

**LAO PEOPLE'S DEMOCRATIC REPUBLIC
PUBLIC WORKS AND TRANSPORT INSTITUTE,
MINISTRY OF PUBLIC WORKS AND TRANSPORT
DEPARTMENT OF POLLUTION CONTROL,
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT
VIENTIANE CAPITAL
DEPARTMENT OF PUBLIC WORKS AND TRANSPORT
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT**

**THE PROJECT FOR URBAN WATER
ENVIRONMENT IMPROVEMENT
IN VIENTIANE CAPITAL
IN
THE LAO PEOPLE'S DEMOCRATIC
REPUBLIC**

PROJECT COMPLETION REPORT

DECEMBER, 2017

**JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)**

NIHON SUIDO CONSULTANTS CO., LTD.

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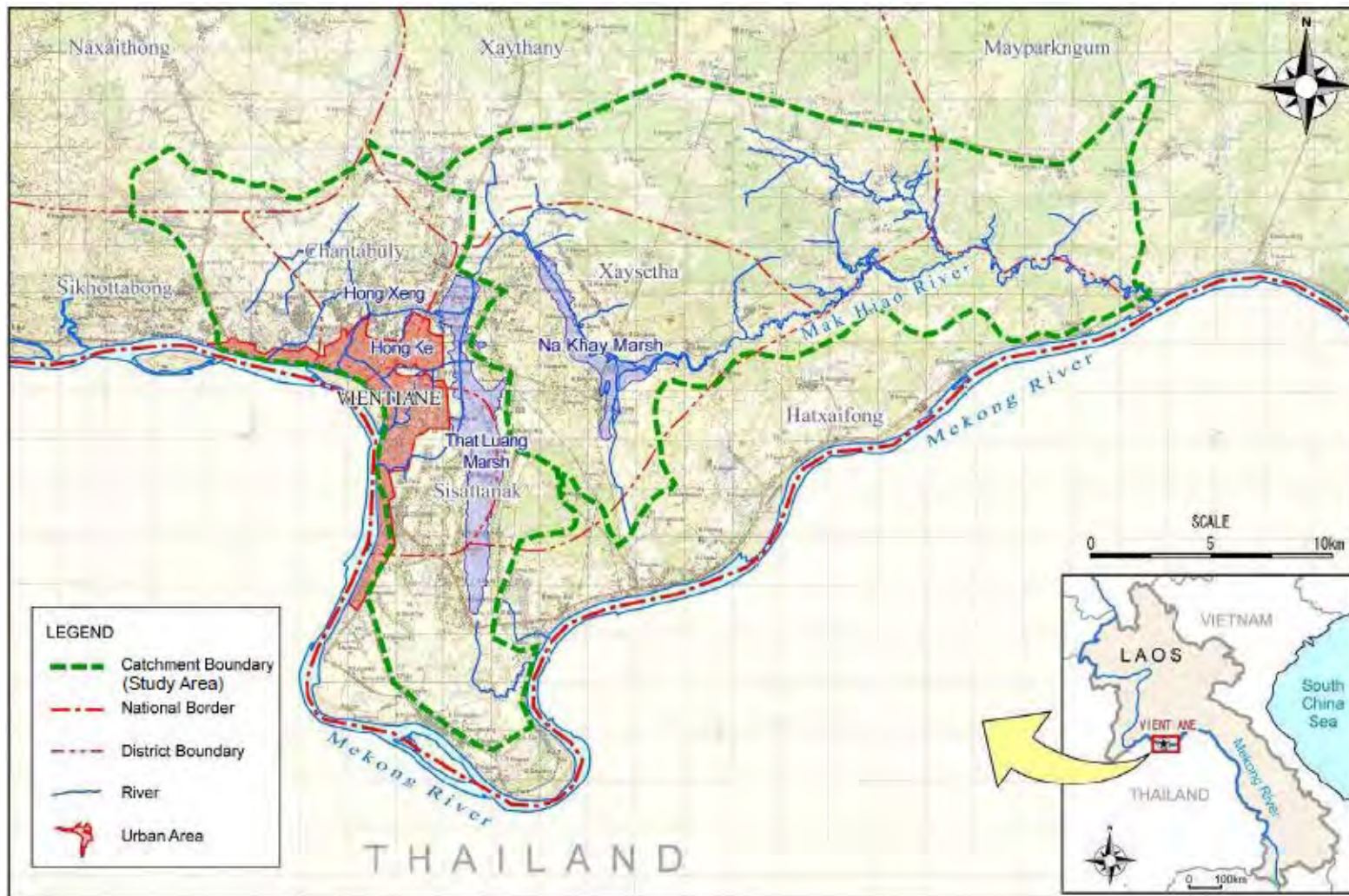
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Location Map

ABBREVIATIONS

BORDA	Bremen Overseas Research and Development Association
CBS	Community Based Sanitation
C/P	Counterpart Personnel
DAF (VC)	Department of Agriculture and Forestry, VC
DESIA (MONRE)	Department of Environmental and Social Impact Assessment, MONRE
DEWATS	Decentralized Wastewater Treatment System
DHUP (MPWT)	Department of Housing and Urban Planning, MPWT
DoES (VC)	Department of Education and Sports, VC
DoIC (VC)	Department of Industry and Commerce, VC
DONRE (VC)	Department of Natural Resources and Environment, VC
DPWT (VC)	Department of Public Works and Transport, VC
EMSP	Environmental Management Support Program
FSM	Fecal Sludge Management
IEE	Initial Environmental Examination
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoJ	Government of Japan
GoL	Government of Lao People's Democratic Republic (PDR)
JCC	Joint Coordinating Committee
JET	JICA Expert Team
JICA	Japan International Cooperation Agency
Lao PDR	Lao People's Democratic Republic
LPP	Laos Pilot Project
LPPE	Environmental Management/Component of LPP
M/M	Minutes of Meeting
M/P	Master Plan
MAF	Ministry of Agriculture and Forestry
MoES	Ministry of Education and Sports
MoIC	Ministry of Industry and Commerce
MONRE	Ministry of Natural Resources and Environment
MPWT	Ministry of Public Works and Transport
NREI (MONRE)	National Resources and Environment Institute, MONRE
NSC	Nihon Suido Consultants Co., Ltd.
PCD (MONRE)	Department of Pollution Control, MONRE
PDM	Project Design Matrix
PDR	People's Democratic Republic
PMU	Project Management Unit
PO	Plan of Operation
ProCEED	Promotion of Climate-related Environmental Education
PTI (MPWT)	Public Works and Transport Institute, MPWT

R/D	Record of Discussion
SBS	School Based Sanitation
VC	Vientiane Capital
VCOM	Vientiane Capital Office Service and management
WBS	Work Breakdown Sheet
WG	Working Group
WM	Weekly Meeting
WWTP	Wastewater Treatment Plant

Chapter 1 Project Outline

1.1 Background

The drainage network in Vientiane Capital (VC), the capital of Lao People's Democratic Republic (PDR) with a population of about 0.8 million in 2012, has improved with assistance from various donors since the early 1990's. However, the water quality in the drainage canals and marshes has been getting worse due to the increasing discharge of domestic wastewater from urban areas as a result of the improved living standards, as well as the rapid economic and population growth.

The National Strategy on Environment up to the year 2020 of Lao PDR stipulates "To implement measures for sustainable development" as one of its main objectives, where water environment management is included. On the other hand, Japan's country assistance policy for Lao PDR describes "To promote assistances contributing to build up a comfortable society (environmental management, water purification plant, urban planning, etc.) which is harmonized with the environment for realizing balanced economic development."

Government of Japan (GoJ) dispatched the study team in the middle of January 2009 to formulate the master plan of improvement of the water environment in VC. The study includes the formulation of improvement measures against the worsening environmental hygiene and the formulation of environmental conservation measures for the Mak Hiao River. This study completed in June 2011. Then, Government of Lao PDR (GoL) requested a technical cooperation project, "The Project for Urban Water Environment Improvement in Vientiane Capital" for the purposes of implementing the master plan and promoting water environment improvement.

The field activities of the project were commenced on 14th October, 2014 and are finalized on 13th October, 2017.

1.2 Goal, Purpose, Outputs, and Project Area

Project goal, project purpose and activities for respective outputs are shown in **Table 1.2.1**.

Table 1.2.1 Project Goal, Project Purpose and Activities for Respective Outputs

Overall Goal	Water environmental management is continuously implemented.
Project Purpose	The institutional framework and organizations are strengthened for wastewater treatment in Vientiane capital through participatory approach
Outputs	<ol style="list-style-type: none">1. Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment.2. The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment facilities.3. The operation of legal and regulatory framework is strengthened for industrial wastewater.4. People's awareness is raised through environmental education.
Project Area	Vientiane Capital
Implementing	DPWT : Department of Public Works and Transport, VC

Agencies	DONRE : Department of Natural Resources and Environment, VC PTI : Public Works and Transport Institute, MPWT PCD : Department of Pollution Control, MONRE
Supporting Agencies	DoIC : Department of Industry and Commerce, VC DoES : Department of Education and Sports, VC VUDAA : Vientiane Urban Development and Administration Authority, VC NREI : Natural Resource and Environment Institute, MONRE Districts : Districts, VC DHUP : Department of Housing and Urban Planning
Concerned Agencies	DAF : Department of Agriculture and Forestry, VC MAF : Ministry of Agriculture and Forestry DESIA : Department of Environmental and Social Impact Assessment, MONRE MoIC : Ministry of Industry and Commerce

1.3 Overall Implementation Schedule

Project period is three (3) years from October, 2014 as shown in **Figure 1.3.1**. Detailed work schedule of each activity is shown in **Chapter 2**.

Year	2014			2015						2016						2017																										
Project Term	1st Year									2nd Year									3rd Year																							
Month	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
1st Year	█																																									
2nd Year										█																																
3rd Year																			█																							
1st Year Work Plan	▲																																									
Progress Report No.1					△																																					
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2nd Year Work Plan																																										
Progress Report No.3																																										
Progress Report No.4																																										
3rd Year Work Plan																																										
Progress Report No.5																																										
Completion Report																																										

Figure 1.3.1 Overall Project Implementation Schedule

1.4 Implementation Structure

The implementation structure and the division of roles of each agency concerned are indicated in **Figure 1.4.1**.

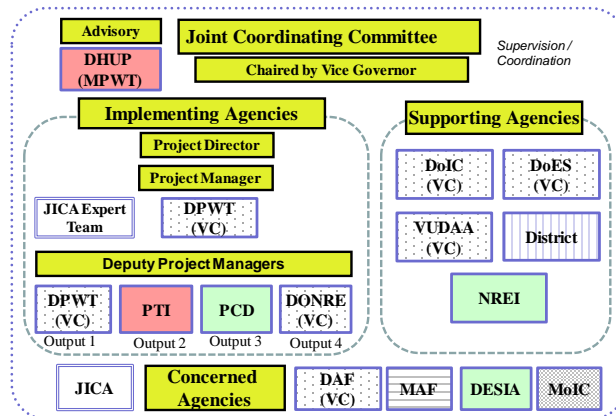


Figure 1.4.1 Implementation Structure of the Project

2.1 Plan of Operation (PO)

Activities of the project were carried out based on Plan of Operation (PO), which was revised 2 times according to the changes of Project Design Matrix (PDM). The final PO (PO_2) shown in **Table 2.1.1** was prepared based on PDM_2 through the discussion between JICA Expert Team (JET) and counterparts (C/Ps).

Table 2.1.1 Plan of Operation_2 (PO_2)

Plan of Operations (PO)

Project Title: The Project for Urban Water Environment Improvement in Vientiane Capital

Date: September 22 nd, 2015

Project Duration: 36 Months from October 2014

Ver. 3

Activity	Project Year	Year 1									Year 2									Year 3																		
	Japanese Fiscal Year	2014			2015						2016			2017																								
	Lao Fiscal Year	2014									2015									2016																		
	Year	2014			2015						2016									2017																		
	In Charge	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	
Output 1: Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment.																																						
1-1 To collect necessary data for Strategy for Wastewater Treatment for Vientiane Capital	(See attached matrix)																																					
1-2 To plan a viable financial mechanism for the maintenance of the wastewater treatment and consolidate it into the strategy	(See attached matrix)																																					
1-3 To formulate the strategy considering site selection, pre F/S and so on for the construction of facilities for waste water treatment in the future	(See attached matrix)																																					
1-4 To support public hearing and authorization of the strategy	(See attached matrix)																																					
Output 2: The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment facilities.																																						
2-1 To prepare/ improve standard designs for toilet facilities with septic tanks and other decentralized wastewater treatment measures	(See attached matrix)																																					
2-2 To prepare and enforce guidelines/ rules for the proper installation and maintenance of septic tanks and decentralized wastewater treatment facilities in accordance with the standard designs	(See attached matrix)																																					
2-3 To undertake a study on the improvements of existing facilities for decentralized wastewater treatment and implement training programs	(See attached matrix)																																					
2-4 To strengthen community groups for the management of decentralized wastewater treatment and support system for the groups	(See attached matrix)																																					
2-5 To support the monitoring (including water quality analysis) of existing facilities for decentralized wastewater treatment	(See attached matrix)																																					

2.2 Activities by Output

(1) Output1: Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment.

1-1 To collect necessary data for Strategy for Wastewater Treatment for Vientiane Capital

After the discussions on required data for preparation of Strategic Plan of Wastewater Treatment and Pre-F/S, data collection was started by C/Ps in April, 2015 and almost all the required data were collected by September 25, 2015. The collected data include:

- Data collection on legislation from related organizations
- Maps of administration area, land use plan, conservation area, river basin, large scale development area, water supply service area
- Data of population by area, ground elevation, and construction cost data
- Water supply data: service population and consumption by user type (domestic, industry, and administration), big user, non-revenue water ratio, etc.

1-2 To plan a viable financial mechanism for the maintenance of the wastewater treatment and consolidate it into the strategy Capital

Presentations / Lectures, Short Test regarding the topics in Presentations, Workshops & Discussions, Personal Computer Training, and other activities are performed through the entire project period.

1) Presentations / Lectures

Main topic: Sewerage Finance

- 1st. Financial System of Wastewater Treatment in Japan
- 2nd. Financial System of Sewerage Sector in Overseas Countries
- 3rd. Economic and Financial Analysis of Overseas Project
- 4th. Example of Financial Analysis of Sewerage Projects
- 5th. Review of 1st year presentations (Sewerage budgeting, Financial System, Financial and Economic Analysis)

Main topic: Institutions of Sewerage and Sanitation

- 6th. Institutional arrangement of sewerage & sanitation in Japan
- 7th. Authorities and O&M Entity of Sewerage Service, Japan and Overseas
- 8th. Case Study of Phnom Penh Water Supply Authority (PPWSA)(Independence of O&M Entity)
- 9th. Corporate Accounting System to be recommended for Sewerage Service
- 10th. Review of 2nd year presentations (Water Environment Management and Sewerage Institution in 2nd year)
- 11th. Sewerage Finance and Tariff, Japan and Overseas
- 12th. Sewerage Finance and Tariff, Japan - 2

2) Short Test regarding the topics in Presentations:

Short Test concerning sewerage finance in 1st year

Short Test concerning sewerage institution in 2nd year

3) Workshops & Discussions:

1st to 7th; Preparation of Cost Burden and Financial Source Plan for Sanitation / Sewerage Facilities in VC and their PowerPoint for explanation

8th to 12th; Preparation of Responsibility of Organization for Sanitation / Sewerage Facilities and Water Quality Management in VC and their PowerPoint for explanation

13th to 18th; To confirm description for “Cost Burden” and “Responsibility” plans to be included in Strategy of wastewater management in VC

19th to 22nd; Preparation of Action Plan to realize Cost Burden and Responsibility plan for Sanitation / Sewerage Facility in VC

As products of the above activities, there are three plans including; i) Cost burden and financial source plan of sanitation / sewerage facilities, ii) Responsibility of organization for sanitation / sewerage facilities and water quality management in VC, and iii) Action Plan to realize the cost burden and responsibility plan. These are included in Strategy of wastewater management in VC. The Strategy and the Action Plan have their explanation to understand them correctly.

4) Personal Computer Training:

1st. O&M costs estimation

2nd. FIRR calculation

3rd and 4th. FIRR and sewerage tariff calculation by using construction and O&M costs of the projects in the Strategy

5th. FIRR and sewerage tariff calculation of Pre F/S

6th. Economic Analysis of Pre F/S (EIRR calculation)

5) Other activities

- Meeting with Management Class of DPWT (9th November, 2015) and DHUP (10th November, 2015) to discuss about Cost burden plan in VC
- Meeting chaired by Project Director, DDG, DPWT (21st January, 2016), regarding the Responsibility of Water Quality Management and of Each Sanitation / Sewerage Facility
- Visiting CP offices one by one to collect information, and to discuss about the cost burden and responsibility plan, and so on
- Awarding certificates to CPs for completion of trainings of sewerage financial and institutional aspects for each 1st, 2nd and 3rd year

1-3 To formulate the strategy considering site selection, pre F/S and so on for the construction of facilities for waste water treatment in the future

1) Strategy of Wastewater Management in Vientiane Capital

The first draft of the Strategy was prepared in March, 2017. Before preparation of the draft, the following discussions were held.

- The second quarterly meeting (26/2/2016): Plan of the wastewater treatment, roles of relevant authorities
- The third JCC meeting (25/5/2016): Plan of wastewater treatment, standards of septic tanks
- The fourth JCC meeting (16/12/2016): Outline and the gist of the strategy

After stakeholders meeting on the Strategy held on March 23, 2017, the second draft was formulated based on the results of discussion, comments from authorities concerned. Contents of National Environmental Standards, 2017 were reflected to the second draft.

The third draft was prepared based on the discussion of the public hearing held on August 11, which will be proposed to VC for authorization.

2) Pre F/S

Pre F/S for sewerage system project for 507 ha of service area in upstream catchment of Hong Ke, Hong Pasak, and Hong Wattay with treatment plant with capacity of 12,900m³/day was prepared from May to July, 2017. During the preparation of the Pre F/D, C/Ps were trained all the required planning methods including:

- Present water environmental situation and issues to be tackled in VC.
- Items and procedure to prepare feasibility study of sewerage system project
- Review of the previous studies
- Population Projection and estimate of wastewater amount to be treated
- Planning of sewer, pumping station and treatment plant
- Preparation of drawings
- Cost estimate for construction, operation and maintenance
- Environmental and social consideration
- Institutional arrangement
- Financial arrangement and economic analysis

1-4 To support public hearing and authorization of the strategy

Public hearing for the Strategy was held on August 11 and the third draft of the Strategy will be proposed to VC for authorization to implement.

Developed documents prepared under Output 1 are:

- Strategy of Wastewater management in Vientiane Capital (Developed materials of output 2, Management of Septic Tank for Household in Vientiane Capital (Draft) and Guidelines of On-Site Treatment for Effluent BOD₅ less than 60 mg/L (Draft) are contained in annexes)
- Preliminary Feasibility Study of Wastewater Management for Vientiane Capital

Table of contents of the developed documents above are presented in **Appendix 1** and documents are prepared as separate volumes.

(2) Output 2 :The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment facilities

2-1 To prepare standard designs for toilet facilities with septic tanks and other decentralized wastewater treatment measures

There were two(2) septic tank drawings, which treat only black water (wastewater from toilet) and four (4) existing DEWATSs treating black and gray (wastewater other than toilet) in VC at the time of the project commencement.

