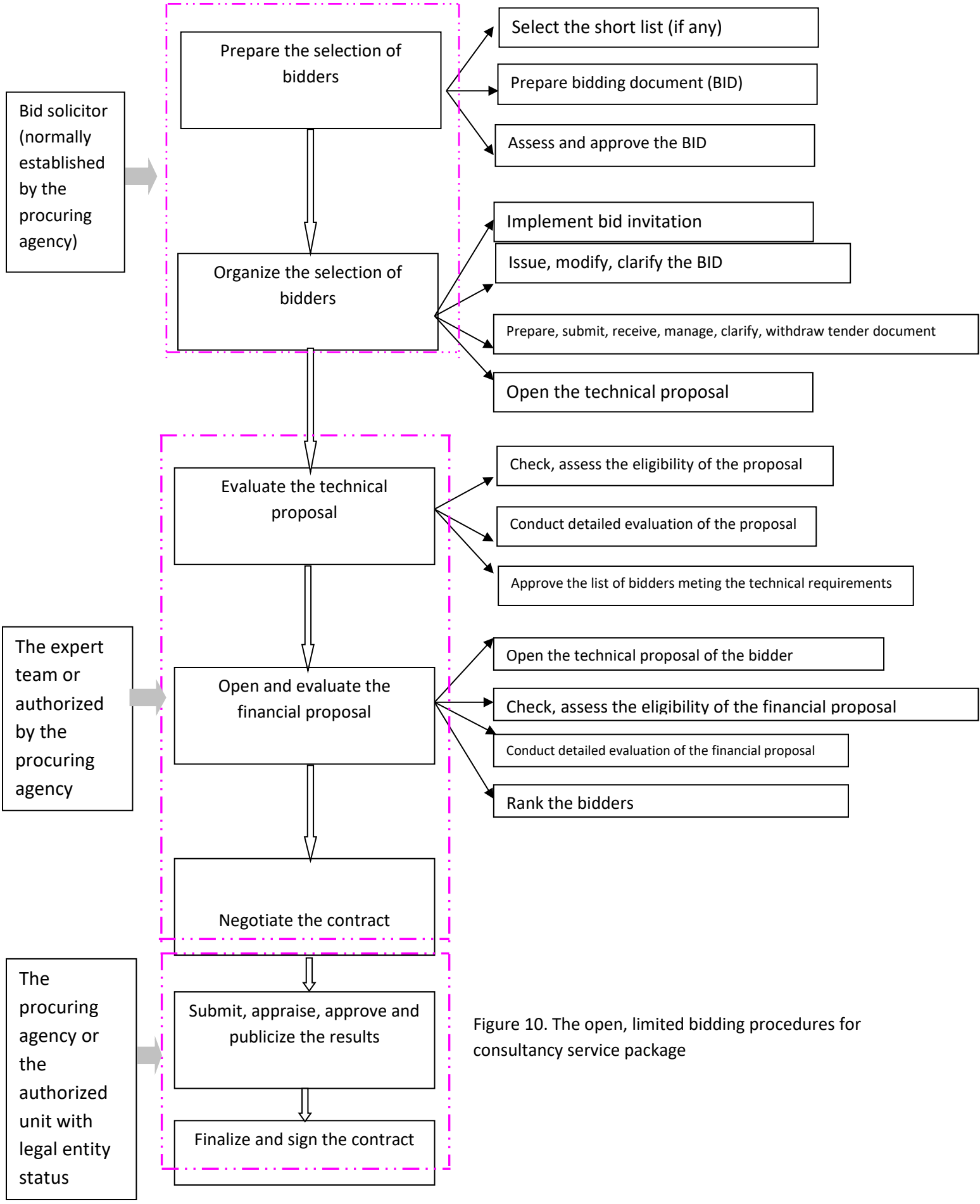


Figure 10. The open, limited bidding procedures for consultancy service package

The short-listing is a process to select the bidder who prove their proper competence and experience as required in the contract for participation in the bidding. The application of the short-listing process shall be decided by competent persons (the bid solicitor is established or appointed by the procuring agency)

The expert team and the bid solicitor are established as follows:

Case 1: If a procuring agency has sufficient personnel who satisfy the requirement of capacity, the procuring agency may itself act as the bid solicitor. In this case, the establishment of the bidding expert team shall be decided by the procuring agency in accordance with his rights and obligations stipulated in Clause 3, Article 61 of the Bidding Law.

Case 2: If the procuring agency has insufficient personnel or if it has personnel but they fail to satisfy the requirements related to capacity, then he shall conduct a selection process to select a consultancy organization or a professional bidding organization with sufficient capability and experience to represent him in acting as the bid solicitor. In this case, all the activities related to bidding shall be performed by the appointed bid solicitor, who shall be responsible for establishment of the expert team.

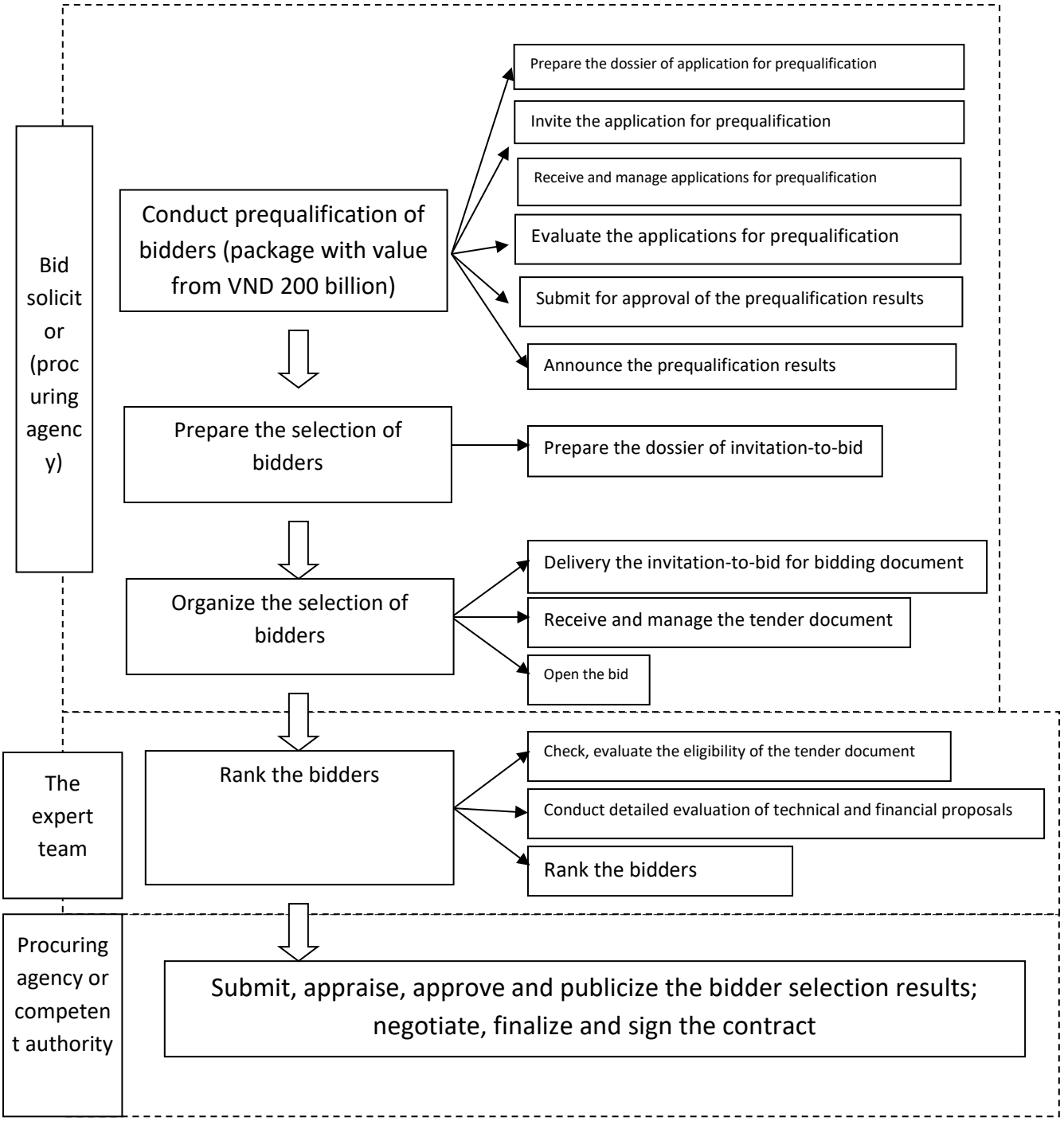
This unit shall help the procuring agency/ the state agency (acting as the procuring agency to prepare and organize the selection of contractors). The expert team shall evaluate the technical proposal and cooperate with the bid solicitor to evaluate and consider the financial proposal.

Upon evaluation, appraisal of the financial dossiers, the expert team and bid solicitor shall act on behalf of the procuring agency/ the stage agency to conduct negotiation of contract; submit, appraise, endorse and publicize the results.

The procuring agency or the authorized agency with legal entity status shall finalize the sign the contract.

Duration for implementation of this procedure: 138 days to 178 days

The procedure to select the contractors for the construction and installation bid package



Construction and installation bidding is a type of biding in which the procuring agency (bid solicitor) organizes the competition between the bidders (construction enterprises) in order to select the bidder with capacity to perform the works related to the construction and installation of the work equipment, work items, etc., satisfactory to the requirements of the procuring agency.

The main contents of construction and installation bidding comprises of:

- Procuring agency (with the need of construction) shall specify his requirements and announce to the bidders.

- Based on the requirements of the procuring agency, the bidders shall propose execution and installation solutions for consideration and assessment by the procuring agency.

- Procuring agency shall assess the capacity and solutions of the bidders to select the most suitable bidders.

The construction and installation bidding procedure

Basically, construction and installation bidding complies with the procedures stipulated by the Bidding Law; however, it is also necessary to follow the Construction Law, especially the Decree No. 85/2009/ND-CP dated 15th October 2009 on guiding the implementation of the Bidding Law and selection of the construction bidders in accordance with the Construction Law. The details are as follows:

Upon the preparation of the invitation-to-bid dossier, bid solicitor shall send this dossiers for the bid packages that adopt the limited bidding or have conducted pre-qualification, or have selected the short-list. Invitation-to-bid announcement is applied for the open bidding, which must be posted on three consecutive issues of the Bidding Newspaper, on the bidding website, and possibly on the other mass media. The invitation-to-bid dossier shall be distributed for free to the bidders.

The time limit for the bidders to prepare the tender document is at least 10 days for domestic bidding and 20 days for international bidding.

The offer price of bidders must be composed of all expenses necessary to execute the awarded contract, inclusive of taxes, fees and charges (if any). Taxes, fees and charges shall be calculated by reference to statutory tax rates and fee or charge levels 28 days prior to the bid's closing date.

When participating in the bid, bidders shall be responsible for studying, calculating, and proposing the quoted price which includes types of taxes, fees, and charges (if any). In the event that the tender document does not mention taxes, fees or charges, the bidder's quoted price shall be considered to include all of taxes, fees, or charges; in this case, if the bidder is selected and awarded the contract, all liabilities or obligations to pay such taxes, fees, or charges (if any) to the State must be fulfilled. In

the event that the bidder submits the quoted price excluding taxes, fees or charges (if any) in the bid package, this tender document shall be rejected.

Bid opening preparation: The bid solicitor shall invite representative of each bidder and may invite representatives of concerned management bodies to attend and witness the bid opening. The bid opening shall be conducted at places and time inscribed in the bidding dossiers, without depending on the presence or absence of the invited bidders.

The bid solicitor and the representatives of the concerned management units (if any) shall sign in the bid-opening minute. The expert team or the bid solicitor shall sign in the originals of the tender document before making evaluation. The originals of tender documents shall be preserved under the confidentiality regime and the evaluation shall be made upon their copies.

Detailed evaluation of the tender documents comprises two steps, including:

Step 1: The technical evaluation for selection of the short list shall be based on the requirements and evaluation criteria prescribed in the bidding dossiers and the detailed evaluation criteria already approved by the competent persons or authorities before the bid opening. Those tender documents scoring at least 70% of the total technical points shall be selected into the short list for further evaluation.

Step 2. Financial and commercial evaluation for determination of evaluation prices

The investors or project owners shall have to submit the bidding results to competent persons or competent levels for consideration and approval.

Immediately after obtaining the decisions of the competent persons or the competent levels, the bid solicitor shall proceed with the announcement of bidding results through written notices on the bidding results, sent to participating bidders, including the bid winners and the unsuccessful bidders as well. Where there is no bid winner or the bidding is cancelled, the bid solicitor shall also have to notify the bidders thereof.

Before signing official contracts, the bid solicitor shall update changes in the bidders' capabilities as well as other information related to the bidders. If detecting any changes, which affect the contract performance capacity such as the declining financial

capabilities, bankruptcy danger, the bid solicitor shall have to promptly report such to the competent persons or the competent levels for consideration and decision.

The bid solicitor must send written notices on bid winning to the bid winner together with the draft contract and noticeable points to be discussed in negotiation on contract finalization. At the same time, the bid solicitor shall also inform the bidder of the time table, clearly stating the requirement on time for negotiation on contract finalization, the deposit paid as guarantee for the contract performance and the signing of contract.

Upon receiving the bid winning notice, the bid winner shall have to send to the bid solicitor a letter accepting the negotiation on contract finalization.

The contract finalization negotiation covers contents aiming to solve existing incomplete matters on the contract by the bid winner, particularly the application of prices to disparities against the requirements of the bidding dossiers on the principle that the contract value shall not exceed the approved bid-winning price. The contract finalization negotiation shall also cover the study of innovations and superior solutions proposed by the bidder.

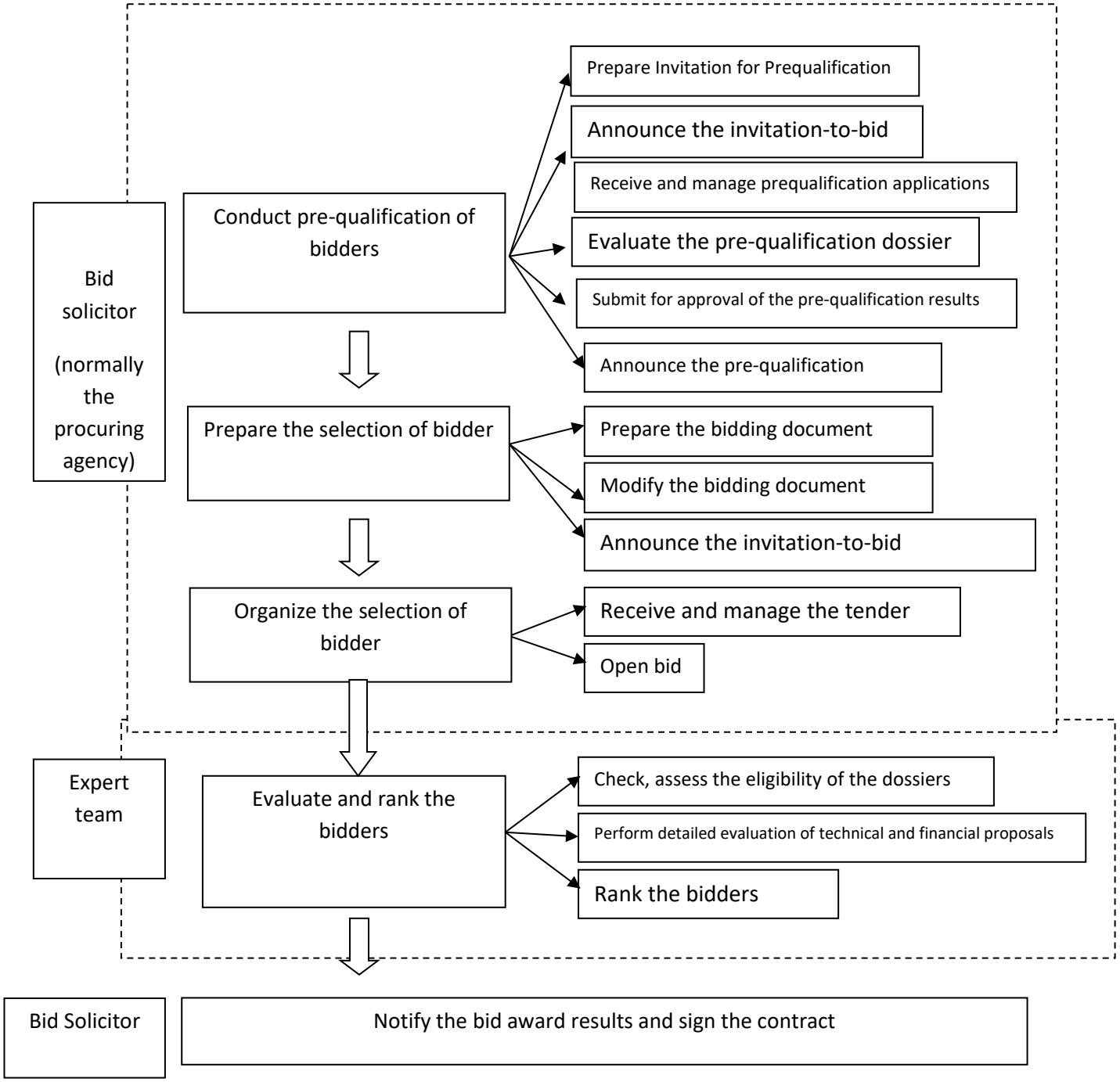
The bid solicitor shall receive the contract performance guarantee from the bid winner before signing the contract. Where the bidder has signed the contract and already paid the contract performance guarantee, but failed to perform the contract, the bid solicitor may not refund the contract performance guarantee to the bidder.

The bid solicitor shall return the bid guarantee, if any, only when receiving the contract performance guarantee from the bid winner. For bidders who have failed at biddings and not breached the Bidding Regulation, even when there is not bidding result, the bid solicitor shall return the bid guarantee to such bidders within no more than 30 days after the announcement of the bidding results.

The bidder selection for shopping package

The general bidding procedure and process are prescribed in the Bidding Law 2013, while those for shopping, service bidding in shopping sector is stipulated in the Commercial Law 2005.

The procedure to select the bidder for the shopping bid package is based on the common principle of the Bidding Law with observation with the relevant provisions of the Commercial Law. The details are as follows:



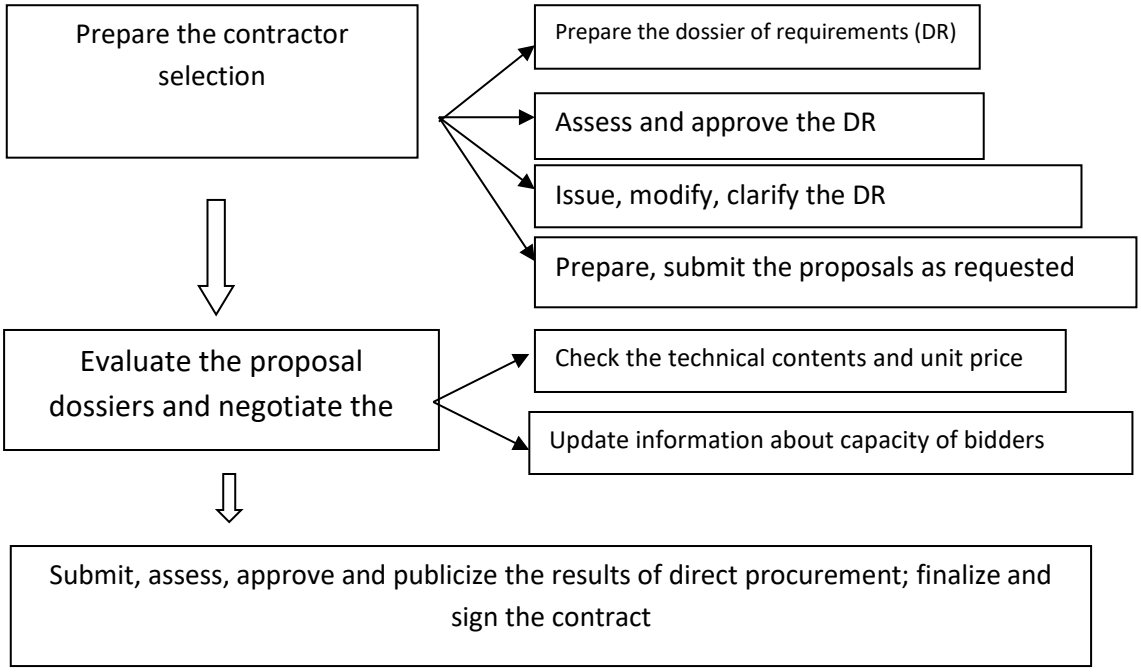
The bid solicitor may collect issuance fee of bidding document (article 218 of the Commercial Law)

Bid solicitors may request bidders to make bid deposits, bid collaterals or provide bid guarantees when submitting their bid dossiers. The percentage of a bid deposit or collateral shall be set out by bid solicitor but must not exceed 3% of the total estimated value of goods or services subject to bidding (clause 2, Article 222 of the Commercial Law). In case of bid deposits or collaterals, such deposits or collaterals shall be returned to unsuccessful bidders within seven working days from the date the bidding results are announced.

Bidders shall not be allowed to receive back their bid deposits or collaterals in cases where they withdraw bid dossiers after the expiration of the time limit for submitting bid dossiers (referred to as “bidding closure”), fail to enter into contracts or refuse to perform contracts in cases where they are bid winners. Guarantors for bidders are obliged to guarantee bids for the guaranteed within the value equal to deposits or collaterals.

Immediately after bidding results are available, bid solicitors shall have to notify them to bidders. The involved parties may agree that bid winners should make deposits or collaterals or be provided with guarantees to secure the performance of contracts. Money amount to be deposited or used as a collateral shall be set by bid solicitors but must not exceed 10% of the contract value.

Direct shopping process



If goods in the direct shopping contract are one of those in a similar contract that was signed earlier, the value of such goods must be lower than 130% of the value of the goods in the earlier contract.

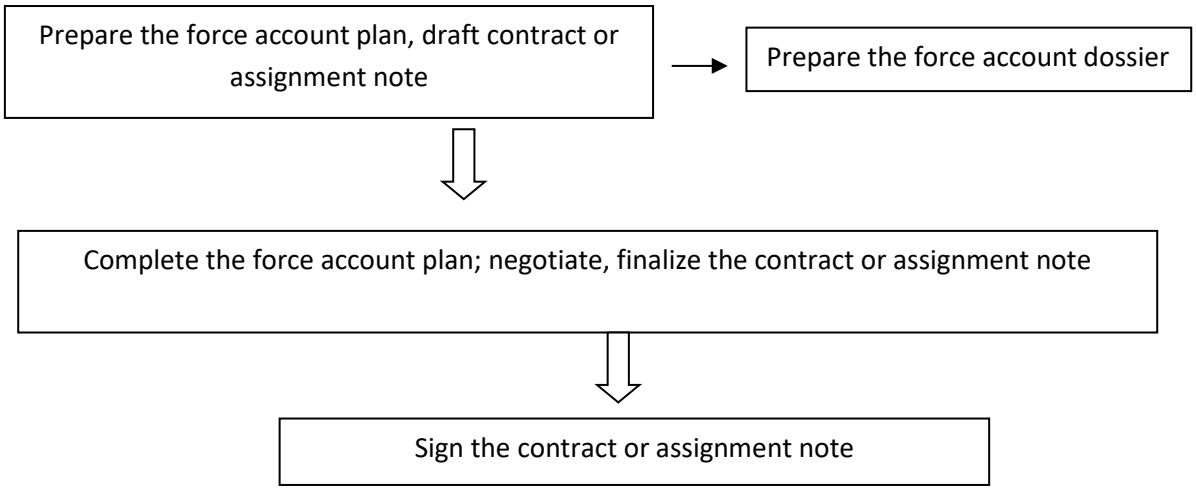
Force account

The employment of force account method must be approved in the contractor selection plan in accordance with Article 25 of the Bidding Law, and satisfy preconditions below:

The licensed business lines are suitable for the contract requirements;

The ability to mobilize manpower and equipment to ensure punctuality must be proven in the self-supply plan;

The unit appointed to perform the contract must not transfer any part thereof if its value is 10% of the contract value or higher than VND 50 billion, whichever comes first



The entity that directly manages, use the bid package shall sign the contract or assignment note with a unit to perform the contract.

If specialized law prescribes that the contract performance must be supervised, the procuring entity must select a supervisory contractor who is legally and financially independent to supervise the contract performance; If specialized laws do not require this or an independent supervisory contractor is not available because the contract has to be performed in a remote area or the contract value is below VND 01 billion, the procuring entity shall supervise the contract performance itself.

Moreover, the ministries, sectors have promulgated some documents detailing some regulations of the Bidding Law and specific provisions applied to each relevant ministry, sector, for example:

Decision No. 2468/QD-BTC dated 23nd November 2015 on guiding some regulations of the Bidding Law in term of selection of contractors in the financial sector

Article 3 guides the competent persons in accordance with Clause 34, Article 4 of the Bidding Law No. 43/2013/QH13 in the field of procurement of properties, commodities and other services:

1. Procurement:

1.1. Concentrated procurement:

Director of the Planning and Finance Department is the competent person to select the contractors for the concentrated procurement of properties, commodities and services in Ministry of Finance.

Heads of the units at general directorate level shall act as the competent persons in selection of contractors for procurement of properties, commodities and services in the general directorates. In the event of decentralization to the heads of the line inferior level, they shall act as the competent persons in selection of contractors.

1.2. Regular shopping:

Heads of the estimating units under the Ministry shall act as the competent persons in selection of contractors for the shopping of properties, goods, and services within the competence of such units.

Thus, after the study of this, the research the group (team) found that the process being used to select service providers is stipulated in Law on Bidding 43/2013/QH13, and the Decree No. 63/2014/ND-CP.

For relevant ministries and agencies, when bidding is carried out, the bidding process shall be governed by the process regulated in the Law on Bidding. At the stage of reviewing and analyzing the technical and financial proposals, the criteria of relevant Ministry should be applied.

The bidding process has been regulated by "forms", which will not be confusing the bidding parties. This increases the practicalness and transparency in bidding process.

The selection process of contractors is well defined and there are separate procedures for different targets.

Accordingly, time to implement in each stage is clearly specified, functions, and rights of each party are also stated.

PART III. ANALYSIS OF THE DIFFERENCE BETWEEN THE PROCEDURES (MENTIONED ABOVE) BY THE TARGETS AND FORMS OF BIDDING (OPEN, LIMITED, DIRECT APPOINTMENT)

According to the local and international experts, the Bidding Law 2013 is one of the laws with the most advances in Vietnam, which unify regulations on bidding in various sectors. The bidding organization process has been “formalized”, highly valued by the investors and consultants. This shall facilitate the stakeholders in their participation in bidding; improve the objectiveness of the implementation; enhance the transparency of the bidding process. Comparing with the Bidding Law 2005, the Bidding Law 2013 may overcome and restrict the possible risks of the large-scale projects and facilitate the contractors. Regarding the bidding selection process, the Law 2013 provides clear regulation on contract negotiation as one of the important steps to be implemented prior to the submission, approval, and publication of the bidder selection results.