As main sources of deterioration of water environment in VC were untreated gray water of domestic, commercial and institutional discharges, standards for on-site treatment and DEWATS were recommended as combined treatment for both black and gray water. This recommendation also comply with SDG target 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

“Standard Specification of Septic Tank (first draft)” was prepared in September, 2016 including consideration of O&M (desludging etc.) from the planning stage, check of installation and so on. Based on the above first draft, “Septic Tank Standard for Household (draft)” was prepared including good maintenance by owner and responsibility of DPWT, after confirmation of description on O&M especially desludging at planning stage with “Fecal Sludge Management Project” (FSM).

For authorization, “Septic Tank Standard for Household (Draft)” was revised to "Additional Decision for Management of Septic Tank of Household in Vientiane Capital (Draft)" with drawings of septic tank included in Appendix.

More high level on-site treatment is required for commercial buildings in environmental standards, for instance effluent BOD₅ is less than 60 mg/L. It is impossible to achieve stable effluent BOD₅ less than 60 mg/L with only anaerobic treatment and aerobic treatment is required. “Guidelines of On-Site Treatment for Effluent BOD₅ less than 60 mg/L (Draft)” was prepared in which contact aeration or facultative pond added to septic tank and Japanese type Johkasou are introduced as examples.

The above Standard and Guidelines were discussed in the stakeholder meeting on 30th March, 2017. At the meeting, the participant of DPH commented that new environmental standard was approved in February, 2017 and the guidelines should consider to deal with it. Then “Guidelines of On-Site Treatment for Effluent BOD₅ less than 60 mg/L and 30 mg/L (Draft)” was prepared. In the guidelines, contact aeration with stricter criterion than former one was added.

Final draft of “Standard Designs and Guidelines for the Proper Installation and Maintenance of Decentralized Wastewater Treatment Facilities” was prepared in June, 2017. It aims to apply for new construction of collective systems for 2 or more houses and buildings including new development of housing estate, industrial park, etc. It contains planning and design methods, maintenance requirement of sewer network, pumping station and wastewater treatment plant. Various type of treatment processes are also introduced in the above Standard Designs and Guidelines of DEWATS.

2-2: To prepare and enforce guidelines/ rules for the proper installation and maintenance of septic tanks and decentralized wastewater treatment facilities in accordance with the standard designs

Enforcement regulation for on-site treatment facility is Building Permission stipulated in Zoning Code (ZC) of Urban Plan of VC and the facilities are evaluated when Building Permission of construction or rehabilitation of houses and buildings is applied. The existing Zoning Code (ZC) mentions only “A building site must be equipped with wasted water drainage” for wastewater, and it was revising by the Project on Urban Development Management funded by JICA. In the occasion, following control terms of wastewater discharge was included in Detail Zoning Code (D-ZC) for Inner Zone (4,200ha) of VC.

“A building site must be equipped with:

(Wastewater)

In case where the building site is located in an area specified by the VC as a service area of public sewerage system, wastewater including black water (wastewater from toilet) and grey water (wastewater from kitchen, shower, washing machine, etc.) must be discharged to the system.

In case where the building site is out of the service area of public sewerage system, wastewater of both black water and grey water must be discharged after treatment less than 60 mg/l in effluent BOD₅ (Biochemical Oxygen Demand). In case of residential building with total floor area less than 300 m², septic tank in accordance with “Standards of Septic Tank for Households” should be applied.”

As of September, 2017, D-ZC for Inner Zone is under the process of authorization. The basic part (General Land Use Plan and Zoning Code; G-LUP/ZC) was approved at the City Assembly in January, 2017 and waiting for the Prime Minister’s decision. After Prime Minister’s decision on G-LUP/ZC, MPWT Minister’s decision on Building Permission, Land-Development Permission, etc. are scheduled. And then through the approval of the City Assembly, Vientiane Capital Governor’s decision on urban management regulations such as Detail Land Use Plan and Zoning Code (D-LUP/ZC) is planned. The above Zoning Code will be requested to be reflected in General “Land Use Plan and Zoning Code (LUP/ZC)” and then the objective area of the above regulation will be expanded to Urbanized Area and Its Outskirts.

Installation of DEWATS is further regulated by Governor's Decision of VC by served area. For a new development area, installation of DEWATS should be obliged by Land-development permission. However, wastewater treatment system is not included in Land-development permission in "Ministerial Order on Construction Management Regulation", since the Order stipulated only the permission system. Therefore, Installation of DEWATS for a new development area should be regulated by Governor's Decision of VC. The Governor's Decision should include:

"In a new development area with development area of 0.5 ha or more, DEWATS should be installed and the details of the system shall be appraised in Land-development permission. DEWATS to be installed should comply with "Standard Designs and Guidelines for the Proper Installation and Maintenance of Decentralized Wastewater Treatment Facilities".

2-3: To undertake a study on the improvements of existing facilities for decentralized wastewater treatment and implement training programs

There are four (4) small scale collective systems constructed from 2010 to 2012 in VC. Two (2) systems in Khoualuang Primary School and Faculty of Engineering Dormitory, National University of Laos are running and maintained properly. Other two (2) systems in Thongkhankham village and Khoualuang temple stopped operation even only after 3 to 5 years of construction. Main reasons of functional disruption are collection pipe damage and poor maintenance. Thongkhankham CBS is in serious situation. Maintenance organization was disappeared and collected wastewater overflowed to the ground and entered into near-by residents' houses. And then improvement study and work including O&M restructuring of DEWATS were focused on Thongkhankham CBS as follow.

- Study on requirement for sewer pipeline of small-scale collective wastewater treatment facility
- Explanatory meeting for users at Thongkhankham village office on July 7, 2016
- Repair work in Thongkhankham CBS on a trial basis in July and August, 2016
- Cleaning of the filter bed and sludge removal on October 18, 2016
- Restructuring of O&M organization and training (Details in 2-4)

After repair and desludging in August, 2016, suspended solids (SS) of the effluent from Thongkhankham CBS was still higher than 500 mg/L. The amount of SS in the effluent was estimated to be derived from sludge accumulated in the anaerobic filter bed. Filter cleaning was considered necessary for proper maintenance of the CBS to keep good performance in long time. And then cleaning of the filter bed and sludge removal was implemented on October 18, 2016.

After cleaning the filter bed, effluent water qualities were analyzed 3 times from January to March, 2017. The average results were SS: 45 mg/L, BOD₅: 99 mg/L, and COD(Cr): 291 mg/L. Treatment condition got back to normal by cleaning of the filter bed. On the other hand, the filter cleaning cost is over 2 years of user fee scheduled for collection as O&M expenses. Even

if cleaning frequency is about once in five years as recommended by BORDA, there is a possibility to raise the administration expenses by nearly 50%.

Results of study on requirement for sewer pipeline were contained in “Standard Designs and Guidelines for the Proper Installation and Maintenance of Decentralized Wastewater Treatment Facilities”.

For the treatment facility, “Improvement of Thongkhankham CBS to effluent BOD₅ less than 30 mg/L” was prepared to cater for effluent BOD₅ less than 30 mg/L that is required by the new Environmental Standards, upon the request of DPWT.

Since improvement of the existing septic tanks is difficult, improvement of O&M, especially periodic desludging was promoted to reduce pollution load from the existing septic tanks. The promotion activities were conducted in corporation with Fecal Sludge Management Project (FSM) supported by French Organizations of Public Service of Sanitation in France (SIAAP), International Association of Francophone Mayors (AIMF), Seine-Normandy Water Agency, and GRET and Water Technical Assistance (WTA) as implementing organizations with VUDAA (VC) as a counterpart (Details are in 4-5).

Construction and operation of new septage treatment plant at km21 (FSTP: Fecal Sludge Treatment Plant) had been planned by FSM and FSTP started trial operation from February, 2017 and full-scale operation from July, 2017.

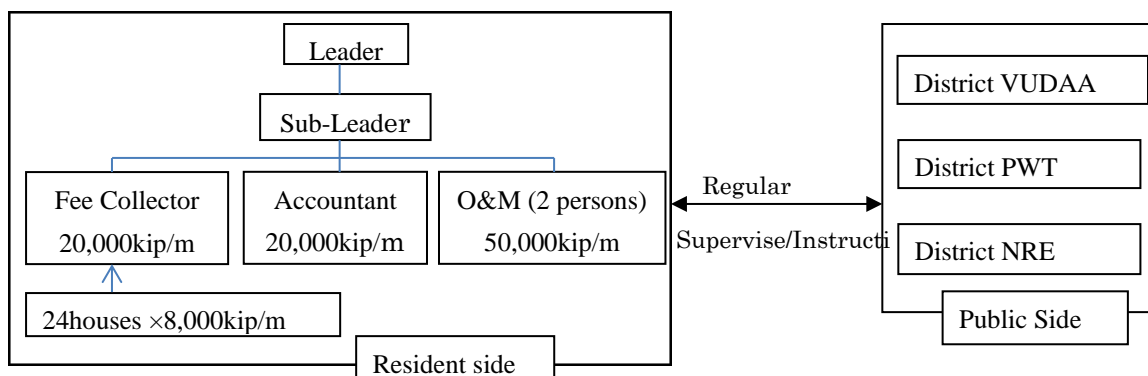
Collaboration with FSM was started from the first year of the Project in information exchange and mutual support. The meetings with both parties were held regularly and collaboration activities were the research of desludging situation in VC, having explanatory meeting for desludging businesses at the start of trial operation of FSTP, and promotion for regular desludging. Both parties shared roles each other on the management of on-site wastewater treatment. Especially for regulatory framework of septic tank, FSM and VUDAA (VC) implemented the construction and operation of FSTP and established the rule for septage management including roles of stakeholders, operating permits of desludging companies, proper dispose of the sludge, monitoring and so on, while PWEV and DPWT (VC) prepared Standards and Guidelines for proper installation and maintenance of septic tank. The both projects coordinated improvement plan of on-site treatment in line with building permission in Activity 2-1, 2-2 of the Project and FSM proposed rules to the Governor of VC. Coordinated activities on management of on-site wastewater treatment facilities are effective for improving water environment.

2-4: To strengthen community groups for the management of decentralized wastewater treatment and support system for the groups

Thonkhankham CBS was constructed by PTI with the previous JICA funded project. The concept of the previous project was;

- User's committee was established to manage the facility and to collect user fee
- The facility was handed over from PTI (MPWT) to the user's committee at the end of the project

But the user fee was collected only three months and planned management system was not functioned substantially. Without supporting mechanism of the scheme, the facility was left without necessary O&M. C/Ps and JET found that the public side involvement of the scheme was necessary to improve the situation. The new O&M agreement included the support system of the district to the management of wastewater treatment facility by the user's committee. It was expected that involvement of the district in the scheme would lead to keep sustainable O&M of the facility and it would be one of models of the management system for this type of facility. The chart of the new management system is shown below.



Reestablished Management System for DEWATS in Thongkhankham

In the agreement, each household pays 8,000 Kip/month to fee collector, and the fee collector, accountant, and O&M (2 persons) are paid 20,000 Kip/month, 20,000 Kip/month, 50.000 Kip/month respectively from the collected fee. Accountant sends a report to users regularly. The accounting report is also sent to the departments of the district involved (District PWT is primarily responsible.) at the same time. Once a problem happens, district would be expected to take necessary actions to solve it. The meeting of users and stakeholders of Thongkhankham CBS was held in the night of February 5th, 2016 and all participants agreed to the draft plan including re-election of the committee and above O&M arrangement. This management system was approved by District Governor of Chanthabouly on March 23, 2016.

After the repair work, explanatory meeting on proper use of the wastewater system for users and workshop on management and O&M of CBS for the persons in charge were held on August 18 and 27, 2016, respectively at Thongkhankham village. When a series of explanatory meeting and workshop finished, the leader of the management group informed that collection of user fee and regular report would start in September, 2016. But in the hearing from the management

group in January and February 2017, following opinions were reported on the situation of Thonkhankham CBS,

- User fee collection was started and there were some unpaid houses, but total 1,000,000 LAKs were collected.
- After repair work, there have been no problems in sewer lines etc., so the management group has not done daily work but would do it when problems occur in coming rainy season.
- No daily work done, so no money has been paid to the persons in charge.
- Because there was no expenditure, regular report has not been issued.

For the comments above, JET explained following matters to the management group,

- Regular inspection of control boxes is important even though no problems occurred.
- Regular distribution of the report on O&M and accounting is important, because these activities raise user's awareness and it would lead sustainable management.

2-5: To support the monitoring (including water quality analysis) of existing facilities for decentralized wastewater treatment

Water quality data required for the study on decentralized wastewater treatment facilities, such as existing septic tanks and small scale collective type facilities, were not sufficiently obtained in VC by the departure of the Project, in particular almost no water quality data of the existing septic tanks effluent. So data collection of effluents water quality of existing facilities was started in the Project.

Water quality analysis of the existing CBS and SBS samples was outsourced to Irrigation Science Research Center in VC in April, 2015. However, due to complicated procedures of analysis request, selection of measurement items, and analysis accuracy, water quality analysis became to be conducted by DONRE laboratory with on the job-training of laboratory staff.

After DONRE laboratory was ready to analyze required items of water quality, collection of water quality data was carried out steadily from June 2016. Existing DEWATS and septic tanks effluent was main target of water quality analysis.

Regarding DEWATS, water quality data were mainly collected at Thongkhankham CBS, which was model of improvement of management system, improvement of pipeline, and anaerobic filter bed washing. Data on fluctuations by time passage from desludging and washing of the filter bed or seasonal factor were tried to be obtained, but time span was only one year, which is too short to discuss the matter.

For septic tank, data collection from various conditions such as years from construction or desludging was planned. However, sampling of septic tanks effluent did not progressed enough, because even house owner could not recognize drainage path of wastewater or place to collect

the sample. In spite of the difficulty, some data of septic tank effluent and combined wastewater including septic tank effluent and domestic wastewater were analyzed.

Although the number of reliable data is not sufficient, the following can be estimated.

- Pollution load of the wastewater including untreated domestic wastewater is high.
- Effluent BOD₅ of the controlled septic tank (for black water only) falls within about 50 to 100 mg/L.
- Even CBS (combined treatment) with no abnormality, it is almost impossible to keep effluent BOD₅ below 60 mg/L by anaerobic treatment alone.

Developed documents prepared under Output 2 are:

- Technical Standards and guidelines of On-site Treatment
 - Management of Septic Tank for Household in Vientiane Capital (Draft)
 - Guidelines of On-Site Treatment for Effluent BOD₅ less than 60 mg/L and 30 mg/L (Draft)
- Guidelines for the Proper Installation and Maintenance of Decentralized Wastewater Treatment Facilities(draft)

Table of contents of the developed documents above are presented in **Appendix 1** and documents are contained in Strategy of Wastewater management in Vientiane Capital prepared as separate volumes.

(3) Output 3: The operation of legal and regulatory framework is strengthened for industrial wastewater.

3-1 To conduct inventory survey on industries/ key polluters in Vientiane Capital

- 1) Inventory survey on industries/key polluters based on data provided by Environmental Management Support Program (EMSP) (First year)
 - Project was shared factory data from EMSP who collected 709 factory data for VC.
 - Items recorded are 15 in total consisting of “scale (number of employees)”, “name of factory”, “product”, “name of owner”, “nationality”, “village”, “district”, “ratio of investment (domestic, foreign)”, “number of female employees”, “number of male employees”, “number of laborer”, “production scale”, “distribution” and “contact phone number”.
 - Result of the inventory survey was listed in **Table 2.2.3.1** and **Figure 2.2.3.1** and **Figure 2.2.3.2**.

Table 2.2.3.1 Number of Factories Classified by Districts and Scales

		Chanthabuly District	Sikhottabong District	Xaysetha District	Sisattanak District	Naxaithong District	Xaythany District	Hadxayfong District	Sangthong District	Mayparkngum District	Unknown
	Area [km ²]	36	182	166	48	851	806	230	308	1,293	
	Population [person]	81,584	102,412	104,998	76,652	65,757	150,725	93,231	27,478	51,517	
Scale of factory	Number										
10-50 people		399	56	78	37	35	39	80	37	8	19
51-200 people		172	18	26	17	15	11	54	14	7	10
Larger than 200 people		138	9	17	12	7	16	36	34	2	5
Total		709	83	121	66	57	66	170	85	17	34
Density of factory [n/km ²]		2.31	0.66	0.40	1.19	0.08	0.21	0.37	0.06	0.03	

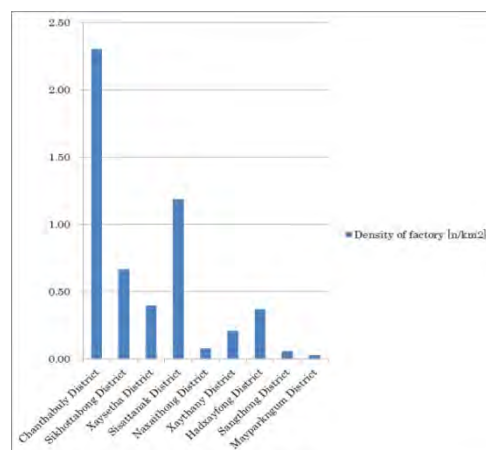
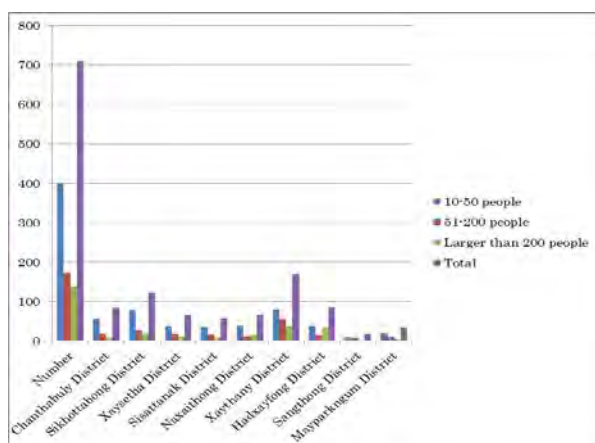


Figure 2.2.3.2 Density of Factories

- As a next step, factories concerned as wastewater sources were selected for inspection targets. The selection of factories for inspection was conducted, by “product” data as it indicates possibility of emitting “high concentrated organic effluent” and “potential toxic substance contained effluent”. 225 factories were selected in total, of which 199 have possibilities to discharge “high concentrated organic wastewater” and 26 to

discharge “potential toxic substance contained wastewater”. As no data of exact address was obtained, effort was made for investigating location (latitude and longitude) of each village, which was also plotted on a map by using an open mapping service.

- The result as described in **Figure 2.2.3.3** shows most of factories that may need inspection rather tend to concentrate to central area of VC. On the other hand, some large scale factories described as red mark also scatter in the surrounding area. There are more factories of “organic wastewater” in the central area, while less number of “potential toxic substance contained wastewater” still scattered in the surrounding area

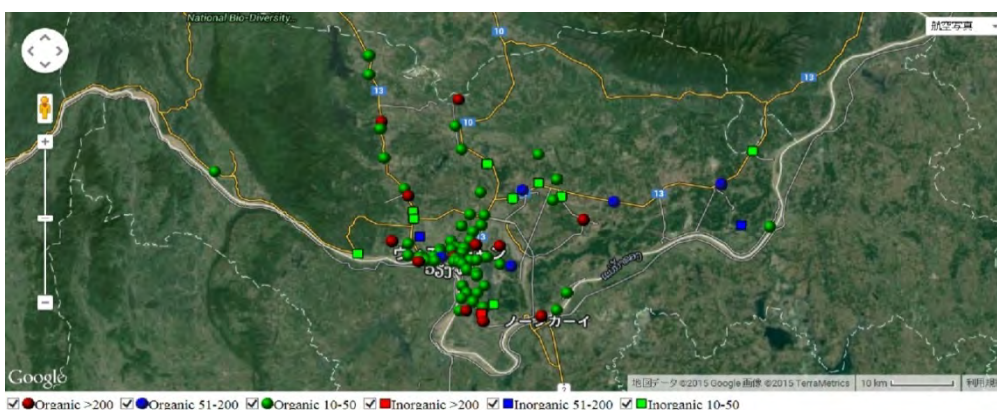


Figure 2.2.3.3 Distribution of Inspection Target Factories in Vientiane Capital

- 2) Factory inquiry visit to investigate actual situations and problems associated with wastewater discharge (Second year)
 - For the second year, inquiry visit was implemented for 83 factories that may be considered to emit effluent of toxic matter or large amount effluent.
 - **Table 2.2.3.2** and **Figure 2.2.3.4** shows total amount of water used all of those factories. It shows somewhat smaller amount of wastewater is discharged to environment than expected.