As being analyzed above, the service provider selection procedures in Vietnam apply the Bidding Law. Depending on the nature and value of the bid package, it is possible to apply one among seven procedures stipulated in the Bidding Law No. 43/2013/QH13 and the Decree No. 63/2014/ND-CP on guiding the implementation of the Bidding Law.

The difference in the bidding processes between the relevant ministries, sectors lies in the method (criteria) on evaluation of the technical proposals and financial proposals. Evaluation criteria are different among different sectors. For example, during the detailed technical evaluation of the bid packages in the construction, finance, health, investment sectors, etc., the evaluation criteria established by relevant ministries, sectors in accordance with the law documents shall be adopted.

According to the Bidding law, there are 7 procedures to select contractors, investors; however, this research only focuses on the three main and commonly-used forms of biddings, including open bidding, limited bidding, and direct appointment (normal appointment and simplified direct appointment).

Each bidding procedure is applied to each type of bid package, which is prescribed clearly in the Bidding Law, i.e. open bidding (Article 20, section 1, chapter

II), limit bidding (Article 21, section 1, chapter II), and direct appointment of contractor (Article 22, section 1, chapter II).

Towards the proposal of the procedure to select the organizations, individuals that provide monitoring and measurement services to determine environmental damages, the research team has analyzed the difference between bidding procedures as well as identified its strengthens and weaknesses as the base to propose the most suitable procedure.

Table 2. Differences between the procedures applied to different forms of bidding

No.	Type of procedure (bidding)	Applied bid package	**Strength** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	**Weakness** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Duration of implementation	Remarks
1	Simplified direct appointment of contractor	- The packages need to be performed to immediately overcome or timely handle consequences caused by force majeure event. - The packages need to be performed to ensure national secret - The packages need to be carried out immediately to not cause damages directly to human life, health and properties of residents,	- The contract should be implemented quickly. In the event of incident, the procuring agency/the state agency may consider and sign the contract immediately. Within 15 days from the bid appointment, the relevant parties	- Not exceeding VND 500 million for contracts for consulting services, non-consulting services, and public services - Not exceeding VND 1 billion for contracts for	Maximum **15 days**	- There is only one service provider - The contractor, the state management agency sends the request document.

No.	Type of procedure (bidding)	Applied bid package	Strength (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Weakness (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Duration of implementation	Remarks
		communities, or not severely affect to adjacent projects - Shopping of drugs, chemicals, supplies, and health equipment in order to carry out the activities of prevention and fighting of epidemics in urgent cases - Urgent packages need be carried out aiming to protect national sovereignty, national borders, and islands	must finalize the appointment procedure of bidding - The procedure is simple to make the most rapid selection of contractor. - Be suitable with the occurrence of incident.	goods procurement, construction, installation, procurement of medicines, medical equipment, public products - Not exceeding VND 100 million		- Request document is attached with the draft contract for consideration and implementation by the contractor in the urgent cases

No.	Type of procedure (bidding)	Applied bid package	**Strength** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	**Weakness** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Duration of implementation	Remarks
		- Packages of consulting services, non-consulting services, shopping of goods, which must buy from contractors performed previously due to ensuring the compatibility of technologies, copyright, which not able to buy from other contractors - packages with nature of research, test; purchase of intellectual property copyright - Packages provide consulting service for making feasible study		for contracts for regular shopping - The state management agency, procuring agency should have list of capable contractors (candidates) that have been licensed basing on		

No.	Type of procedure (bidding)	Applied bid package	Strength (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Weakness (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Duration of implementation	Remarks
		reports, construction designs, which have been appointed for authors - Packages of relocation of technical infrastructure work that is managed directly by a specialized unit in order to serve the work of ground clearance - Packages of providing public products and services, packages with procurement price in the range of applicability of direct		the criteria of the sector.		
2	Normal direct appointment of contractor		Relatively rapid implementation time with the minimum 74 days for the whole procedure. - The bid solicitor shall evaluate the technical proposals and financial proposals	- There must be list of qualified contractors (candidates) - There may possibly be hidden agreement between the state management	- Preparation by the bid solicitor: minimum 8 days (details are referred to figure 1 of the report) - Preparation of dossiers by the contractor: minimum 15 days (details are	

No.	Type of procedure (bidding)	Applied bid package	**Strength** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	**Weakness** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	**Duration of implementation**	**Remarks**
		appointment of contractor as prescribed by Government in line with economic-social conditions in each period		agency and the contractor	referred to figure 1 of the report) - Evaluation of the proposal dossiers by the bid solicitor: 30 days (details are referred to Table 1: Time limit applicable during the selection of contractors) - Approval of dossiers by the bid solicitor: 10	

No.	Type of procedure (bidding)	Applied bid package	**Strength** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	**Weakness** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Duration of implementation	Remarks
					days (details are referred to Table 1: Time limit applicable during the selection of contractors) - Contract signing: In the urgent cases, it is possible to sign the contract right after the approval of the dossiers: 01 day	

No.	Type of procedure (bidding)	Applied bid package	**Strength** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	**Weakness** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Duration of implementation	Remarks
					- Minimum duration of time: 74 days (including Saturdays and Sundays)	
3	Open bidding	Consulting services, non-consulting services, goods, construction and installation for: - Projects on development investment financed by state - Projects financed by state, state-owned enterprises owning 30% and higher of the shares or owning less	- All the steps must be implemented, including preliminary evaluation, evaluation of capacity and experience, technical evaluation, price evaluation	- The time of selection of bidders: minimum 138 days and maximum 178 days are not suitable with the environmental	- Long implementation duration of bidding: ***(minimum: 138 days, maximum 178 days)*** Details: - The time for preparation by the bid	- In the event of shortlisting, there are maximum 06 bidders contained in

No.	Type of procedure (bidding)	Applied bid package	**Strength** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	**Weakness** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	**Duration of implementation**	**Remarks**
		than 30% of the shares but more than 500 billion VND in total invested capital of project - Procurement of goods financed by state aiming to maintain regular activities, provide public serve products - Purchase of drugs, medical supplies financed by state - Selection of providers of consulting services, non-consulting services, goods in Vietnam's	- Base on the available criteria, the bid solicitor (the expert team/ the evaluation team) shall carry out detailed evaluation of technical proposal and financial proposal; therefore, the bidders are more selective.	incidents, pollution.	solicitor: 8 days (Details are referred to Figure 1) - Time of preparation of the dossiers for expression of interest (bidders): 10 days for local bidding, 20 days for international bidding - Time for approval by bid solicitor: 10 days	the selected short-list

No.	Type of procedure (bidding)	Applied bid package	Strength (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Weakness (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Duration of implementation	Remarks
		territory for implementation of overseas direct-investment projects of Vietnamese enterprises, in which the state shares accounting for 30% and higher or accounting for less than 30% but more 500 billion VND in total invested capital of project - Investment projects in form of public-private partnership (PPP), investment projects with land use			- Time for announcement on bidder selection: 5 days - Preparation of tender document (bidders): 20 days for local bidding and 40 days for international bidding - Time for modification (if any):	

No.	Type of procedure (bidding)	Applied bid package	**Strength** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	**Weakness** (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Duration of implementation	Remarks
		- Petroleum sector (except for selection of contractors to supply petroleum services directly relating to activities of search, exploration, and development of mines and petroleum exploitation as prescribed by Law on Petroleum			10 days for local bidding, 15 days for international bidding - Time for preparation of the proposal dossiers (bidders); 5 days - Time for evaluation of the proposal dossiers: 30 days.	

No.	Type of procedure (bidding)	Applied bid package	Strength (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Weakness (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Duration of implementation	Remarks
					- Appraisal of the bidder selection results: 20 days - Approval of the results: 10 days - Contract negotiation and signing: 10 days.	
4	Limited bidding	Applicability in case of procurement with highly technical requirements or technical peculiarities for which only a limited number of bidders are	- Number of bidders are limited (these bidders must have good capacity of specific techniques)	The selection time is not suitable for the case requiring immediate handling such as	Minimum 75 days	- In event of short-listing, maximum 03 bidders are

No.	Type of procedure (bidding)	Applied bid package	Strength (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Weakness (Comparing in order to propose the most suitable procedure in case determination of environmental damages)	Duration of implementation	Remarks
		capable of satisfying the requirements of the procurement		environmental incidents, damages		contained in the short list

The analysis found differences in forms of bidding, in specific: time for selection of contractor, contract value, type of bidding, etc...

In the event of a serious incident, the most effective and appropriate form of contractor selection is a quick designation of contractor. However, in order to effectively implement this method, MONRE shall prepare and regulate quality assurance conditions to ensure consistency and systematicness in the application process.

PART IV. PROPOSAL OF THE PROCEDURE TO SELECT THE ORGANIZATIONS, INDIVIDUALS THAT PROVIDE MONITORING, MEASUREMENT SERVICES FOR CALCULATION OF DAMAGES AND DETERMINATION OF RESPONSIBILITY TO MAKE COMPENSATION FOR ENVIRONMENTAL DAMAGES

In the event of severe environmental incidents and pollution, the steps that need to be implemented immediately include:

In Japan (information from Japanese experts)

- Generally, the officers of the Ministry and sectors of environment conduct any site survey immediately.

- And, the state management agency has enough capacity to conduct necessary activities. If this agency would not be able to cover everything, this agency can ask relevant organization which they can sign the annual principle. Therefore, these organizations can conduct all kinds of activities in the event of occurred incidents. In-kind service activity is main principle.

- Regarding the outsourcing cases, Japan does not apply direct appointment of contractors. If additional research is necessary, at first, it should be confirmed the allocation budget.

Current situation in Vietnam

- Since 2008, several severe environmental pollution cases have occurred in Vietnam such as VeDan case, recent is the Formosa case and other cases. According to the study of the research team, the procedure to respond to the environmental incidents, pollution by the Government of Vietnam is as follows:

- Upon receiving information about the incident, the environmental management agencies (MONRE – VEA) shall assign officers (including state management officers and technical officers) to the site for checking and inspection;

- After site inspection, the working delegation shall report to the leader (VEA/MONRE) for determination of the next steps;

- Technical agencies and units shall conduct technical activities, including measurement, monitoring, etc., (normally CEM shall be in charge of these activities);

- Regarding intersectional incidents, MONRE shall report to the Government for instruction (i.e. Formosa case);

- The Government shall instruct the relevant ministries, sectors to cooperate and address the incidents. Correspondingly, the technical units of the relevant ministries shall be mobilized. Moreover, the capable and intensive technical units shall be appointed to participate in the severe environmental incidents (Vietnam Institute of Technology, Institute of Natural Resources and Environment, etc.).

In cases that some activities go beyond the capacity of the agencies and units under the relevant ministries, sectors, independent service providers with better capacity and ability may be employed. However, it is necessary to make careful consideration of how to select these service providers and apply a clear selection procedure in order to make good implementation of the tasks in the event of severe environmental incidents and pollution.

In the collection of data, evidence for determination of environmental damages, it is necessary to clarify 02 activity groups related to selection of service providers, including:

(1). Monitoring, analysis of the polluted environmental parameters;

(2). Calculation of damages and determination of responsibility to make compensation for damage

In term of the issue (1), MONRE has licensed the organizations that are capable of rendering the environmental monitoring service in accordance with the Decree No. 127/2014/ND-CP on stipulating the requirements applicable to environmental monitoring service activities. MONRE has developed the list of organizations with certified qualification for environmental monitoring services, stating the name of the organization, location where such organization operates, decision/certify number, field of operation (field of monitoring, analysis, etc.).

The certification of qualification for environmental monitoring services has the validity of 36 months from the date of issuance with possible multiple-extensions. Each period of extension shall not exceed 36 months. MONRE is competent to issue, extend, modify the content, re-issue, temporarily suspend the validity, revoke and cancel the certification.

Regarding the issue (2), there are some agencies, organizations that are capable of calculating damages, which are normally appointed by the State in the event of severe environmental incidents, including the Institute for Environment and Resources,

Vietnam Institute of Technology, etc. However, the Government has instructed all the stakeholders to cooperate in calculation and determination of environmental damages in order to identify the responsibility to make compensation for severe environmental incidents. For example, upon the occurrence of the severe incident in Ha Tinh, the Government has directed the relevant ministries, sectors such as MONRE, MARD, Ministry of Health, etc., to cooperate and support each other to identify the causes, make calculation and determination of such damages. Especially, there is currently no legal document stipulating the selection of the organizations that are capable of calculating the damages and determining the responsibility of compensation for damages.

To meet the timeliness of the determination of damages, the research team recommends that in the near future MONRE should organize the selection, licensing of the qualified organization; develop the list of qualified organizations that can provide services of determination of damage compensation liability (This list is promulgated and used internally within MONRE, which can be amended and supplemented annually. Some enterprises that can meet the requirements may be added, while those fail to meet the requirements shall be removed from the list). This list is used to provide information about the candidate service providers in the necessary or urgent cases.

It is necessary to organize selection and develop the List of qualified service providers on calculation of damages and determination of damage compensation liability in each sector that require determination of damages (land, water, ecosystem, the species prioritized for protection) as a base for the competent authorities, in the event of occurred incidents, to select the organizations providing environmental monitoring, analysis and services related to calculation of damages and determination of damage compensation responsibility serving the timely collection of evidence and data to request compensation for environmental damage.

Based on the study of theory, current law regulations and analysis of the bidding processes in the previous section of this report, the research team hereby proposes to select the service providers on monitoring, evaluation and measurement services in accordance with the Biding Law; utilize the combined method (techniques, prices combined with prerequisite technical criteria) to evaluate, select the service providers on data and evidence collection. Therefore, it is possible to consider two options as follows:

Option 1: Only one service provider is selected and contracted to render monitoring, assessment and measurement services for collection of data and evidence. This service provider may, if only implementing a part of the contract works, collaborate with the other functional organizations to perform the service. The equipment may be outsourced; however, this contracted service provider must take responsibility to the selecting agency/bid solicitor.

The strength of this option is to reduce the management works for the selection by the agency/bid solicitor because the service is rendered in one contract package.

Weakness: It is the fact that there are few service providers are capable of providing all the services relating to monitoring, assessment, measurement; therefore, the organization awarded contract shall be responsible for the works implemented by its collaborating organizations. As a result, it is difficult to control the results as well as the accuracy, transparency of the subcontractors, if the sub-contractors are weak in capacity.

Option 2: Depending on the typical characteristic of the damages to be determined, the monitoring, assessment, and measurement works can be divided into several sub-packages, for each of which the most suitable service provider shall be selected and contracted. Any service providers with sufficient capacity for several sectors can participate in the performance of several contracts.

Strength: It is easy to implement and select the monitoring, assessment, and measurement service providers with high level experiences and specific for individual sector regarding determination of damages. In addition, service providers themselves shall be responsible for the performance of the works specified/assigned in the contracts.

Weakness: It is necessary to organize multiple selections and signs of service contracts with various organizations, causing complications and time-consuming in comparison with the selection of only one contractor. Moreover, the specific nature of the environment, the environmental damages and pollutions may change its characteristics when the relevant authorities, bid solicitors finish their long time selection of the service providers.

According to the Bidding Law, the direct appointment of contractor shall be applied on the following cases: procurements need be performed to immediately overcome or timely handle consequences caused by force majeure event; procurements need be carried out immediately to not cause damages directly to life, health and

properties of population communities[13]. The environmental incidents, damages can be considered for the applicability of direct appointment, including normal direct appointment (minimum period for selection of contractor is 74 days, including Saturday and Sunday) as well as simplified direct appointment (maximum period for selection of contractor is 15 days).

After studying the relevant laws such as LEP, Law on Bidding, Law on State Compensation Liability, and bidding procedures, etc., the research team hereby proposes the application of *direct appointment of contractors or limited bidding* for environmental procurements for the following reasons:

- Direct appointment of contractor is quick in selection of contractor, which can be implemented within 15 days at maximum and immediately after the occurrence of incident. However, this form of bidding may lead to non-transparency in the contractor selecting process.

- Limited bidding is applied to procurements with high or special technical requirements that are met by few contractors, of which the number of bidders is limited (these bidders must have good technical capacity) and the selection procedure must be open, transparent, and highly competitive.

From these regulations, all of the procurements relating to the environmental incidents or damages shall apply the direct appointment or limited bidding of contractor. *Direct appointment should apply on activities of the monitoring, analyzing, measurement when the incidents, seriously pollution occurring. Limited bidding should apply on activities of calculation and determination of damages to increase the transparency in the contractor selecting process*.

Moreover, the research team proposes the steps procurement dealing with the environmental incident/pollution as follows:

Step 1. Selection of organizations that carry out monitoring, sampling, and analysis

This is the most important step that must be implemented right after the occurrence of incidents because the environmental characteristics, especially water environmental pollution may change with time. It is recommended by the research team that the direct appointment of contractor should be applied in these cases

[13] Article 22, Law on Bidding No. 43/2013/QH13.

In the event of environmental incident (severe or less severe), the first task is to determine the causes timely and rapidly by carrying out monitoring, sampling, and analysis of samples. This task requires professional, high capacity, and experience units with transparency of implementation in order to collect all the necessary evidences for performing calculation in the next step.

Step 2. Calculation of damages caused by environmental incident/pollution

Upon identification of the causes of the incident/pollution, calculation may be made basing on the analysis results and available information, data.

Step 3. Identification of the subjects causing incident/pollution

Following the calculation step is the identification of the incident/pollution causing subjects.

Step 4. Determination of responsibilities of the incident/pollution causing subjects and request for compensation basing on the results of Step 2.

By comparing the Biding Law 2013 and Law on Environmental Protection 2014, the research team proposes to divide the damages into two types:

- Extremely serious environmental damage and serious environmental damage
- Environmental damage

From the viewpoint of the research team, the activities that need to be conducted immediately upon the occurrence of environmental incidents (severe environmental incident or severe environmental pollution) are taking samples, measurement, monitoring, etc. As mentioned above, the adoption of direct appointment of contractor is essential and appropriate. However, it is not necessary to apply direct appointment of contractor but limited bidding for steps 2, 3 and 4 of the proposal.

Therefore, if one service provider implements all the steps from 1 to 4, the procurement should be split into several packages such as step 1: direct appointment of contractor, steps 2, 3, 4: limited bidding.

In cases that several service providers implement separate packages corresponding to step 1, step 2, step 3 and step 4, the direct appointment of contractor is applied to step 1, while limited biding is applied to other steps.

Summary: In severe and extremely severe environmental damage cases, it is possible to apply two forms of bidding including: direct appointment of contractor and limited bidding.

Direct appointment of contractor is only applied to the service providers that render the activities mentioned in step 1.

For extremely serious environmental damage and serious environmental damage, the simplified direct appointment of contractor could be applied because of following reasons:

- The maximum time limit for implementation of the procedure is 15 days

- The state management agencies can appoint and identify the capacity, implementation ability of these organizations (contractors) because they are certified by the State through business licenses.

- Capacity and ability of these organizations are considered and assessed by the state management agencies in each stage.

Also, according to the Bidding Law, simplified direct appointment of contractors is applied to the procurements with the maximum contract value of VND 500 million. To address this issue, the state management agency /bid solicitor may consider to separate the bid package into several sub-packages depending on each specific sector.

In order to implement steps 2, 3, and 4 above, limited bidding can be utilized:

- The procedure and steps of implementation of limited bidding are stipulated in the Bidding Law No. 43/2013/QH13.

- The criteria to score the technical proposal must be based on the assessment criteria set provided by MONRE. The criteria set to assess the proposed price of the procurement are also established by MONRE with comments from Ministry of Finance basing on the service price of the sector.

For environmental damage, it is possible to apply the limited bidding, but technical evaluation criteria must be developed by MONRE based on the specific characteristics of the natural resources and environment sector and the price criteria of the package items that are also established by MONRE on the base of the service provision price of the sector.

From the above analysis, the research team proposes the procedure to select the service providers on calculation and determination of environmental damages as follows:

<u>Step 1.</u>

MONRE should establish the list of qualified institutions that provide services on calculation of damages, determination of damage compensation responsibilities in each sector subject to determination of damage (land, soil, ecosystem, the species prioritized for protection).

This list is circulated internally within MONRE for use in the necessary and urgent cases.

Step 2.

MONRE is recommended to develop the criteria set for supporting the evaluation of tender documents submitted.

MONRE shall cooperate with Ministry of Finance to develop the price and cost criteria in alignment with the specific sector and in accordance with the Governmental regulations (in cases where the Ministry of Finance has specified regulations on norms and expenses, cost, price..., it shall be in accordance with the regulations of the Ministry of Finance) These criteria shall be used by the bid solicitors in evaluation, consideration of the financial proposals. Technical criteria and financial criteria shall be combined to rank and select the most qualified bidders.

Step 3.

Based on the Law on Environmental Protection, classify the serious environmental incidents, extremely serious environmental incidents and environmental incidents in order to select the most suitable bidding procedures.

a. The procedure for serious environmental incident is proposed as follows.

Step 1. Identification of the causes of environmental incident/pollution

State management agencies

- Develop and appraise the plans on selection of service providers on monitoring, measurement, and analysis (this is the most important point and must be well-implemented to select the institutions/organizations with the most suitable capacity and experience).

- Prepare and submit the request document and draft contract to the contractors named in the MONRE list.

Service provider

- Prepare the proposal dossiers and consider the draft contracts

- Sign the contract with the bid solicitor/state management agency

Step 2. Calculation of damages caused by environmental incidents/pollution

After the contractor identified the causes of environmental incidents/pollution in the first contract (Step 1), the state management agency may continuously apply the direct appointment to the contractor who conducted the Step 1 (if that contractor has enough capacity and ability to calculate the damage) or select other qualified institutions/contractors (limited bidding process is applied in this case) to implement calculation and determination of damage compensation responsibilities basing on the results obtained in Step 1.

- Step 3. Identification of the subject causing environmental incident/pollution

Identification of the subject causing environmental incident/pollution shall be implemented by the awarded organization(s)/contractor(s) in Step 2 (above).

- Step 4. Determination of responsibilities of the subject(s) causing environmental incident/pollution and claim for damage compensation

Organization(s)/contractor(s) awarded for implementation of Step 2 shall determine the responsibilities of the pollution causing subject(s) and send all the results to MONRE who is acting on behalf of the Government to request the relevant parties to make compensation for damages.

b. The procedure applied to environmental incident is proposed as follows:

All the steps are the same with case (a) above, except for that the procedure to select the service provider(s), which applies the limited bidding process.

Shortcomings of proposal ideas at part 4 on the report:

- MONRE has not yet developed the selection criteria to select the service providers/the qualified organizations who high capacity of calculation and determination of environmental damages

- List of the organizations capable of calculation and determination of environmental damages has not been developed by MONRE.

- The method of bidding was proposed after the research team reviewed, studied, analyzed. The applicable bidding methods are direct appointment and limited bidding. In this case, the direct appointment may cause the violation of principle when the state management agency conclusively deal with the contractor in bidding process.

- The limited price of bidding package is lower than 500.000.000 VNĐ

- Annually, MONRE has to re-evaluate the capacity of the service providers who are in the list of MONRE.

Problems to be addressed

- MONRE should study, develop the selection criteria to select qualified organizations who have high capacity of calculation and determination of environmental damages as soon as possible.

- MONRE should develop the list of the organizations capable of calculation and determination of environmental damages

- MONRE strengthen the capacity of inspection in order to limit the issues mentioned in item 3 of the part "***Shortcomings of proposal ideas at part 4 on the report".***

REFERENCE

1. The Bidding Law No. 43/2013/QH13 dated 26th November 2013;

2. Decree No. 30/2015/ND-CP on guiding some articles on the selection of investors;

3. Decree No. 63/2014/ND-CP on guiding the Bidding Law in term of selection of contractors;

4. Decree No. 85/2009/ND-CP on guiding the Bidding Law and the selection of construction contractors under the Construction Law;

5. Decree No. 68/2012/ND-CP amending, supplementing some articles of Decree No. 85/2009/ND-CP;

6. Decision No. 50/2012/QD-TTg on the application of contractor appointment to bid packages in special cases considered and decided by the Prime Minister;

7. Decision No. 88/QD-BTNMT on promulgation of the bidding regulation, order of public service supply using the state budget in MONRE;

8. Decision No. 2370/QD-BTNMT on promulgation of the list of public service use of natural resource and environment using the state budget;

9. Decree No. 130/2013/ND-CP on the production and provision of public-utility products and services.

MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

THE JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT

FOR

STRENGTHENING CAPACITY OF WATER ENVIRONMENTAL MANAGEMENT IN RIVER BASIN

REPORT ON

2nd INDIVIDUAL LOCAL RESEARCH, DEVELOPMENT OF CIRCULAR -6 ON CRITERIA, SELECTION PROCESS, AND RESPONSIBILITIES REGARDING SERVICE ON MONITORING, MEASUREMENT, AND EVALUATION UNDER THE TASK OF COLLECTING DATA AND EVIDENCES, ESTIMATING THE DAMAGE, AND DETERMINING THE LIABILITY OF COMPENSATION FOR DAMAGE

Reporter: Nguyen Mai Hanh

Hanoi, May 2017

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PREAMBLE

In recent years, the practice of settling claims for damages caused by activities of polluting the environment in Vietnam has encountered many difficulties, obstacles and inadequacies since the current regulations are not detailed enough. The problem of determining environmental damage is considered as not only one of the most difficult tasks but also the urgent requirement that people as well as the authorities of Vietnam are facing.

In order for the compensation for damage to be made, two important issues need to be clarified: Who is responsible for damaging and how can the damage be quantified? So as to answer these, pursuant to point b, clause 1, article 5 of Decree No. 3 the competent state authority is entitled to request the organizations with sufficient capability and competent authority to collect data and evidence from which the damage to the environment can be determined. However, based on which basis, what criteria to choose the provider of data and evidence collection services? This is a big question that needs to be addressed.

Based on the results of previous studies, this study evaluates legal provisions on the selection criteria for service providers: monitoring, evaluation, measurement, and estimating the costs of calculating, ..., reviews and assesses the capacity of accredited organizations providing monitoring and measurement services in order to propose initially criteria for selecting qualified units.