Table 2.2.3.2 Amount of Water Used by Large Factories

Name of District	Area [km ²]	Population [Person]	Population density [Person/km ²]	Volume of water used for major factories [m ³ /day]	City water [m ³ /day]	Ground water [m ³ /day]	Ground water use per area [m ³ /day/km ²]	Number of factory	Factory density [factory/km ²]
1.Chanthabouly District	36	81,584	2,266	0	0	0	0	1	0.028
2.Hathxaifong District	230	93,231	405	1,450	410	1,040	4.52	15	0.065
3.Naxaithong District	851	65,757	77	5,010	0	5,010	5.89	6	0.007
4.Paknguem District	1,293	51,517	40	4,350	0	100	0.08	4	0.003
5.Sangthong District	308	27,478	89	0	0	0	0	0	0.000
6.Xaisettha District	166	104,998	633	6	0	6	0.04	6	0.036
7.Sikhottabong District	182	102,412	563	180	130	50	0.27	4	0.022
8.Sisattanak District	48	76,652	1,597	830	830	0	0	4	0.083
9.Xaithany District	806	150,725	187	860	180	680	0.84	43	0.053
Total	3,920	754,354	192	12,700	1,550	6,886	1.76	83	0.021

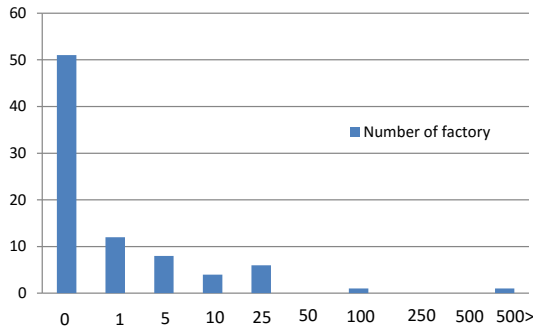


Figure 2.2.3.4 Amount of Factory Effluent [m3/day]

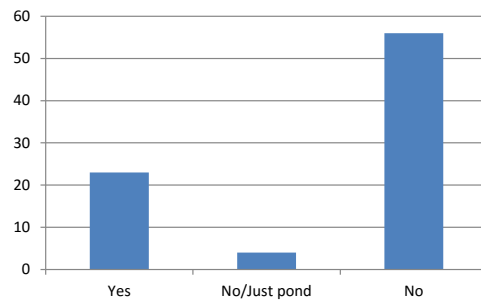


Figure 2.2.3.5 Installation of Wastewater Treatment Process

- For the installation of wastewater treatment process, actually there are still small numbers of factory only have treatment process, while more than half of them do not have sufficient process. **Figure 2.2.3.5** describes the situation.
- The detail is shown in **Figure 2.2.3.6**.

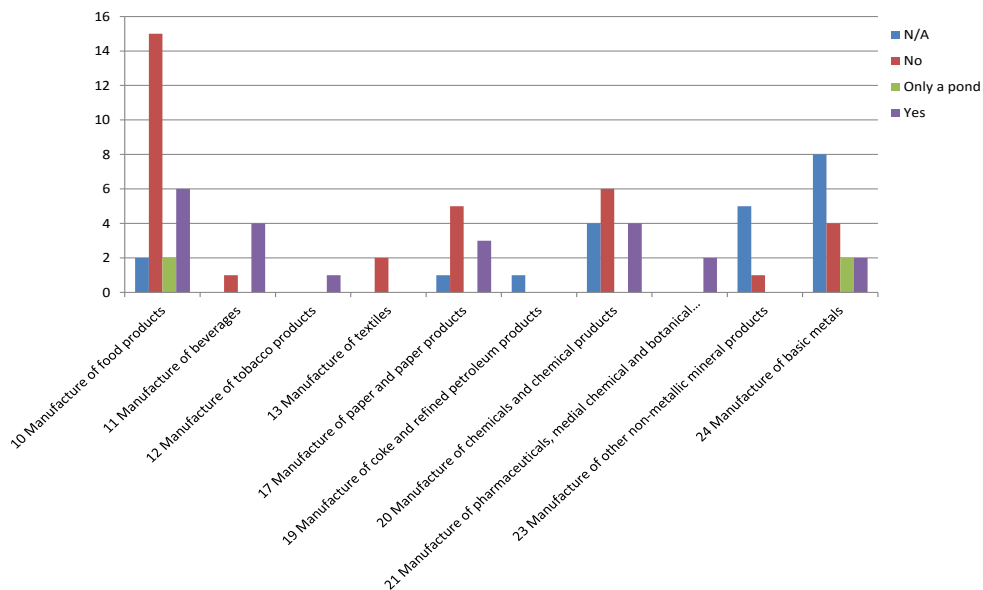


Figure 2.2.3.6 State of Wastewater Treatment Plant Installation Practice of Major Factories in Vientiane Capital

- 3) Creating “Database Systems” that can record various data related with wastewater of factories for providing inventory tools. (Second and Third year)
 - After extensive discussion for proper design of database, importance has been recognized as it should be used by practical work of each organization without any resistance. For that purpose, the form of the data base system should inherit “inspection records” of their own organizations.
 - The specification was determined as it includes total four records including

inspections by DoIC, DPWT and DONRE as well as newly designed desludging record. It would then also include conventional “Factory list”, “Questionnaire survey” of this activity, “Results of water quality analysis” and common inspection record as well

- Basic functions of Database should include implementation of internet communication that can provide a common platform where each organization can “input data”, “select data”, “output data” independently but can see inspection situation of other organizations. It also can provide “monthly report” tabulation function automatically.
- **Table 2.2.3.3** shows accessible relations between those tables and relevant organizations. In principle, the system does not allow correction of data by no other organization except office that controls the document. The final specifications of “Database system” were determined and contract was made with local software company.

Table 2.2.3.3 Accessible Relations between Tables and Relevant Organizations

Table No.	Name of Table	Number of items	Accessibility							
			DoIC	DONRE	DONRE (Laboratory)	PCI	Districts	DPWT	VUDA	JET
1	Factory list.accdb	40	●	○	○	○	○	○	○	●
2	Factory outline.accdb	34	●	●	●	●	●	●	●	●
3	DoIC inspection record.accdb	64	●	○	○	○	○	○	○	●
4	DONRE inspection record.accdb	25	○	●	○	○	○	○	○	●
5	DPWT inspection record.accdb	57	○	○	○	○	○	●	○	●
6	Record of questionnaire and JICA PWEV activity.accdb	38	●	●	●	●	●	●	●	●
7	Result of effluent quality analysis.accdb	47	●	●	●	○	○	○	○	●
8	Inspection record.accdb	40	●	●	●	●	●	●	●	●
9	Record of desludging practice.accdb	21	○	○	○	○	○	○	●	●
10.	DONRE Social Environment Trouble Shooting Record	25	○	●	○	○	○	○	○	●

Note: ●:Write/Read, ○:Read only

Some of the items may also include JPG pictures and PDF files.

Display layout should provide proper space for easy looking.

- The functions of Database can be summarized below;
 - ✓ **Data input:** Easy data input from prescribed formats. Some of the parameters should be provided by selection of data rather than input characters.
 - ✓ **Data selection:** Easy data selection from specially made inquiry form of Database, the selective conditions should have several items including "ID", "Name of factory", "Date of inspection", "Inspected organization", "Span of date", "Existing of effluent quality analysis data",

- ✓ **Output data selection:** Easily convert Database files into relevant Excel files. Easily print or output selected records into Excel file. Easily tabulate the number of selected records and print or output the results. Print out "Monthly Report" of each Table. The total number of effective records can be expressed in the Report, but number of records for each day of the month can be also presented for each Table.
- Interfacial efforts were made to bring easy operation as most of operations can be done by selection of icons as shown in **Figure 2.2.3.7**.



Figure 2.2.3.7 Screen of “Business Effluent

- **Hold training courses for operation of the database:** After completion of the first version, a series of training courses have been given in order to familiarize personnel who are to use it daily. The results of training and discussion are shown in **Table 2.2.3.4** and photos below.
- Operational manual of the database is attached as part 3 of “Inspection Guideline” as a reference for daily inspection works.

Table 2.2.3.4 List of Database Training and Discussion

Date	Main purpose of training	Number of participants
31/1/2017	Learn how to install “Google Drive” and “Database” Learn how to operate “Database”	21
7/2/2017/	Learn how to input data to “Database”	18
16/2/2017/	Discussion to deal with new factories and listing problems associating with operation	16
21/3/2017/	Discussion regarding how to handle with new requests presented from each administrative organization. Example: <ul style="list-style-type: none"> ✓ Need to add “Factory site area”, “Building area”, “License expire date” from DoIC ✓ Need to add “Date of analysis”, “Issue of results”, “Sample ID”, “Name of analysis personnel”, “New table for water quality table corresponding to customer service that shall not be open to the public” 	8

3-2 Through close collaboration with EMSP, to prepare/ improve guidelines/ draft rules for regular inspection of industries, monitoring of water quality from the industries, application for effluent discharge, administrative and technical guidance and regulatory enforcement

- 1) First version of Inspection Guideline (First year)
 - Creating first version of Inspection Guideline: Based on the fundamental attitude of Environmental Protection Law (revised 2012), the first version of Inspection Guideline was proposed by JET and the contents of it has been discussed among C/P members. Each of main statements was written as main part of the guideline.

- 2) Second version of Inspection Guideline (Second year)
 - Supplementary reference which described industrial wastewater treatment was made as Part2 of the guideline. In the second year, efforts have been also made to write explanatory parts for each main text that was written in the first version.

- 3) Final version of Inspection Guideline (Third year)
 - Results of factory research have been compiled as proper examples of wastewater treatment practices in Lao PDR.

3-3 To select pilot industries and industry groups/ associations and undertake capacity building activities regarding the operation of guidelines

- 1) Seminar at Lao National Chamber of Commerce and Industry on 24th, June 2016
 - The seminar was originally aimed to present “Japanese SME’s Products and Technologies for Water and Wastewater in 2016”.
 - To this seminar the Project participated as a presenter to make a lecture of “Introduction of industrial wastewater regulation and future trend of wastewater management in Lao PDR”
 - By this lecture, both the importance of the Project activity as well as future trend of regulation toward industrial wastewater was presented to Lao companies.

- 2) Seminar on Industrial Wastewater Management at Lao National Chamber of Commerce and Industry on 3rd April, 2017
 - For the final year, the Project held a seminar joint hosted by the Project and Lao National Chamber of Commerce and Industry in order to share its major outcome of the activities among industry owners and relevant officials. It was held in order to share its major outcome of the activities among industry owners and relevant officials. Fifty two in total have participated in the seminar.
 - In the seminar, C/P members pointed out that the present situation, introduced new “Inspection Guideline”, and acknowledged present situation of most of Lao administration offices. They also explained that the Project developed a new Database

System that can store most of administration works among relevant departments in Vientiane to bring innovative work for inspection. They also appealed importance of cooperation between public sectors and private sectors

- The JICA expert who has led the Project activities so far also shows three topics related with industrial wastewater treatment process. In the Seminar, he at first explains outline of treatment technology as he shows process examples implemented in Japan. Some basic knowledge is also presented
- By this seminar all the participants can understand importance of water environment and must have shared common understanding and recognition that many factories have direct responsibilities to the environment to improve. And mutual cooperation would be promoted by this basis of just and fair inspection and development of wastewater treatment technologies. A newspaper article reporting the seminar is shown below.



Vientiane Times (5/4/2017)

3-4 Train DONRE staff of VC for improvement of analytical skills of water quality including heavy metals, and to support the establishment of sustainable system of water quality monitoring and analysis for public water bodies and industrial discharges


- 1) Acquired analysis capacity in this project
 - Since November, 2016, starting the training of DONRE staff in the Project, DONRE laboratory has obtained analysis capacity of thirty two parameters as described their brochure published in April 2017.
 - However, some parameters such as cyanide, ammonia nitrogen are assumed by analyzed by HACH system, a simplified method not by authorized methods.
 - The project activity proceeded not only to acquire analysis capacity on operational level of reagent making and titration techniques, it also aimed to compile “Laboratory Manual” that can be used as a textbook for newcomers and precision

control. The part of laboratory management has been written in accordance with ISO 17025. Basic knowledge of water quality analysis is also included in it as a basic text to analysis. Standard Operation Procedures (SOP) for most of acquired parameters of analysis has been written by each member of DONRE laboratory to fix their actual methods.


- The content of “Manual of Good Laboratory Practice (GLP)” is presented in **Appendix 1**.

Parameter		
No	Item and Analysis Method	Unit
1	Transparency	cm
2	Temperature (Laboratory & Other non-depth measurement)	°C
3	Temperature (Depth measurement)	°C
4	Hydrogen Ion Exponent (pH)	pH Unit
5	Conductivity (EC)	µS/cm
6	Dissolved Oxygen DO (Direct Sensing Membrane Diffusion Method)	mg/L
7	Biochemical Oxygen Demand (BOD)	mg/L
8	Chemical Oxygen Demand (COD _{mn})	mg/L
9	Chemical Oxygen Demand (COD _{Cr})	mg/L
10	Total Coliform	MPN/100ml
11	Oil and Grease	mg/L
12	Total Nitrogen (T-N)	mg/L
13	Total Hardness	mg/L
14	Nitric Nitrogen (NO ₃ -N)	mg/L
15	Suspended Solid (SS)	mg/L
16	Total Dissolved Solid (TDS)	mg/L
17	Ammonia Nitrogen (NH ₃ -N)	mg/L
18	Calcium (Ca) AAs	mg/L
19	Lead (Pb) AAS	mg/L
20	Cadmium (Cd) AAS	mg/L
21	Zinc (Zn) AAS	mg/L
22	Copper (Cu) AAS	mg/L
23	Iron (Fe) AAS	mg/L
24	Manganese (Mn) AAS	mg/L
25	Hexavalent Chromium Cr ⁶⁺	mg/L
26	Total Chromium (T-Cr) AAS	mg/L
27	Cyanide (CN ⁻)	mg/L
28	Total Phosphorus (T-P)	mg/L
29	Sulfide (S ²⁻)	mg/L
30	Nickel(Ni) AAS	mg/L
31	Chloride (Cl ⁻)	mg/L
32	Residual Chlorine	mg/L

"Good Quality", "Accuracy" and "Fast" is our service motto !




Location Map of DONRE



Water Quality Analysis Laboratory

Department of Natural Resources and Environment, Vientiane Capital



Department of Natural Resources and Environment, Vientiane Capital

Village: Nonsa.Art. Rd 10

District: Xaythany, Vientiane Capital

Telephone: 0305520495, 020 55909695

Email: DONRE.Lab@gmail.com

Brochure of DONRE laboratory

- Evaluation of analysis capacity as a laboratory for water environmental monitoring agency.
 - ✓ Comparisons were made for how many parameters the laboratory has authorized method for each standard as defined by the Environmental Standard (2017) that has been newly established in Lao PDR.
 - ✓ **Table 2.2.3.5** presents analysis capacity and future requirement of equipment to cover environmental standard of surface water quality. Twenty one parameters including BOD, COD, SS, Coliform and so on can now be analyzed by authorized methods. Besides, seven more parameters including Color, H₂S, Cr⁶⁺ and so on can soon be analyzed if the laboratory obtains some budget to buy reagents and glass wares.

- ✓ However, the laboratory has to obtain budget in order to obtain to analysis capacity further to cover all the other parameters as described in Environmental Standard (2017).
- ✓ The detail has been discussed on the next section.

Table 2.2.3.5 Present Analysis Capacity and Future Requirement of Equipment to Cover Environmental Standard Parameters for DONRE Laboratory

No	Parameter	Symbol	Unit	Analysis Method	Present Capacity	Newly Required Equipment to Analyzes
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">NOTICE</p> <p>● : Possessing capacity ○ : Possible within existing facilities × : Require to newly install equipment</p> <p>*) : Colored analysis method is the one that should be selected another method for convenience.</p> </div>						
1	Color (and Odor)	Not identified	Not identified	Spectrophotometry	Need to buy consumable items but possible within existing facilities.	
10	Fecal Coliform Bacteria	Not identified	MPN/100 ml	Multiple Tube Fermentation Technique	Require to Newly Install	Another Incubator for (44.5°C)
12	Sediment Solid	SS		Imhoff Cone 1,000 cm ³ 1hour	Need to buy consumable items but possible within existing facilities.	
14	Hydrogen Sulphide	H ₂ S	mg/L	Titration	Need to buy consumable items but possible within existing facilities.	
15	Formaldehyde	CH ₂ O	mg/L	Spectrophotometry	Require to Newly Install	Distillation Apparatus
16	Per-manganese	MnO ₄ ⁻	mg/L	Per Iodic Acid Spectro Absorption Method	Need to buy consumable items but possible within existing facilities.	
20	Ammonium ion	NH ₄ ⁺	mg/L	Nesslerization	Require to Newly Install	Digestion Apparatus + Distillation Apparatus
21	Nitrate-Nitrogen	NO ₃ -N	mg/L	Cadmium Reduction	Need to buy consumable items but possible within existing facilities.	
22	Ammonia-Nitrogen	NH ₃ -N	mg/L	Distillation Nesslerization	Require to Newly Install	Distillation Apparatus
23	Total Nitrogen	TKN	mg/L	Nesslerization	Require to Newly Install	Digestion Apparatus + Distillation Apparatus
24	Phenol	C ₆ H ₅ OH	mg/L	Distillation, 4-Amino antipyrine	Require to Newly Install	Distillation Apparatus
30	Chromium Hexavalent	Cr ⁶⁺	mg/L	Diphenylcarbazide method	Need to buy consumable items but possible within existing facilities.	
33	Barium	Ba	mg/L	AA-Direct Aspiration	Need to buy consumable items but possible within existing facilities.	
34	Mercury	Hg	mg/L	AA-Cold Vapour Technique	Require to Newly Install	Cold-Vapor Atomic absorption Apparatus
35	Arsenic	As	mg/L	AA-Hydride Generation or ICP	Require to Newly Install	AA-Hydride Generation Apparatus
36	Selenium	Se	mg/L	AA-Hydride Generation or ICP	Require to Newly Install	AA-Hydride Generation Apparatus
37	Cyanide	CN ⁻	mg/L	Pyridine-Barbituric Acid	Require to Newly Install	Distillation Apparatus
38	Radioactive (Alpha)	α	Becquerel/L	GC	Require to Newly Install	Geiger-Muller Counter
39	Radioactive (Beta)	β	Becquerel/L	GC	Require to Newly Install	Geiger-Muller Counter
40	Organochlorine pesticide		mg/L	GC	Require to Newly Install	GC/MS
41	Dichlorodiphenyltrichloroethane	DDT	μg/L	GC	Require to Newly Install	GC/MS
42	alpha Benzene hexachloride	α-BHC (C ₆ H ₆ Cl ₆)	μg/L	GC	Require to Newly Install	GC/MS
43	Dieldrin	C ₁₂ H ₄ Cl ₁₀ O	μg/L	GC	Require to Newly Install	GC/MS
44	Aldrin	C ₁₂ H ₈ Cl ₄	μg/L	GC	Require to Newly Install	GC/MS
45	heptachlor and heptachlor epoxide	C ₁₂ H ₁₀ Cl ₇ And C ₁₂ H ₉ Cl ₇ O	μg/L	GC	Require to Newly Install	GC/MS
46	Endrin	C ₁₂ H ₆ Cl ₁₀ O	μg/L	GC	Require to Newly Install	GC/MS
47	Pesticide	-	mg/L	GC	Require to Newly Install	GC/MS
48	Radioactive		mg/L		Require to Newly Install	Detector
50	Turbidity		NTU	Turbidity Meter	Require to Newly Install	Turbidity Meter
51	Fluorine	F	mg/L	Ion Chromatograph	Require to Newly Install	Steam Distillator + Ion Chromatograph
53	Ignition Loss (Organic Content)		mg/L	Weight Method	Require to Newly Install	Electric Furnace
54	MLSS	MLSS	mg/L	Weight Method	Require to Newly Install	Centrifuge
55	General (Pure water)				Require to Newly Install	Pure Water Production System
56	Microorganisms			Microscopic observation	Require to Newly Install	Microscope

- 2) Future visions of analysis capacity to meet the needs for the laboratory who should contribute as a representative water quality laboratory section in Vientiane Capital
- Future expansion should be planned by two steps in accord with progress in capacity development of laboratory members.