ABBREVIATIONS

Dept.	Department
DONRE	Department of Natural Resources and Environment
MONRE	Ministry of Natural Resources and Environment
VEA	Vietnam Environment Administration

LIST OF FIGURES

PART I. PROCEDURE TO SELECT CONSULTANCY PRACTICES

According to the results of the report Review and analysis of legal normative documents on the bidding process to propose options for selection of units providing environmental monitoring, evaluation and measurement service to collect data and evidence for the assessment of environmental damage performed in March 2017, the process of selecting consultancy practices is proposed as follows:

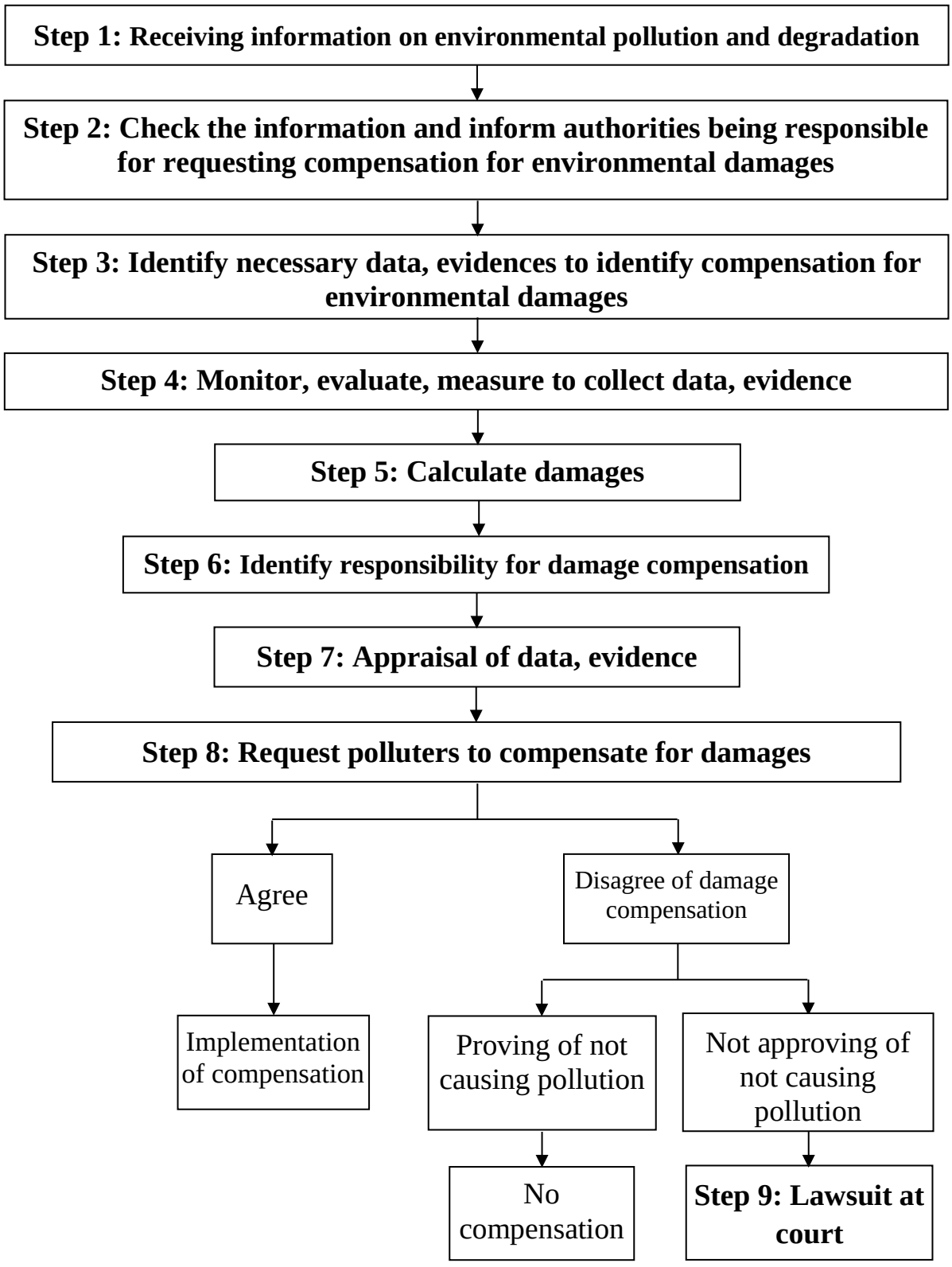
1. In case the environment is seriously damaged, the procedure of designating contractor for monitoring, measurement, analysis, sampling … shall be applied based on the information of the units in the selection list of MONRE. To determine environmental damage, a restricted bidding process to select units shall be applied.

2. In case the environment is damaged, if the units of the state management agency are incapable, the service provider shall be selected and the restricted bidding process is to be applied to select the unit.

3. Procedures shall be implemented in accordance with the Law on Bidding while technical criteria shall be based on the specificity of the sector in order to calculate and select.

In the report on Overall review of regulations relating to the process of developing the Circular regarding compensation for damages conducted by Nguyen Mai Hanh's research team, the procedure of claiming for compensation for damage caused by the degradation of environmental functions and usefulness is proposed as follows:[1]

[1] Page 23, report on Overall review of regulations relating to the process of developing the Circular regarding compensation for damages, Nguyễn Mai Hạnh, December 2015


Step 1: Receiving information on environmental pollution and degradation
Step 2: Check the information and inform authorities being responsible for requesting compensation for environmental damages
Step 3: Identify necessary data, evidences to identify compensation for environmental damages
Step 4: Monitor, evaluate, measure to collect data, evidence
Step 5: Calculate damages
Step 6: Identify responsibility for damage compensation
Step 7: Appraisal of data, evidence
Step 8: Request polluters to compensate for damages
Agree
Disagree of damage compensation
Implementation of compensation
Proving of not causing pollution
Not approving of not causing pollution
No compensation
Step 9: Lawsuit at court

Accordingly, the procedure of compensation consists of 8 steps as described in the above figure. The research team realized that the selection of units providing services of monitoring, assessment and estimation of environmental damage compensation is taken after step 2 of the above process, which means:

- After receiving information on pollution and environmental degradation, management agencies as well as competent agencies of MONRE / VEA shall confirm, check the information and inform the responsible agency.

- Providing that the specialized agencies of MONRE / VEA are capable of carrying out the task, these units will be prioritized to do so. In case the situation is beyond the capabilities of these agencies, the bidding process shall take place.

Consequently, after reviewing previous studies relating to the subject in which the research team investigate, we re-confirm that:

1. Regarding the form of selecting service providers:

   - Apply the direct contracting in serious cases.

   - Apply restricted bidding in case of pollution and environmental incidents.

2. When is the selection of unit done?

   - After step 2 of the process of compensation for environmental damage mentioned above, this shall only be applicable once the situation is beyond the capabilities of the specialized units under MONRE / VEA.

PART II. REVIEW OF LEGAL DOCUMENTS

II.1. Legal documents regulating the criteria/conditions of selecting data and evidence collection service providers

Studying legal documents of Vietnam over the past time helps to show that the documents directly regulating the criteria to select units providing the services of determining and estimating environmental damage is not yet available, but in relation to this issue these can be mentioned:

Bidding Law No. 43/2013/QH12: The bidding law contains provisions on the conditions for awarding contracts for contractors including:

- Have valid bid dossiers;
- Meet requirements of capacity and experience;
- Meet technical requirements;
- Meet the financial requirements;
- Satisfy requirements of implementation project with feasibility and highest efficiency.

Regarding technical and financial requirements there will be criteria for marking bidders.

Decree No.63/2014/ND-CP: Detailing the implementation of some articles of the Law on Procurement about contractor selection. The contractor selection performed by the tenderer must be based on assessment criteria including[2]:

- Assessment criteria of capacity and experience;
- Assessment criteria of techniques;
- Assessment criteria to determine the lowest price;
- Assessment criteria to select the optimum service provider.

Decree No. 03/2015/NĐ-CP on claiming compensation for environmental damage: This decree does not specify the criteria for the selection of the service providers in the environmental field. However, it stipulates liability for claiming for damage and

[2] Item 5, Article 12, Decree No. 63/2014/NĐ-CP

determining the damage to the environment[3] and specifies data and evidence used to determine the environmental damage[4]. In order to carry out the identification and estimation of environmental damage, it is necessary and important to consider and select units with sufficient capacity and equipment to perform. Therefore, the criteria for selecting these units need to be legally clear and transparent.

Decree No. 127/2014/NĐ-CP stipulating the conditions of organization and operation of environmental monitoring services:

This is a direct document stipulating conditions for environmental monitoring service, dossiers and procedures for issuance, extension, adjustment of contents, re-issuance, temporary suspension, revocation and cancellation of certificate of eligibility for implementing environmental monitoring service. In order to be qualified and certificated, the environmental monitoring service providers must meet the requirements on legal status, sufficient capacity, facilities and equipment to carry out.

According to the provisions of this Decree, only units providing environmental monitoring services that meet the requirements on legal status sufficient capacity, facilities, machinery and equipment to provide the service are eligible to operate.

According to Item 4, Article 3 of the Decree, the conditions of organizations providing environmental monitoring services; organizations providing environmental monitoring services include:

- Enterprises established under the Enterprise Law;

- Organizations engaged in scientific and technological activities, established under the Law on Science and Technology;

- Environmental service providers established and operating under the Government's Decree No. 55/2012 / ND-CP of June 28, 2012 on the establishment, reform, and dissolution of public service providers.

[3] Article 3, Chapter I, Decree No. 03/2015/NĐ-CP
[4] Chapter II, Decree No. 03/2015/NĐ-CP

Thus, in order to be licensed to operate in the field of environmental monitoring, evaluation and measurement, organizations (enterprises) must satisfy all criteria stipulated by law.

Circular No. 19/2015/TT-BTNMT detailing the assessment and appraisal of conditions of eligibility for provision of environmental monitoring services and certificate form is an important legal basis for MONRE to review, appraise and issue certificates. The procedures to appraise entities that are eligible to provide environmental monitoring services stipulated in Article 7, Chapter II of the Circular include:

Step 1: Examining the application dossiers for certificates of eligibility for provisions of environmental monitoring service. Applicants must satisfy the requirement on legal status, personnel, equipment and facilities to perform environmental monitoring activities under the provisions specified in Article 8 and Article 9 of Decree No. 127/2014/ND-CP.

Step 2: Evaluation and actual inspection at organizations and units; [5]

Step 3: Evaluation Council assesses[6]: Structure of the Council includes: (1) the maximum number of members is 05; (2) The head of delegation is the representative of the evaluating agency and its members are representatives of some relevant Ministries, Departments or DONREs and experts with expertise in the field of environmental monitoring.[7]

Decision No.88/QD-BTNMT on the promulgation of the regulation on bidding and ordering for the provision of public services using the state budget at MONRE, clearly stipulates condition for participation in bidding which is to meet the criteria specified in the Bidding Law No. 43/2013 / QH13 and Decree No. 63/2014 / ND-CP.

After having studied the documents mentioned above, the research group has some comments as follows:

1. The Vietnamese authority has paid great attention to compensation for environmental damage. However, in order to implement the compensation in practice, other

[5] Item 2, Article 7, Chapter II, Decree No. 127
[6] Item 3, Article 7, Chapter II, Decree No. 127
[7] Item 1, Article 8, Circular No.19/2015/TT-BTNMT

legal normative documents including regulations on criteria for selecting units that provide geodesic and environmental measurement services are needed.

2. Criteria for selecting units providing monitoring, measurement and estimation of environmental damage are not regulated. However, in relation to this issue, Decree 127/2014 / ND-CP sets out the criteria for licensing environmental monitoring services. In the process of developing the Circular, some criteria need to be considered as reference documents, specifically as follows: criteria for capacity of organizations providing services, criteria for monitoring methods, criteria about the equipment and apparatuses for monitoring …which needs to be studied during the development of Circular 6.

3. The Law on Bidding No. 43/2013 / QH13 and Decree No. 63/2014 / ND-CP provide relatively sufficient procedures and process for considering and approving bids, inviting bidders and selecting contractors. In the process of developing the Circular, these regulations need to be studied carefully for reference, specifically as follows: the regulations on the procedures for selecting contractors and evaluation of contractors of the Bidding Laws need to be carefully reviewed in order to provide the order and procedures for selection of units providing monitoring, assessment and measurement services that collect data and evidence so as to determine environmental damage.

4. The method of evaluating bidding dossiers for bidding packages of service-providing units is an important content relating to the study contents of the Circular. Therefore, it is necessary to refer to this content of the Law on Bidding. During the development, the research/drafting group should pay particular attention to the particularities of the environment, pollution and environmental damage so as to propose appropriate regulations.

II. 2. The provisions of the law on the selection of service providers

Methods of assessment of bidding dossiers for a bidding package is the service provider [8]

Regarding consultancy contractors being organizations, one of the following methods shall be applied:

[8] Article 40, Bidding law

- The lowest-price method is applied to simple consultancy bid packages: Bid assessment criteria are technical ones. Regarding bids which have passed the technical evaluation, it shall be up to the price after correction, rectification of deviation and subtraction of the discount value (if any). The bidder with the lowest price is ranked no.1;

- The fixed-price method is applicable to simple consultancy packages in which the cost of implementing bid package is specified and fixed in the tendering dossier. The bid assessment criteria are technical ones. Regarding bids that have passed the technical evaluation and have the bid price after correction, rectification of deviation and subtraction of the discount value (if any) not exceeding the cost of executing the bidding package, technical scores are based on for comparison and ranking. The contractor having the highest technical score is ranked no.1;

- The method of combining technique and price is applied to the bid package which focuses on both the quality and cost of executing the bid package. The criteria for evaluating the bid dossiers are the technical assessment criteria and the comprehensive assessment criteria that are based on the combination of technique and price. When general assessment criteria are formulated, the principal proportion of technical varying between 70% and 80% must be ensured, with the price point ranging from 20% to 30% of the total point scale. The total point is 100%. The contractor with the highest score is ranked no.1;

- The method based on the technique is applied to the bid package with high technical requirements with particularities. Criteria for evaluation of bids are technical ones. When assessment criteria are formulated, the required minimum point is regulated to be not less than 80% of the total technical point. The contractor satisfying the minimum technical specifications and obtaining the highest technical point is ranked no.1 and invited to open the financial proposal dossiers as a basis for negotiating the contracts.

Regarding the technical assessment criteria prescribed at sub-clause a, b, c and d, Clause 1, Article 40 of the Bidding Law, when technical evaluation criteria are constructed, the method of marking in which the minimum required point must not be less than 70% of the total technical point must be used, except for cases specified at sub-clause a, Clause 1 of this Article.

II.2.1. Regulations on expenses

The administrative costs in the process of selecting contractors [9]

To purchase bidding documents.

Expenses for composing and assessing request for expression of interest and bidding documents include:

+ Expense for request for expression of interest;

+ Expenses for appraisal of request for expression of interest.

Expenses for composing and assessing of bidding documents include:

+ Expenses for composing of bidding documents;

+ Expenses for appraisal of bidding documents.

Expenses for assessing bidding documents, requalification dossiers, bids and dossiers of proposals include:

+ Expenses for assessing bidding documents, requalification dossiers;

+ Expenses for assessing bids and dossiers of proposals.

Expense for appraisal of contractor selection results.

Other expenses are specified in Clauses 2, 3, 4, 5 and 6, Article 9 of Decree 63.

Expenses for the consultation council to resolve contractor's dispute on the selection results.

Costs of posting information about procurement.

Details and specifications of these costs are provided in Article 9 of Decree 63/2014 / ND-CP guiding the implementation of the Law on Bidding.

b. *Expenses for implementation of the items of the service package and consultancy:*

- Expenses for technical norms are prescribed in relevant legal documents

Table 1. Expenses for technical norms are prescribed in relevant legal documents

No.	Expense name	Maximum cost norm (VND)	Source cited
1	Costs for monitoring, evaluation,	The unit price of environmental monitoring and evaluation announced by the People's Committee of the	Decision on promulgation of price sets of monitoring and environmental analysis

[9] Detail and cost value in Article 9, Decree No.63

No.	Expense name	Maximum cost norm (VND)	Source cited
	measurement and analysis of environmental parameters (specific details for each item detailed in Appendix 3 of this report)	province or municipalities or under the Decision No. 2090 / QD-BTNMT dated 29/9/2014 of the Minister of Natural Resources and Environment on the issuance of the detailed unit price for monitoring and analysis of the environment product ordered by the government, allocation of the central budget in 2014 and market prices for parameters not yet included in the regulations.	in province ..., Decision No. 2090 / QD-BTNMT dated 29/9/2014 of the Minister of Natural Resources and Environment on the issuance of the detailed unit price for monitoring and analysis of the environment product ordered by the government, allocation of the central budget in 2014
2	The cost of hiring a solicitor	40% of baseline salary regulated by the Government / 08 hours per Working Day	Inter-ministerial Circular No. 191/2014 / TTLT-BTC-BTP dated December 12, 2014 of the Ministry of Finance and Ministry of Justice, providing guidelines on remunerations and payment of legal costs in case of lawyers' participation in proceedings at the request of bodies conducting proceedings
3	Expense of hiring experts to estimate the damage and	Not exceeding VND 25,000,000 / person / month (22 days / month) for professionals equivalent to senior	Inter-ministerial Circular No. 55/2015 / TTLT-BTC-BKHCN (22/04/2015)

No.	Expense name	Maximum cost norm (VND)	Source cited
	determine the liability of compensation	researchers of grade 1 or higher and not exceeding VND 20,000,000 / person / month (22 days / month) With professionals equivalent to primary researcher level 1 or higher	

In addition, other related costs are detailed in Appendix 2 of this report.

Conclusion: In this section, the research team reviewed legal documents regulating the criteria/conditions for selection of organizations service providers in order to collect data, evidence. Criteria are specified in Decree No. 43/2013/QH12, Decree No. 63/2014/ND-CP and Decree No. 127/2014/ND-CP regulating the conditions of organizations providing services of environmental monitoring. Decree 63 only specifies the criteria for evaluating bidders, including four criteria: capacity, technique, price and evaluation price. Article 8 and Article 9 of Decree No. 127/2014/ND-CP stipulates the conditions for enterprises to be granted certificates of operation in the field of environmental monitoring and analysis. Therefore, enterprises that meet the above requirements only fulfil the necessary condition. This means that when environmental incidents or severe environmental pollution occur, it is possible to select units in list that satisfied the of Decree No. 127/2014/ND-CP to estimate damage and pollution. However, how to choose these units, based on which criteria to choose ... is the problem to be solved. In this study, after reviewing the relevant legal documents, reviewing and evaluating the capacity of the organizations in the list satisfied the Decree No. 127/2014/ND-CP, the research team will initially propose criteria for selecting units to carry out the tasks set out.

In particular, the research team will carefully review the conditions regulated in Clause 3 of Article 8 and Clause 3 of Article 9 of Decree No. 127/2014/ND-CP, along with the current capacity of service providers serving as scientific basis in order to proposes a set of criteria to select units providing services of monitoring, assessment, measurement and estimation of compensation for environmental damage.

In order to select the contractors to carry out these tasks, the research team consider to apply the limited bidding method (a combination of technique and prices for selection of service providers). In case of incidents, particularly serious pollution, the method of bidding shall be applied.

Regarding costs: the costs that the Ministry of Finance has issued in the legal documents according to the table above and Appendix 2 of this report shall be applied.

The review of criteria in the existing legal documents is the initial basis, along with the analysis and assessment of the capacity of the service providers made in Part III of this report, so as to propose criteria for selecting service providers.

PART III. REVIEW AND ANALYSE THE CAPABILITIES OF THE SERVICE PROVIDERS

Organizations providing data and evidence collection services for determining environmental damages to claim compensation are agencies and organizations whose human resources and facilities are capable of providing results that are technically and legally valid under a given quality regulation system.

Organizations providing data and evidence collection services for determining environmental damages to claim compensation have to meet the requirements of technical facilities and human resources during the process of monitoring, assessment, measurement in order to estimate or determine environmental damage in such a complete, accurate and timely manner at the request of the agency, organization or individual requesting to identify the damage and claim compensation for damage caused by environmental pollution and degradation.

Organizations providing data and evidence collection services are to carry out monitoring, evaluation and measurement of one or more indicators of physical, chemical and biological properties of environmental components according to the devised plans about time, space, methods and procedures, so as to provide basic information with high reliability and accuracy and to evaluate the quality of the environment. This activity is required to meet certain objectives, including requirements of information, parameters, locations, frequency and duration of observation, equipment requirements, methods of analysis, measuring and testing; human resources requirements and budget for implementation.

In Vietnam, the problem of compensation has been mentioned much since 2008, after the case of Vedan Vietnam Co., Ltd. discharging wastewater that did not meet the regulation into the Thi Vai River with the flow of 44,800 m^3 per months, severely affecting the aquatic environment of Thi Vai River; the death of fish in Cha Ca River having resulted in the loss of thousands of people living near the river; the large mortality among the fish in Buoi River, the household was compensated by the enterprise; serious pollution in four provinces in Central Vietnam ... In the cases mentioned above there was economic

compensation for affected people, but no claims for compensation were made for the natural environment. The settlement of compensation has mainly been done by negotiation and reconciliation in the presence of the local authorities but not by the mean of lawsuit in court.

From the investigation of cases it is found that the authorities have always taken these following steps:

- Collect samples, identify the cause;
- Identify the waste sources and activities causing pollution;
- Propose enterprises/ companies polluting to stop running;
- Start handling pollution consequences (handling dead fish, relocating cages, supporting farmers with rice, …);
- Determine the pollution scale;
- Identify the causes of damage as well as organizations or individuals who must compensate;
- Collect data and evidence, investigate, record and estimate damage, start negotiating with enterprise and claim compensation for damage.

In fact, through the above four typical environmental pollution problems, the Governmental agency has directed the relevant ministries to determine the causes and levels of pollution. Units that have measured and collected evidence and data include: Central institute of Natural Resources and Environment Studies, Institute of Environmental Technology, and some other agencies of MONRE and other relevant ministries.

Currently, since there is not enough legislative basis for the selection of units providing data and evidence collection services, whenever serious incidents regarding environmental pollution occur, the Vietnam Government follows steps as follows:

- MONRE is the main agency that is responsible to the Government for issues related to environmental pollution. When the incident occurs, MONRE will set up the inspection group to investigate the incident;

- Providing the case is serious, the ministry will set up a scientific council to investigate the matter;

- Organizations that are designated to collect data and evidence by the Scientific Council, MONRE shall coordinate with the management agencies which are under the Ministry to execute given tasks. For example, environmental pollution caused by the Vedan Company, MONRE assigned the Institute for Environment and Natural Resources to determine the level of pollution on the Thi Vai River and estimate the damage.

It can be pointed out that so far, there have not been any procedures or criteria for the competent authorities to select competent and capable units to carry out the activities of identifying environmental damage and estimate compensation. In order to construct a process as well as a set of selection criteria, it is important and necessary to review the capability of organizations providing environmental monitoring, analysis, measurement and estimation services. In this section, the research team reviews the service providers, based on which data the group shall select from 20 to 30 capable units to analyze their capability of determining and estimating the damage caused by pollution and environmental incidents.

At present, as of 05/09/2016, the Ministry of Natural Resources and Environment has licensed 172 qualified units and organizations to provide monitoring and survey services so as to collect data and evidence under the provisions of Decree 127/2014 / ND-CP. This list is publicized on portals of MONRE's, VEA and DONREs. Based on this list, enterprises are in need of monitoring and analysis of pollution parameters can review, reference and select.

III.1. Methodology:

In order to assess the capacity of service providers, the research team needs to have a database and data used for analysis and evaluation. During the process of collecting data to assess the capacity of the service providers, the team used the following methods:

- Study the available materials from the Internet: (website of units, enterprises, websites of DoNREs, MoNRE website, Center for Environmental Monitoring, related reports, MoNRE / TCMT, articles, presentations at conferences, seminars with contents related ...

- With the assistance of Environmental Science Institute, so as to collect data, the research team has sent official dispatch to 15 DONREs (5 in Northern, 5 in Southern and 5 in Central) and 25 organizations that provide the services of monitoring, measurement and estimation of environmental damage (the team sending official dispatch to units need to gather more information and verify some data from the internet). The purpose is to collect information and to verify some of the data that the research team had. These are either unofficial or ones that has not yet been comprehended clearly.

- In addition, during the study process, apart from sending information through official dispatch, the group also made phone calls and emails to some DoNREs, units and enterprises to verify the information that the team had and edit it (if any)

- After gathering all the information based on the methods mentioned above, the team has had two meetings and worked with Group 27 of the Center for Environmental Monitoring – VEA (the unit responsible for assisting VEA/MONRE in the evaluation of the technical content to license VIMCERT-certificated enterprises) in order to:

a. Verify all information the team collected

b. Ask for comments from experts on the selection of 25 enterprises, organizations from 172 enterprises on the list of VIMCERT.

III.2. Review service providers

Of 172 [10] organizations certified to be eligible for provision of environmental monitoring services (licensed by MONRE), 132 units (accounting for 76.74%) belong to public sector while the other 40 (24.26%) are private organizations.

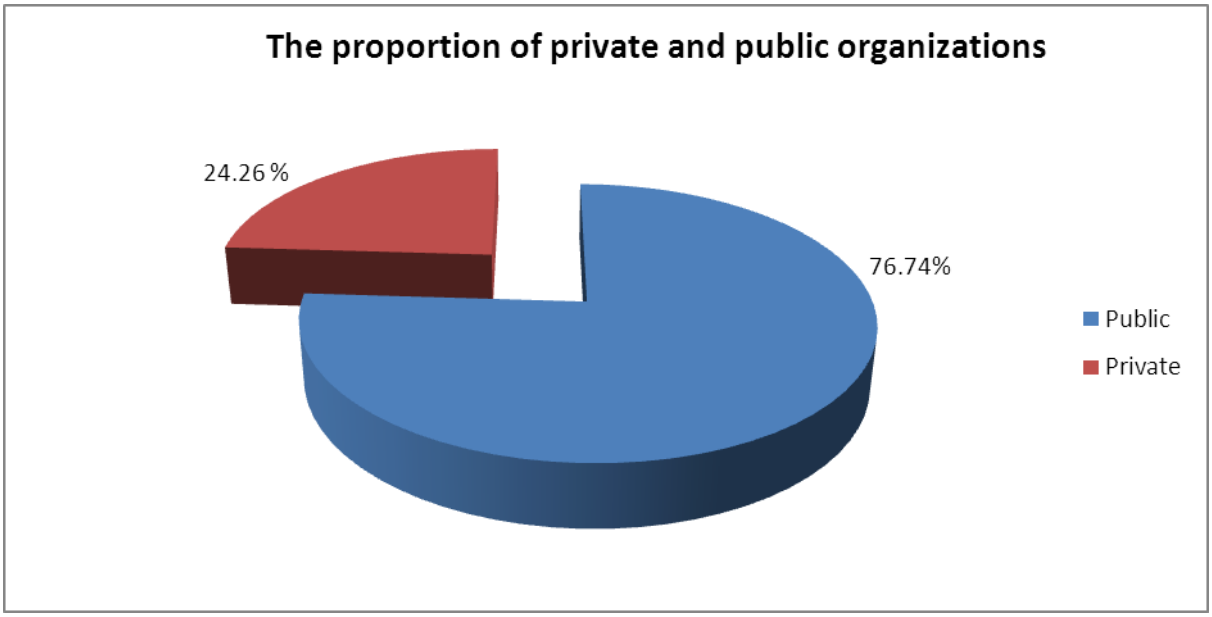


Figure 1. The proportion of private and public organizations

Ones of the public sectors are center of environmental monitoring belonging to DONRE, Institutes, centers of institutes, universities, …

Organizational structures of environmental monitoring centers usually consist of the following departments:

- General administrative department or general planning department; general administrative office; Department of Organization and Administration;

- Department of environmental monitoring and analysis or division of environmental monitoring and analysis; Department of analysis and chemistry experiment; analysis dept.; laboratory;

- Department of consultancy and technical services or division of environmental consultancy and technique services; dept. of technical services; Environmental protection dept.; specialized department; Technical and specialized dept. sections; technical dept.