- The first step should to establish more common parameters that should be regarded as on the extension of acquired parameters as of today.
- The second step may be planned in order to meet all the remaining parameters of Environmental Standard as of 2017.
- The initial cost of installation is totalized in **Table 2.2.3.6** and image of laboratory building expansion is illustrated in **Figure 2.2.3.8**.
- However, more important is establishing scheme that relevant organizations of Vientiane Capital would provide water quality samples and necessary budget to DONRE laboratory to continue their analysis. And DONRE should pay their efforts to announce that new laboratory can provide water quality analysis services both for official sectors as well as private sectors.

Table 2.2.3.6 Cost of Installing New Equipment

First Step		
Parameter	Equipment	Cost [USD]
Expansion of laboratory building	Building of 58m ²	30,015
	Fume Hood	9,000
	Experimental table(4)	11,000
Turbidity	Turbidity Meter	3,000
Sediment solid	Imhoff cone	500
Ignision Loss (Organic Content)	Electric Muffle Furnace	6,000
MLSS	Centrifuge	3,500
Pure water	Pure Water Production System	7,000
Microorganisms	Microscope	4,500
Fecal Coliform Bacteria	Incubator(44.5 C)	2,800
Formaldehyde, Ammonia ion, Ammonia nitrogen, Total nitrogen, Phenol, Cyanide,	Distillation apparatus	25,000
Ammonium ion, Total nitrogen,	Digestion apparatus	4,500
Mercury	Cold vapor atomic absorption apparatus	1,200
Arsenic Selenium	Atomic absorption apparatus (Furnace type) with AA-Hydride Generation apparatus	88,800
Barium	Hollow cathode lamp for AA	1,000
Fluorine	Steam Distillation apparatus	5,600
	Ion Chromatograph	100,000
Total (First Step)		303,415
Second Step		
Parameter	Equipment	Cost [USD]
Organochlorine pesticide, Dichlorodiphenyltrichloroethane, alpha- Benzene hexachloride, Dieldrin, Aldrin, heptachlor and heptachlor epoxide, Endrin,	GC/MS	132,500

Pesticide		
Radioactive (Alpha)	Detector	10,000
Radioactive(Beta)		
	Total (Second Step)	142,500
	Grand Total	445,915

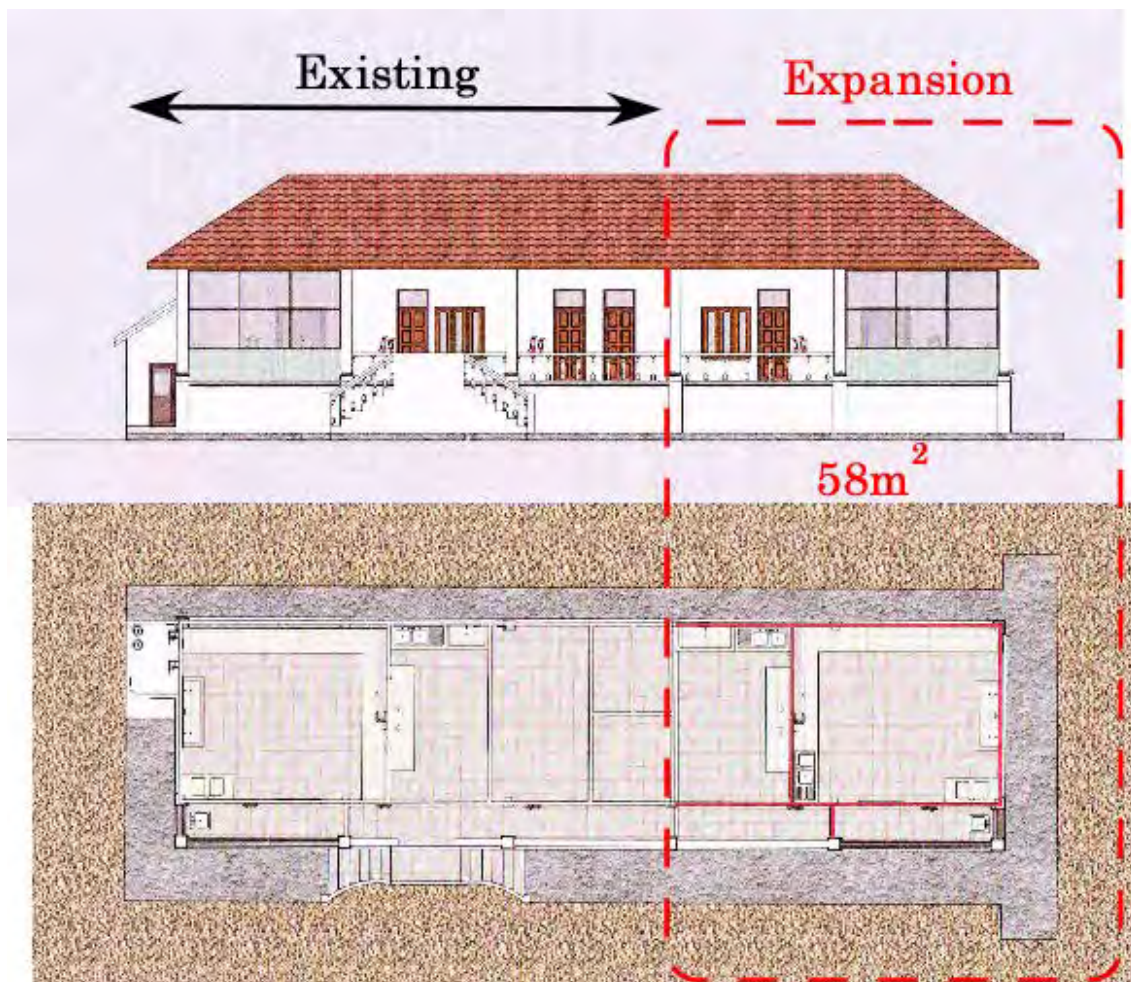


Figure 2.2.3.8 Image of Laboratory Building Expansion

Developed documents prepared under Output 3 are:

- “Inspection Guidelines”
- “Manual of Good Laboratory Practice (GLP)”

Table of contents of the developed documents above are presented in **Appendix 1** and documents are prepared as separate volumes.

(4) Output 4: People’s awareness is raised through environmental education

4-1 To establish/ strengthen the network of various organizations in the environmental education programs, together with developing educational tools

The activities related to Output 4 on environmental education have been conducted in collaboration with the following NGOs, governmental institutions and donors. The results of collaboration are shown as follows:

Table 2.2.4.1 Results of Collaboration with other Environmental Education Programs

	Project / Organization	Outline of Collaboration
1	BORDA : Bremen Overseas Research and Development Association (NGO)	➤ Re-establishment of O&M system and awareness campaign for DEWATS in Thongkhankham village
2	ProCEEd (GIZ)	➤ Exchange information and experiences
3	LPPE (JICA)	➤ Application of contents and tools prepared by LPPE to educational tools of PWEV
4	Green School Project (DONRE, MONRE)	➤ Application of contents and tools prepared by Green School Project to educational tools of PWEV
5	French Project (GRET & WTA)	➤ Exchange information and progress between PWEV and FSM for standard of septic tanks, regulation of sludge management and awareness campaign for promotion of proper desludging
6	Kyoto Project (JICA Partnership Program)	➤ Exchange information and experiences

(PWEV: The Project for Urban Water Environment Improvement in Vientiane Capital in the Lao People’s Democratic Republic)

(FSM: Fecal Sludge Management Project supported by French donors)

The seminar on environmental education was held in July 2017 to share information, experiences and lesson learned for environmental education with related organizations in Laos.

4-2 To develop facilitators and resource persons for environmental education to the community (not only school)

The educational tools for environmental education including 3 posters, card game and side reader were newly developed according to the request from C/Ps and school teachers. Training of Trainer for environmental education intended for C/Ps and teachers in 10 primary schools was implemented. Finally, the environmental education at 10 public primary schools in VC was implemented by trained teachers. The 10 primary schools, which conducted the session for environmental education, were designated as “Model School for Environmental Education” by Department of Education and Sports in VC. It is expected that the designated 10 schools will conduct the environmental education with the provided educational tools and program continuously after next year.

1) Development of Educational Tools for Environmental Education

Table 2.2.4.2 Developed Educational Tools for Environmental Education

	Educational Tool	Contents
1	Side Reader	<ul style="list-style-type: none"> ▪ Amendment of side reader developed by PTI-JICA and LIRE-BORDA in “The Study on Improvement of Water Environment in Vientiane City” (2011, JICA) ▪ Table of Contents <ul style="list-style-type: none"> I. Water Environment <ul style="list-style-type: none"> 1 Let’s Learn about Water Pollution 2 Quiz for Activities to Prevent Surrounding Water Pollution 3 Let’s Learn How to Make Household Wastewater Clean 4 Let’s check where polluted water is around you 5 Let’ clean around your school or community together II. Hygiene and Sanitation <ul style="list-style-type: none"> 6 Let’ Wash Hands with Soap 7 Let’s Learn Good and Bad Hygiene Behaviors 8 Let’s Keep Clean Environment through Housekeeping
2	Poster	<ul style="list-style-type: none"> ▪ Poster 1: Surrounding Water Pollution ▪ Poster 2: How to Make Household Wastewater Clean? ▪ Poster 3: 3R (Reduce, Reuse, Recycle)
3	Card Game	<ul style="list-style-type: none"> ▪ Quiz for activities to prevent surrounding water pollution

2) Training of Trainer for School Teachers

Table 2.2.4.3 Training of Trainer for School Teachers

	Item	Description
1	Date	26th Feb, 2016 3rd, 10th and 17th March, 2017
2	Participants	50 people in total Target Teachers in 10 Primary Schools in VC District of Education (Sikhottabong, Sisattanak, Chanthabuly)
3	Agenda	1) Model Lecture for Poster and Card Game (by trained teacher) 2) Model Participatory Learning for “School Mapping” (by trained teacher)



Training of Trainer at Khualuang Primary School

3) Environmental Education in Primary Schools

Table 2.2.4.4 Environmental Education at Primary Schools

	Item	Description
1	Target School	10 Primary Schools in VC (Khualuang, Phonesinuan, Nongbuathong, Sihorm Hongkha, Sathaphone, Saphanthongnuea, Sokpalouang, Xokyai, Nongbouathongtai)
2	Target Grade	3rd, 4th and 5th grade students
3	Date	Half a day in March for each primary school (Year 2016) Half a day in March to April for each primary school (Year 2017)
4	Agenda	1) Lecture for Poster and Card Game (by trained teachers) 2) Participatory Learning for “School Mapping” (by trained teachers)



Environmental Education in School



Environmental Education by Poster



Sketch of Canal at Site



Group Work for “School Mapping”

4-3 To support water quality monitoring for public water bodies, rivers and streams and publication of the monitoring results with its interpretation

1) Plan for Water Quality Monitoring

The plan for water quality monitoring was prepared to establish sustainable framework for water quality monitoring in public water body of VC.

Table 2.2.4.5 Plan for Water Quality Monitoring

	Item	Description
1	Monitoring Point	<ul style="list-style-type: none"> ▪ 9 points of public canal in urbanized area of VC (2nd Year) ▪ 5 points of public canal in urbanized area of VC (3rd Year)
2	Period	<ul style="list-style-type: none"> ▪ October 2015 to September 2016 (2nd Year) ▪ October 2016 to September 2017 (3rd Year)

Item	Description
3 Frequency	<ul style="list-style-type: none"> Basically 1 time per 1 month (8 times in total) (2nd Year) October 2016, January, April, July 2017 (4 times in total) (3rd Year)
4 Analysis Items	<ul style="list-style-type: none"> Site measurement: Water Temperature, pH, DO, EC Analysis in laboratory: BOD, COD(Mn), COD(Cr), SS, T-N, T-P, Total Coliform, Heavy Metal

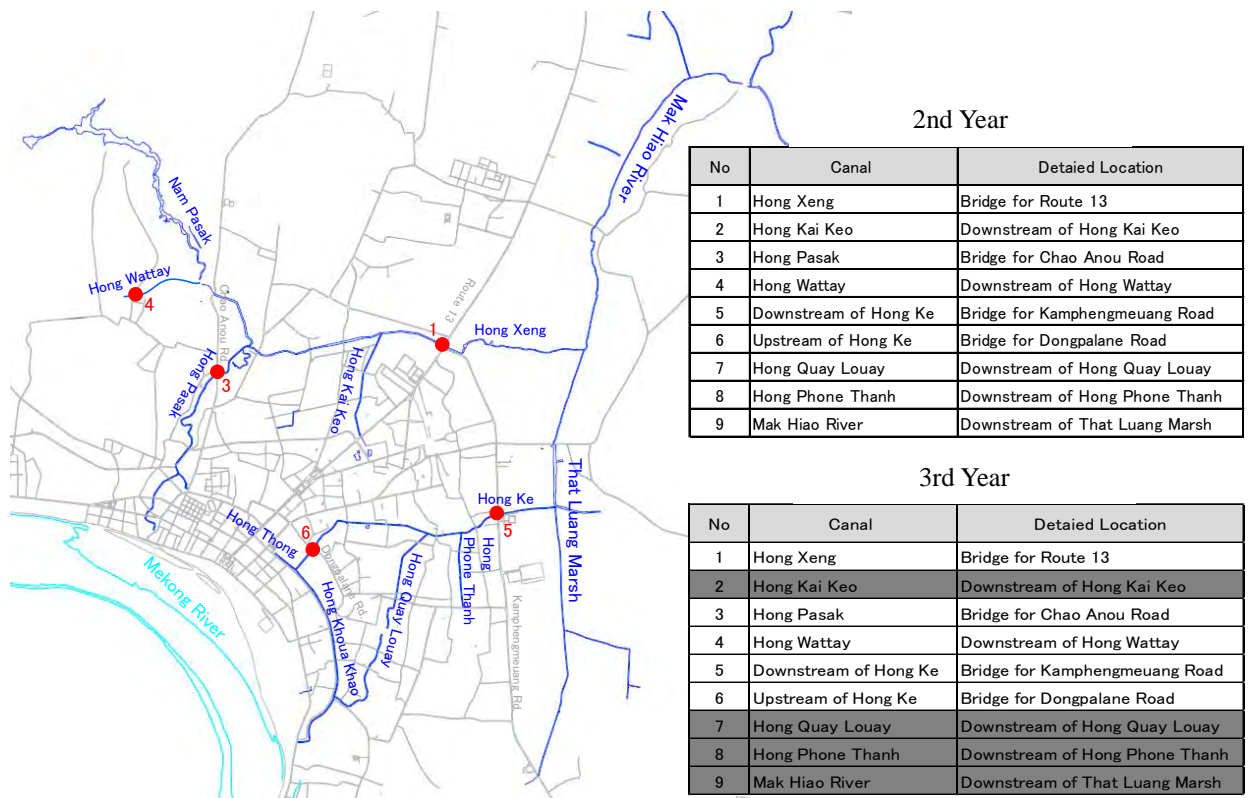


Figure 2.2.4.1 Water Quality Monitoring Points

2) Water Quality Monitoring Report for Public Water Body

The water quality monitoring report for public water body in VC in 2015 to 2016 was prepared according to the monitoring results of 2nd year of the Project. The description of BOD in the monitoring report is shown in **Figure 2.2.4.2**.

Results of Water Quality Monitoring

(1) BOD

- The Value of BOD in upstream of Hong Ke and Hong Xeng (No. 3, 4 and 6) is higher than that in other points.
- It is found that upstream of Hong Ke and Hong Xeng are heavily polluted due to discharge of wastewater from households, factories and commerce facilities.
- The value of BOD in every points doesn't meet the national environmental standard of Laos.
- The value of BOD in the end of dry season is higher than that in the beginning of dry season. The water quality has deteriorated as dry season goes by.

No.	Canal	Detailed Location
1	Hong Xeng	Bridge for Route 13
2	Hong Kai Kao	Downstream of Hong Kai Kao
3	Hong Pasak	Bridge for Chao Anou Road
4	Hong Vatay	Downstream of Hong Vatay
5	Downstream of Hong Ke	Bridge for Khamthongmeasuring Road
6	Upstream of Hong Ke	Bridge for Songkhana Road
7	Hong Ouai Louay	Downstream of Hong Ouai Louay
8	Hong Phou Thaneh	Downstream of Hong Phou Thaneh
9	Nak Hae River	Downstream of That Luang Marsh

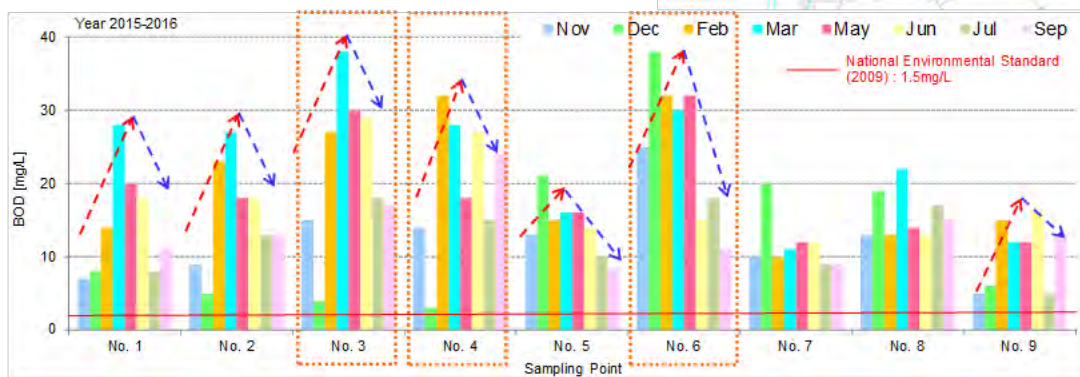


Figure 2.2.4.2 Description of BOD in Monitoring Report

3) Publication of Monitoring Results

It is important to disclose water quality monitoring results to not only government sectors but also general public. People's awareness for water environment could be raised through publication of water quality monitoring results with easily understandable interpretation.

All the results of water quality monitoring conducted by the Project until now have been disclosed on the following Project Homepage and Facebook.