The service providers of the research institutes basically also have the following departments:

[10] Detail of organizations and units can be found in the Appendix of the report.

- Department of environmental monitoring and analysis;
- Department of research and development of environmental technology;
- Department of scientific research and technology transferring services.

Private organizations operating in the field of environmental and monitoring analysis, depending on their scale, may have some other departments as follows:

- Environmental monitoring, analysis and measurement;
- Environmental consultancy;
- Designing, installation and transferring environmental treatment systems.

Organizations providing monitoring, evaluation and measurement services for data and evidences collection often carry out the following sets of activities:

- Activities of environmental monitoring and analysis, supporting state management according to the annual plans already approved and inspection and handling of violations and settlement of complaints regarding environmental pollution;

- Providing monitoring and consultancy services in the field of environmental protection to organizations and individuals in need, including: Investigating, monitoring and sampling to analyze the quality of the air, water and soil environment, making environmental impact assessment report; making commitments to protect the environment; formulation of environmental protection schemes; Devising the project on environmental rehabilitation and restoration; Formulation of schemes for discharge of wastewater into water sources; Compiling dossiers of application for water resource exploitation permits; Make periodic environmental monitoring reports; Compiling dossiers certifying the completion of environmental protection items;

- Research institutes often conduct the following activities: Consultation for industrial enterprises on industrial environment monitoring and measuring equipment; Training staff to monitor and analyze the environment; Training and guiding the operation of environmental treatment facilities; Conducting research and development of waste treatment technologies; Supporting and transferring technology for industrial pollution treatment; Designing and construction of environmental treatment facilities; Consultation, designing and transferring waste treatment technology.

Regarding operation field, most of the certified organizations carry out both environmental monitoring and analysis (analysis of environmental parameters in the laboratory). Of 172 certified organizations, there are 8 units providing environmental field monitoring, 1 unit delivering environmental analysis and 163 ones that implement both of them, as follows:

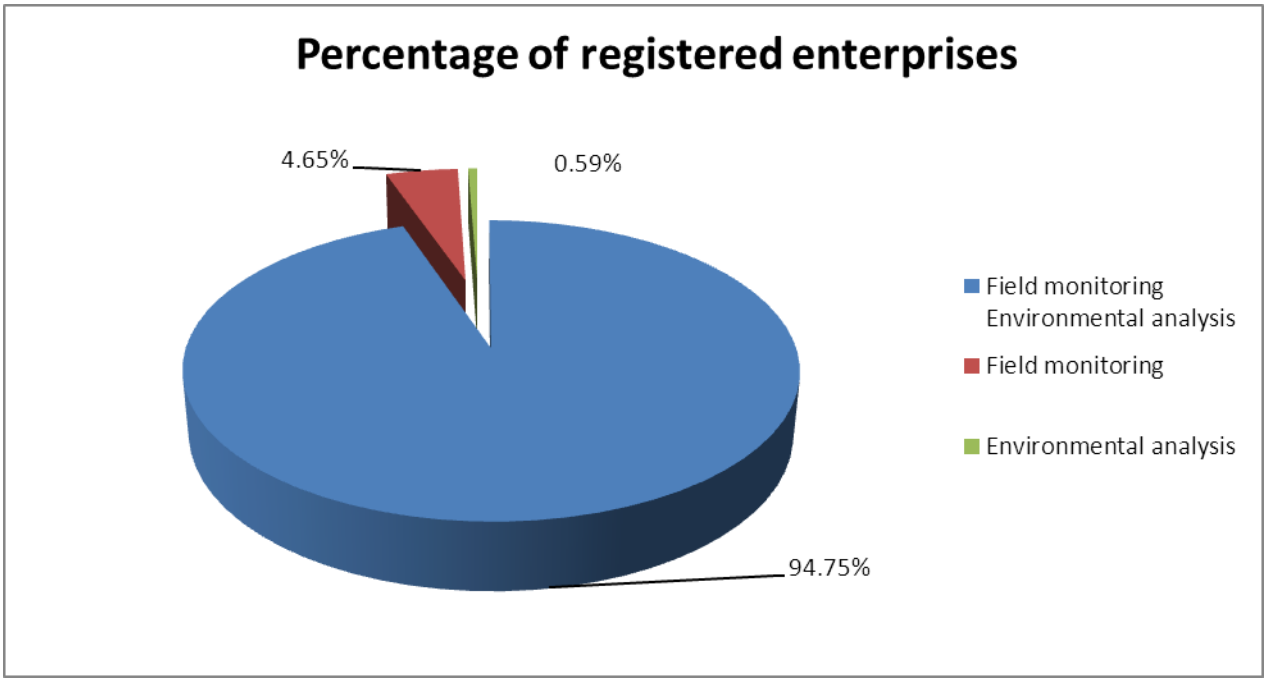


Figure 2. Percentage of registered enterprises

III. 2. Analyze the capacity of service providers

Of the 172 organizations that have been certified as eligible for environmental monitoring services, 171 are eligible for water environment analysis services, 114 are eligible for service of analyzing soil environment and there are 3 units that qualify for and services of monitoring ecosystem and species prioritized protection.

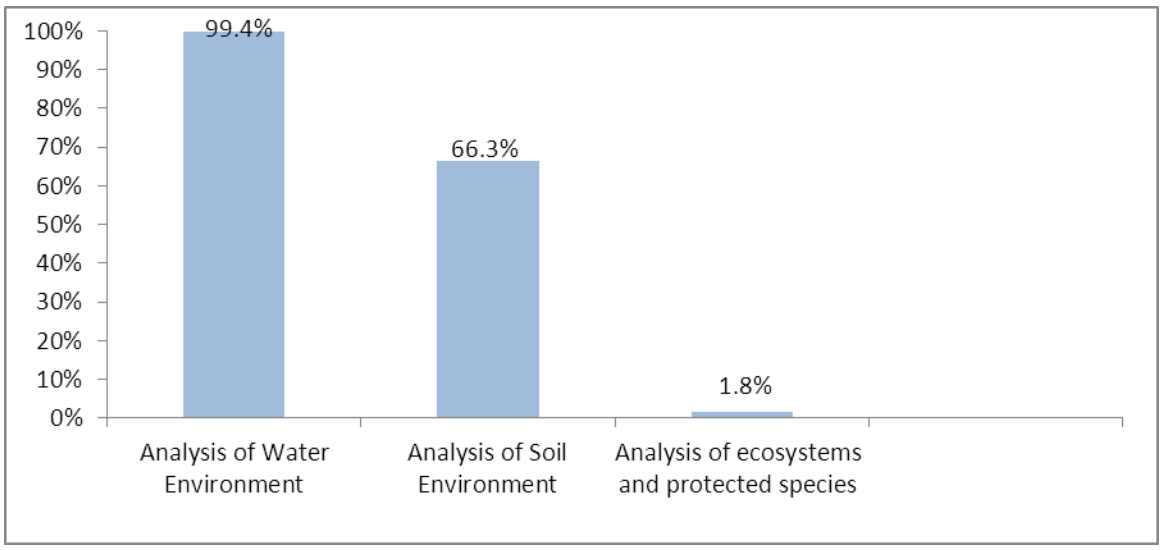
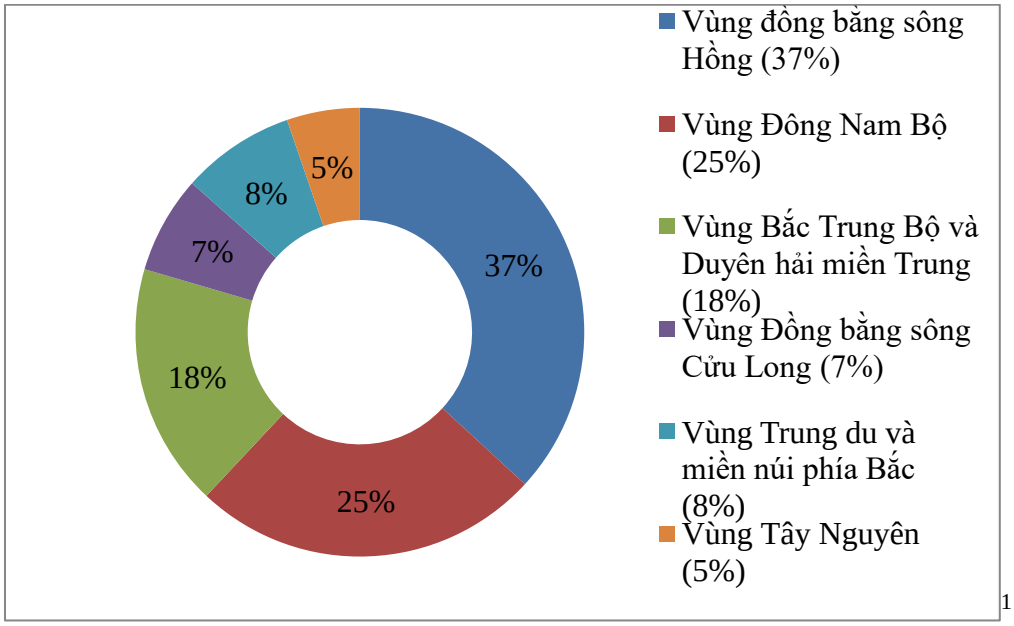


Figure 3. Proportion of service providers operating in each sector (soil, water, ecosystem and protected species)

It can be pointed out that monitoring and analysis of water environment parameters for estimation and determination of damage to the water environment to claim compensation is fully feasible with surface water, wastewater, groundwater, sea water. Regarding sediment, although the number of enterprises having the capability of monitoring and analyzing is not great but the work can still be implemented (03 units are capable). Monitoring and analysis of soil environment parameters for estimation and determination of damage to the soil environment to claim compensation is possible. The collection of data and evidence to identify damage to ecosystems and species prioritized for protection is not that simple given that very few units can provide services of monitoring and analyzing these parameters (03 units).

The research team shall then gather and analyze organizations operating in the field of monitoring environment divided by regions rather than provinces. The reason the team chooses to divide by region is that Vietnam has 07 key economic zones, where enterprises and factories mainly take place. After research, it was found that organizations providing monitoring and measuring services are located in key economic zones and provinces where industrial parks and industrial clusters are situated.



[11]

Figure 4. The distribution of environmental monitoring and analysis organizations in accordance with Decree 127/2014 / ND-CP

According to VILAS's 2014 statistical data, there are currently 565 laboratories meeting ISO 17025, of which about 130 laboratories qualify in the field of the environment. According to the results of the research team, up to July 2015, 116 organizations were qualified to carry out water analysis services in accordance with ISO 17025 (90% of labs in the environmental field) and accounted for nearly 21% of the total number of laboratories meeting ISO 17025.

Current status of organization and operation of units providing monitoring, evaluation and measurement services in the field relating to wastewater

Up to now, 50 local environmental monitoring centers have been approved for the overall environmental monitoring program, with approved environmental components namely air, water (surface water, waste water, water) Sea, groundwater), land.

According to data published by VEA, there are 171 organizations that are eligible for water environment analysis services under Decree 127/2014 / ND-CP. These organizations have two types of activities: field monitoring and laboratory analysis.

[11] Compiled data from the research team

Analyzed environmental parameters are surface water, wastewater, groundwater, seawater and rainwater.

Organizations with approved functions of water quality monitoring and analytsis in accordance with Decree 127/2014 / ND-CP are distributed in three main areas: i) Red River Delta 37% (63 organizations); Ii) Southeast region 25% (43 organizations), mainly in Hanoi (54 organizations) and Ho Chi Minh City (34 organizations); and iii) North Central and Central Coast 18% (30 organizations)

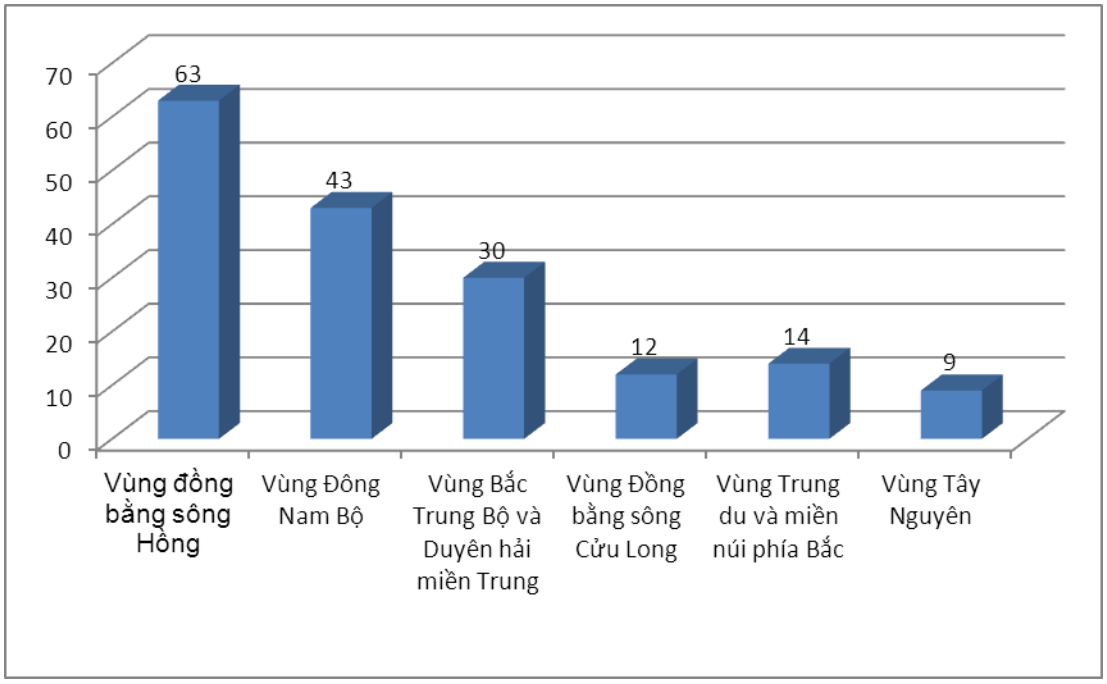


Figure 5. The number of organizations with approved functions of water quality monitoring and analysis in accordance with Decree 127/2014 / ND-CP

Many organizations whose water quality analysis meets ISO 17025 standards are situated in the Red River Delta (39/116 organizations) and in the South East (34/116 organizations), mainly in Hanoi (33 organizations) and Ho Chi Minh City (26 organizations). The other regions namely Northern midlands and mountainous, North Central and Central Coast, Central Highlands and Mekong River Delta.

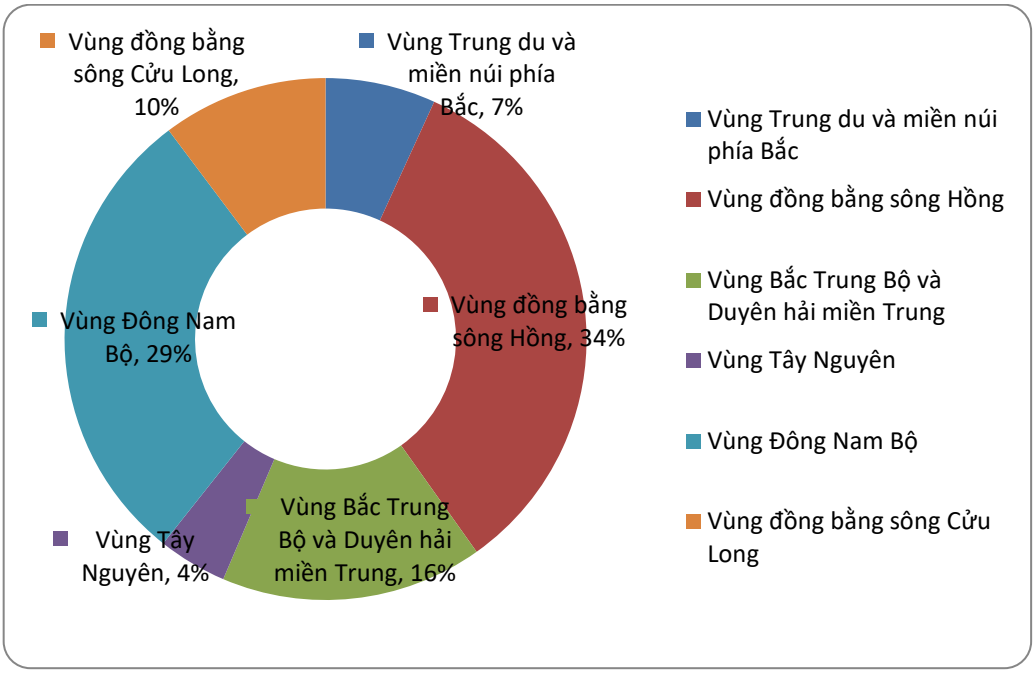


Figure 6. The number and distribution of organizations approved in accordance with ISO 17025

Current status of organization and operation of units providing soil monitoring, evaluation and measurement services

There are two forms of accreditation for qualified organizations providing environmental services in Vietnam: i) Accreditation under Decree 127/2014 / ND-CP; ii) ISO 17025 accreditation.

According to data published by VEA, there are 114 organizations that are qualified for soil environment analysis services out of 172 accredited under Decree 127/2014 / ND-CP. These organizations have two types of activities: i) monitoring field, which is almost exclusively soil sampling and preservation; ii) Analysis of environmental parameters including 41 indicators: pH_{H2O}, pH_{KCl}, moisture and dryness coefficient, total exchangeable base, total N, total P, N dissolvable available, ammonium, P Organic Carbon, Moisture, Acid Acidity, Fe, Al, As, Ba, K, Pb, Antimony (Sb), Cd, Cr, Cu, Zn, Ni, Mn, Sn, Ag Berry (Ca) Co, Mg, Mo, Thallium (TI) Vanadium (V), Se, Coliform, Fecal Coli, E.Coli, total aerobic bacteria... pursuant to QCVN 03-2015 National Technical Regulations on soil heavy metal, QCVN 43-2012 National Technical Regulations on sediment quality Of these organizations, 18 organizations provided only general information about analysis of soil

environment, 31 organizations only monitored the site (taking and preserving land samples) and 65 of them stated specifically details of analytical parameters.

Regarding distribution, organizations accredited under Decree 127/2014 / ND-CP are distributed in two main areas: i) Red River Delta 36% (41 organizations) and ii) Southeast region 26 % (30 organizations), mainly in Hanoi (31 organizations) and Ho Chi Minh City (23 organizations).

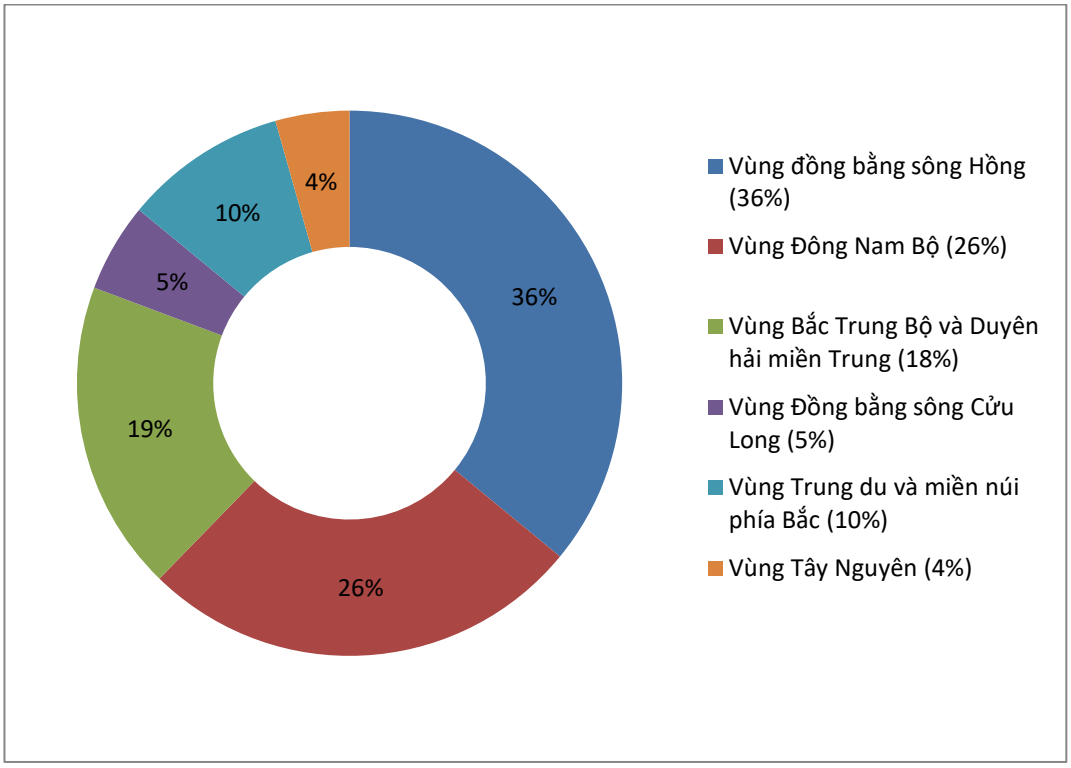


Figure 7. The distribution of organizations accredited under Decree 127/2014 / ND-CP

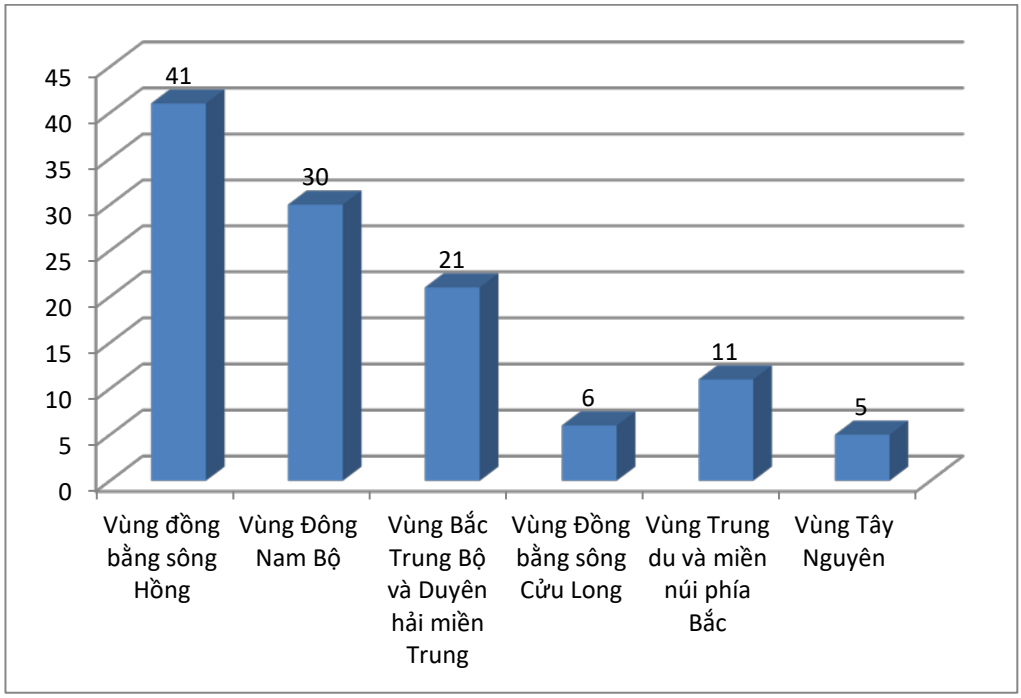


Figure 8. The number of organizations accredited under Decree 127/2014 / ND-CP

Laboratory quality management system ISO 17025 is one of the leading management systems in the field of analysis in general and environment in particular. According to VILAS office's statistical data, there are now 565 laboratories that meet ISO 17025 standards (2014 data), of which the environmental sector accounts for 23% (see Figures 8 and 9).