<http://pwevproject.weebly.com/>

<https://www.facebook.com/pwevproject/?fref=ts>

4-4 To support regular cleaning activities of canals by the communities displaced by VUDAA providing incentives to the communities (reminding rainy season)

Although VUDAA have a responsibility to conduct maintenance for river and canal in VC, they have rarely conducted maintenance for small canals except for big canals (e.g. Hong Ke and Hong Xeng, etc.) due to lack of sufficient budget. In the 2nd year, the cleaning activity with participation of residents for Hong Phone Thane was conducted as a pilot project in cooperation with Xaysettha District, Saphangmor Village, Phonethan Village and VUDAA. In the 3rd year, the cleaning activity with participation of residents for the most polluted area of Hong Pasak

was conducted as a pilot project in cooperation with Chantabuly District, Khoualuang Village and VUDAA. The purposes of these cleaning activities with participation of residents are to establish the sustainable framework for cleaning activities of small canals by communities and to raise people’s awareness for water environment conservation. The participants mainly cut grass by grass cutter and collected garbage along the canal by iron rake or hand. The accumulated sludge and garbage in the canal was removed by the excavator arranged by the Project. The removed sludge was stored temporarily at empty land to dry up for a certain period, and was finally disposed as landfill soil.

Table 2.2.4.6 Outline of Cleaning Activity (2nd Year)

	Item	Contents
1	Target	Hong Phone Thanh (950m)
2	Participants	Around 100 residents and children in Saphangmor and Phonethan Village
3	Date	1st time: 12th March, 2016 2nd time: 18th June, 2016
4	Organized by	Xaysetha District, Saphangmor and Phonethan Village
5	Supported by	VUDAA, PWEV, JICA



Opening Ceremony (Awarding Certificate)



Cutting Grass by Cutting Machine and Sickle



Sludge Removal by Excavator



Collecting Garbage and Grass on Truck

Table 2.2.4.7 Outline of Cleaning Activity (3rd Year)

	Item	Contents
1	Target	Hong Pasak
2	Participants	Around 100 residents and children in Khoualuang Village
3	Date	7:00 to 16:00, 25th March, 2017 8:00 to 13:00, 26th March, 2017
4	Organized by	Chantabuly District, Khoualuang Village
5	Supported by	VUDAA, PWEV, JICA



Before Cleaning Activity



After Cleaning Activity

The agreement to establish the framework for sustainable cleaning activity in Hong Phone Thane as shown in **Figure 2.2.4.3** was approved by Xaysetha District on 3rd of October, 2016. According to interview with the head of Phonethane village, the cleaning activity for Hong Phone Thane was conducted by residents of Phonethane village on 4th of March, 2017. Hong Phone Thane has been kept in clean condition as a result of continuous cleaning activity by residents.



Hong Phone Thane after Cleaning Activity

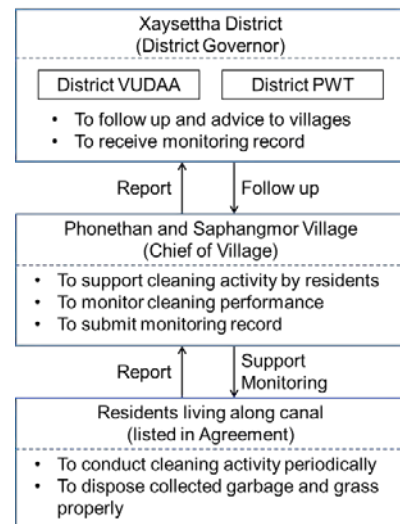


Figure 2.2.4.3 Framework of Sustainable Cleaning Activity

4-5 To implement the campaign for the load reduction from wastewater and to support cleaning and proper management of septic tanks and decentralized wastewater treatment facilities providing incentives to the communities

1) Collaboration with French Project

The construction of sludge treatment plant at KM21, Nahai village and the preparation of regulation for septage management are included in the component of the Fecal Sludge Management Project (FSM) supported by French donors. The meeting with the person in charge of FSM (GRET and WTA) has been held periodically to confirm the project activities and progress of both projects. It is good opportunity to establish the effective fecal sludge management system and promote proper desludging from septic tanks, because new sludge treatment plant at KM21, Nahai village closer to urbanized area of

VC than existing one at KM32 started commissioning in the beginning of 2017. The both sides mutually agreed the framework of collaboration as shown in **Figure 2.2.4.4**.

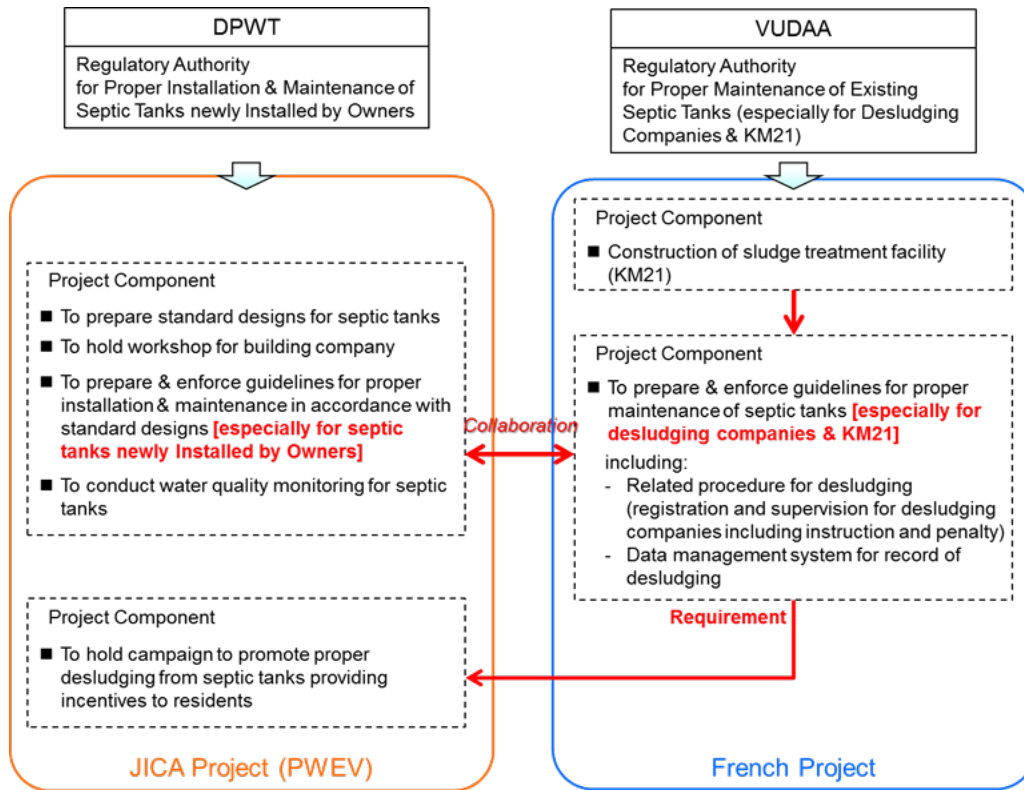


Figure 2.2.4.4 Framework for Collaboration with Fecal Sludge Management Project

2) Promotion of Desludging

The campaign for promotion of proper desludging from septic tanks was held at Thongkhankham village in cooperation with VUDAA and FSM in March 2017. The Project Director of FSM also joined the demonstration of desludging, and explained the importance of periodical desludging and new sludge treatment plant through the interview in the documentary program of Lao Television. After the demonstration of desludging, totally 43 households applied and conducted desludging from septic tanks. The desludging company transported the collected sludge to new sludge treatment plant at KM21, Nahai village and distributed the designated pamphlet and sticker to households for raising awareness.

The awareness movie which promotes the periodical desludging from septic tanks was posted on the Project Facebook. The documentary program which introduced the campaign for promotion in Thongkhankham village was also put on Lao Television. The Fecal Sludge Management Project (FSM) supported by French donors will also conduct an awareness campaign for promotion of desludging in cooperation with the Project through social media in this year. The awareness campaign for promotion of desludging from septic tanks is continuing through social media, so it is expected that the

regular desludging from septic tanks is continued in the target village and expanded to other villages.



Desludging Truck



Desludging from Septic Tank



Sticker



Provision of Pamphlet and Sticker

4-6 To establish a framework for sustainable environmental education in the formal education and social system in Vientiane Capital

1) Proposal for Improvement of School Textbook

The project for amendment and improvement of curriculum and textbook in basic education has been implemented by Research Institute of Education Science, Ministry of Education and Sports (RIES, MoES) from 2015 to 2022 with assistance provided by Australia. In Lao PDR, the contents related to environmental issues in primary school are included in the subject named “World around Us”. It is good opportunity to update the contents related to environmental issues in the textbook of “World around Us” for establishment of sustainable environmental education system.

The revised contents only for environmental issues and education in the textbook of “World around Us” were proposed to RIES based on the developed educational tools (side reader, card game and poster).

2) Student Picture Competition

The student picture competition sponsored by the private company under the theme of water environment conservation was held in May 2016 and May 2017. The targets were students of 4 primary schools (Khualuang, Nongbuathong, Phonesinuan and Sihorm Primary School) in 2016 and students of 30 primary schools in Chantabuly, Sikottabong, Xaysettha and Sisattanak District of Vientiane Capital. The excellent pictures were displayed and awarded on Children’s Day Festival at Department of Education and Sports (30th May, 2017 and 31st May, 2016). The awareness campaign for children participating in Children’s Day Festival was also implemented by DONRE staff using educational tools developed by the Project.



One of Selected Excellent Picture



Exhibition of Pictures



Awarding Ceremony



Awareness Campaign

3) Seminar on Environmental Education

The seminar on environmental education was held on 7th of June, 2017 to share information, experiences and lesson learned for environmental education with related organizations in Laos. Totally 45 people including related public agencies, donors and NGOs joined the seminar chaired by Deputy Director General of DONRE.

The developed tools and material prepared under Output 4 including educational tools, water quality monitoring report and revised textbook are presented in separate volumes.

2.3 Meetings and Study Tours

(1) Meetings

1) Kick-off Meeting

Kick-off Meeting was held at the departure of the site work of JET of the Project on October 15th, 2014 chaired by Mr. Bounchanh KEOSITHAMMA, Deputy Director General, DPWT, VC and participated by representatives of Lao authorities concerned, JICA, and JET. Summary of the meeting is as follow:

Time: 9:00 A.M. - 11:00 A.M.

Venue: Meeting Room in DPWT, VC

Main Agenda:

- (a) Explanation of JICA Technical Cooperation Project
- (b) Explanation of Draft Work Plan
- (c) Confirmation of Items and Schedule

2) Joint Coordinating Committee Meetings and Other Meetings of High Rank Officers

Joint Coordinating Committee (JCC) meetings were organized to explain, discuss, and agree on the Work Plan and to discuss project progress and to coordinate with other institutions concerned throughout the project period. The JCC meetings were scheduled to be held at least once a year and whenever necessity arises. Its functions are as follows:

- To discuss and decide overall strategies in the management and coordination of the Project
- To review and endorse the annual plan of the Project
- To monitor and evaluate the progress of the Project
- To discuss any other issue(s) pertinent to the smooth implementation of the Project.

Member of the JCC, which was agreed and signed by DPWT and JICA in June 11th, 2014, is shown in **Table 2.3.1**.

Table 2.3.1 Member of JCC

Position in the JCC	Organization
Chairperson	Vice Governor, VC
Committee Members in Lao side	Representative(s) of DHUP, MPWT
	Representative(s) of PTI, MPWT
	Representative(s) of PCD, MONRE
	Representative(s) of NREI, MONRE
	Representative(s) of DESIA, MONRE
	Representative(s) of MoIC
	Representative(s) of MAF
	Representative(s) of DPWT, VC
	Representative(s) of DONRE, VC
	Representative(s) of VUDAA, VC
	Representative(s) of DoIC, VC
	Representative(s) of DAF, VC
	Any other invitees deemed necessary and appropriate by the chairman and other

Position in the JCC	Organization
	members
Committee Members in Japanese side	JICA Experts
	Representative(s) of JICA Laos Office
	Other personnel concerned to be decided and/or dispatched by JICA, if necessary
Observer	Official(s) of the Embassy of Japan in Lao PDR
	Other official(s) of appointed by the Project Leader may attend the Committee meetings as observer(s)

Quarterly meeting was proposed by Mr. Bounthanong KEOSITHAMMA, the Project Director and C/Ps following the request of Mr. Keophilavanh APHAILATH, Vice Governor, VC and Chairman of JCC meeting who would like to increase JCC meetings, to make better understanding and to get advice and support of higher rank officers. Quarterly meetings were held with the same Chairman and invited officers as JCC meeting. In the third year, Stakeholders meetings and Public Hearing were held instead of Quarterly meeting, as invited officers were the same as Quarterly meeting. JCC meetings, Quarterly meetings, Stakeholders meetings and Public Hearing held are summarized in **Table 2.3.2**. Minutes of Meeting of JCC are attached in **Appendix 9**.

Table 2.3.2 JCC and Quarterly Meetings

Date	Meeting	Venue	Main Agenda
15/10/2014	The First JCC Meeting	Meeting Room in DPWT, VC	<ul style="list-style-type: none"> • Overall Explanation of Draft Work Plan by Project Manager • Explanation of the Project including each activity of 4 WGs in the first year by Co-Chief Advisor • Supplementary Explanation by Chief Advisor • Discussion of the Project • Conclusion by Chairman
26/8/2015	The First Quarterly Meeting	Meeting Room in DPWT, VC	<ul style="list-style-type: none"> • Presentation of Quarterly Report and the results of Training in Japan by Project Manager and team readers of 4 working groups • Discussion of the Project • Conclusion by Chairman
23/10/2015	The Second JCC Meeting	Conference Room in Mercure Hotel, VC	<ul style="list-style-type: none"> • Overall Explanation of Activities done in the First Year • Explanation of Revised PDM • Overall Explanation of Work Plan of Second Year • Key Issues in Second Year • Attention points of 2nd year activity implementation • Discussion of the Project • Conclusion by Chairman
26/2/2016	The Second Quarterly Meeting	Meeting Room in DPWT, VC	<ul style="list-style-type: none"> • Project activity of the last 3 months by Project Manager • Presentation of strategy of wastewater management, decentralized wastewater treatment facility and septic tank, factory inspection guideline, and environment education • Topic of Water Environment Improvement in VC by Chief Advisor • Discussion of the Project

			<ul style="list-style-type: none"> • Conclusion by Chairman
25/5/2016	The Third JCC Meeting	Conference Room in Vientiane Plaza Hotel, VC	<ul style="list-style-type: none"> • New Arrangement for CBS Management (DEWATS in Thongkhankham Village) • Mid-term evaluation report • Project activities of the last 3 months and plan for the next 3 months • Discussion of the Project • Conclusion by Chairman
16/12/2016	The Forth JCC Meeting	Meeting Room in City Hole, VC	<ul style="list-style-type: none"> • Progress Report (May - December, 2016) • Explanation of Draft Work Plan for 3rd year Meeting schedule of the Third year • Discussion of the Project • Conclusion by Chairman
14/2/2017	Stakeholders Meeting for Inspection Guideline for VC	Meeting Room in DPWT, VC	<ul style="list-style-type: none"> • Background of proposing an inspection rule • Outline of “Rule for Regular Inspection of Industrial Effluents” • Discussion of the rule
23/3/2017	Stakeholders Meeting for Strategy of Wastewater Management for VC	Meeting Room in DPWT, VC	<ul style="list-style-type: none"> • Fundamentals of the Strategy (Background, Contents, Purpose, Target, ZC) • Measures and Activities of the Strategy • Discussion of the Strategy • Conclusion by Chairman
30/3/2017	Stakeholders Meeting for Standard designs and guidelines of septic tank and DEWATS	Meeting Room in DPWT, VC	<ul style="list-style-type: none"> • Frame work for decentralize wastewater treatment facility • Draft of technical management for decentralize wastewater treatment facility • Discussion of on-site treatment facility including septic tank • Conclusion by chairman
22/6/2017	The Fifth JCC Meeting	Meeting Room in Crown Plaza Hotel, VC	<ul style="list-style-type: none"> • Project Activities from start up to now and plan to the end of the project • Terminal Evaluation Report • Discussion on the activities and Terminal Evaluation Report • Signing of Evaluation Report • Conclusion by Chairman
16/8/2017	Public Hearing for Strategy of Wastewater Management for VC	Meeting Room in DPWT, VC	<ul style="list-style-type: none"> • Introduction of Project activities • Explanation of Strategy of Wastewater Management for Vientiane Capital (Draft) • Discussion on the Strategy • Conclusion / Closing Remarks
27/9/2017	The Sixth JCC Meeting	Meeting Room in Muong Thanh Luxury Vientiane Hotel	<ul style="list-style-type: none"> • Presentation of the Project Activities from the start up to the end of the Project • Explanation of Project Completion Report • Discussion on Project completion Report

3) Weekly Meetings of C/Ps and JET

Technologies and knowledge were transferred from JET to C/Ps mainly through training programs and seminars in Laos, Japan, Vietnam, and Thailand, such as weekly meeting of C/Ps, workshops with related entities, field activities in schools and communities.

Weekly meeting has functioned not only for information sharing purpose but also for training opportunities of specific agenda such as findings of water environmental situation and solution, design of wastewater treatment facilities, management of industrial wastewater, sewerage planning, roles and responsibilities of relevant authorities, and financial arrangement, etc.

Weekly meeting were held basically every Thursday morning with participants of all C/Ps, JET and representative of JICA Laos office. Numbers of meetings with C/Ps and JET including weekly meeting are summarized in **Table 2.3.3**.

Table 2.3.3 Numbers of Meetings with C/Ps and JET

Period	The first Year 2014/10 -2015/9	The Second Year 2015/10 -2016/9	The Third year 2016/10 -2017/10
CP Meeting	1	-	-
Working Group Meeting	6	-	-
Group Leader Meeting	2	-	-
Weekly Meeting	41	42	42

(2) Training in Japan and Study Tours

In total, 39 Lao counterpart personnel participated in training courses held in Japan, and study tours in Vietnam and Thailand. The summary of the training courses are shown in **Table 2.3.4**.

Table 2.3.4 Summary of Training Overseas Courses

Country: Title	Period	Number of Participants
1) Training in Japan: Capacity Improvement for Wastewater Treatment in Vientiane Capital I	21st July - 31st July, 2015	14
2) Study Tour in Vietnam Capacity Improvement for Wastewater Treatment in Vientiane Capital II	21st November - 25th November, 2016	15
3) Study Tour in Thailand Capacity Improvement for Wastewater Treatment in Vientiane Capital III	12th December -14th December, 2016	5
4) Study Tour in Bangkok, Thailand Capacity Improvement in Water Quality Analysis and Laboratory Management skills	28th August -30th August, 2017	5
Total	-	39

1) Training in Japan (Capacity Improvement for Wastewater Treatment in Vientiane Capital I)

Objectives of the training were to study Japanese experience of planning and O&M of wastewater management and to strengthen the capacity to manage water environment conservation. Targets of the training were to consider possible application of Japanese practice on institution, planning, and operation of wastewater management, decentralized wastewater treatment facilities, control of factory discharge, and public awareness raising activities. The record of training in Japan including outline and trainee list is shown in **Appendix 5**.

2) Study Tour in Vietnam (Capacity Improvement for Wastewater Treatment in Vientiane Capital II)

Study tour in Vietnam headed by Mr. Bounchanh KEOSITHAMMA was held with total 15 C/Ps at Hanoi, Danang, and Hoi An, Viet Nam to understand the practice of neighboring country on institutional arrangement for wastewater management and projects implementation using Japanese ODA.