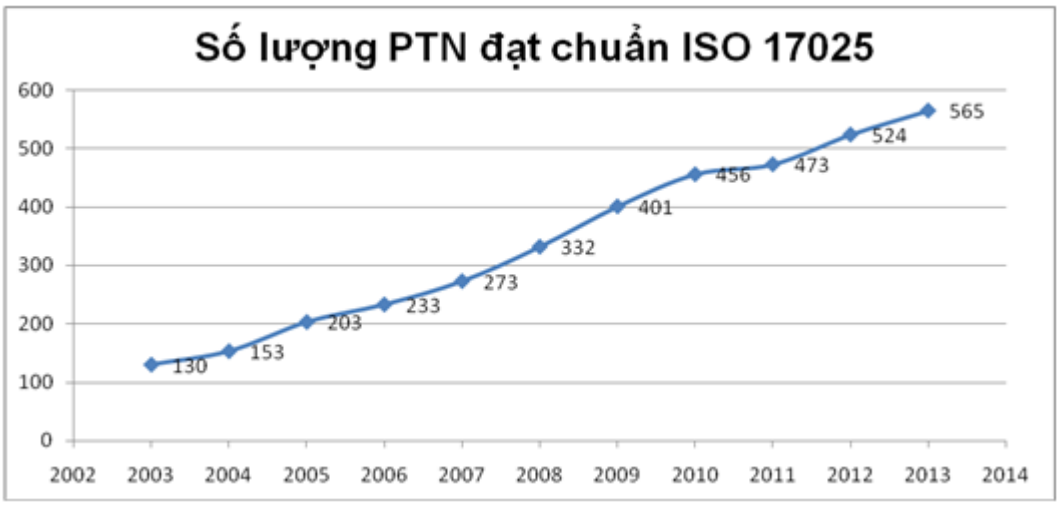


Figure 9. The number of laboratories meeting ISO 17025

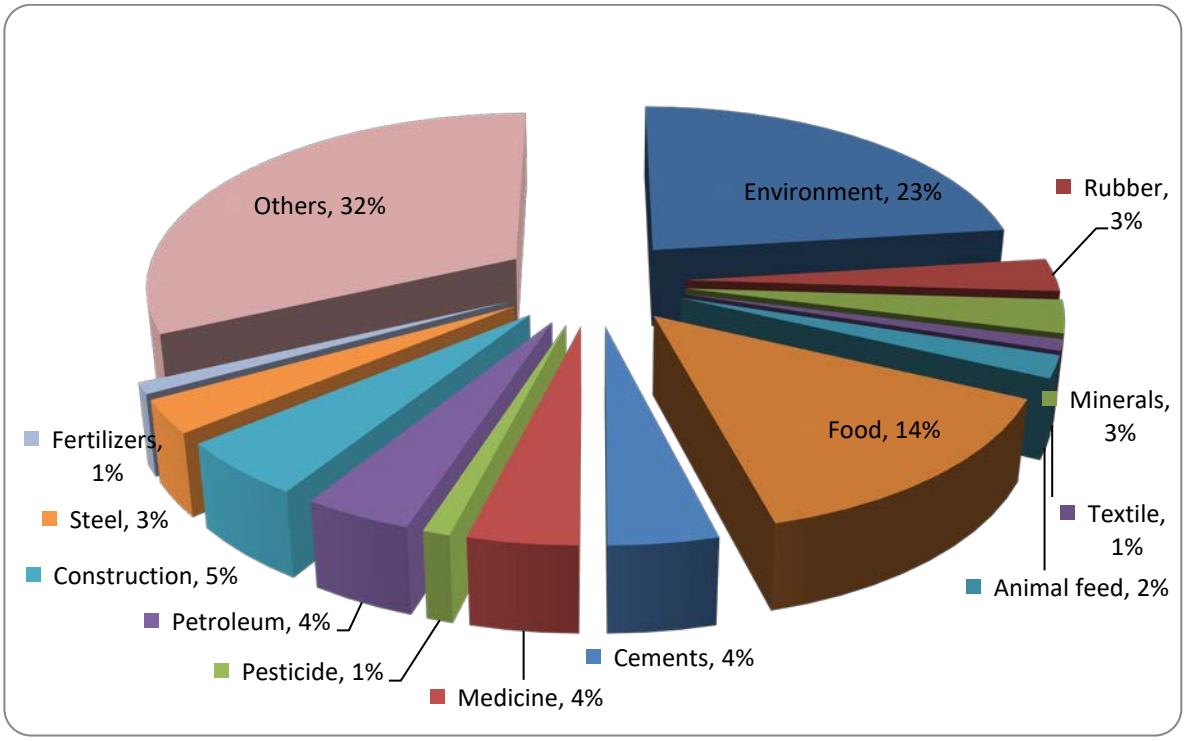


Figure 10. The number of laboratories meeting ISO 17025 regarding different fields

According to the compiled results of the research team, up to July 2015, 25 organizations were qualified for soil analysis services in accordance with ISO 17025. The major analytical parameters were: Laboratory determination of PCBs compound; Laboratory determination of specific weight; Laboratory determination of moisture and hygroscopic water amount; Laboratory determination of plastic limit and liquid limit; Laboratory determination of grain size distribution; Laboratory determination of shear strength; Laboratory determination of the compressibility; Laboratory determination of volume weight; pH; Laboratory determination of trace metals and metalloid; Pesticides group chlorine; Organic pesticides; exchangeable acidity, exchangeable Al^{3+}, Hydrolysis acidity; some heavy metals (Cd, Zn, Cr, Co, Ni, Mn, Pb, Fe, Cu, As, ..); Determination of beta activity; Determination of some isotopes of elements; Content lost when calcined; Total and dissolvable available N, P, K; Moisture, moisture error coefficient; Catrion exchange; Total organic matter; Identification of organic chlorine pesticides; Determination of phenol; exchangeable Fe; Determination of dry matter content and water content; SiO_2; Al_2O_3; Fe_2O_3; CaO; MgO; Determination of grain composition; Determination of total Dioxin-Furan PCDDs isomers' content; PCDFs; Determination of

organic carbon and total carbon after burning; Determination of volatile organic compounds; Analysis of 17 Diosin isomer; Determination of radioactive isotope content, pursuant to QCVN 03-2015 National Technical Regulations on soil heavy metal, QCVN 43-2012 National Technical Regulations on sediment quality ...

Similar to the distribution of these organizations in compliance with decree no.127, ISO 17025 accredited organizations are mainly situated in Red River Delta (9/25 organizations) and Southeast (7/25 mainly in Hanoi (8 organizations) and Ho Chi Minh City (7 organizations).

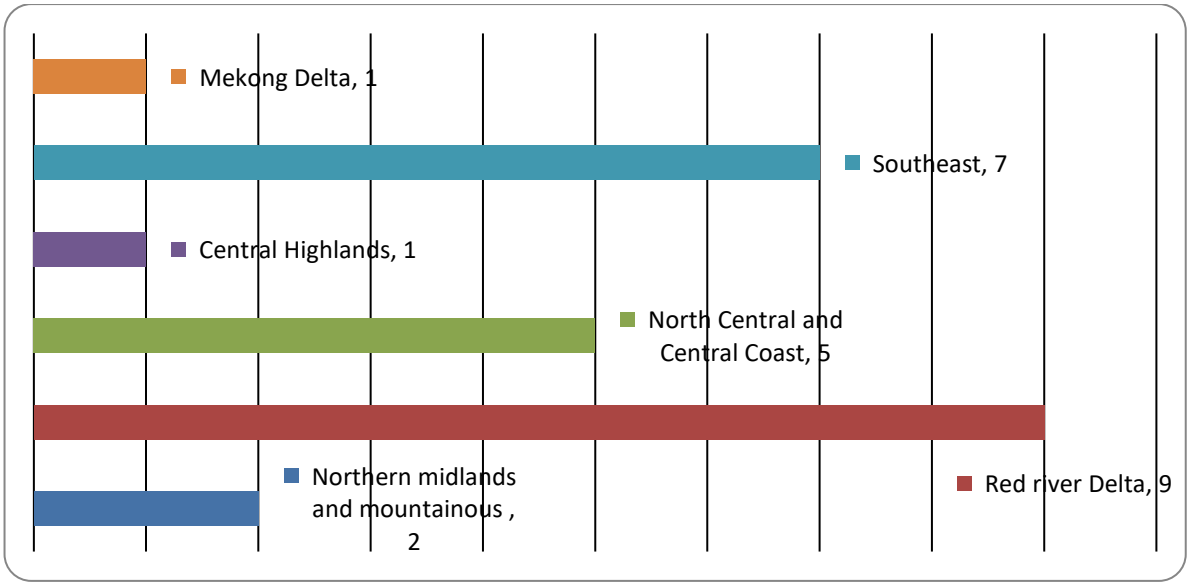


Figure 11. The number and distribution of organizations meeting ISO 17025

Current status of organization and operation of units providing monitoring, evaluation, and measurement of ecosystems and species prioritized for protection

Based on the research on the organizational status of organizations involving in monitoring, evaluation and measurement of ecosystems and species prioritized for protection, some comments and assessments are made as follows:

- *Pursuant to Decree no.32/2006/NĐ-CP dated 30/03/2006 of the government on management of endangered, precious and rare forest plants and animals; Decree no.160/2013/NĐ-CP dated 12/11/2013 of the government on criteria to determine species and the regime of managing species under lists of endangered, precious and rare species prioritized protection*

Organizations involving in monitoring, evaluation and measurement of ecosystems

and species prioritized for protection are, as follows:

a) VEA (Biodiversity Conservation Agency); Ministry of Agriculture and Rural Development (Department of Forest Protection); and units under management of the province People's committee (DONRE, Department of Agriculture and Rural Development).

However, these units are state management agencies, performing professional tasks in the scope of sectors and domains assigned namely Environmental management and Agriculture and Rural Development. Regarding activities of monitoring, evaluation and measurement of ecosystems and species prioritized for protection, these units have the responsibilities as follows:

- Managing and guiding research and assessment of the status of endangered, precious and rare forest flora and fauna.

- Managing and organizing the evaluation of the status of endangered, precious and rare forest plants and animals. Compiling the status of endangered, precious and rare forest flora and fauna.

- Organizing and guiding the investigation, monitoring and evaluation of the status of wild fauna and flora species, plant varieties, livestock breeds, microorganisms and fungi on the list of species prioritized for protection.

- Generating statistical data and compiling information on the changes of wild animals, wild plants, plant varieties, livestock breeds, microorganisms and fungi on the list of species prioritized for protection nationwide.

- Organizing the investigation, monitoring and assessment of the status of wild animals, wild plants, plant varieties, animal breeds, microorganisms and fungi on the list of priority protected species

It can be pointed out that these organizations mainly carry out the tasks of managing and guiding the study and evaluation; managing and organizing the evaluation; organizing, guiding the investigation, monitoring and evaluation; as well as compiling the status of wildlife, wild plants, plant varieties, livestock breeds, microorganisms and fungi on the list of species prioritized for protection, without directly implementing the assignment of monitoring, assessment and measurement of ecosystems and species prioritized for

protection.

b) Forest owners and management boards of nature conservation zones have the responsibility to investigate, monitor and assess the status of species prioritized for protection; To inspect, supervise the exploitation and verify specimens exploited within the scope of their management and report them to the direct managing agencies under the provisions of law.

- Pursuant to Decree no. 127/2014/NĐ-CP dated 21/12/2014 of the government regulating the requirements applicable to environmental monitoring service activities (including services of monitoring, evaluation and measurement of ecosystems and species prioritized for protection):

At present, the number of accredited organizations involving in monitoring, assessment and measurement of ecosystems and species prioritized for protection is only 03 of 172 units certified as qualified to implement monitoring and Environmental analysis. The details are, as follows:

Branch of Vietnam Petroleum Institute -

Research and Development Centre for Petroleum Safety and Environment

- ID number: VIMCERTS 001
- Decision No. 1154/QĐ-BTNMT dated 18/6/2014
- Field: Field monitoring and Environmental analysis.

Services of monitoring, evaluation and measurement of ecosystems and species prioritized for protection: ***Biodiversity monitoring.***

Fields of monitoring consist of:

+ *Field monitoring:* Parameters (sampling): zooplanktons and zoobenthos.

+ *Environmental analysis:* zooplanktons and zoobenthos.

Dong Nai Center for Environmental Monitoring and Techniques, Dong Nai DONRE

- ID number: VIMCERTS 003
- Decision No. 1152/QĐ-BTNMT dated 18/6/2014
- Field: Field monitoring and Environmental analysis.

Services of monitoring, evaluation and measurement of ecosystems and species prioritized for protection: ***Biodiversity monitoring***

Fields of monitoring consist of:

+ *Field monitoring:* Aquatic organisms (zooplanktons, zoobenthos)

+ *Environmental analysis:* Aquatic organisms (zooplanktons, zoobenthos).

Center of Radiative environment monitoring and analysis, Geological division for Radioactive and Rare minerals

- ID number: VIMCERTS 095
- Decision No. 1537/QĐ-BTNMT dated 19/6/2015
- Field: Field monitoring and Environmental analysis.

Services of monitoring, evaluation and measurement of ecosystems and species prioritized for protection: ***Plant monitoring***

Fields of monitoring consist of: ***Field monitoring:*** Sampling and preservation of plant specimens; and ***Environmental analysis***.

The investigation of the scope and field of monitoring of the three organizations shows that they only perform the monitoring with very narrow scope relating to biodiversity, namely: monitoring of phytoplankton and zoobenthos; aquatic life monitoring; Sampling and preservation of plant specimens.

In fact, the determination of environmental damage has been made by some of the following agencies and organizations:

The following organizations have the capacity not only to monitor and analyze the water and soil environment but also to monitor and analyze the environment so as to determine the damage caused by the degradation of environmental functions and usefulness, including:

- Centre for Environmental Monitoring (VEA – MONRE) and stations of monitoring and analyzing natural resources and environment under the management of local DONREs. These centers determine practical damage to natural environments like public administrative units provide public services;
- Other administrative units, such as: Institute for Environment and Resources (Ho Chi Minh City National University), Institute of Ecology and Biological Resources (IEBR), Vietnam Academy of Science and Technology (regarding ecological damage); Institute of Oceanography in Hai Phong and Nha Trang (regarding marine resources); Center for

Technology Environmental Treatment, High Command of Chemical – Ministry of Defense (regarding soil resources)...

After the analysis of organizations proving services of monitoring, analysis, measurement, assessment, … named in the list of licensed organizations of MONRE and list of accredited organizations of Vilas and ISO: 17025, the research team has reviewed, analyzed and selected 25 organizations that are competent to carry out environmental monitoring and analysis and they are capable of estimating damage and determining compensation for it.

Criteria for selecting these organizations constructed by the research team are, as follows:

Having participated in the activities of monitoring, measurement and estimation of damage in recent incidents;

Having joined the inspection group of MONRE;

Characteristics of the activity: For example, only 03 units have been certified for monitoring, assessment and measurement in the field of ecosystems and priority protected species, the research team will add these three units into the list regarding cases of soil, ecosystems and species prioritized for protection ...

Expert opinion from the appraiser before licensing.

Table 2. Shortlist of Service Providers

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
1	Branch of Vietnam Petroleum Institute - Research and Development Centre for Petroleum Safety and Environment	Public	Vimcerts 001	- Monitoring - surveying offshore and onshore environment of constructions relating to oil and gas, chemicals, power plants, seaports, river ports, transportation ... - Analyze the environment with samples of oil, gas, soil, water, air, benthic animals, phytoplankton, ecotoxicity, disintegration and bioaccumulation. - Assess the environmental damage caused by the oil spill, study the weathering process of crude oils and identify the origin of the polluted oils.	A staff of 85 members and collaborators. Including: Board of Directors, Science and Technology Council and 06 departments. 02 specialized departments that carry out the monitoring and analysis namely: Environmental Technology Division and Environmental Chemistry Laboratory	- 02 specialized departments that carry out the monitoring and analysis namely: Environmental Technology Division and Environmental Chemistry Laboratory with sufficient analytical and monitoring equipment. - Standard laboratory system	Established in 1993, more than 20 years of experience in the research field and safety and environmental protection service. Being a leading unit regarding response to oil spill.	Carry out assessment of environmental damage caused by oil spills in a number of cases Help develop the safety management, labor environment and pollution control in the petroleum industry of Vietnam
2	Center for Monitoring - Technique Natural Resources and Environment, Binh Duong DoNRE	Public	Vimcerts 002	Monitoring resources and environment, investigating, researching, applying, transferring technology and providing technical and professional services in the field of natural resources and environment.	five specialized departments: Field monitoring, Automatic monitoring and Data, Testing Laboratory, Consultancy department, and Technology Department.	Vilas Standard laboratory system. Field monitoring equipment.	Implement environmental monitoring and analysis activities in Binh Duong to serve environmental management	Implement environmental monitoring and analysis activities in Binh Duong to serve environmental management
3	Dong Nai Center for Environmental Monitoring and	Public	Vimcerts 003	Monitoring and analysis of the environment, measurement, analysis, monitoring and controlling quality of environmental components	The center has 04 specialized departments including: Environmental Monitoring Division; Division of analysis, testing; Consultancy	Vilas Standard laboratory system. Field monitoring equipment.	Carry out environmental monitoring in the province to serve the environmental management, measurement,	Support the implementation of monitoring and analysis in Vedan case

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
	Techniques				department; equipment calibration department		analysis, monitoring and supervision of environmental quality in Dong Nai	
4	Hanoi Environment analysing and technique joint stock company	Private	Vimcerts 006	- Analyzing air, water, solid parameters; - Controlling environment pollution - Field monitoring	The total number of staff working in the professional field is 25, of which there are 17 officers related to the analysis department. The company has 6 departments, including 3 laboratories: Analyzing dept. and 2 Field dept.	- Laboratory analyzing absorption spectroscopy UV-VIS; - Atomic absorption spectroscopy laboratory; - Total dust sampling and emission sampling machine (ISO - Kinetic); - Gas chromatography laboratory; - atomic absorption spectrometer AAS; - System of field observation equipment.	Active since 2004. Experienced in activities: Analyzing air, water and solids parameters, Environmental monitoring, make environmental impact assessment reports; Make periodic environmental monitoring reports.	- Monitoring the environment in Thai Nguyen Samsung company; - Monitoring the environment in Bac Ninh Samsung company - Environmental monitoring bidding package PKK1_B Dong Anh - Yen Phong road - Monitoring the construction of the A6, Noi Bai - Lao Cai highways - Monitoring the current status of air, water and soil in Bac Kan province - Environmental monitoring of the project of Ben Luc - Long Thanh Highway
5	Hai Duong Center for Environmental monitoring analysis	Public	Vimcerts 017	Monitoring and analyzing environmental parameters and providing environmental technical services to serve environmental management and protection in the province.	The center has 38 employees, the number of employees with tertiary and postgraduate degrees accounts for 81.5% The center is capable of analyzing 26/32 criteria for wastewater samples, 27/32 parameters for	- Analytik Jena AG - contrAA 700 - High-Resolution Continuum Source Atomic Absorption Spectrometer; - Agilent 7890A Gas Chromatograph (USA), - UV-VIS, - High Performance Liquid Chromatography HPLC,	Established and put into operation in 2006. Monitoring and analyzing environmental norms and provide environmental technical service to help the	The center has conducted environmental assessment for 196 projects, including ones on industrial parks and urban areas (such as Dai Duong Industrial Park, Dai

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
					surface water and 23/25 ones for groundwater samples, analyzing most heavy metals in Soil, sludge, sediment ... samples and CO, SO2, NO2, Dust, Pb, VOCs, ... in air environment,	chimney exhaust meter, - Total dust sampler, PM10 dust sampler, air sampler. - The equipment for monitoring the water, air, soil	environmental management and protection in the locality. Monitoring and analyzing environmental parameters including: surrounding environment, sources of waste from production, business, services … to make annual environmental status report; Charging for industrial wastewater; proposing and recommending plans for treatment, prevention and mitigation of pollution and remedy of environmental incidents	An Industrial Park, Cao Industrial Park). Chi Linh (Chi Linh), Chi Linh new urban area, Tue Tinh street, etc.), concentrated aquaculture in some districts (Cam Giang, Kinh Mon, Ninh Giang) Projects on resource exploitation, industrial production, ... - Monitoring and analyzing environmental parameters (surrounding environment, sources of waste from production, business, service...) to make annual environmental status reports.

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
6	Can Tho Center for Technical Standards, Metrology and Quality	Public	Vimcerts 019	Field monitoring Environmental analysis	Including 08 departments in which the specialized departments involve in the field of environmental monitoring and analysis include: Biochemistry Laboratory. The total number of staff is 56	Vilas Standard laboratory system. Field monitoring equipment.		
7	Eurofins Sac Ky Hai Dang Co., Ltd	Private	Vimcerts 020	- Devise plans to monitor the level of air pollution, conduct measurements and sampling air quality. - Consulting, analyzing and measuring, participating in environmental monitoring, controlling and reporting environmental quality. - Perform sampling & analysis in the field	In the company there is an Environmental Monitoring Dept. specializing in field monitoring and environmental analysis. The dept. has 07 members, including the head, 01 member responsible for studying and developing new method, 05 technicians carrying out professional activities. In addition, there are Contractual employees providing technical support such as spectrum analysis, chromatography, microbiology ...,	- Emission analyzer TESTO 350 XL (3 sets); - Gas sampler DESAGA (1 set), SIBATA (2 items); - Small air suction pumps (10 items), large air intake pumps (3 items) - SIBATA dust sampler (3 sets); - Testo noise level meter (2 items); - Thermometer, moisture meter, wind meter, light meter (3 items) -Noise level meter of Metrosonics, Quest, Tenmars (3 items); Handheld pH meter (1 set); Handheld DO meter (1 set); - Conductivity meter (02 sets) Sampling equipment used for stratificated water level, by depth (2 sets), - Aquarium sampling, bottom sediment sampling equipment; GPS navigator…	Established in 1998, in May 2015 the company affiliated with Eurofins Scientific Group to establish Eurofins Sac Ky Hai Dang Co., Ltd	

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
8	National working environment monitoring station	Public	Vimcerts 024	Field monitoring Environmental Analysis	Station has a staff of 66. The station has 03 departments and 01 manufacturing business. In the dept.'s there is the Department of Environmental Monitoring and Analysis	Sufficient equipment for Field monitoring, Standard laboratory carrying out Environmental Analysis. In addition, the station also has one manufacturing business producing - importing and exporting environmental equipment. The station has carried out research and produced equipment controlling air, water, … environmental pollution.	Having operated since 2018, the station is one of the units that are highly appreciated in activities of environmental monitoring and analysis namely: Perform monitoring and analysis of environmental parameters for VEA and Ministry of Science and Technology; carry out training and professional guidance for monitoring and analysis staff at central and local levels	- Study and install dust and paint solvent treatment system at Vinh Hanh Plastics Company - Waste treatment system for diesel oil fired in Bac Ninh Vinamilk Company Smoke treatment system - Perform monitoring of environmental parameters as required by the MONRE, analyze and provide information on quality criteria and environmental status. - Monitor the environmental parameters as required by VEA - Provide raining and professional guidance to monitoring and analysis staff on management demand and environmental protection at the central and local levels.
9	Consultancy center for O.S.H and Environmental technolog	Private	Vimcerts 026	Field monitoring, Environmental Analysis especially the working environment	Specialized departments include: Monitoring and Measurement of working environment dept.; Laboratory	The laboratory is well-equipped to carry out specialized activities. Field monitoring equipment; Laboratory analyzers	More than 10 years in the field of environmental monitoring and analysis	Solving environmental problems for P & G, Orion, Pepsi, VinaAcecook companies; Signing regular contracts

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
	y (COSHET), HCM city							with: Environmental Protection Agancy of Binh Phuoc, Gia Lai, Quang Binh, Ho Chi Minh City export processing and industrial zone authority (HEPZA), DoNREs of District 1, 2 and 3. The center has a co-operative contract with the Dong Nai Department of Health
10	Center for Environmental Monitoring – Vietnam Administration of Environment	Public	Vimcerts 027	Field monitoring Environmental analysis	5 specialized departments and 03 monitoring station (Central and Central Highlands, South East, South West) A staff of 128 Quality accredited laboratories include: Division of Environmental Laboratory (15 employees); Division of Dioxin Laboratory; Division of Equipment Calibration; Division of Environmental Monitoring System (23 employees)	- GC/MS-Gas Chromatography Mass Spectrometry (GCMS) and other auxiliary devices: devices with higher resolution, allowing the analysis of organic compounds. - Atomic absorption spectrometer (AAS): devices with high sensitivity, stability, allowing the analysis of trace metals in the environment - Equipment for analysis of water chemistry - Equipment of storage, sample handling, laboratory safety. - Field monitoring equipment system	Being a focal center in the national environmental monitoring network, the focal point for implementing the overall planning of the national environmental monitoring system	Implement the analysis, assessment and measurement of environmental parameters in four central provinces A specialized unit to assist VEA in evaluating eligible units for monitoring activities The unit helps VEA - MONRE to carry out activities of monitoring, analyzing incidents and environmental damage throughout the country.
11	Center for Technology and Environm	Private	Vimcerts 052	Measurement and analysis of water quality (supply water, waste water), gas and solid waste.	The center has 06 departments, including 04 specialized depts. 02 professional depts.	1. Spectrophotometer - HACH DR/2010, USA & UV-VIS 2800, Labomed, USA & UV-1800, Shimadzu-Japan.	Having operated in environmental monitoring and analysis since 2003	- Monitoring and analysis of environmental air

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
	ental Management HCM city			Supervisory contractor and controlling environmental quality.	conducting monitoring, measurement and analysis activities including: scientific research labs and laboratories. The total staff of the Center is 35.	2. ICP spectrometer - Optima 7000DV ICP – OES & Perkin Elmer, USA. 3. GC/MS and FID Agilent Technologies - GC/MS, USA. 4. Soxhlet Extractor - Behr, Germany. 5. Rotary Evaporator - Heidolph, Germany. 6. 850 Professional IC ion chromatography - Metrohm, Switzerland. 7. Distillation Unit - K-355, Buchi, Switzerland & VAP30S, Gerhardt-Germany. 8. The Speed Digester K-439 - Buchi, Switzerland. 9. 862 Compact Titro sampler - Metrohm, Switzerland. 10. Water purification system - Human, Korea. 11. Double distillation machine - Hamilton WSC/4D, England. 12. pH meter - Mettler Toledo MP 220 and S220, Switzerland & WTW 720, Germany. 13. pH meter (portable) - Schott, Germany & Martini. 14. Conductivity meter - Hach Sension 7, USA. 15. Turbidity meter - Hach 2100P, USA. 16. Multi-parameter meter (pH, EC, salinity, DO, temperature) - Multi 340i , WTW, Germany. 17. Dissolved oxygen meter - WTW 330i, USA. 18. Horizontal Water Sampler - USA.		quality in HCM City in 2016; - Monitoring, analyzing water samples of the project "Post certificated examination of the constructions that exploit ground water, that emit wastes into water source" managed by Ho Chi Minh city DoNRE; - Monitoring, analyzing environment quality of the canal routes Tham Luong, Ben Cat, Vam Thuan within the project named Risk management of flooding in Ho Chi Minh city area; - Periodical monitoring, analyzing water quality, sludge in wastewater treatment plants in 2016; - Monitoring, analyzing and assessing sludge quality in the project

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
						19. Bethic macro-invertebrate sampling equipment - Petite Ponar Grab, USA. 20. Centrifuge - Hermle Z300, Germany. 21. Shaker - Vortex Genie-z. 22. Magnetic stirrer - Gallenkamp SWT 315 010N, Germany. 23. Oven - WTB Binder, Germany & UNB 400, Memmert-Germany. 24. Furnace - Nabertherm, Germany. 25. Inoculator - Biobase, China. 26. Incubator - WTB Binder, Germany. 27. BOD incubator - LI5-2, Shellab – USA & TS 606/3-I , WTW-Germany. 28. Microscope - Olympus CH30, Japan. 29. Autoclave - Hirayama HL30e, Japan & Sturdy, Taiwan. 30. Digital Burette - Brand, Germany. 31. Dispenser - EM, England – Brand GS, Germany. 32. BOD apparatus - Kimble, USA, HACH. 33. Water bath - Memmert, Germany. 34. Vacuum filter holder - Millipore, USA. 35. Cyanide distillation apparatus - Kontes, England. 36. Analytical balance - Mettler Toledo AB204, Switzerland. 37. Automatic mercury analyzer - AULA 254, Germany.		Settling flood caused by tides in Ho Chi Minh city area that is concerning to the factor of climate change (phrase 1); - Inspecting and analyzing environment quality in economic zones Dung Quat (phrase 1) and Doosan Vina Hai Phong (phrase 2) for ERM company in Vietnam; - Monitoring and assessing solid waste components in the landfills, monitoring and assessing municipal waste components complied with solid waste classification of sources model in Ho Chi Minh city area for Hitachi Zosen corporation, Japan ; - Analyzing water quality for Preventive Medicine Center of Ho Chi Minh city in 2016;

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
						38. Total organic carbon - TOC-VCPH, Shimadzu . 39. Vibration meter - Rion VM 53A, Japan. 40. Sound pro meter - Quest SP DL2, USA & ST107, SOUNDTEK, TAIWAN & TPS.MC-85, Australia & Tes 1351B, Taiwain. 41. Thermo hygrometer - Ebro, Germany. 42. Light meter - Extech 401025. 43. Flow rate meter - Flowatch, USA. 44. Wind speed indicator - Davis 94545, USA. 45. Flowmeter - Zyia, Japan. 46. Multi function instrument - Lutrom LM 8000, Tawain & Lutrom LM 8010, Tawain. 47. Air sampling pump - Sibata, Japan. - SKC, USA. 48. Air volume meter - SKC Quick take 30 & EPAM 5000, EDC – USA & 831, MetOne – USA & H-810 (DIGITAL) – RADECO. 49. Portable emission analyzer - Testo 350XL, Germany. 50. Ultrasonic Tank - RK 510H, Bandelin, Germany. 51. Noise meter - DB 200, KIMO, France. 52. Multi-parameter meter - Mi306, Martini. 53. pH meter (Martini) - Mi105, Martini.		

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
						54. Furnace LE6/11/B150 - LE060K1BN, Nabertherm, Germany. 55. CALORIMETER 6200 - A1290DDEE, Parr Instrument, USA. 56. Ammonia distillation system - Gerhardt, Germany. 57. Electromantle 1000 ml - KP1, Behr, Germany. - Electrothermal & England. 58. Portable pH, DO meter - HandyLab 680,SI ANALYTICS, Germany. 59. ORP & Temperature Meter - ORP 57, Martini, Italy. 60. Portable Air Samplers - CF – 902 (/230), HiQ, USA. 61. Atomic Absorption Spectrometric - PinAAcle, Perkin Elmer. 62. Microwave Digestion System - Multiwave Go, Anton Baar. 63. Air Compressor - Pegasus. 64. Hydro Generator - PEAK, Scientific. 65. Weather & Environmental Meter - Kestrel 4000 – U.S.A.. 66. Electromantle 1000 ml - Electrothermal & England. 67. EC/TDS/NaCl/temperature - Milwakee- Romania. 68. Mettler Toledo scale - Switzerland. 69. UV/Vis Spectrophotometers - PerkinElmer. 70. Sample storage freezer – Sanaky & Alaska - Vietnam. 71. AAnalyst 800 - Perkin Elmer.		

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
						72. Shaker apparatus - Labotech, Germany RS 500. 73. UASB reactor - Holland. 74. UAF reactor - Holland. 75. EGSB reactor - Holland. 76. Reverse Osmosis - USA. 77. Quantitative pump - Waston, 101UR, England & Waston, 505S, England. 78. Wet-test gas meter - Schlumberger. 79. Ion exchanging reactor - Holland. 80. Glassware ozone equipment - Germany. 81. Jartest equipment - Phipps & BirdTM, USA PB – 700TM.		
12	School of Environmental Science and Technology (INEST)	Public	Vimcerts 055	Field monitoring and Environmental Analysis	In the field, INEST has Centre for Industrial Environmental Monitoring and Pollution Control and Research and development laboratory in environmental technology	1. AST Sampler, Thermo branch 2. Kane May - 9106 Quintox Upgradeable Combustion Analyser 3. Testo 350XL flue gas analyzer, Testo branch 4. Ambient air sampling equipment PM2. 5; PM10 sampler, Airmetrics branch 5. High volume air sampler, Model-121V, Kimoto branch 6. High Performance Liquid Chromatography (HPLC) 7. Total organic carbon analyzer (TOC) 8. Ion Chromatography DIONEX 600 9. Gas Chromatography - mass spectrometry system GC/MS 10. Computrace	Established in 1998. The Institute has been conducting environmental monitoring activities since 2000. Has a leading staff in the environment field.	Assist VEA – MONRE in determining the cause of pollution incidents in 04 central provinces

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
						11. Atomic Absorption Spectroscopy AA 800Perkin Elmer 12. Inductively Coupled Plasma Mass Spectrometry ICP-MS 13. Automatic KJELDAHL distillation unit 14. Perkin Elmer SPECTRUM GX FTIR System 15. Spectrophotometers UV/vis 16. Chlorofill analyzer 17. Microwave digestion lab-station 18. NIC MA 2 Mercury analyzer 19. CE-440 ELEMENTAL ANALYZER 5 elements: C, H, O, N, S 20. Anaerobic BIO / EV pilot 21. Pipeline resistance measuring device		

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
13	Institute of Environmental Technology, Vietnam Academy of Science and Technology	Public	Vimcerts 079	Field monitoring Environmental Analysis	10 research departments; 02 Institutes in the Central and the South, center for environment technology research and application and Vietnam-Russia Center for Scientific and Technological Cooperation 174 members (01 Prof., 04 Assoc. Prof, 16 Dr., 56 Msc., 79 employees)	1. Gas Chromatography GC/ECD, GC/MS GC/MS/MS 2. Liquid Chromatography HPLC/UV, LC/MS and LC/MS/MS 3. Equipment ICP-MS 4. Equipment TOC/TN, AOX 5. Equipment UV-VIS 6. Vacuum drying equipment kiln Atomic absorption spectrometer (AAS) 7. Solid digestion equipment 8. Dioxin detector Biommunoassag 9. Photocatalytic air purification and decontamination system TIOKRAFT 10. Hydraulic computational software (HEC-RAS, HEC-HMS and MUDFLOW; MIKE 11 and MIKE 21, GIBSI)		Having participated in the analysis, assessment and measurement of environmental incidents in four central provinces Support MONRE when requested by the Ministry or the Government
14	Vietnam Institute of Chemical Industry - Vietnam National Chemical Group	Public	Vimcerts 087	Analysis and inspection of natural resources, minerals, chemicals, raw materials and products; Provide services, consultancy, monitoring, environmental impact assessment and environmental treatment technology;	Institute has 24 departments including 19 specialized departments. Two main operating units are: Center for Environmental Engineering and Chemical Safety; Analysis Center	- Field monitoring equipment - Standard laboratory system	Being experienced in the analysis and assessment of natural resources and minerals. As a professional unit of the Vietnam Chemical Group, the institute assists the Group in management field	==
15	Vietnam Science and Technology Joint	Private	Vimcerts 121	- Field monitoring - Analysis of environmental chemical parameters, measurement	Company has 2 divisions: Environmental monitoring and Monitoring of working environment. Laboratory	- VOCs and hazardous gaseous emissions sampling equipment EPA 0030 & 0031; - ISOKINETIC sampling equipment;	The company established in 2006 is one of the units that have the capacity of	Implement periodic monitoring for enterprises: Samsung Electronics Vietnam (SEVT), Samsung

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
	Stock Company				system comprises: Microbiology Laboratory; Atomic absorption Spectroscopy Laboratory (AAS); Basic Chemistry Laboratory.	- TESTO multi-parameter detector/meter; - Handheld bump (mini pump) SIBATA ∑30, ∑300, ∑500; - High volume air sample Sibata HV-500; - CO, CO2, dust,… multi-parameter meter TESTO & Casella - TOA DDK multi-parameter meter; - horizontal water samplers; - Soil sampling equipment - The standard laboratory system.	environmental monitoring and analysis Monitoring and Environmental Analysis	Electro Mechanics (SEMV), Samsung Display Vietnam (SDV), Enshu Vietnam.
16	Saigon Environment Consultant Joint Stock Company	Private	Vimcerts 140	Making Environmental Impact Assessment (EIA) report. Devising environmental protection schemes; Committed to environmental protection standards, periodic environmental monitoring for factories and manufacturers Consultant on cleaner production technology for factories	The company has 05 departments, in which laboratories carrying out environmental monitoring and analysis have a staff of 13.	- UV-VIS - Analytical balance - Microbiological cabinet - Field monitoring equipment - Other equipment and machines	Have experience of waste water treatment and monitoring: Industrial, hospital, domestic,…; Treating and monitoring air ...	

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
17	Center of Analytical Services and Experimentation of HCM City, Ho Chi Minh City Department of Science and Technology	Public – Independent	Vimcerts 147	- Monitoring and analysis of environmental parameters of water (surface water, groundwater, wastewater ...), ambient air, soil, solid waste, ecology and noise; - Analyze and evaluate the quality of water, sewage, land, mud, and solid waste according to standards.	The center has 10 departments and 01 branch in Can Tho. There are 02 departments of analysis: chromatographic analysis and environmental analysis.	- Water acquity UPLC H-Class system - Ion Trap Gas Chromatography Mass Spectrometry - IC-Ion Chromatography - GC-Gas Chromatography - Ion Trap Liquid Chromatography Mass Spectrometry - Inductively Coupled Plasma Mass Spectrometry ICP-MS Agilent 7700xLC ICP-MS - X-Ray Fluorescence Spectrometer - Liquid Chromatography Mass Spectrometry AP QTRAP 4000 - Triple Quadrupole LC/MS - HPLC - High Performance Liquid Chromatography - High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS) - X-Ray Diffractometer - Fat analyzer - Furnace - Nitrogen analyzer - Real Time PCR - Field monitoring equipment.		
18	Institute for Environment and Resources (Ho Chi Minh City National University)	Public	Vimcerts 138	Field monitoring Environmental Analysis	A staff of 103, including 65 specialized employees. 01 Prof., 04 Assoc. Prof., 8 Dr., 33 Msc., 39 bachelors and other research employees. The organizational structure consists of 3 divisions and 1 national	Standard laboratory system. Field monitoring equipment.	Established since 1996, the laboratory of the institute has been invested since 1996. Possessing strong and modern laboratory infrastructure with	- Vedan incident (Identify the cause and estimate the damage), Cha Va (Investigating the cause of fish death). The monitoring activities, environmental

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
					environmental monitoring station. Of the 3 divisions, there is 01 specialized one (7 specialized department) and 01 department of laboratories (04 labs)		certified quality standards (ISO / VILAS) and the well-trained professional staff and additionally, trusted by MONRE with the task of monitoring the country annually, the Institute has been successfully carrying out the monitoring activities in a variety of environments, ranging from the network of national monitoring periodically to the monitoring activities based on the needs of society or orders from the agency for environmental management and localities, industrial enterprises, project development, ... The most prominent one in recent years (2010) is the completion of the tasks of environmental monitoring water Thi Vai river (to	analysis of Saigon - Dong Nai water basin - Institute for Environment and Resources (IER) is one of three mainland stations in the national environmental monitoring system that is responsible for regular monitoring and tracking environmental changes in Ho Chi Minh City and the Delta Mekong river (Station Region III). This monitoring mission given by the Ministry of Science, Technology and Environment under Decision No. 1211-QD / MTG dated 10.22.1994 of the Minister of Science, Technology and Environment. - Participate in the implementation of observation and analysis of water quality systems Saigon River - Dong Nai and the program of monitoring traffic-related pollution in HCMC

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
							assess the damage caused by environmental pollution) given by VEA – MONRE.	- Monitoring pollution caused by hazardous substances in water and sediment of the Saigon - Dong Nai river system as well as toxic substances in the air within the framework of Project Vietnam – Switzerland
19	Institute of Ecology and Biological Resources (IEBR), Vietnam Academy of Science and Technology	Public		Monitoring and management of natural resources and the environment	The Institute has 115 research staffs. Associate Professors: 10 Doctors: 34 Masters: 43 Bachelors: 35 Technicians and laboratory assistants: 3 The Institute is divided into 16 Departments and 01 Biodiversity Field Station.	Standard laboratory system. Field monitoring equipment.	To inventory and evaluate biological resources in order to provide a basis for rational utilization of the species having scientific, economic and conservation values. To undertake research on the structure and function of typical ecosystems in Vietnam for the monitoring and management of natural resources and their environment.	

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
20	Center of Radiative environment monitoring and analysis, Geological division for Radioactive and Rare minerals	Public	VIMCERTS 095	Analysis, assessment, monitoring, analysis of radiation environment Field monitoring, analysis of radiative nuclide.	25 employees, 18 of which carry out specialized activities	1.The high resolution gamma analyzer, HP-Ge crystalline ultra-pure, having the ability to analyze most of the radionuclides in soil samples, water samples, gas samples for environment research. 2. Low background alpha/beta radiometer UMF-2000, determining separately alpha, beta activity measurements of samples. 3. RAD7 electronic radon detector, determining separately concentrations of radioactive gases (222Rn, 220Rn) to help study radioactive environment. 4. Gamma radiation dosimeter, determining amount equivalent to radiation of the environment. 5. Gas sampler, determining the activity of radioactive nuclei in the air. 6. On-site analyzer of heavy metals in water	- Established in 2012, although having officially operated recently, the center has operating experience in the field of radioactive environment for nearly 20 years. - The center is the only geological unit to have conducted all research on environment regarding toxic minerals	1. Devise and implement a network of monitoring radioactive sources according to the plan to 2020 assigned by MONRE 2. Monitor radiation in the environment of mines. 3. Delineate the area containing toxic minerals and assess the possibility of environmental damage in the territory of Vietnam (mainland) for sustainable socio-economic development. 4. Assess radioactive environmental impact due to the exploration of Nam Xe rare-earth element mine, Phong Tho district, Lai Chau province. 5. Assess radioactive environment in Kim

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
								Thuong commune, Vinh Tien commune - Tan Son district and Van Mieu commune, Kha Cuu commune, Thanh Son district, Phu Tho province.
21	Institute for tropicalization and environment, HCM city	Public	Vimcerts 009	Field monitoring and Environmental Analysis	The institute has 50 employees and 10 contractual ones. It has 8 departments and 1 manufacturer. Dept. of Monitoring and Environmental Analysis, responsible for the task already shown in its name, has 09 employees.	- GC-MS Chromatography Mass Spectrometry; - Inductively Coupled Plasma Mass Spectrometry ICP-MS; - Equipment for ultrasonic sample digestion; - UV/VIS spectrometer lambda 11; - UV/VIS Spectrophotometer; - Total organic carbon and total nitrogen analyzers in soil and water; - Ion Trap Liquid Chromatography Mass Spectrometry; - Ultraviolet visible spectrometer; …. - Dust sampler - Air sampler - Emission analyzer - Equipment for sampling dioxin – Furan - Equipment for sampling bottom mud ….	Established in 2003, the center provides environmental analysis and monitoring especially for military projects.	==
22	Quality Assurance And Testing Center 1	Public	Vimcerts 093	- Field monitoring - Analysis of the quality of the environment: air, water, soil & sediments, ...	The center has 22 departments, 20 of which are specialized dept. The laboratory of environmental testing chemical is responsible	Standard laboratory system. Field monitoring equipment.	Established in 1962, the center is considered the leader in the field of quality measurement including	As an agency under the Ministry of Science and Technology, the center has implemented activities of

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
				- Analysis of chemicals and fertilizers. - Analysis of pesticide residue, organic compounds such as chlorophenols, PCBs, PAHs. in water, soil and sediments. - Analysis of trace of heavy metals.	for monitoring and environmental analysis		monitoring, environmental analysis	monitoring and analysis to support the management of the Ministry and assist MONRE in environmental monitoring and analysis when tasked.
23	Quality Assurance And Testing Center 3	Public	Vimcerts 078	Field monitoring Environmental Analysis	- The center has 14 laboratories, 07 Measurement departments, 08 business departments, 02 affiliated centers and a branch in the Central - The laboratory of environmental testing chemical is responsible for monitoring and environmental analysis	Standard laboratory system. Field monitoring equipment.	Being the leader in the field of quality measurement including monitoring, environmental analysis among branches in HCM City	As an agency under the Ministry of Science and Technology, a branch in HCM, the center has implemented activities of monitoring and analysis to support the management of the Ministry and assist MONRE in environmental monitoring and analysis when tasked.
24	Center for Technology Environmental Treatment, High Command of Chemical	Public	Vimcerts 088	- Make Environmental Impact Assessment, the environmental status for programs, projects and production and business establishments. - Monitoring and analyzing the field in order to warn deal with and control the radioactive incidents safely.		Field monitoring equipment Standard laboratory for Environmental Analysis	Established in 1993, the center is experienced in analysis operations and environmental monitoring, especially dealing with radioactive environment problems of dioxin ...	1. Directly participate and handle safely multiple incidents of chemical or radioactive disasters nationwide 2. Monitoring, warning chemistry - radiation in the key areas of Hanoi, Ho

No.	Organization	Sector	License/ Decision number	Field	Personnel resources	Facilities	Operation experience	Contracts executed relating to compensation assistance
25	– Ministry of Defence Center for Environmental analysis and measurement Phuong Nam (Bả Rịa – Vũng Tàu)	Private	Vimcerts 075	Field monitoring Environmental Analysis of water and air pollution	35 staffs, 20 staffs in monitoring and analysis, 4 divisions	Vilas Standard laboratory system. Field monitoring equipment.	Carry out environmental monitoring in the province (BRVT) and other provinces in the South of Vietnam	Chi Minh City, Da Nang ...

Table 2 is a list of units and enterprises that are well placed to provide field monitoring and environmental analysis services, and these units are capable of estimating environmental damage. This a short list is made to provide MONRE / VEA with timely information on the selection of competent units. This list is expected to be issued as an internal document of MONRE for use in emergencies.

One of the downsides is the low stability of this list (as these units will be licensed for ViMCERT and licenses are updated annually). In order to maintain the stability of the list and to ensure that the listed units are always well-performing ones in the field of monitoring, measuring, estimating and determining the environmental damage compensation, the research team proposed that: leaders of MONRE / VEA assign Group 27 (the group assesses the professional competence of registered enterprises certified with VIMCERT) under the Center for Environmental Monitoring to be the focal unit and have the responsibility to update the list of the 25 units that have the best capacity for monitoring, measuring, estimating and determining environmental damages.

PART IV: INITIAL PROPOSAL OF A SET OF CRITERIA FOR SELECTING SERVICE PROVIDERS

Under the provisions of Law on Bidding, regarding selection of service providers it is required to comply with the following standard:

Technical capability standard: using the 1000 or 100-point grading scale to set standards of technical evaluation. The details are, as follows[12]:

- Experience and competence of the contractor: from 10% to 20% of the total score;
- Solution and methodology of the contract execution: from 30% to 40% of the total score;
- Personnel for the contract execution: from 50% to 60% of the total score;
- Total score proportion of the content specified in regulations stated in Point a, b, c of this Clause must equal 100%

Technical proposals are evaluated to meet the technical requirements when their technical scores are not lower than 70% (equivalent to 80% of total score in terms of the consulting contracts that set out high and particular technical criteria). Additionally, the score of each content in terms of the competence, experience, solution, methodology and personnel of bidders is not lower than 60% (equivalent to 70% applied to the consulting contracts that set out high and particular technical criteria) of the maximum score that that content can obtain.

The general evaluation criteria[13] (set out for the application of combined technical and price-based method shall be specified as follows):

a. Identifying the pricing score:

100 or 1,000 – point system is made identical to technical point scales to identify the pricing score. Pricing score is calculated by the formula:

$$\text{Pricing score}_{\text{under consideration}} = \frac{G_{\text{Lowest}} \times (100 \text{ or } 1000)}{G_{\text{Under consideration}}}$$

In which:

- Pricing score$_{\text{under consideration}}$: the pricing score of technical proposal in consideration;

[12] Clause 3, Article 34, Chapter III, Decree no.63.
[13] Clause 6, Article 34, Chapter III, Decree no.63

- G_{Lowest}: the lowest quoted bid after error correction, deviation adjustment and discount deduction (if any) out of the quoted bids whose financial proposals are evaluated;

- $G_{under\ consideration}$: the bid after error correction, deviation adjustment and discount deduction (if any) specified in the financial proposal that has been taken into account.

b. General evaluation criteria:

Overall score is calculated by the formula:

$$\text{Overall score}_{\text{under consideration}} = K \times \text{Technical score}_{\text{under consideration}} + G \times \text{Price-based score}_{\text{under consideration}}$$

In which:

- Technical score $_{\text{under consideration}}$ is identified at the technical evaluation step;

- Price-based score$_{\text{under consideration}}$ is identified at the price-based evaluation step;

- K: Proportion of technical scores regulated in the overall scoring scale, ranging from 70% to 80%;

- G: Proportion of price-based score regulated in the overall scoring scale, ranging from 20% to 30%;

- K + G= 100%.

In order to have a basis for evaluating and selecting suitable service providers, it is necessary to comply with certain criteria. These criteria are conditions that require the service provider to meet so as to ensure that the selected unit will effectively support the assessment and determination of damage caused by environmental pollutant behavior. The construction of these criteria is pursuant to the following key basis:

- *Law on Environmental Protection 2014 and guiding documents*

- *Law on Bidding and guiding documents*

- *Review the criteria set out in the system of legal documents relating to conditions of organizations providing services in the environmental field of Vietnam which have been promulgated and still in force. Specifically: Decree No.63/2014/NĐ-CP, article 8, article 9 chapter II of Decree No.127/2014/NĐ-CP*

- *Review the functions and tasks of companies and research institutes operating in the environmental field.*

- *Practice of organization and operation*

In addition to, the criteria for selecting service providers should meet the following requirements:

- *Objectivity, which is the basis for impartial assessment of service providers;*

- *Completeness, which is the basis for a comprehensive assessment of the performance of the service provider.*

- *Specificity, clarity and quantification, which is reflected in the development of clear criteria for assessing service provision; At the same time, it must be quantifiable to be able to compile, compare and render the most suitable units, and it must also be easy to understand so that service providers and functional agencies can implement with ease.*

- *The suitability with practice, shown that the criteria set should be appropriate with the practical conditions of the service providers and based on the rationale so that the service providers and the state management authorities can implement.*

How the criteria are defined in accordance with the guidelines of the Law on Bidding and based on the characteristics of the analysis and measurement to collect data, evidence, estimation of damage and determination of liability and in compliance with practical activities of units and organizations providing services is analyzed in part 3 of the report...

In Part III of the report, the research team proposed 25 organizations capable of providing field monitoring and environmental analysis services out of 172 units that the research team reviewed, analyzed and evaluated (by September 2016). The list of these 25 units will be the basis for MONRE to select service providers when incidents occur.

The criteria proposed by the research team will be applied, by MONRE, to select 25 well-qualified units that carry out services of monitoring, estimating, measuring and determining environmental damage.

After reviewing, the research team initially proposes the criteria for selecting a service provider as follows:

IV.1. Prerequisite criteria

Only service providers that meet the prerequisites criteria are reviewed and evaluated in terms of technical criteria.

- *Regarding monitoring and measurement to collect data and evidence,* the prerequisite is the business license for qualification for environmental monitoring and analysis services matching the required field of monitoring and analysis to collect data and evidence since this is a conditional business.

- *Regarding the estimation of damage and determination of liability for compensation,* the prerequisite is the establishment decision or the certificate of scientific and technological activities or the business registration certificate or investment certificate granted by a competent state management agency that still remains in force for at least one of the these fields namely providing consulting services on technology design, research and development of waste treatment technologies;

IV.2. Technical criteria

1. Criteria of experience and competence of service providers

Regarding monitoring and measurement to collect data and evidence, criteria of Experience and competence of service providers consist of:

Criteria of competence are assessed through:

Precision of the monitoring and analysis stands for the accuracy of the results used to estimate environmental damage.

Accuracy of machinery and equipment indicates the modernity of machinery, equipment and determines the accuracy of the results used to estimate environmental damage.

VIMCERT certificate.

Criteria of experience:

- Demonstrated through contracts executed and inspected in the field of monitoring, measurement and estimation of damage

- Demonstrated through the severity level of the incidents in which organizations took part

Criteria of capability: assessed through whether fields of operation and research are suitable with the work of estimating the damage and determining the liability for compensation. This means that operation fields of the organization namely monitoring, measurement and estimation of damage are closely related to the required tasks. Capacities of the organization as a whole and specialized employee as individuals are also considered.

Criteria of experience: demonstrated in similar contracts that has been executed and inspected, based on the evaluation results of both scientists and managers.

2. Criteria of solutions and methodology to implement service package:

Regarding monitoring and measurement to collect data and evidence, these criteria are assessed through plans of monitoring evaluation, measurement to collect data and evidence devised by the service provider, in which explanations for time and location of sampling and parameters to monitor, analyze, evaluate and measure need to be included.

Regarding the estimation of damage and determination of liability for compensation, these criteria are assessed through plans to conduct research, treat and restore polluted and degraded environment and to estimate the liability of relevant subjects for compensation.

3. Criteria of personnel for the contract execution:

Regarding monitoring and measurement to collect data and evidence, personnel implementing the bid package are assessed through the number of employees, years of experience, qualification and workmanship error level.

Regarding the estimation of damage and determination of liability for compensation, personnel for the contract execution are assessed the number of specialized experts in one of the fields namely environmental engineering, economic management of natural resources and environment, identification and evaluation of environmental damage; CVs of their experts on their working process and individual experiences relating to the implementation of the bidding package.

Grading scheme for each technical criterion is proposed under the provisions of Law on Bidding. Specifically, pursuant to Decree No.63/2014/NĐ-CP dated June 26th 2014 detailing the implementation of several provisions of the law on bidding regarding the selection of contractors, Technical criteria: Using 100 or 1,000-point grading scale, more detail as follows:

a) Experience and competence of the contractor: From 10% to 20% of the total score;

b) Solution and methodology of the contract execution: From 30% to 40% of the total score;

c) Personnel implementing the bid package: from 50% to 60% of the total score;

d) Total score proportion of the content specified in regulations stated in Point a, b, c of this Clause must equal 100%;

Based on this instruction, the research team proposes 100-point grading scheme for technical criteria in order to select organizations providing monitoring and measurement to collect data and evidence. The details are, as follows:

a) Experience and competence of service providers: 20 points;

b) Solutions and methodology to implement service package: 30 points;

c) Personnel for the contract execution: from 50 points;

Scores for sub-criteria of each criterion for the Experience and competence of service providers, solutions and methodology to implement service package and personnel for the contract execution are given based on the number of criteria, significance level of each criterion and the number of service providers.

Grading scheme for each technical criterion is presented in the following tables:

Table 3. Criteria and grading scheme to assess Organizations proving the service of monitoring and measurement to collect data and evidence

	Criteria	Parameters to evaluate	Value		Score
1	**Experience and competence of the service providers: 20 points**				
1.1	Capability	Precision of the method[14]	Precision	Highest	4
				Second highest	$4-\frac{3}{n-1}$
				Third highest	$4-\frac{3}{n-1}\times 2$
				...	
				Lowest	1
		Accuracy of equipment[15]	Precision	Highest	4
				Second highest	$4-\frac{3}{n-1}$
				Third highest	$4-\frac{3}{n-1}\times 2$
				...	
				Lowest	1
		VILAS Certificate of Accreditation	Yes		2
			No		0
1.2	Experience of service provision	Ability to meet the requirements of customers (through the number of similar	Having carried out more than 5 similar contracts		10
			Having carried out 1-5 similar contracts		5

[14] Precision of the method: to consult operation results of the contractors assessed through the review of the capacity profile so as to know the contractor's method of implementation; n is the number of service providers participating in the selection process, the bidder who has the most precise monitoring method get 4 points, the least precise bidder get 1 point, the other contractors' scores shall be calculated based on the formula in the table

[15] Evaluated through the assessment records of the units responsible for annual equipment testing and calibration. For example: Regarding units in the list of 127, their laboratory equipment will have to be tested and calibrated, etc. Based on these data, the precision of equipment can initially be evaluated

	Criteria	Parameters to evaluate	Value		Score
		contracts that the service provider has done ...)	Having not carried any similar contracts		0
2	**Solutions and methodology to implement service package: 30 points**				
		Plans of monitoring evaluation, measurement to collect data and evidence	Suitability and scientific level[16]	Highest	30
				Second highest	$30-\frac{20}{n-1}$
				Third highest	$30-\frac{2}{n-1}\times 2$ [17]
				...	
				Lowest	10
3	**Personnel for the contract execution: 50 points**				
		Number of employees[18]	Assess through the rank of organizations	Most	10
				Second most	$10-\frac{8}{n-1}$
				Third most	$10-\frac{8}{n-1}\times 2$
				Least	2
		Year of experience[19]	Assess through the rank of organizations	Most	15
				Second most	$15-\frac{10}{n-1}$
				Third most	$15-\frac{10}{n-1}\times 2$
				Least	5

[16] It means that: When the service provides devise the plan of monitoring, evaluation and measurement, these monitoring sites must be considered against the monitoring sites of the national monitoring system (if any). The monitoring sites must match the practical situation and the local or national monitoring system (if any)

[17] n: the number of service providers

[18] Number of employees: the research team estimated the number of employees with qualified expertise and capacity meeting requirements of Decree no.127/NĐ-CP

[19] Years of experience: the research team estimated the number of years of experience of employees responsible for monitoring and measurement. Older ones shall have the skills to deal with complex samples affected by multiple factors.