3) Study Tour in Thailand (Capacity Improvement for Wastewater Treatment in Vientiane Capital III)

Study tour in Thailand headed by Mr. Khamthavy THAIPHACHANH was held with total 5 C/Ps at Chian Mai, Thailand to understand the practice of neighboring country on supplying water to canal for purification of canal water.

4) Study Tour in Bangkok, Thailand (Capacity Improvement in Water Quality Analysis and Laboratory Management skills)

Study Tour in Bangkok, Thailand headed by Ms. Khamla THAMMAVONG was held with total 5 C/Ps to obtain technical knowledge and know-how of water quality analysis and management of laboratory.

Chapter 3 Issue, Countermeasure, and Lesson Learnt in the Project

3.1 Issue and Countermeasure

	<u>Issues</u>	<u>Countermeasures</u>
1	Necessity of conservation of water environment and wastewater treatment is not enough recognized by public and city personnel level, though it is discussed in the national level.	Discussion among C/Ps and JET was started on the present situation, causes, and future threat of water environment in VC, and measures to be taken. To enlighten public awareness, periodical water quality monitoring for public water bodies and publication of analysis results were proposed and this activities were decided to add the project activities from second year.
2	Available time of C/Ps is limited. Available time for the training is only half day a week for the activities of all groups, since the group members of all WG are overlapped and cannot be separated to each WG either use longer hours for the C/Ps in order not to disturb their own job.	JET tries to visit a key person for 1 to 2 C/Ps per week to discuss with a certain matter and for data collection. It is very difficult for JET to cover the scheduled activities with their limited assignment and not clear that one by one meeting is enough for the work schedule to be on time. Grouping of C/Ps were revised to participate maximum two groups for one person to reduce the C/P's burden and the operation of new group members will start from the second year of the project.
3	It's necessary to increase incentive of counterparts.	The project was proposed to be approved by VC in JCC meeting on December 15, 2014 and budget of the project activities was proposed to VC. Higher priority to be nominated as trainee for training in Japan should be given to actively participated C/Ps. Performance certificates according to the contribution levels to the project were awarded occasionally to keep C/Ps incentive always high level.
4	It's necessary to find out proper analysis way of water quality for existing wastewater treatment facilities (DEWATS, septic tanks, and industrial wastewater WWTP) and canals in VC.	In this time, water quality analysis is requested to Department of Irrigation, which is only one agent to be able to comply with JET requirement at the moment. A part of samples will be analyzed in Japan for confirmation purpose of accuracy. After getting the results, it was found that the analysis by locally available entities was not sufficient against the Project requirement. DONRE was decided to analyze water qualities for the Project with on the job training. Training of water quality analysis for DONRE staff was added to PDM of the Project, and required equipment and consumable goods were being provided.
5	It's necessary to conduct the project activities continuously, while Japanese experts belonging to each WG aren't assigned to the project.	One project coordinator (local staff) was assigned throughout the year to coordinate the weekly meeting and other related activities. In addition, the chief advisor of JET has to manage all WGs and make progress on all activities in cooperation with Japanese experts belonging to each WG.

<u>Issues</u>		<u>Countermeasures</u>
6	As the collaborative coordinating body/mechanism, Quarterly Meeting was established in the project. However, it has not authorized as a regular meeting to make important decisions regarding water environmental management in VC.	Discussions among high rank officers of VC and JET will be held for authorization of continuous mechanism to make important decisions regarding water environmental management in VC.
7	There are many items to be discussed and decided in this project and many authorities are involved, and, it is difficult to decide all the items in JCC meetings.	Stakeholders meetings are held and ways for decision are confirmed item by item.
8	Representatives from DOF and MOF, who can discuss financial matters of VC and Central Government, are not included in C/Ps. However, C/P is not supplemented, although JET frequently requested.	Questioner for confirmation items is prepared and required information is collected from relevant authorities other than C/Ps.
9	Key issue of Factory Database being prepared for effective factory inspection is how to use the database regularly.	Database is designed following the routine work of the authorities concerned so that it is easy for them to input the data. Periodical meetings are held during preparation of Database so that it becomes easy for C/Ps to handle the Database. All the requests from C/Ps are reflected in preparation of Database, which promote usage of Database.
10	Specific treatment technics of industrial wastewater are inquired from many factories. However, C/Ps do not have enough experience to provide proper information.	Detailed investigation on factories having good practice is made and the investigation records are included in "Inspection Guideline" which would be referred for factory instruction. Design spreadsheets of treatment technics for organic and inorganic wastewater with cost estimate are prepared so that C/Ps can refer them in actual inspection and instruction for factories.

3.2 Lesson Learnt

Approval Procedures for Authorization and Budget preparation of the Project

The project was approved by VC and required funding arrangement was made. After getting the confirmation of work plan in JCC meeting, the project was proposed to VC for official approval. The project was approved in February, 2015. It was already 6 month passed from the commencement of the project. The budget was proposed after getting the approval. Project approval procedure should be started in earlier stage.

Administrative Procedure

Generally, every request and activity needs administrative procedure on document basis even for the related authorities of the project, and it takes unexpected long time to proceed, since most decisions have to go upward to the highest authority. All the activities should be planned in advance and enough time should be secured for authorities concerned to reply for smooth implementation of the project activities.

To remedy the above situation, quarterly meeting by high rank officers chaired by Vice

Governor was established and the meeting was expected to help for smooth progress of the necessary procedure.

Proceeding Way for JCC and Quarterly Meetings

Discussions were not focused on particular subject and expected decision was not reached in the two meetings of JCC and Quarterly Meeting. Therefore, JET requested to have pre-meetings immediately before the official meetings to advisor of the Project and subject matters and required decision were discussed among some members of official meeting. Even though, expected utterances were not taken place in the official meetings and the discussions were not focused again. It was learnt that even high rank officers do not express decisive opinion in the official meeting. Presentation would be made topic by topic and JET would propose some decision from the next official meeting onward.

For Sustainable Activities

In order to maintain appropriate laboratory work, acquisition of analytical skill of staff alone is not enough. The laboratory must have some systematic management system to keep reliable laboratory. It is inevitable to prepare a manual including Good Laboratory Practice (GLP) as well as Standard Operation Procedure (SOP) and textbook to understand analytical knowledge of general chemistry.

In addition to the support by this project, awareness raising activities, such as student picture competition of DoES, visiting lectures for primary and secondary schools by DONRE, and dredging of canals are also supported by Lao private companies, which agree with this kind of activities. One of the ways to sustain the activities is to find the supporters of the activities before completion of the project.

Detailed Planning Survey on Japanese Technical Cooperation

Shortage of budgets for translation and interpretation of the Project were distinguished and the contract between JICA and consultants was amended to increase the said budgets. It supposed that higher ranked officers, who discussed the Project contents, spoke English very well in the detailed planning survey on Japanese technical cooperation for the Project. However, C/Ps had not enough English skills to communicate without translation and interpretation from English to Lao. Careful attention should be paid to the capacities of C/Ps in the detailed planning survey as well.

Objectively Verifiable Indicators in PDM

Some indicators in PDM are very difficult to be used for evaluation of project achievement. For instance, plural objects of septic tank and DEWATS are included in one indicator in “2-1 Based on the piloting, a viable guideline is prepared/ improved for promoting proper maintenance of septic tanks and decentralized wastewater treatment facilities, and is discussed at least 5 times with adequate participation by the concerned stakeholders.” and canal, septic tank, and

DEWATS are included in “4-2 The target communities are continuing cleaning activities of canal and regular maintenance of septic tanks and decentralized wastewater treatment facilities.” Some are very difficult to monitor the percentage of residents of target communities in “4-1 At least 80% of residents in the target communities have positively changed their behaviors towards the wastewater discharge and management.” Target objects should be one in one indicator and indicators should be prepared with possible monitoring way.

4.1 Project Design Matrix (PDM)

Achievement levels of targets are measured by Objectively Verifiable Indicators of each output in Project Design Matrix (PDM), which was revised 2 times, and the final PDM_2 shown in **Table 4.1.1** was signed on September 22, 2015.

Table 4.1.1 PROJECT DESIGN MATRIX_2 (PDM_2)

Project Name: The Project for Urban Water Environment Improvement in Vientiane Capital

Duration: 36 Months from October 2014

Project Site: Vientiane Capital

Target Group: Key staff members of authorities concerned, officers of supporting agencies and concerned agencies, residents of pilot sites, industrial groups/ associations

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal</p> <p>Water environmental management is continuously implemented.</p>	<ol style="list-style-type: none"> 1. A collaborative coordinating body/ mechanism recommended in the project is functional continuously, holding regular meeting and making important decisions regarding water environmental management. 2. The technologies/ models introduced by the project are replicated in another area/ site in Vientiane Capital. 3. The number of regular inspection is increased. 4. There is clear evidence that “Strategy for Wastewater Treatment in Vientiane Capital” is referred to during important decision-making discussions among policy makers. 	<ol style="list-style-type: none"> 1. Minutes of Meeting of the body/ mechanism 2. Field visit/ visual observation, interview, relevant report 3. Inspection report, interview 4. Minutes of Meeting, interview 	<ul style="list-style-type: none"> • There is no change in the priority of the government on water environmental management. • The sites for water treatment measures proposed by the plan are secured.
<p>Project Purpose</p> <p>The institutional framework and organizations are strengthened for wastewater treatment in Vientiane capital through participatory approach.</p>	<p>By the end of this Project,</p> <ol style="list-style-type: none"> 1. At least 80% of trainees are applying skills/ knowledge learned during the training organized by the project. 2. Roles of the relevant authorities for water environmental management are identified and active participation of the citizens in water environment improvement is continued. 3. “Strategy for Wastewater Treatment in Vientiane Capital”, including proposed zoning, sewerage networks, utilization of EU Pond as a candidate site for Wastewater Treatment Plant, and management system with proper legal framework, planning, monitoring and evaluation for water environmental management in Vientiane Capital is prepared after at least one public hearing and endorsed by the competent authority. 	<ol style="list-style-type: none"> 1. Post-training evaluation report and interview 2. Post-training evaluation report, interview, and relevant report 3. The plan with a letter of endorsement by the competent authority, report on public hearing 	<ul style="list-style-type: none"> • The financial and human resources of the Lao Government remain for the water environmental management.
<p>Outputs</p> <ol style="list-style-type: none"> 1. Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment. 	<ol style="list-style-type: none"> 1-1 Through the experience of pilot studies and preparation of “Strategy for Wastewater Treatment in Vientiane Capital”, C/P personnel can explain properly the strengths and weaknesses of various types of decentralized and centralized wastewater treatment methods. 1-2 “Strategy for Wastewater Treatment in Vientiane Capital” is discussed at least 5 times with adequate participation by the concerned stakeholders. 	<ol style="list-style-type: none"> 1-1 Interview, field visit/ visual observation and report on pilot study, the plan itself 1-2 The plan itself and workshop report/ Minutes of Meeting 	<ul style="list-style-type: none"> • Trained C/P personnel remain in the project. • Various concerned agencies collaborate to the project. • The interests of local communities to improve water environment remains.
<ol style="list-style-type: none"> 2. The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment facilities. 	<ol style="list-style-type: none"> 2-1 Based on the piloting, a viable guideline is prepared/ improved for promoting proper maintenance of septic tanks and decentralized wastewater treatment facilities, and is discussed at least 5 times with adequate participation by the concerned stakeholders. 2-2 C/P personnel can explain clearly the guidelines. 2-3 At least 90% of participants of training programs on decentralized wastewater treatment measures expressed their overall satisfaction 	<ol style="list-style-type: none"> 2-1 The guidelines/ regulations themselves and workshop report/ Minutes of Meeting 2-2 Interview 2-3 Training report/ evaluation sheet 	

	over the training programs.		
3. The operation of legal and regulatory framework is strengthened for industrial wastewater.	<p>3-1 Based on the piloting, a viable guideline is prepared/ improved for each step of inspection, monitoring, application for effluent discharge, guidance and regulatory enforcement for proper wastewater treatment and is discussed at least 5 times with adequate participation by the concerned stakeholders.</p> <p>3-2 C/P personnel can explain clearly the guidelines.</p> <p>3-3 At least 90% of participants of regulatory training programs under the project expressed their overall satisfaction over the training programs.</p> <p>3-4 Water quality monitoring system was established and continuous monitoring and analysis activities are observed.</p>	<p>3-1 The guidelines/ regulations themselves and workshop report/ Minutes of Meeting</p> <p>3-2 Interview</p> <p>3-3 Training report/ evaluation sheet</p> <p>3-4 Field visit/ visual observation, interview and relevant report</p>	
4. People's awareness is raised through environmental education.	<p>4-1 At least 80% of residents in the target communities have positively changed their behaviors towards the wastewater discharge and management.</p> <p>4-2 The target communities are continuing cleaning activities of canal and regular maintenance of septic tanks and decentralized wastewater treatment facilities.</p> <p>4-3 At least 20 desludging activities are observed for the septic tanks in the target communities.</p> <p>4-4 Water quality monitoring results are published by HP and the HP is periodically renewed.</p>	<p>4-1 Field visit/ visual observation, interview and relevant report</p> <p>4-2 Field visit/ visual observation, interview and relevant report</p> <p>4-3 Interview and relevant report</p>	
Activities		Inputs	
<p>1-1 To collect necessary data for Strategy for Wastewater Treatment for Vientiane Capital</p> <p>1-2 To plan a viable financial mechanism for the maintenance of the wastewater treatment and consolidate it into the strategy</p> <p>1-3 To formulate the strategy considering site selection, pre F/S and so on for the construction of facilities for waste water treatment in the future</p> <p>1-4 To support public hearing and authorization of the strategy</p> <p>2-1 To prepare/ improve standard designs for toilet facilities with septic tanks and other decentralized wastewater treatment measures</p> <p>2-2 To prepare guidelines/ rules for the proper installation and maintenance of septic tanks and decentralized wastewater treatment facilities in accordance with the standard designs and to support the operation of the guideline in the pilot areas</p> <p>2-3 To undertake a study on the improvements of existing facilities for decentralized wastewater treatment and implement training programs</p> <p>2-4 To strengthen community groups for the management of decentralized wastewater treatment and support system for the groups</p> <p>2-3 To support the monitoring (including water quality analysis) of existing facilities for decentralized wastewater treatment</p>	<p><Laos Side></p> <p>1) Counterparts personnel</p> <ul style="list-style-type: none"> ▪ Project Director ▪ Project Manager ▪ Other Counterpart Personnel <p>2) Facilities</p> <ul style="list-style-type: none"> ▪ Office space at DPWT ▪ Office equipment and utilities for project operation ▪ Field for environmental education <p>3) Local operational cost</p> <ul style="list-style-type: none"> ▪ Activity cost of counterpart personnel ▪ Other necessary cost for project operation <p>4) Others</p> <ul style="list-style-type: none"> ▪ Information as well as support in obtaining medical service; 	<p><Japanese Side></p> <p>1) Dispatch of experts</p> <ul style="list-style-type: none"> ▪ Chief Advisor/ Water Environment Planning and Improvement ▪ Environmental Regulations and Enforcement ▪ Project Coordinator ▪ Environmental Education ▪ Decentralized Wastewater Treatment ▪ Integrated Wastewater Management ▪ Institutional Strengthening and Financial Analysis <p>2) Training of counterpart personnel in Japan and third countries</p>	<p>Preconditions</p> <ul style="list-style-type: none"> ▪ C/P personnel are assigned properly and timely ▪ Adequate budget for local operational cost is secured by Lao Government

Activities	Inputs	
<p>3-1 To conduct inventory survey on industries/ key polluters in Vientiane Capital</p> <p>3-2 Through close collaboration with EMSP, to prepare/ improve guidelines/ draft rules for regular inspection of industries, monitoring of water quality from the industries, application for effluent discharge, administrative and technical guidance and regulatory enforcement</p> <p>3-3 To select pilot industries and industry groups/ associations and undertake capacity building activities regarding the operation of guidelines</p> <p>3-4 To train DONRE staff of VC for improvement of analytical skills of water quality including heavy metals, and to support the establishment of sustainable system of water quality monitoring and analysis for public water bodies and industrial discharges</p> <p>4-1 To establish/ strengthen the network of various organizations in the environmental education programs, together with developing educational tools</p> <p>4-2 To develop facilitators and resource persons for environmental education</p> <p>4-3 To support water quality monitoring for public water bodies, rivers and streams and publication of the monitoring results with its interpretation</p> <p>4-4 To support regular cleaning activities of canals by the communities disposed by VUDAA providing incentives to the communities.</p> <p>4-5 To implement the campaign for the load reduction from wastewater and to support cleaning and proper management of septic tanks and decentralized wastewater treatment facilities providing incentives to the communities</p> <p>4-6 To establish a framework for sustainable environmental education in the formal education and social system in Vientiane Capital</p>	<ul style="list-style-type: none"> ▪ Credentials or identification cards; ▪ Available data (including maps and photographs) and information related to the Project; 	<p>3) Machinery and equipment</p> <ul style="list-style-type: none"> ▪ Office equipment

4.2 Achievement of Outputs

Table 4.2.1 shows achievement of outputs by agreed performance indicator mentioned in the PDM.

Table 4.2.1 Achievement of the Project

Output 1: Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment.	
Indicator	1-1. Through the experience of pilot studies and preparation of “Strategy for Wastewater Treatment in Vientiane Capital”, C/P personnel can explain properly the strengths and weaknesses of various types of decentralized and centralized wastewater treatment methods.
Activities and Achievement Level	<p>The indicator was nearly achieved.</p> <ul style="list-style-type: none"> - The third version of draft “Strategy of Wastewater Management in Vientiane Capital” was developed in July, 2017 and public hearing was held on August 16th, 2017. - Final version was prepared in September, 2017 reflecting comments provided in the public hearing. - In the course of preparing the Strategy, representative of C/Ps presented the contents of the Strategy in several occasions. - C/Ps could judge that the model design of on-site treatment and DEWATS at the time was not enough, when new National Environment Standards was issued and C/Pc came to know the change of the parameter of BOD₅ for discharges from toiles, which became stricter from 60mg/l to 30mg/l. - Therefore, it is expected that C/P will be able to fully understand the final version of the strategy.
Indicator	1-2. “Strategy for Wastewater Treatment in Vientiane Capital” is discussed at least 5 times with adequate participation by the concerned stakeholders
Activities and Achievement Level	<p>The indicator was fully achieved.</p> <ul style="list-style-type: none"> - In the course of preparing the Strategy 3 times of the discussions were held for the contents of the Strategy as follow. <ol style="list-style-type: none"> 1) The second quarterly meeting (26/2/2016/): Plan of the wastewater treatment, roles of relevant authorities 2) The third JCC meeting (25/5/2016): Plan of wastewater treatment, standards of septic tanks 3) The fourth JCC meeting (16/12/2016):outline and the gist of the strategy - After preparation of the first draft, 3times of discussion were held as follow. <ol style="list-style-type: none"> 4) The first stakeholders meeting on the Strategy (23/3/2017): Discussion on first draft of the Strategy 5) The fifth JCC meeting (22/6/2017): Discussion on second draft of the Strategy 6) Public hearing on the Strategy (16/8/2017): Discussion on third draft of the Strategy - The Strategy was discussed 6 times with adequate participation by the concerned stakeholders
Overall Assessment of Output 1	
<ul style="list-style-type: none"> ➤ Output 1 has been achieved according to the evaluation above. ➤ “Strategy of Wastewater Management in Vientiane Capital” has been developed through the series of discussions among the related authorities. The strategy was revised with 	

reference to the new National Environment Standards.	
Output 2: The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment facilities.	
Indicator	2-1. Based on the piloting, a viable guideline is prepared/ improved for promoting proper maintenance of septic tanks and decentralized waste water treatment facilities, and is discussed at least 5 times with adequate participation by the concerned stakeholders.
Activities and Achievement Level	<p>The indicator was achieved.</p> <ul style="list-style-type: none"> - The guidelines including septic tanks specification were prepared in the first year of the Project and discussed 2 times to be finalized as a draft of On-site wastewater Treatment. <ol style="list-style-type: none"> 1) The second JCC meeting (23/10/2015): Discussion on concept of Septic Tank Standard Specification first draft 2) The fourth JCC meeting (16/12/2016): Discussion on the plan collaborate with the zoning code regulating building permit - Regarding on-site wastewater treatment facilities, the Project organized three times of discussion as follows. <ol style="list-style-type: none"> 3) A stakeholders meeting of “Framework of Management for DEWATS and Technical Standards of On-site Treatment” was held on March 30th, 2017. 4) The fifth JCC meeting (22/6/2017): Discussion as a part of “Strategy of Wastewater Management in Vientiane Capital” second draft 5) Public Hearing (16/8/2017) on “Strategy of Wastewater Management in Vientiane Capital”: Discussion as a part of the Strategy third draft - Regarding decentralized wastewater treatment facilities management, Thongkhankham CBS was selected as a pilot site and the draft agreement was prepared based on the stakeholders meeting in November, 2016 at Chanthabouly District office and some coordination meetings.. <ol style="list-style-type: none"> 1) The stakeholders meeting on Thongkhankham CBS(5/2/2016): The draft agreement was discussed and agreed with users and related organizations along with re-election of the committee members 2) The third JCC meeting (25/5/2016): Discussion on Thongkhankham case 3) Explanatory meeting for Thongkhankham users (18/8/2016): Re-explanation of the agreement and hearing from users 4) The fourth JCC meeting (16/12/2016): Discussion on Thongkhankham case 5) The fifth JCC meeting (22/6/2016): Discussion as a part of “Strategy of Wastewater Management in Vientiane Capital” second draft - Public Hearing (16/8/2017) on “Strategy of Wastewater Management in Vientiane Capital”: Discussion as a part of the Strategy third draft
Indicator	2-2. C/P personnel can explain clearly the guidelines.
Activities and Achievement Level	<p>The indicator was nearly achieved.</p> <ul style="list-style-type: none"> - According to internal reports by C/P about the first draft of septic tanks specification in January 2016, the capacities of C/Ps were developed and knowledge of wastewater treatment was transferred. On the other hand, it was confirmed that the reports were not explained enough from water environment perspective. - Through the discussions on guidelines, C/P has improved the capacity of the understanding of wastewater treatment. In the stakeholders meeting

	<p>in March 2017, Mr. Thinnakone (DPWT) explained the outline of the guidelines, Mr. Xayabandith (PTI, MPWT) chaired the meeting and Mr. Khammone (DPWT) wrapped up the meeting.</p> <ul style="list-style-type: none"> - C/P requested implementation of a pilot project on model design of aerobic wastewater treatment to disseminate the facility in VC where there is little experience of aerobic wastewater treatment. It showed C/P came to understand the needs of aerobic treatment to improve water environment in VC. - Since the National Environment Standards was revised in 2017, the guidelines should take the new standards of water quality, which was set BOD₅ less than 30mg/l, into consideration. C/Ps asked detail explanations about the difference of model designs for different values of BOD₅, to understand the relation of effluent water quality and facilities. - It is expected that C/Ps will be able to fully understand the guidelines of on-site treatment and DEWATS by the final version of the guidelines.
Indicator	2-3. At least 90% of participants of training programs on decentralized wastewater treatment measures expressed their overall satisfaction over the training programs.
Activities and Achievement Level	<p>The indicator was nearly achieved.</p> <ul style="list-style-type: none"> - The results of questionnaires survey after training programs in Japan, and study tours in Vietnam and Thailand showed the rate of satisfaction was high for each training program. - The questionnaire was distributed for survey of self-assessment for all training programs at final stage of the Project, and eight (8) out of ten (10) C/Ps (80%) rated excellent or good for output 2. And no C/P rated not satisfactory or poor. - There were suggestions from C/Ps that advanced septic tank pilot project could be implemented as part of the training programs.
<p>Overall Assessment of Output 2 Output 2 was almost achieved.</p> <ul style="list-style-type: none"> ➤ The Project prepared the following technical standards and guidelines for on-site wastewater treatment including septic tank and DEWATS. “Additional Decision for management of Septic Tank for Household in Vientiane Capital” “Guidelines of Onsite treatment for Effluent BOD₅ less than 60 mg/L” “Standard Designs and Guidelines for Proper Installation and Maintenance of Decentralized Wastewater Treatment facilities” ➤ The Project exchanged information with “The Project for Urban Development Management” by JICA (2013-2017) for inserting a consideration on wastewater to the criteria of building permission and preparing the specifications model of on-site treatment. ➤ The monitoring of the pilot project of DEWATS is still ongoing in Thongkhankham village. The DEWATS system was constructed by BORDA (NGO) in 2010, but it was malfunctioned and there was a problem of leakage of wastewater from the pipelines. The Project repaired the pipelines in July 2016 in collaboration with BORDA in order to obtain O&M information for the guidelines. ➤ According to the result of interviews of the stakeholders in the village, the DEWAT has been working well since the above repair. ➤ The users committee was established for operation and maintenance of the DEWATS and started collecting fees of DEWATS (LAK 7,000/month/household) from 24 households 	

(As 6 houses were destroyed by the fire on 31st March, 2017, it is 18 houses now.).	
Output 3: The operation of legal and regulatory framework is strengthened for industrial wastewater.	
Indicator	3-1. Based on the piloting, a viable guideline is prepared/ improved for each step of inspection, monitoring, application for effluent discharge, guidance and regulatory enforcement for proper wastewater treatment and is discussed at least 5 times with adequate participation by the concerned stakeholders.
Activities and Achievement Level	<p>The indicator was achieved.</p> <ul style="list-style-type: none"> - “Inspection Guideline” contains how to plan regular inspection, details of inspection procedures, effluent sampling and evaluation of violation as well as relevant regulation in details. It also presents overall essence of knowledges that every inspector should have, including basic knowledges of industrial wastewater and its treatment process. - The guideline also provides detail design examples how to treat inorganic and organic industrial wastewaters. - In addition, it also compiles actual practices of industrial wastewater treatment in Lao PDR. It should provide beneficial references when inspector instructs factory owners to improve their effluent qualities. - By those facts and evidence, the level of achievement (guideline) should be considered to be satisfactory achieved. - The contents of guidelines were discussed at the following meetings, and it is at the final stage for publication. <ol style="list-style-type: none"> 1) Conference on the first draft guidelines (2016/2/29) 2) JCC meeting (2016/12/16) 3) The first stakeholders meeting (2017/2/14) 4) The workshop for owners of factories in collaboration with the Chamber of Commerce in VC (2017/4/3) 5) The second stakeholders meeting (2017/5/16)
Indicator	3-2. C/P personnel can explain clearly the guidelines.
Activities and Achievement Level	<p>The indicator was achieved.</p> <ul style="list-style-type: none"> - As for the evaluation of understanding, tests have been implemented twice, one in 2015 and the other in 2016. - As the results shown in Table 4.2.3.2, level of understanding increased only 3%. It is caused by the fact that all of C/P members do not have inspection or analysis work as his or her profession. - But the result shows there has been remarkable improvement in understanding of hazardous substances contained in wastewater from factories. Also some upgrade was recorded in knowledge in understanding of wastewater treatment. - However, there was no time to implement the third evaluation test in the activity in 2017 as most of activities went to discussing on practical wastewater treatment after editing Inspection Guideline of the final version. - When thinking of stakeholder meetings of relevant organizations that have been held to discuss Inspection Guideline, the level of achievement for explain guideline should be sufficiently achieved at the end of the activity.

Table Summary of comprehension tests on Inspection Guideline			
		Average percent of correct answer [%]	
		Jan, 2015	July, 2016
	Number of questions		
1. Understanding of the importance of the water quality control	4	33.3	30.6
2. Understanding of hazardous substances contained in wastewater from factories	2	4.2	38.9
3. Understanding of the technologies used in the analysis of wastewater from factories	2	12.5	5.6
4. Understanding of the technologies for treatment of wastewater from factories	2	25.0	38.9
5. Understanding of the purposes and methods of the on-site inspections at plants	3	63.9	59.3
Total	13	33.8	36.7

Indicator	3-3. At least 90% of participants of regulatory training programs under the project expressed their overall satisfaction over the training programs.
Activities and Achievement Level	<p>The indicator was achieved.</p> <ul style="list-style-type: none"> - In the end of the final year, a questionnaire of “Self-assessment after having participated to the project” has been done for each C/P members. - From the result, rate for overall attainment (A: excellent, B: good, C: moderate, D: not satisfactory, E: poor) and their reason to evaluate so has been described in Appendix 10. - Even though not all the member provided the answer, the result shows higher rating by DPWT, PTI, DoIC and DONRE members for the activity. It should be also considered that the activities fitted to their everyday work.
Indicator	3-4. Water quality monitoring system was established and continuous monitoring and analysis activities are observed.
Activities and Achievement Level	<p>The indicator was achieved.</p> <ul style="list-style-type: none"> - The Project has been conducting water quality monitoring and analysis activities by C/P of DONRE since 2015. From November 2015 to October 2016, the Project set 9 monitoring points and implemented eight (8) times of monitoring activities accompanied with a JICA expert. - After October 2016, the number of monitoring points was reduced to five (5) due to the increment of monitoring activities of water from septic tanks and DEWATS. Four (4) times of monitoring activities were conducted from October 2016 to July 2017. - Technical skills of DONRE C/P for water analysis have also been improved by the Project. For water environment monitoring work, the C/P now can analyze planned parameters including pH, DO and electric conductivity, BOD, COD(Mn), COD(Cr), SS, T-N, T-P, Coliform and heavy metals precisely without any help. - For 32 parameters of analysis as listed in the brochure, DONRE C/P now can provide analysis service to meet to the needs from factories who want to analyze their effluents or samples that DONRE inspection team needs to analyze. - Moreover, C/P learned alternative testing methods that can check the values obtained by meters. Winkler titration method against DO meter and Iodine titration method for Residual Chlorine meter as examples.

Overall Assessment of Output 3	
<ul style="list-style-type: none"> - Output 3 was achieved. - The Following materials were prepared by the Project, and those are expected to be disseminated to the concerned authorities and organizations. <ul style="list-style-type: none"> *Inspection Guidelines *Business Effluent Database *Manual of Good Laboratory Practice (GLP) of DONRE - Regarding the database system that has been developed and trained by the Project, it will need continuous practice of using it. For this purpose, a regular meeting among relevant organizations regarding inspection work and database operation has been advised and written in “Instruction” (7. Establishment of Cooperative Relationships with Relevant Institutions and Organizations) of Inspection Guideline. 	
Output 4: People’s awareness is raised through environmental education.	
Indicator	4.1 At least 80% of residents in the target communities have positively changed their behaviors towards the wastewater discharge and management.
Activities and Achievement Level	<p>The indicator was achieved.</p> <ul style="list-style-type: none"> - The questionnaire survey for participants of clean activities for Hong Phone Thans and Hong Pasak showed more than 90% had had a positive attitude towards environment and cleaning activities. - The agreement on cleaning activities by a community in Hong Phone Thane was signed by Xaysetha District in October 2016. - It was reported from the head of the Hong Phone Thane Village that the canal has been kept clean by local residents.
Indicator	4-2. The target communities are continuing cleaning activities of canal and regular maintenance of septic tanks and decentralized wastewater treatment facilities.
Activities and Achievement Level	<p>The indicator was achieved.</p> <ul style="list-style-type: none"> - The Project implemented cleaning activities of canals twice at Hong Phone Thane on 12th March and 18th June, 2015. After those activities, similar activities are continuing in Hong Phone Thane Village by the local residents. - It was reported that the canal has been kept clean by the local residents in Phonethane Village. - Moreover, it was informed that collection of users’ fee of Community Based Sanitation (CBS) has been implemented by the regulation in Thongkhankham Village. - The campaign for promotion of proper desludging from septic tanks was held at Thongkhankham village in March 2017, and totally 43 households applied and conducted desludging from septic tanks. - The awareness movie which promotes the periodical desludging from septic tanks was posted on the Project Facebook. - The Fecal Sludge Management Project (FSM) supported by French donors will also conduct an awareness campaign for promotion of desludging in cooperation with the Project through social media in this year. - The awareness campaign for promotion of desludging from septic tanks is continuing through social media, so it is expected that the regular desludging from septic tanks is continued in the target village and expanded to other villages.
Indicator	4-3. At least 20 desludging activities are observed for the septic tanks in the

	target communities.
Activities and Achievement Level	<p>The indicator was achieved.</p> <ul style="list-style-type: none"> - The campaign for promotion of proper desludging from septic tanks was held at Thongkhankham village in March 2017, and totally 43 households applied and conducted desludging from septic tanks. - The awareness movie which promotes the periodical desludging from septic tanks was posted on the Project Facebook. - The Fecal Sludge Management Project (FSM) supported by French donors will also conduct an awareness campaign for promotion of desludging in cooperation with the Project through social media in this year. - The awareness campaign for promotion of desludging from septic tanks is continuing through social media, so it is expected that the regular desludging from septic tanks is continued in the target village and expanded to other villages.
Indicator	4-4. Water quality monitoring results are published by HP and the HP is periodically renewed.
Activities and Achievement Level	<p>The indicator was achieved.</p> <ul style="list-style-type: none"> - The Project has set up two websites, one is the Project Home Page (http://pwevproject.weebly.com) in 2015, and the other one is a Facebook (https://www.facebook.com/pwevproject/?fref=ts), set up by C/P's own idea, in 2016 in order to introduce the Project activities and results of water quality monitoring regularly. - The results of water quality monitoring have been updated 11 times since November 2015 by the Project. Also, the information on Facebook is updated by C/Ps.
<p>Overall Assessment of Output 4 Output 4 was achieved.</p> <ul style="list-style-type: none"> - It was informed that some model schools for environmental education were utilizing materials introduced by the Project. - It was reported that the canal has been kept clean by the local residents in Phonethane Village. - The activities were introduced by TV programs and website. - The awareness campaign for promotion of desludging from septic tanks is continuing through social media, so it is expected that the regular desludging from septic tanks is continued in the target village and expanded to other villages. 	

4.3 Achievement of Project Purpose

Table 4.3.1 shows achievement of the Project Purpose by agreed performance indicator mentioned in the PDM.

Table 4.3.1 Achievement of the Project

Project Purpose: The institutional framework and organizations are strengthened for wastewater treatment in Vientiane capital through participatory approach.	
Indicator	1. At least 80% of trainees are applying skills/ knowledge learned during the training organized by the Project.

Activities and Achievement Level	<p>The indicator was achieved.</p> <ul style="list-style-type: none"> - It was observed that water analysis, industrial wastewater management and environmental education activities have been practiced continuously. - For instance, the teachers who participated in the training of trainers now teach environmental education to their students with tools such as posters and card games introduced by the Project in the designated 10 environmental education model schools. - DPWT also apply the knowledge from the Project to prepare the guidelines for DEWATS and septic tanks.
Indicator	<p>2. Roles of the relevant authorities for water environmental management are identified and active participation of the citizens in water environment improvement is continued.</p>
Activities and Achievement Level	<p>The indicator was achieved.</p> <ul style="list-style-type: none"> - Through a series of discussion on roles for water environmental management among the authorities concerned at JCC meetings, a plan of demarcation of the roles was prepared by the Project. Discussions were held based on lectures on the experiences in Japan and other developing countries. - Roles of the relevant authorities for water environmental management were identified, though the documents on roles for water environmental management are necessary to be approved by the authorities concerned. - Regarding active participation of the citizens to improvement of environmental activities, it is observed that positive water environment management activities such as reestablishment of management system by users in Thongkhangkham Village, campaigns for cleaning canals and desludging septic tanks by local community have been observed. - In addition, it was confirmed that some schools which participated in the environmental education program by the Project have been continuing cleaning activities in collaboration with neighboring communities.
Indicator	<p>3. “Strategy for Wastewater Treatment in Vientiane Capital”, including proposed zoning sewerage networks, utilization of EU Pond as a candidate site for Wastewater Treatment Plant, and management system with proper legal framework, planning, monitoring and evaluation for water environmental management in Vientiane Capital is prepared after at least one public hearing and endorsed by the competent authority.</p>
Activities and Achievement Level	<p>The indicator was almost achieved.</p> <ul style="list-style-type: none"> - The final draft of “Strategy of Wastewater Management in Vientiane Capital” was discussed in public hearing held on August 16, 2017. - “Strategy of Wastewater Management in Vientiane Capital” is expected to be endorsed by Assembly of VC and confirmed by relevant Ministries. <p>Though land of EU pond was sold by the VC, alternative land for Wastewater Treatment Plant was set up in Sikottabong Park and agreed by the VC as well.</p>
<p>Overall Assessment:</p> <p>The Project Purpose was almost achieved.</p> <ul style="list-style-type: none"> - Through a series of training programs and discussions on strengthening framework, capacity development programs on wastewater management were conducted regularly especially throu weekly meetings. - The future use of the experience and acquired knowledge can be substantially expected through their answers as listed in Appendix 10. - All of the participants showed strong intentions to continue and improve their capacity to 	

- regulatory work.
- Endorsement of “Strategy for Wastewater Treatment in Vientiane Capital” remained, as the next assembly of VC was scheduled after the end of the Project period.

Chapter 5 Recommendation for Achievement of Overall Goal

5.1 Overall Goal

The Overall Goal and agreed performance indicator mentioned in the PDM are shown in **Table 5.1.1**.

Table 5.1.1 Overall Goal, performance indicator, and Means of Verification

Narrative Summary	Objectively Verifiable Indicators	Means of Verification
<p>Overall Goal</p> <p>Water environmental management is continuously implemented.</p>	<ol style="list-style-type: none"> 1. A collaborative coordinating body/ mechanism recommended in the project is functional continuously, holding regular meeting and making important decisions regarding water environmental management. 2. The technologies/ models introduced by the project are replicated in another area/ site in Vientiane Capital. 3. The number of regular inspection is increased. 4. There is clear evidence that “Strategy for Wastewater Treatment in Vientiane Capital” is referred to during important decision-making discussions among policy makers. 	<ol style="list-style-type: none"> 1. Minutes of Meeting of the body/ mechanism 2. Field visit/ visual observation, interview, relevant report 3. Inspection report, interview 4. Minutes of Meeting, interview

5.2 Situation and Recommendation

(1) A collaborative coordinating body/ mechanism recommended in the project is functional continuously, holding regular meeting and making important decisions regarding water environmental management.

Steering Committee like JCC and Task Force like C/P group in this project were proposed as a collaborative coordinating body/ mechanism in “Strategy for Wastewater Management for Vientiane Capital”. Once the Strategy is authorized in VC, required budgets will be prepared and the committee will be established to discuss and decide water environmental issues in VC.

One of the important factors to implement water environmental management according to the Strategy is demand and requirement of the public. The fundamental things to raise the public are information on the actual situation of water environment and their will to live in desirable water environmental condition. Continuous water quality monitoring and publication of information of the results, and awareness rising activities for water environment would be the key issues for the government to implement effective activities for management of water environment in VC.

(2) The technologies/ models introduced by the project are replicated in another area/ site in Vientiane Capital.