	Criteria	Parameters to evaluate	Value		Score
		Qualification	Assess through the rank of organizations based on degrees	Highest	15
				Second highest	$15-\frac{10}{n-1}$
				Third highest	$15-\frac{10}{n-1}\times 2$
				Least	5
		Workmanship error level		Lowest	10
				Second lowest	$10-\frac{8}{n-1}$
				Third lowest	$10-\frac{8}{n-1}\times 2$
				Highest	2

Table 4. Criteria and grading scheme to assess Organizations proving the service of estimating damage and determining liability for compensation

	Criteria	Parameters to evaluate	Value	Score
1	**Experience and competence of service providers: maximum of 20 points**			
1.1	Capability	Whether fields of operation and research are suitable with the work of estimating the damage and determining the liability for compensation	Very suitable[20]	10
			Suitable	5
			Not suitable	0

[20] Suitability: meaning whether the strength of each unit is appropriate for the required field of monitoring, measurement and damage estimation. For example, regarding estimation of damage to bottom sediments, in the selection list, there will be units that have the advantage of sediment analysis and estimating the damage.

	Criteria	Parameters to evaluate	Value		Score
1.2	Experience of providing service	Ability to meet the requirements of customers (through the number of similar contracts that the service provider has done ...)	Having carried out more than 5 similar contracts [21] or research projects relating to waste treatment, evaluation, and assessment of environmental damage.		10
			Having carried out 1-5 similar contracts or research projects relating to waste treatment, evaluation, and assessment of environmental damage.		5
			Having not carried out any similar contracts or research projects relating to waste treatment, evaluation, and assessment of environmental damage.		0
2	**Solutions and methodology to implement service package: Maximum of 30 points**				
		Plans to conduct research, treat and restore polluted and degraded environment	Suitability and scientific level	Highest	15
				Second highest	$15-\frac{10}{n-1}$
				Third highest	$15-\frac{15}{n-1}\times 2$
				...	
				Lowest	5
		Plans to estimate the liability of relevant subjects for compensation	Suitability and scientific level	Highest	15
				Second highest	$15-\frac{10}{n-1}$
				Third highest	$15-\frac{15}{n-1}\times 2$

[21] Similarity: referring to contracts of estimating similar environmental damage, for example: Water environment, soil…

	Criteria	Parameters to evaluate	Value		Score
				...	
				Lowest	5
3	**Personnel for the contract execution: Maximum of 50 points**				
		Number of specialized experts	Assess through the rank of the organizations	Most	25
				Second most	$25-\frac{10}{n-1}$
				Third most	$25-\frac{10}{n-1}\times 2$
				Least	5
		Experience	Assess through the rank of the organizations based on the CVs of their experts on their working process and individual experiences relating to the implementation of the bidding package.	Most	25
				Second most	$25-\frac{20}{n-1}$
				Third most	$25-\frac{20}{n-1}\times 2$
				Least	5

CONCLUSIONS

Based closely on the terms of reference (TOR), the team implemented the following content:

a. Implemented content

1. Studying prior issues relating to environmental compensation (these reports are listed in the references). From them: (1) A comprehensive overview the issues content was acquired; (2) the relevant, previously studied content has been inherited as reference material in the process of developing criteria for selection of service providers.

2. Reviewing, studying and analyzing relevant legal documents that stipulates criteria for selection of service providers as well as related implementation costs as the scientific basis for the proposal of selection criteria, serving for the construction of Circular No. 6.

3. Gathering information and data of the organizations providing the services of environmental monitoring and analysis in the list of VIMCERT. These data were, then, used to can study, analyze, evaluate and select 25 capable units, which is the premise to propose a list of organizations and individuals capable of monitoring, measuring and estimating environmental damage. The methodology is described in detail in section III. 1, Part III of this report.

4. Proposing criteria for selecting organizations providing the service of monitoring, measuring and estimating damage, which serve as a basis for the drafting process of Circular No 6.

b. Achieved results

- Review and analysis of legal documents on selection criteria;

- Analysis and assessment of the capacity of the service providers in the VIMCERT list; having proposed a list of 25 capable units capable of measuring, monitoring and estimating damage.

- A set criteria for selection of service providers has been proposed by the research team. However, in order for this to be applied effectively, the research team proposed that the drafting team need to get comments from relevant ministries and sectors, especially localities to enhance practicality.

c. Some recommendations from the research team

- In practice, in Vietnam there have been a number of environmental incidents including serious environmental pollution such as the Vedan incident, one in marine environment of four provinces in Central Vietnam. From these, it can be pointed out that: in case of serious incidents, the Government directly order the relevant ministries and sectors to incorporate to take measures. However, through practical experience, the coordination between concerned ministries and sectors has not been very close, the coordination is not harmonious and they have not yet really supported each other. Therefore, the team suggested that the team drafting Circular no.6 carefully study this issue because compensation for damage to the natural environment is a matter of concern to many different sectors.

- The list selecting capable units provided by the research team and data from VEA/MONRE are ones from 2016. One of the downsides is the low stability of this list (as these units will be licensed for ViMCERT and licenses are updated annually). In order to maintain the stability of the list and to ensure that the listed units are always well-performing ones in the field of monitoring, measuring, estimating and determining the environmental damage compensation, the research team proposed that: leaders of MONRE / VEA assign Group 27 (the group assesses the professional competence of registered enterprises certified with VIMCERT) under the Center for Environmental Monitoring to be the focal unit and have the responsibility to update the list of the 25 units that have the best capacity for monitoring, measuring, estimating and determining environmental damages.

- The list proposed by the research team includes state-owned enterprises and organizations. Owing to business, enterprise relating factors, the legal documents issued cannot be attached as appendixes. Therefore, the research team suggests that: the drafting group should ask Department of Legal Affairs of MONRE and Department of Examination of Legal normative document of Ministry of Justice for detail and specific recommendation about the form of issuing this short list in accordance with the law.

ANNEX 1

No (VIMCERETS)	Name of province	Name of organization	No. of Decision, certification	Field of activities
HCM city				
001	HCM city	Research and Development Centre for Petroleum Safety and Environment	1154/QĐ-BTNMT dated 18/6/2014	Site monitoring Environmental Analysis
009		Institute of Tropical Technical and Environmental Protection	1387/QĐ-BTNMT	Site monitoring Environmental Analysis
010		Petro Vietnam Technical Safety Registration Company Limited	1687/QĐ-BTNMT	Site monitoring Environmental Analysis
020		Eurofins Scientific	1388/QĐ-BTNMT	Site monitoring Environmental Analysis
026		COSHET	2611/QĐ-BTNMT	Site monitoring Environmental Analysis
032		Center for Environmental Technology in Ho Chi Minh city	2894/QĐ-BTNMT dated 17/12/2014	Site monitoring Environmental Analysis
039		Phuong Nam Science Technology and Environmental Analysis company	2997/QĐ-BTNMT dated 24/12/2014	Site monitoring Environmental Analysis
044		Branch of Environmental Science and Technology and Environmental analysis JSC Bien Duc	3190/QĐ-BTNMT dated 30/12/2014	Site monitoring Environmental Analysis
052		Center for Environmental Technology & Management	254/QĐ-BTNMT dated 03/02/2015	Site monitoring Environmental Analysis
053		Center of Environmental Technology and Natural resources management	381/QĐ-BTNMT dated 12/02/2015	Site monitoring Environmental Analysis
064		Center for Environment and Applied Ecology	576/QĐ-BTNMT dated 19/3/2015	Environmental analysis
065		Hydrometeorological Observatory Southern region	577/QĐ-BTNMT dated 19/3/2015	Site monitoring Environmental Analysis
066		Dai Viet Environment Development Investment Joint Stock Company	578/QĐ-BTNMT dated 19/3/2015	Site monitoring Environmental Analysis
073		Sub – Institute of Hydro – Meteorology and Climate Change (in Ho Chi Minh City)	783/QĐ-BTNMT dated 06/4/2015	Site monitoring Environmental Analysis
074		Institute of water resources planning, Southern region	827/QĐ-BTNMT dated 10/4/2015	Site monitoring Environmental Analysis
076		Tan Huy Hoang Environment Consulting service trading company	829/QĐ-BTNMT dated 10/4/2015	Site monitoring Environmental Analysis
077		Center for Environmental Technology – Institute of Environment and Natural resources	981/QĐ-BTNMT dated 10/4/2015	Site monitoring Environmental Analysis
078		Quatest 3	982/QĐ-BTNMT dated 10/4/2015	Site monitoring Environmental Analysis
086		Chugai Technos Vietnam Co., Ltd	1270/QĐ-BTNMT dated 28/5/2015	Site monitoring Environmental Analysis

No (VIMCERETS)	Name of province	Name of organization	No. of Decision, certification	Field of activities
089		Research and Sevices Centre for Technology and Environment	1273/QĐ-BTNMT dated 28/5/2015	Site monitoring Environmental Analysis
101		REC Centre	1881/QĐ-BTNMT dated 23/07/2015	Site monitoring Environmental Analysis
106		Institute of Hygience and Public Health, HCM	2097/QĐ-BTNMT dated 18/8/2015	Site monitoring Environmental Analysis
108		Institute of water and Environmental Technology	2253/QĐ-BTNMT dated 04/09/2015	Site monitoring Environmental Analysis
113		Sub institute of Labour and environmenta protection in the South of Vietnam	2326/QĐ-BTNMT dated 11/09/2015	Site monitoring Environmental Analysis
117		Hai Au Environmental Consultant JSC	2715/QĐ-BTNMT dated 22/10/2015	Site monitoring Environmental Analysis
BINH DUONG PROVINCE				
002	Binh Duong	Center for Natural Resources and Environmental Monitoring, Binh Duong	1153/QĐ-BTNMT dated 18/6/2014	Site monitoring Environmental Analysis
068		Centre for environmental analysis	629/QĐ-BTNMT Dated 25/3/2015	Site monitoring Environmental Analysis
DONG NAI PROVINCE				
003	Dong Nai	Centre for Environmental Monitoring and Techniques		Site monitoring Environmental Analysis
031		SONADEZI Service JSC	2893/QĐ-BTNMT dated 17/12/2014	Site monitoring Environmental Analysis
045		Bach Viet Company Limited, Đồng Nai	3191/QĐ-BTNMT dated 30/12/2014	Site monitoring Environmental Analysis
BA RIA –VUNG TAU PROVINCE				
011	Ba ria – Vung Tau	Centre for Environmental Monitoring and Analysis	1993/QĐ-BTNMT dated 18/9/2014	Site monitoring Environmental Analysis
075		Phuong Nam Center for Analysis and Measurement	828/QĐ-BTNMT dated 10/4/2015	Site monitoring Environmental Analysis
084		MICCO – South mining chemical industry company Limited	1267/QĐ-BTNMT dated 28/5/2015	Site monitoring Environmental Analysis
NGHE AN PROVINCE				
004	Nghe An	Resources And Environment Co., Ltd	1236/QĐ-BTNMT dated 25/6/2014	Site monitoring Environmental Analysis
005		Centre for Environmental Monitoring and Techniques Nghệ An	1237/QĐ-BTNMT dated 25/6/2014	Site monitoring Environmental Analysis
097		Truong Son Environmental and Water JSC. TS- ENWAT	1619/QĐ-BTNMT dated 24/06/2015	Site monitoring Environmental Analysis
HA TINH PROVINCE				
061		Centre for Environmental Monitoring and Techniques Hà Tĩnh	573/QĐ-BTNMT dated 19/3/2015	Site monitoring Environmental Analysis

No (VIMCERETS)	Name of province	Name of organization	No. of Decision, certification	Field of activities
105		T&T Natural Resources and Environment Joint stock company	2096/QĐ-BTNMT dated 18/8/2015	Site monitoring Environmental Analysis
HA NOI				
006	Hanoi	Environmental analyzing and Tecnique Joint Stock Company	1504/QĐ-BTNMT dated 21/7/2014 và 782/QĐ-BTNMT dated 06/4/2015	Site monitoring Environmental Analysis
007		Hanoi Environmental Science and Tecnique Joint Stock Company	1502/QĐ-BTNMT dated 21/7/2014	Site monitoring Environmental Analysis
012		Center for Analysis and Environment	1992/QĐ-BTNMT dated 18/9/2014	Site monitoring Environmental Analysis
025		National working Environment monitoring Station	2610/QĐ-BTNMT dated 18/11/2014	Site monitoring Environmental Analysis
027		CEM – VEA	2612/QĐ-BTNMT dated 18/11/2014	Site monitoring Environmental Analysis
030		Vinacomin Informatics, technology, environment JSC	2615/QĐ-BTNMT dated 18/11/2014	Site monitoring Environmental Analysis
034		Center for Environment and Minerals - Branch of CM Investment Joint Stock Company	2991/QĐ-BTNMT dated 24/12/2014	Site monitoring Environmental Analysis
037		Centre for science Technology and Environmental Protection of transport and communications	2995/QĐ-BTNMT dated 24/12/2014	Site monitoring Environmental Analysis
053		Center for Technology and Environmental and Resource Management	381/QĐ-BTNMT dated 12/02/2015	Site monitoring Environmental Analysis
054		Institute for Environmental Science and Technology	382/QĐ-BTNMT dated 12/02/2015	Site monitoring Environmental Analysis
055		Institute of Environmental Science and Technology	383/QĐ-BTNMT dated 12/02/2015	Site monitoring Environmental Analysis
056		Centre for environmental conossultancy and Technology transfer –VEA	384/QĐ-BTNMT dated 12/02/2015	Site monitoring Environmental Analysis
058		National Institute of Occupational and Enviromental Health	390/QĐ-BTNMT dated 13/02/2015	Site monitoring Environmental Analysis
059		Transport engineering design INC – TEDI	391/QĐ-BTNMT dated 13/02/2015	Site monitoring Environmental Analysis
063		Institute of Regional Research and Development	575/QĐ-BTNMT dated 19/3/2015	Site monitoring Environmental Analysis
069		VINACOMIN	604/QĐ-BTNMT dated 23/3/2015	Site monitoring Environmental Analysis

No (VIMCERETS)	Name of province	Name of organization	No. of Decision, certification	Field of activities
070		Institute of New Technology	630/QĐ-BTNMT Dated 25/3/2015	Site monitoring Environmental Analysis
072		Centre for Environment and Clean Production	630/QĐ-BTNMT dated 25/3/2015	Site monitoring Environmental Analysis
079		Institute of Environmental Technology – VAST	983/QĐ-BTNMT dated 10/4/2015	Site monitoring Environmental Analysis
082		Centre for environmental Analysis and Technology transfer.	1055/QĐ-BTNMT dated 08/05/2015	Site monitoring Environmental Analysis
083		Institute for Agricultural Environment	1266/QĐ-BTNMT dated 28/5/2015	Site monitoring Environmental Analysis
087		Vietnam Institute of Industrial Chemistry- VINACHEM	1272/QĐ-BTNMT dated 28/5/2015	Site monitoring Environmental Analysis
088		Center for Environmental Treatment Technology - Chemical Command	1273/QĐ-BTNMT dated 28/5/2015	Site monitoring Environmental Analysis
090		Center for Mining Technology and Environment - University of Mining and Geology	1274/QĐ-BTNMT dated 28/5/2015	Site monitoring Environmental Analysis
091		Cadastre and Environmental resources JSC	1275/QĐ-BTNMT dated 28/5/2015	Site monitoring Environmental Analysis
093		QUATEST 1	1389/QĐ-BTNMT dated 08/06/2015	Site monitoring Environmental Analysis
095		Centre for Monitoring and Radioactive Environment investigation	1537/QĐ-BTNMT dated 19/06/2015	Site monitoring Environmental Analysis
099		Institute of Environmental Science and Health	1621/QĐ-BTNMT dated 24/06/2015	Site monitoring Environmental Analysis
102		AN BINH TEC.,JSC	1882/QĐ-BTNMT dated 23/07/2015	Site monitoring Environmental Analysis
104		Center for Applied Research in Science, Technology and Environment (Mausoleum Management)	2095/QĐ-BTNMT dated 18/8/2015	Site monitoring Environmental Analysis
112		Institute of Engineering and Envronmental Technology - VIETNAM UNION OF SCIENCE AND TECHNOLOGY ASSOCIATIONS	2257/QĐ-BTNMT dated 04/09/2015	Site monitoring Environmental Analysis
114		Centre for Environmental Technology Việt Nhật	2327/QĐ-BTNMT dated 11/09/2015	Site monitoring Environmental Analysis
115		Centre for Natural Resources and Environmental Monitoring, Hanoi	2328/QĐ-BTNMT dated 11/09/2015	Site monitoring Environmental Analysis
116		Branch of Petrovietnam Drilling and Well Milling Corporation - JSC in Hanoi	2535/QĐ-BTNMT dated 01/10/2015	Site monitoring Environmental Analysis

No (VIMCERETS)	Name of province	Name of organization	No. of Decision, certification	Field of activities
121		Vietnam Science and Technology Joint Stock Company	2691/QĐ-BTNMT dated 20/10/2015	Site monitoring Environmental Analysis
122		KIMLONG SUDEINCO. JSC	2692/QĐ-BTNMT dated 20/10/2015	Site monitoring Environmental Analysis
124		GOSHU KOHSAN (VIETNAM) CO., LTD (Việt Nam)	2649/QĐ-BTNMT dated 19/10/2015	Site monitoring Environmental Analysis
126		P.T - PENEC J.S.C	2651/QĐ-BTNMT dated 19/10/2015	Site monitoring Environmental Analysis
HA NAM				
081		Centre for Monitoring and Analysis of Natural Resources and Environment, HANAM DONRE	1054/QĐ-BTNMT dated 08/5/2015	Site monitoring Environmental Analysis
HAI PHONG				
008		CEM - HAI PHONG DONRE	1501/QĐ-BTNMT dated 21/7/2014	Site monitoring Environmental Analysis
047		Centre for Monitoring – Analysic Environmental Marine	77/QĐ-BTNMT dated 15/01/2015	Site monitoring Environmental Analysis
LANG SON				
080		CEM – EPA Lang Son	1053/QĐ-BTNMT Dated 08/5/2015	Site monitoring Environmental Analysis
094		Centre for Education and Consultants of Science and Tech for Marine Environmental Protection	1390/QĐ-BTNMT dated 08/06/2015	Site monitoring Environmental Analysis
CAN THO				
019		CaTech	2245/QĐ-BTNMT dated 10/10/2014	Site monitoring Environmental Analysis
BAC NINH				
049		Centre for Monitoring of Natural Resources and Environment	144/QĐ-BTNMT dated 26/01/2015	Site monitoring Environmental Analysis
BAC GIANG				
096		CEM – BAC GIANG DONRE	1538/QĐ-BTNMT dated 19/06/2015	Site monitoring Environmental Analysis
KON TUM				
013		Centre for Environemtal Monitoring and Analysis	1991/QĐ-BTNMT dated 18/9/2014	Site monitoring Environmental Analysis
BINH DINH				
014		Centre for Natural Resources and Environment Monitoring	2249/QĐ-BTNMT dated 10/10/2014	Site monitoring Environmental Analysis
015		Binh Dinh Analysis and experiment Centre	2241/QĐ-BTNMT dated 10/10/2014	Site monitoring Environmental Analysis
HAI DUONG				
017		Centre for environmental monitoring and Analysis	2243/QĐ-BTNMT dated 10/10/2014	Site monitoring Environmental Analysis
TUYEN QUANG				

No (VIMCERETS)	Name of province	Name of organization	No. of Decision, certification	Field of activities
018		Centre for Environmental Monitoring and Protection	2244/QĐ-BTNMT dated 10/10/2014	Site monitoring Environmental Analysis
QUANG TRI				
021		Quang Tri Centre for Environmental Monitoring and Techniques	2453/QĐ-BTNMT dated 31/10/2014	Site monitoring Environmental Analysis
QUANG BINH				
022		Quang Binh Centre for Environmental Monitoring and Techniques	2454/QĐ-BTNMT dated 31/10/2014	Site monitoring Environmental Analysis
060		Quang Binh Quatest	572/QĐ-BTNMT dated 19/3/2015	Site monitoring Environmental Analysis
QUANG NINH				
023		Centre for Environmental Monitoring and Analysis	2455/QĐ-BTNMT dated 31/10/2014	Site monitoring Environmental Analysis
042		Quang Binh Centre for Science and Technology Progress Application	3184/QĐ-BTNMT dated 30/12/2014	Site monitoring Environmental Analysis
043		Centre for FPD Analysis	3185/QĐ-BTNMT dated 30/12/2014	Site monitoring Environmental Analysis
050		Quang Binh Centre for Preventive Medicine	145/QĐ-BTNMT dated 26/01/2015	Site monitoring Environmental Analysis
QUANG NAM				
048		Quang Nam Centre for Environmetal Monitoring and Analysis	143/QĐ-BTNMT dated 26/01/2015	Site monitoring Environmental Analysis
QUANG NGAI				
051		Centre for geodetic and Environmental Monitoring	146/QĐ-BTNMT Dated 26/01/2015	Site monitoring Environmental Analysis
029		Environmental Monitoring Technical Centre Quang Ngai	2614/QĐ-BTNMT dated 18/11/2014	Site monitoring Environmental Analysis
QUANG TRI				
021		Environment Monitoring Technical Centre, Quảng Trị	2453/QĐ-BTNMT dated 31/10/2014	Site monitoring Environmental Analysis
THAI BINH				
016		Centre for Natural Resources and Environment Monitoring and Analysis	2242/QĐ-BTNMT dated 10/10/2014	Site monitoring Environmental Analysis
THAI NGUYEN				
024		Centre for Environmental Monitoring and Techniques	2457/QĐ-BTNMT dated 31/10/2014	Site monitoring Environmental Analysis
THUA THIEN HUE				
033		Environmental Monitoring and Analysis Station, Hue	2895/QĐ-BTNMT dated 17/12/2014	Site monitoring Environmental Analysis
KHANH HOA				
035		Centre for Natural Resources and Environmental Monitoring, Khanh Hoa	2990/QĐ-BTNMT dated 24/12/2014	Site monitoring Environmental Analysis

No (VIMCERETS)	Name of province	Name of organization	No. of Decision, certification	Field of activities
DA NANG				
036		Central Meteorological and Hydrological Station	619/QĐ-BTNMT dated 24/3/2015	Site monitoring Environmental Analysis
085		Centre for Environmental Techniques, DANANG DONRE	1269/QĐ-BTNMT dated 28/5/2015	Site monitoring Environmental Analysis
118				
119		QUATEST 2, Da Nang	2648/QĐ-BTNMT dated 19/10/2015	Site monitoring Environmental Analysis
200		Centre for Environmental Technology, Da Nang	2690/QĐ-BTNMT dated 20/10/2015	Site monitoring Environmental Analysis
071		Sub-Institute of Labour and Environment protection at centre of Vietnam		Site monitoring Environmental Analysis
DAK NONG				
118		Centre for Natural Resources and Environment Monitoring, Dac Nong	2647/QĐ-BTNMT dated 19/10/2015	Site monitoring Environmental Analysis
DONG THAP				
109		Centre for Environmental Monitoring and Techniques, Dong Thap	2254/QĐ-BTNMT dated 04/09/2015	Site monitoring Environmental Analysis
LAO CAI				
038		CEM – LAO CAI DONRe	2992/QĐ-BTNMT Dated 24/12/2014	Site monitoring Environmental Analysis
TAY NINH				
040		CEM – Tay Ninh Donre	3182/QĐ-BTNMT dated 30/12/2014	Site monitoring Environmental Analysis
LAM DONG				
057		Centre for Natural Resources and Environmental Monitoring	385/QĐ-BTNMT dated 12/02/2015	Site monitoring Environmental Analysis
NAM DINH				
111		CEM – NAM DINH DONRE	2256/QĐ-BTNMT dated 04/09/2015	Site monitoring Environmental Analysis
KIEN GIANG				
062		Kien Giang Center for application and transformation of Technology	574/QĐ-BTNMT dated 19/3/2015	Site monitoring Environmental Analysis
KHANH HOA				
107		QUATEST Khanh Hoa	2252/QĐ-BTNMT Dated 04/09/2015	Site monitoring Environmental Analysis
PHU THO				
125		Centre for Environmental Monitoring and Protection – Phu Tho DONRE	2650/QĐ-BTNMT dated 19/10/2015	Site monitoring Environmental Analysis
NINH THUAN				
067		CEM – NINH THUAN DONRE	618/QĐ-BTNMT Dated 24/3/2015	Site monitoring Environmental Analysis

No (VIMCERETS)	Name of province	Name of organization	No. of Decision, certification	Field of activities
VINH PHUC				
028		Centre for Natural resources and Environmental Protection	2613/QĐ-BTNMT dated 18/11/2014	Site monitoring Environmental Analysis
BAC KAN				
100		CEM – BAC KAN DONRE	1622/QĐ-BTNMT dated 24/06/2015	Site monitoring Environmental Analysis
AN GIANG				
103		Science and Technology Progress application center of An Giang Province	1883/QĐ-BTNMT dated 23/07/2015	Site monitoring Environmental Analysis
041		Centre for Natural Resources and Environmental Monitoring and Techniques	3183/QĐ-BTNMT dated 30/12/2014	Site monitoring Environmental Analysis
DAK LAC				
046		Centre for Environmetal monitoring and Analysis, Dak Lak	76/QĐ-BTNMT dated 15/01/2015	Site monitoring Environmental Analysis
TAY NINH				
040		CEM – TAY NINH DONRE	3182/QĐ-BTNMT Dated 30/12/2014	Site monitoring Environmental Analysis
SON LA				
		CEM – SON LA DONRE	1276/QĐ-BTNMT dated 28/5/2015	Site monitoring Environmental Analysis
VINH LONG				
098		Đa Phương Co., Ltd	1620/QĐ-BTNMT dated 24/06/2015	Site monitoring Environmental Analysis
110		Science and Technology Progress application center of Vinh Long Province	2255/QĐ-BTNMT dated 04/09/2015	Site monitoring Environmental Analysis
YEN BAI				
123		CEM – YENBAI DONRE	2693/QĐ-BTNMT dated 20/10/2015	Site monitoring Environmental Analysis

ANNEX 2

SOME COST IS REGULARED IN LEGAL DOCUMENTS

STT	Name of item	Maximum price per unit (vnđ)	References
1	Copy	300/page	Base on market price
2	Print	500/page	Base on market price
3	Post office to distribute documents	Base on market price	Base on market price
4	Car Rents	Bases for package payment of car rents include a travel warrant of cadres or civil servants on work trips, certified by the receiving agency (or hotel or guesthouse), and a table listing travel distances, which shall be submitted to heads of agencies or units for payment approval and included in internal spending regulations of agencies or units	Circular 97/2010/TT-BTC on work-trip allowances and conference expenditures applicable to state Agencies and Public, Non Public business, MOF
5	stay allowance	For work trips to urban districts of Hanoi, Ho Chi Minh, Hai Phong, Can Tho and Da Nang cities, and provincial grade-I urban centers, the package allowance must not exceed VND 350,000/day/person; rural districts of centrally run cities and other towns and provincial cities, the package allowance must not exceed VND 250,000/day/person; other areas, the package allowance must not exceed VND 200,000/day/person, For holders of ministerial, deputy-ministerial or other equivalent titles who receive package payment, the package allowance	

STT	Name of item	Maximum price per unit (vnđ)	References
		must not exceed VND 900,000/day/person	
6	Perdiem	not exceed VND 150.000/day	
7	Expenses for consultancy to evaluate the types of data and evidence necessary to determine the damage		Joint – Circular 55/2015/TTLT-BTC-BKHCN (22/04/2015)
A	Council meeting		
	Chairman	1.500.000	
	Vice chairman	1.000.000	
	Assisstant	300.000	
	Participants/person	200.000	
B	Cost for Evaluation		
	Evaluation of Council member	500.000	
	Envaluation of Defense member of Council	700.000	
8	Drinking for meeting/person	30.000	Circular 97/2010/TT-BTC (06/7/2010)

ANNEX 3

MAXIMUM UNIT PRICE FOR MONITORING OF AMBIENT AIR AND SURFACE WATER
(Attached to Decision No. 2075 / QD-BTC dated 25/8/2014 of the MOF)

Unit price: vnđ/unit

No.	SIGN OF NUMBER	Monitoring parameters	Price
A	**ENVIRONMENTAL MONITORING AND ANALYSIS AMBIENT AIR**		
A1	**Site monitoring (1KK)**		
1	1KK1	Temperature, humidity	55,600
2	1KK2	Speed and direction of wind	55,600
3	1KK3	Atmospheric pressure	55,600
4	1KK4	TSP, PM10, PM2,5, Pb	128,000
5	1KK5	CO	108,700
6	1KK6	NO_2	242,200
7	1KK7	SO_2	244,500
8	1KK8	O_3	348,600
A2	Analysis of air environment parameters in the laboratory (2KK)		
1	2KK4a	TSP, PM10, PM2,5	58,200
2	2KK4b	Pb	347,700
3	2KK5	CO	584,700
4	2KK6	NO_2	254,200
5	2KK7	SO_2	277,800
6	2KK8	O_3	238,400
B	NOISE MONITORING		
B1	**Noise monitoring at site (1TO)**		
a	**Noise of transportation**		
1	1TO1	- Average noise level (L_{Aeq}); - Maximum noise level (LAmax)	81,400
2	1TO2	Vehicle intensity	275,000
b	**Industrial and Urban noise**		

No.	SIGN OF NUMBER	Monitoring parameters	Price
1	1TO3	- Average noise level (L_{Aeg}); - Maximum noise level (LAmax);	96,100
2	1TO4	Noise level by frequency	221,200
B2	**Data treatment of noise** in the laboratory **(2TO)**		
a	**Noise of transportation activities**		
1	2TO1	- Average noise level (L_{Aeq}); - Maximum noise level (LAmax)	78,500
2	2TO2	Vehicle intensity	110,000
b	**Industrial and Urban noise**		
1	2TO3	- Average noise level (L_{Aeq}); - Maximum noise level (LAmax); - Noise level (LA50)	78,500
2	2TO4	Noise level by frequency (dải Octa)	110,200
C	**ENVIRONMENTAL MONITORING AND ANALYSIS SURFACE WATER**		
C1	**Environmental monitoring and analysis surface water at site (1NM)**		
1	1NM1	Temperature of water, pH (TCVN 4557:1998 và TCVN 6492:2011)	181,900
2	1NM2	Dissolved Oxygen (DO) (TCVN 7325:2004)	173,200
3	1NM3	Total dissolved solids (TDS), Electrical Conductivity (EC)	160,700
4	1NM4	Take sample and analysis in parallel: - Temperature of water, pH; - Dissolved Oxygen (DO); - Total dissolved solids (TDS), Electrical Conductivity (EC) *(Price per one sample)*	584,700
5	1NM5	Suspended Solids (SS)	89,700
6	1NM6	- biochemical oxygen demand (BOD_5); - chemical oxygen demand (COD)	89,700

No.	SIGN OF NUMBER	Monitoring parameters	Price
7	1NM7	- Nitơ amôn (NH_4^+), Nitrite (NO_2^-), Nitrate (NO_3^-), , Nitrogen total, Phosphorus total, Sulphat (SO_4^{2-}), Photphat (PO_4^{3-}), Clorua (Cl^-), Heavy metal Pb, Cd, Hg, As, Fe, Cu, Zn, Mn	120,900
8	1NM8	Grease	102,500
9	1NM9	Coliform	98,200
10	1NM10	Chemical Pesticide, Group of Organic chlorine	111,700
11	1NM11	Chemical Pesticide, Group of Pyrethroid	111,700
C2	**Environmental monitoring of surface water in the laboratory (2NM)**		
1	2NM2	Suspended Solids (SS)	148,800
2	2NM3a	biochemical oxygen demand (BOD_5)	218,500
3	2NM3b	chemical oxygen demand (COD)	258,400
4	2NM4a	Nitrogen amôn (NH_4^+)	256,700
5	2NM4b	Nitrite (NO_2^-)	306,300
6	2NM4c	Nitrate (NO_3^-)	226,100
7	2NM4d	Phophosrous Total	302,200
8	2NM4đ	Nitrogen Total	350,800
9	2NM4e	Heavy Metal (Pb, Cd)	542,100
10	$2NM4g_1$	Heavy Metal (As)	649,000
11	$2NM4g_2$	Heavy Metal (Hg)	698,300
12	2NM4h	Metal (Fe, Cu, Zn, Mn, Cr)	362,700
13	2NM4i	Sulphat (SO_4^{2-})	402,100
14	2NM4k	Photphat (PO_4^{3-})	243,500
15	2NM4l	Clorua (CI^-)	252,000
16	2NM5	Grease	842,300
17	2NM6	Coliform	830,100
18	2NM7	Chemical Herbicide, Group of Organic chlorine	2,578,200
19	2NM8	Chemical Herbicide, Group of Pyrethroid	2,526,400
20	2NM9	Analysis of all parameters of one sample *(Price per sample)*	1,194,600

MAXIMUM UNIT PRICE FOR MONITORING OF SOIL

(Attached to Decision No. 2075 / QD-BTC dated 25/8/2014 of the MOF)

Unit price: vnđ/unit

No.	SIGN OF NUMBER	Monitoring parameters	Price
I	**Take a sample at site**		
1	1Đ1	Cl^-, SO_4^{2-}, HCO_3^-, P_2O_5 Total, K_2O Total, P_2O_5, K_2O, Total Nitrogen, Total Phosphorous, Total organic	84,200
2	1Đ2	Ca^{2+}, Mg^{2+}, K^+, Na^+, Al^{3+}, Fe^{3+}, Mn^{2+}, KLN	84,200
3	1Đ3	Chemical Pesticide, Group of Organic chlorine *	111,400
4	1Đ4	Chemical Pesticide, Group of Pyrethroid **	303,900
II	**Soil sample analysis in the Laboratory**		
1	2Đ1a	Cl^-	253,200
2	2Đ1b	SO_4^{2-}	143,400
3	2Đ1c	HCO_3^-	142,500
4	2Đ1đ	Total K_2O	297,600
5	2Đ1h	Total Nitrogen	445,100
6	2Đ1k	Total Phosphorous	260,600
7	2Đ1m	Total Organic	463,200
8	2Đ2a	Ca^{2+}	461,100
9	2Đ2b	Mg^{2+}	457,000
10	2Đ2c	K^+	455,900
11	2Đ2d	Na^+	455,900
12	2Đ2đ	Al^{3+}	504,200
13	2Đ2e	Fe^{3+}	364,500
14	2Đ2g	Mn^{2+}	348,800
15	$2Đ2h_1$	Pb	529,500
16	$2Đ2h_2$	Cd	529,500
17	$2Đ2k_1$	Hg	602,600
18	2Đ2k2	As	591,600
19	$2Đ5l_1$	Fe	426,500

No.	SIGN OF NUMBER	Monitoring parameters	Price
20	2Đ5l_2	Cu	426,500
21	2Đ5l_3	Zn	426,500
22	2Đ5l_4	Cr	426,500
23	2Đ5l_5	Mn	426,500
24	2Đ3	Chemical Herbicide, Group of Organic chlorine *	2,362,000
25	2Đ4	Chemical Herbicide, Group of Pyrethroid**	2,570,700

* Chemical Pesticide, Group of Organic chlorine: 666, Lindan, Aldrin, Dieldrin, DDE, DDD, DDT, AIpha-Endosulfan, Beta-Endosulfan, Endosulfan-sulfate, Endrin, Endrin Aldehyde, Alpha-HCH, Beta-HCH, Delta-HCH, Heptaclor, Trans-Heptaclor, Epoxide, Methoxyclor

** Chemical Pesticide, Group of Pyrethroid: Permethrin, Deltamethrin, Cypermethrin, Fenvalerate

Unit price: vnđ/unit

No.	SIGN OF NUMBER	Monitoring parameters	Price
I	**Take a sample and quick monitoring of ground water at site**		
1	1NN1	Temperature, pH	196,900
2	1NN2	Dissolved Oxygen (DO)	420,000
3	1NN3	turbidity, Electrical Conductivity EC)	347,600
4	1NN4	Analysis of all parameters of one sample *(Price per sample)* - Temperature, pH; - Dissolved Oxygen *(DO);*	601,200
5	1NN5	suspended solids (SS)	103,600
6	1NN6	hardness $CaCO_3$	103,600
7	1NN7	Nitrogen amôn (NH_4^+), Nitrite (NO_2^-), Nitrate (NO_3^-), Oxyt Silic (SiO_3), Total Nitrogen, Total Phophosrous, Sulphat (SO_4^{2-}), Photphat (PO_4^{3-}), Clorua (Cl^-) KLN Pb, Cd, Hg, As, Cr, Fe, Cu, Zn, Mn, Phenol...	110,100
8	1NN8	Cyanua (CN^-)	109,900
9	1NN9	Coliform	101,400
10	1NN10	Chemical Pesticide, Group of Organic chlorine	114,200
11	1NN11	Chemical Pesticide, Group of Pyrethroid	109,900
II	**Environmental monitoring of ground water in the laboratory**		
1	2NN2	Suspended Solids (SS)	120,800
2	2NN3	Hardness $CaCO_3$	214,400
3	2NN4a	Nitơ amoni (NH_4^+)	256,700
4	2NN4b	Nitrit (NO_2^-)	306,300
5	2NN4c	Nitrat (NO_3^-)	225,200
6	2NN4d	Sulphat (SO_4^{2-})	390,500
7	2NN4e	Photphat (PO_4^{3-})	229,300
8	2NN4g	Oxyt Silic (SiO_3)	217,100
9	2NN4h	Total Nitrogen	311,000
10	2NN4k	Total Phophosrous	341,900

No.	SIGN OF NUMBER	Monitoring parameters	Price
11	2NN4l	Clorua (Cl^-)	262,300
12	2NN4m	Heavy Metal (Pb, Cd)	574,500
13	$2NN4n_1$	Heavy Metal (As)	629,300
14	$2NN4n_2$	Heavy Metal (Hg)	695,800
15	2NN4p	Metal (Fe, Cu, Zn, Cr, Mn)	414,000
16	2NN4q	Phenol	662,200
17	2NN5	Cyanua (CN^-)	484,900
18	2NN6	Coliform	912,300
19	2NN7	Chemical Herbicide, Group of Organic chlorine	2,436,300
20	2NN8	Chemical Herbicide, Group of Pyrethroid	2,526,300
21	2NN9	Analysis of all parameters of one sample *(Price per sample)*	1,194,600

MAXIMUM UNIT PRICE FOR MONITORING OF ACID DEPOSITION WATER
(Attached to Decision No. 2075 / QD-BTC dated 25/8/2014 of the MOF)

Unit price: vnđ/unit

No.	SIGN OF NUMBER	Monitoring parameters	Price
I	**Take a sample and monitoring at site**		
1	1MA1	Temperature, pH	253,800
2	1MA2	Electrical Conductivity (EC)	265,500
3	1MA3	Take a sample and Analysis of all parameters (temperature, pH, EC) of one sample *(Price per sample)*	279,300
4	1MA4	Clorua (Cl^-), Florua (F^-), Nitrite (NO_2^-), Nitrate (NO_3^-), Sulphat (SO_4^{2-})	98,400
5	1MA5	Các Ion Na^+, NH_4^+, K^+, Mg^{2+}, Ca^{2+}	167,500
II	Analys of acid deposition water in the laboratory		
1	2MA4a	Clorua (Cl^-)	456,100
2	2MA4b	Florua (F^-)	377,100
3	2MA4c	Nitrit (NO_2^-)	366,300
4	2MA4d	Nitrat (NO_3^-)	286,100
5	2MA4e	Sulphat (SO_4^{2-})	426,100
6	2MA5a	Na^+	437,500
7	2MA5b	NH_4^+	375,100
8	2MA5c	K^+	437,500
9	2MA5d	Mg^{2+}	363,600
10	2MA5e	Ca^{2+}	357,700
11	2MA6	Analysis of anion of one sample: Cl^-, F^-, NO_2^-, NO_3^-, SO_4^{2-} *(Price per sample)*	1,794,000

MAXIMUM UNIT PRICE FOR MONITORING OF ENVIRONMENTAL MARINE
(Attached to Decision No. 2075 / QD-BTC dated 25/8/2014 of the MOF)

Unit price: vnđ/unit

No.	SIGN OF NUMBER	Monitoring parameters	Price
I	**Take a sample and analysis of seawater**		
a	Monitoring at site		
1	1NB1	Temperature, air humidity	89,500
2	1NB2	Speed of wind	89,500
3	1NB3	Wawe	89,000
4	1NB4	Surface flow rate	327,600
5	1NB5	Temperature of water	236,300
6	1NB6	Saltiness	334,700
7	1NB7	Turbidity	396,600
8	1NB8	transparency	402,000
9	1NB9	chrominance	433,100
10	1NB10	pH	448,200
11	1NB11	DO	341,500
12	1NB12	EC	343,600
13	1NB13	Take a sample and Analysis of all parameters: pH, DO, EC of one sample *(Price per sample)*	1,014,400
b	**Take a sample**		
14	1NB14	NH_4^+, NO_2^-, NO_3^-, SO_4^{2-}, PO_4^{3-}, SiO_3^{2-}, Total N, Total P	165,300
15	1NB15	COD, BOD_5	167,000
16	1NB15	Suspended Solids (SS)	156,300
17	1NB17	Coliform, Fecal CoIiform	156,300
18	1NB18	Chlorophyll a, Chlorophyll b, Chlorophyll c	176,600
19	1NB19	Cyanua (CN^-)	176,600
20	1NB20	Pb, Cd, Hg, As, Cu, Zn, Mn, Mg, Ni, CrV, CrVI	176,600
21	1NB21	Grease in the surface water	199,300
22	1NB22	Phenol	176,600

No.	SIGN OF NUMBER	Monitoring parameters	Price
23	1NB23	Chemical Pesticide, Group of chlorine, Chemical Pesticide, Group of Phosphorous	176,600
24	1NB24	Marine sediment *	384,100
25	1NB25	Marine creature **	590,800
II	**Monitoring activities at offshore**		
a	**Monitoring at Site**		
1	2NB1	Temperature, air humidity	140,800
2	2NB2	Speed of wind	134,300
3	2NB3	Wawe	132,500
4	2NB4	Surface flow rate	391,200
5	2NB5	Temperature of marine water	317,100
6	2NB6	Saltiness	589,800
7	2NB7	Turbidity	586,000
8	2NB8	Transmittance	675,500
9	2NB9	chrominance	675,500
10	2NB10	pH	653,900
11	2NB11	DO	728,000
12	2NB12	EC	502,400
13	2NB13	Take a sample, Analysis of all parameters (pH, DO, EC) of one sample *(Price per sample)*	1,097,200
b	**Take a sample**		
14	2NB14	NH_4^+, NO_2^-, NO_3^-, SO_4^{2-}, PO_4^{3-}, SiO_3^{2-}, Total N, Total P	232,200
15	2NB15	COD, BOD_5	177,800
16	2NB16	SS	195,900
17	2NB17	Coliform, Fecal CoIiform	185,900
18	2NB18	Chlorophyll a, b, c	173,100
19	2NB19	CN^-	217,700
20	2NB20	Pb, Cd, Hg, As, Cu, Zn, Mn, Mg, Ni, CrV, CrVI	217,700
21	2NB21	Grease in the surface water	249,200
22	2NB22	Phenol	217,700

No.	SIGN OF NUMBER	Monitoring parameters	Price
23	2NB23	Chemical Herbicide, Group of chlorine, Chemical Herbicide, Group of Phophosours	249,200
24	2NB24	Marine sediment*	542,000
25	2NB25	Marine creature**	745,300
III	**Analysis of marine water in the Labolary**		
1	3NB14a	NH_4^+	334,900
2	3NB14b	NO_2^-	344,000
3	3NB14c	NO_3^-	305,000
4	3NB14d	SO_4^{2-}	404,600
5	3NB14đ	PO_4^{3-}	262,200
6	3NB14e	SiO_3^{2-}	250,500
7	3NB14f	Total Nitrogen	362,600
8	3NB14g	Total Phophorous	358,300
9	3NB15a	COD	360,000
10	3NB15b	BOD_5	300,200
11	3NB16	SS	133,700
12	3NB17	Coliform, Fecal Coliform	541,100
13	3NB18	Chlorophyll a, b, c	204,300
14	3NB19	CN^-	617,500
15	3NB20a	Pb, Cd	569,000
16	3NB20b1	As	718,800
17	3NB20b2	Hg	741,300
18	3NB20c	Cu, Zn, Mn, Mg, Ni, CrV, CrVI	463,500
19	3NB21	Grease in the surface water	1,044,500
20	3NB22	Phenol	472,200
21	3NB23a	Chemical Herbicide, Group of chlorine	2,512,600
22	3NB23b	Chemical Herbicide, Group of Pyrethroid	2,431,100
23	NB23c	Analysis of all parameters (metal) of one sample *(Price per sample)*	1,493,300
24	3NB24a	$N\text{-}NO_2$	342,300

No.	SIGN OF NUMBER	Monitoring parameters	Price
25	3NB24b	$N\text{-}NO_3$	305,300
26	3NB24c	$N\text{-}NH_3$	334,900
27	3NB24d	$P\text{-}PO_4$	261,000
28	3NB24đ	Pb, Cd	558,500
29	3NB24e	Hg, As	826,700
30	3NB24f	Cu, Zn	477,200
31	3NB24g	CN-	647,300
32	3NB24h	Humidity	123,200
33	3NB24i	3NB24i	67,100
34	3NB24j	Organic	596,500
35	3NB24k	Total Nitrogen	338,700
36	3NB24l	Total Phophorous	332,600
37	3NB24m	Chemical Pesticide, Group of chlorine	2,309,400
38	3NB24n	Chemical Pesticide, Group of Phosphorous	2,529,700
39	3NB24o	Grease	972,000
40	3NB25a	Phytoplankton, poison algae	232,800
41	3NB25b	zooplanktons, zoobenthos	278,900
42	3NB25c	Chemical Pesticide, Group of chlorine	2,452,700
43	3NB25d	Chemical Pesticide, Group of Phosphorous	2,107,900
44	3NB25đ	Pb, Cd	619,200
45	3NB25e	Hg, As	851,600
46	3NB25f	Cu, Zn, Mg	477,200

* Marine Sediment: $N\text{-}NO_2$, $N\text{-}NO_3$, $P\text{-}PO_4$, Pb, Cd, Hg, As, Cu, Zn, CN-, Humidity, Tỷ trọng, Organic, Total Nitrogen, Total Phophosous, Chemical Pesticide, Group of chlorine, Chemical Pesticide, Group of Phosphorous, Grease

** Aquatic organisms: zooplanktons, zoobenthos, Pesticide, group of Clorua, P, Pb, Cd, Hg, As, Cu, Zn, Mg.

Unit price: vnđ/unit

No.	SIGN OF NUMBER	Monitoring parameters	Price
I	**Take a sample, quick monitoring at Site**		
a	Meteorology parameters		
1	1KT1	temperature, humidity	96,100
2	1KT2	Speed and direction of wind	96,100
3	1KT3	Atmospheric pressure	94,300
b	Parameters into emissions		
4	1KT4	Exhaust gas temperature	230,300
5	1KT5	Speed of Exhaust gas	420,400
6	1KT6	O_2	520,000
7	1KT7	CO	509,400
8	1KT8	CO_2	514,700
9	1KT9	NO	525,200
10	1KT10	NO_2	494,500
11	1KT11	NOx	530,500
12	1KT12	SO_2	498,200
13	1KT13	Total dust	1,361,500
14	1KT14	Pb, Sb, As, Cd, Cu, Zn *(Price per one sample)*	1,161,800
c	**Waste Sources characteristics**		
15	1KT15	Height of the source, Inner diameter of chimney	140,400
16	1KT16	Emission flows	257,700
II	**Analysis of industrial air in the Laboratory**		
1	2KT6	Oxygen (O_2)	140,500
2	2KT7	CO	140,500
3	2KT8	CO_2	140,500
4	2KT9	NO	140,500
5	2KT10	(NO_2)	140,500
6	2KT11	NOx	140,500
7	2KT12	(SO_2)	140,500

No.	SIGN OF NUMBER	Monitoring parameters	Price
8	2KT13	Total dust	178,200
9	2KT14a	Cd, Pb	454,800
10	2KT14b	As, Sb	517,300
11	2KT14c	Cu, Zn	338,700
12	2KT14d	Analysis of all parameters of one sample *(Price per sample)*	993,100

MAXIMUM UNIT PRICE FOR MONITORING OF RADIOACTIVE ENVIRONMENT

(Attached to Decision No. 2075 / QD-BTC dated 25/8/2014 of the MOF)

Unit price: vnđ/unit

Số TT	Mã hiệu	Thông số quan trắc	Đơn giá
I	**Hoạt động lấy mẫu và quan trắc nhanh phóng xạ tại hiện trường**		
1	1PX1a	Các đồng vị phóng xạ trong mẫu sol khí: Pb^{214}, Bi^{214}, TI^{208}, Ac^{228}, Ra^{226}, Cs^{137}, K^{40}, Be^{7}	1,339,800
2	1PX1b	Gamma trong không khí	697,600
3	1PX1c	Hàm lượng Randon trong không khí	310,800
4	1PX1d	Tổng hoạt độ Beta, Tổng hoạt độ Anpha	439,100
5	1PX2a	Các đồng vị phóng xạ trong mẫu tổng rơi lắng: Pb^{214}, Bi^{214}, TI^{208}, Ac^{228}, Ra^{226}, Cs^{137}, K^{40}, Be^{7}	1,725,500
6	1PX2b	Tổng hoạt độ Beta, Tổng hoạt độ Anpha	659,100
7	1PX3	Các đồng vị phóng xạ trong mẫu đất: Pb^{214}, Bi^{214}, TI^{208}, Ac^{228}, Ra^{226}, Cs^{137}, K^{40}, Be^{7}	616,200
8	1PX4a	Các đồng vị phóng xạ trong mẫu nước: Pb^{214}, Bi^{214}, TI^{208}, Ac^{228}, Ra^{226}, Cs^{137}, K^{40}, Be^{7}	933,500
9	1PX4b	Hàm lượng Randon trong nước	318,700
10	1PX4c	Tổng hoạt độ Beta, Tổng hoạt độ Anpha	616,600
11	1PX5a	Các đồng vị phóng xạ trong mẫu sinh vật, thực phẩm: Pb^{214}, Bi^{214}, TI^{208}, Ac^{228}, Ra^{226}, Cs^{137}, K^{40}, Be^{7}	611,900
12	1PX5b	Tổng hoạt độ Beta, Tổng hoạt độ Anpha	611,400
II	**Công tác phân tích môi trường phóng xạ trong phòng thí nghiệm**		
1	2PX1a	Các đồng vị phóng xạ trong mẫu sol khí: Pb^{214}, Bi^{214}, TI^{208}, Ac^{228}, Ra^{226}, Cs^{137}, K^{40}, Be^{7}	1,052,200
2	2PX1b	Hàm lượng Radon trong không khí	246,900
3	2PX1c	Tổng hoạt độ Anpha, Tổng hoạt độ Beta	293,000
4	2PX2a	Các đồng vị phóng xạ trong mẫu bụi xa lắng: Pb^{214}, Bi^{214}, TI^{208}, Ac^{228}, Ra^{226}, Cs^{137}, K^{40}, Be^{7}	1,462,200
5	2PX2b	Tổng hoạt độ Anpha, Tổng hoạt độ Beta	700,900
6	2PXc	Các đồng vị phóng xạ trong mẫu đất: Pb^{214}, Bi^{214}, TI^{208}, Ac^{228}, Ra^{226},	1,784,200

Số TT	Mã hiệu	Thông số quan trắc	Đơn giá
7	2PX4a	Các đồng vị phóng xạ trong mẫu nước: Pb^{214}, Bi^{214}, TI^{208}, Ac^{228}, Ra^{226}, Cs^{137}, K^{40}, Be^{7}	7,833,200
8	2PX4b	Hàm lượng Randon trong nước	664,100
9	2PX4c	Tổng hoạt độ Anpha, Tổng hoạt độ Beta	739,400
10	2PX5a	Các đồng vị phóng xạ trong mẫu thực vật: Pb^{214}, Bi^{214}, TI^{208}, Ac^{228}, Ra^{226}, Cs^{137}, K^{40}, Be^{7}	1,479,200
11	2PX5b	Tổng hoạt độ Anpha, Tổng hoạt độ Beta	748,600