Possible technologies/ models introduced by the project to be replicated in another area/ site in VC are:

- Technical Standards and guidelines of On-site Treatment
- Standard Designs and Guidelines for the Proper Installation and Maintenance of Decentralized Wastewater Treatment Facilities
- Inspection Guidelines
- Environmental education in primary schools and communities with side reader, poster, and card game
- Cleaning activities in canals with participation of residents
- Promotion of desludging from septic tanks

1) Technical Standards and guidelines of On-site Treatment, and Standard Designs and Guidelines for the Proper Installation and Maintenance of Decentralized Wastewater Treatment Facilities

Preparation of regulations of building permit and development permit so insisted in VC is required. The regulations should refer to the above standards and guidelines and the covered area of the regulations should be expanded gradually.

2) Environmental education in primary schools and communities with side reader, poster, and card game

The project for amendment and improvement of curriculum and textbook in basic education has been implemented by RIES from 2015 to 2022 with assistance provided by Australia. The revised contents only for environmental issues and education in the textbook of “World around Us” were proposed to RIES by the Project based on the developed educational tools (side reader, card game and poster). It is expected that the revised textbook will be used in all primary schools in Lao PDR.

3) Cleaning activities in canals with participation of residents

Cleaning activities with participation of residents should be expanded to canals other than Hong Phone Thane and Hong Pasak where the pilot project was implemented with support from the Project. The established framework for sustainable cleaning activity in Hong Phone Thane should also be expanded to other villages and communities.

4) Promotion of desludging from septic tanks

Promotion of desludging from septic tanks should be expanded to Villages other than Thongkhankham Village where the pilot project was implemented with support from the Project. The Fecal Sludge Management Project (FSM) supported by French donors will also conduct an awareness campaign for promotion of desludging through social media in this year.

The seminar on environmental education was held on 7th of June, 2017 to share information, experiences and lesson learned for environmental education with related organizations in Laos. Totally 45 people including related public agencies, donors and NGOs joined the seminar chaired by Deputy Director General of DONRE. As far environmental education and awareness rising of public, periodical gathering of the above kind of seminar and/or workshop is recommended to effective operation of the activities.

(3) The number of regular inspection is increased.

Under limited conditions of both budget and manpower in VC, the Project could not attain any remarkable increase of number of inspection. However, after DONRE laboratory obtained its capacity of water quality analysis by this project, DONRE increased its inspection capacity in responding to people's complaint. Such capacity build-up shall bring good influence to the other organizations in VC. When effluent samples are to be analyzed by DONRE laboratory and the necessary budget will be sent to it, more inspection works would be made by DoIC and other organizations in Vientiane Capital.

(4) There is clear evidence that “Strategy for Wastewater Treatment in Vientiane Capital” is referred to during important decision-making discussions among policy makers.

In the 5th JCC meeting held on June 22nd, Mr. Keophilavanh APHAILATH, the Chairman of the meeting and Vice Governor of VC concluded that the revised strategy would be approved by VC level and after that the guidelines / regulations would be issued and enforced. If Lao Government receives loan from the other donor, they will follow the approved strategy prepared by this Project. The strategy was revised through adjustment with national sanitation strategy and meeting with Minister of MPWT. After approval in VC assembly, it will be a Governor's decision. The above process should be carefully monitored.

Appendix

- Appendix 1 List of Developed Products and Material
- Appendix 2 Record of Activities Schedule
- Appendix 3 Assignment Record of JICA Expert
- Appendix 4 List of Counterparts
- Appendix 5 Record of Training Acceptance
- Appendix 6 List of Provided Equipment
- Appendix 7 Record of Public Relation
- Appendix 8 Transition of PDM
- Appendix 9 Record of Joint Coordinating Committee
- Appendix 10 Self-assessment after having participated to the Project

Appendix 1 List of Developed Products and Material

List of Developed Products and Material

No	Developed Products and Material
1	Strategy of Wastewater Management for Vientiane Capital
2	Preliminary Feasibility Study of Wastewater Management for Vientiane Capital
3	Technical Standards and guidelines of On-site Treatment
4	Standard Designs and Guidelines for the Proper Installation and Maintenance of Decentralized Wastewater Treatment Facilities
5	Inspection Guidelines for polluted water from processing industrial factories in Vientiane Capital
6	Manual of Good Laboratory Practice (GLP)
7	Educational Tools for Environmental Education
8	Water Quality Monitoring Report
9	Revised Textbook of “World around Us” only for Environmental Education

Strategy of Wastewater Management for Vientiane Capital

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 - 4.1.1.1 Wastewater management by on-site system
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 - 4.1.1.3 Water quality improvement in urban canals by dredging and introduction of river water from the Mekong River
 - 4.1.1.4 Capacity building
 - 4.1.1.5 Environmental education and public awareness
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 - 4.1.2 Mid Term: 2020-2030
 - 4.1.2.1 First priority plan
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- 4.1.3 Long Term: after 2030
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 - 4.2.1 Appropriate treatment technology and required land
 - 4.2.2 Land reservation for WWTP
- 4.3 Population projection and wastewater quantity for WWTP
- 4.4 Cost estimate for construction and O&M
- 4.5 Financial arrangement
- 4.6 Organization responsible for sanitation / wastewater treatment
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 - 4.7.1 Promotion of business effluent management among regulatory organizations
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 - 4.7.4 Promotion of effluent and environment monitoring
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- 2.2.2 Pond (or constructed wet land) after septic tank
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- 2.2.4 Other treatment system
- 2.3 O&M
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 - 3.1 Contact Aeration system after septic tank
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 - 1.1. ທາດແຂງບໍລະລາຍໃນນ້ຳ ແລະ ທາດແຂງທັງໝົດ (suspended solids and total solids)
 - 1.2. ອົກຊີລະລາຍໃນນ້ຳ (Dissolved Oxygen, DO)
 - 1.3. ປະລິມານອົກຊີເທິຕ້ອງການທາງຊີວະເລມີ (BOD)
 - 1.4. ປະລິມານອົກຊີເທິຕ້ອງການທາງເລມີ (COD)Mn
 - 1.5. ໄນໂຕຣເຈນທັງໝົດ (Total Nitrogen, T-N)
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 - 1.7. ທາດຟໍດສ໌ທັງໝົດ (Total Phosphorus, T-P)

- 1.8. ອີອົງຄວໄຮດ (Chloride Ion)
- 1.9. ທາດປະສົມໄຊຍາໄນດ (Cyanide compounds)
- 1.10. ທາດຄວຣິນຕົກຄ້າງ (Residual Chlorine)
- 1.11. ທາດສະກັດດ້ວຍເຮັກເຊນ (Hexane extracts)
- 1.12. ໂຄຣມຽມຄ່າເອມີ VI [Cr (VI)]
- 1.13. ວິທີທົດລອງຈຸລິນຊີໃນສິ່ງແວດລ້ອມທຳມະຊາດ (Analysis of microorganism in natural environment)
- 1.14. ວິທີທົດລອງຈຸລິນຊີໃນນ້ຳປະປາ (Analysis of microorganism in tap water)
- 1.15 Cyanide(HACH)
- 1.16 COD(Cr) (HACH)
- 1.17 Phenols (HACH)
- 1.18 Sulfide, HR (HACH)
2. ຄຸ້ມໃນການໃຊ້ເຄື່ອງ (Instruction manual)
- 2.1. ເຄື່ອງຂ້າເຊືອດ້ວຍອາຍນ້ຳຄວາມດັນສູງ (Autoclave).
- 2.2. ຄຸ້ມການນຳໃຊ້ໂດຍຫຍໍ້ ຂອງເຄື່ອງວັດແທກອົກຊີລະລາຍ(DO) ສຳລັບຫ້ອງທົດລອງ ລຸ້ນYSI-5000
- 2.3. ຄຸ້ມການນຳໃຊ້ເຄື່ອງວັດແທກDO YSI Model 5100 / 5000

Appendix 2 Record of Activity Schedule

Work Breakdown Sheet (WBS) of the 1st Year
The Project for Urban Water Environment Improvement in Vientiane Capital

■ : Plan
▨ : Actual

Year Term Month		2014			2015								
		10	11	12	1st Year								
					1	2	3	4	5	6	7	8	9
Chief Advisor/ Water Environment Planning and Improvement	H. KAMATA	10/14	▨	▨	▨	▨	2/13			▨	▨	▨	▨
Project Coordinator	K. KONNO									▨	▨	▨	▨
(Co-Chief Advisor)/ Integrated Wastewater Management	K. ASADA	10/14	▨	▨	▨		▨	▨		▨	▨	▨	▨
Environmental Regulations and Enforcement	T. TAKESHIMS	10/14	▨	▨	▨		▨	▨		▨	▨	▨	▨
Decentralized Wastewater Treatment	M. NAGAMACHI	10/14	▨	▨		▨	▨					▨	▨
Institutional Strengthening and Financial Analysis	D. IWATA	10/14	▨	▨		▨	▨			▨	▨		▨
Environmental Education	T. TOBE	10/14	▨	▨		▨	▨					▨	▨
Water quality Analysis	To be named											▨	▨
Working Group 1													
1. To summarize the present situation and future threat of water environment in Vientiane Capital, That Luang and Na Khay Marsh, the Mak Hiao River, and the Mekong River													
2. Legal background and national and local policies and plans													
1) To find the existing laws and regulations related to wastewater treatment, water environment, and construction of wastewater treatment system and summarize the outlines of them													
2) To evaluate the related laws and regulations and to point out the required ones to be prepared													
3. To summarize national policy and/or vision for water environment and implementation plan of Laos and Vientiane Capital													
4. Technical background to prepare and evaluate wastewater treatment plan													
1) Lecture on Strategic Plan of Wastewater Treatment and the characteristics of collective wastewater treatment and individual treatment systems													
2) Lecture on various treatment processes of wastewater and sludge treatment													
3) Lecture on the two ways of collection systems, such as combined and separate systems													
5. To identify the required data to prepare Strategic Plan of Wastewater Treatment for whole area of Vientiane Capital													
6. To collect the required data, arrange the collected data for use to prepare Strategic Plan of Wastewater Treatment for whole area of Vientiane Capital													
7. To formulate the strategy considering site selection, pre F/S and so on for the construction of facilities for wastewater treatment in the future													
7-1. Study on structure of Wastewater Treatment Strategy in Vientiane Capital													
7-2. Review the Existing Studies													
F1 (Finance 1). 1st Short test (30 minutes) & explanation of this session (10 minutes) & homework results presentation by C/P (10 minutes)													
F2. Presentation 1; Sewerage sector financial system in Japan (30 minutes) & discussion (Cost burden & budget sources for each sanitation facility) (20 minutes)													
F3. Presentation 2; Sewerage sector financial system in overseas (30 minutes) & discussion (Cost burden & budget sources for each sanitation facility) (20 minutes)													
F4. Presentation 3; Method of project financial analysis (FIRR calculation) (50 minutes) & discussion (Cost burden & budget sources for each sanitation facility) (30 minutes) & explanation of homework (20 minutes)													
F5. Presentation 4; Example of sewerage project financial analysis (30 minutes) & Workshop (Prepare PowerPoint (PPT) of Cost burden & budget sources for each sanitation facility)													
F6. PC training 1; O&M cost estimation & Workshop (Prepare PPT of Cost burden & budget sources, continued from previous one)													
F7. PC training 2; FIRR calculation & Workshop (Prepare PPT of Cost burden & budget sources, continued)													
F8. 2nd Short test & return 2 short tests & homework & Workshop (Finalize PPT of Cost burden & budget sources), if necessary													
F9. Supplementary lesson on sewerage sector financial system in Japan and overseas.													
F10. Internal presentation and discussion of powerpoint of Cost burden and budget source													
Working Group 2													
1. To prepare standard designs for toilet facilities with septic tanks and other decentralized wastewater treatment measures													
1) To summarize present situations and issues of septic tanks and decentralized wastewater treatment facilities in Vientiane Capital													
2) To investigate the present situations and required level of water environment in Vientiane Capital													
3) To study necessary performance of sanitary facilities and propose standard design (first version)													
2. To prepare and enforce guidelines/ rules for the proper installation and maintenance of septic tanks and decentralized wastewater treatment facilities in accordance with the standard designs													
1) To summarize the present laws, regulations and institutions related to septic tanks and decentralized wastewater treatment facilities													
2) To study on other countries experiences related to wastewater treatment and water environment													
3) To study on management method for procedures and record of sludge removal													
3. To undertake a study on the improvements of existing facilities for decentralized wastewater treatment and implement training programs													
1) To study on present situation and performance of existing sanitary facilities													
2) To study management method for existing sanitary facilities													
4. To strengthen community groups for the management of decentralized wastewater treatment and support system for the groups													
1) To extract and analysis the issues from present situation to find the main barrier													
5. To support the monitoring (including water quality analysis) of existing facilities for decentralized wastewater treatment													
1) To study and try monitoring method of water quality of septic tanks and decentralized wastewater treatment facilities													

Year Term Month	2014			2015								
	1st Year											
	10	11	12	1	2	3	4	5	6	7	8	9
Working Group 3												
1. Confirmation work of collected regulations				■	■							■
2. Filling work of unknown data in the industry inventory				■	■							■
3. To summarize present inspection procedure Learn and understand regulatory work practiced in Vientiane Capital				■	■	■	■					
4. To summarize problems associated with present inspection Find problems associated with daily work.				■	■	■	■					
5. Lecture by JET for three topics as listed below. Importance of industry effluent regulation from Japanese experience of water pollution history by attending lecture by JET "History of Water Pollution and Related Laws in Japan" "Outline of Laws for Factory Effluent Control in Japan" "Outline of Discharge Restriction Practice Based on the experience at Tokyo Metropolitan Government"							■		■			
6. To prepare the contents and the contributing member of writing of the "Guideline" and to start writing							■	■				
7. Coordination activities for any problems appeared in making "Guideline" regarding implementing On-The-Spot-Inspection.							■		■			■
8. Preparation of first version of "Guideline of On-The-Spot Inspection"									■	■	■	■
9. Trial implementation of inspection will be done based on the "Guideline".											■	■
11. After coordination by relevant organizations, establishment of "Guideline of On-The-Spot Inspection" (first version)											■	■
12. To review existence of problems regarding to reception of analysis samples, accuracy as well as management of analytical results after the trial implementation.											■	■
13. Discussion on topics of activities for next year.											■	■
Working Group 4												
1. To establish/ strengthen the network of various organizations in the environmental education programs, together with developing educational tools												
1) To investigate present situations and issues of environmental educations being conducted in Vientiane		■	■	■	■	■	■	■	■	■	■	■
2) To prepare a proper network plan based on the present collaboration practice among the related agencies involved in environmental education					■	■	■	■	■	■	■	■
3) To propose and try the network plan to institutionalize environmental education in school and public										■	■	■
2. To develop facilitators and resource persons for environmental education to the community (not only school)												
1) To decide a pilot school/community and prepare contents for environmental education targeting pollution sources					■	■	■	■	■	■	■	■
2) To study training ways for facilitator and lecturer to utilize the contents for environmental education					■	■	■	■	■	■	■	■
3) To conduct the trainings for facilitator and lecturer											■	■
3. To support regular cleaning activities of canals by the communities disposed by VUDAA providing incentives to the communities												
1) To study the feasibility of cleaning activities by the community including investigation of target canals					■	■	■	■	■	■	■	■
2) To understand the present treatment situation of dredged soil generated by the cleaning activities of canals conducted by VUDAA		■	■	■	■	■	■	■	■	■	■	■
4. To implement the campaign for the load reduction from wastewater and to support cleaning and proper management of septic tanks and decentralized wastewater treatment facilities providing incentives to the communities												
1) To study supporting measures for residents to participate sludge removal activity and for community to maintain decentralized wastewater treatment facilities					■	■	■	■	■	■	■	■
5. To establish a framework for sustainable environmental education in the formal education and social system in Vientiane Capital												
1) To study a framework for sustainable environmental education in the formal education in Vientiane Capital with the cooperation of DoE and MoE					■	■	■	■	■	■	■	■

*The above work schedule is the detailed breakdown of each activity based on the Work Plan approved by JCC.

■ : Plan
▨ : Actual

Work Breakdown Sheet (WBS) of the 2nd Year
The Project for Urban Water Environment Improvement in Vientiane Capital

■ : Plan
▨ : Actual

Year		2015			2016								
Term		2nd Year											
Month		10	11	12	1	2	3	4	5	6	7	8	9
Chief Advisor/ Water Environment Planning and Improvement	H. KAMATA	10/15	10/31	12/9	1/8	1/28	3/12						
Project Coordinator	K. KONNO	▨											
Chief Advisor/ Integrated Wastewater Management	K. ASADA	10/1	10/23	12/7	12/25	2/20	3/4	4/22	5/28			8/6	8/26
Environmental Regulations and Enforcement	T. TAKESHIMS	10/29	11/28		2/3	3/4	4/20	5/20	6/19	7/20	8/24	9/23	
Decentralized Wastewater Treatment	M. NAGAMOCHI		11/4	11/28	1/12	2/10		5/23		7/7	8/15	9/16	
Institutional Strengthening and Financial Analysis	D. IWATA	10/2	10/21	11/19	1/12	1/26		6/22	7/9				
Environmental Education	T. TOBE		11/16	11/28	12/15	12/29	2/10	3/25	5/18	6/25	7/20	8/12	
Integrated Wastewater Management 2	Y. Xie						4/25	5/22			8/1	8/26	
Working Group 1													
1-2 To plan a viable financial mechanism for the maintenance of the wastewater treatment and consolidate it into the strategy													
1) Institutional Arrangement (Roles of Entities Concerned, Regulatory Arrangement)													
i) Lecture on the institutional arrangement for water environment management and sewerage sector in Japan & overseas													
ii) Workshop to prepare responsible organization of each roles for water environment management and sewerage service													
2) Financial Arrangement													
i) Explanation by C/Ps and discussion of cost burden and budget source proposal of each sanitation / sewerage system													
ii) Integrate cost burden and budget source plan of sewerage system into the wastewater treatment strategy in Vientiane Capital													
iii) Training C/Ps regarding financial analysis of priority project of wastewater treatment strategy in Vientiane Capital													
3) Preparation of Action Plan													
1-3 To formulate the strategy considering site selection, pre F/S and so on for the construction of facilities for waste water treatment in the future													
1) Study on structure of Wastewater Treatment Strategy in Vientiane Capital													
2) Review the Existing Studies													
3) Identification of Designated Area													
4) Preparing Centralized Wastewater Collection and Treatment Plan													
i) Study on Framework (Policy, Objective, Target Year, and Wastewater Collection System)													
ii) Estimation of Wastewater Quantity and Quality to be Treated and Required Land Area for Treatment													
iii) Preparation of Layout Plan for WWTP, PS, and Trunk Sewers													
5) Identify the Suitable Area for Decentralize Wastewater Treatment Facility													
6) Preparation of Individual Wastewater Plan													
7) Preparation of Operation and Maintenance Plan													
8) Cost estimate for Construction and O&M													
9) Preparation of Phased Development Plan													
Working Group 2													
2-1 To prepare/ improve standard designs for toilet facilities with septic tanks and other decentralized wastewater treatment measures													
1) To collect information of septic tanks and decentralized wastewater treatment facilities from other countries and Vientiane Capital													
2) To study on required performance of septic tanks and decentralized wastewater treatment facilities in Vientiane Capital and the improvement of standard design (first version)													
2-2 To prepare and enforce guidelines/ rules for the proper installation and maintenance of septic tanks and decentralized wastewater treatment facilities in accordance with the standard designs													
1) To collect information of other countries experiences related to O&M of sanitary facilities													
2) To study on proper O&M of septic tanks and decentralized wastewater treatment facilities for keeping required level of performance in long term													
2-3 To undertake a study on the improvements of existing facilities for decentralized wastewater treatment and implement training programs													
1) To study on management method for existing decentralized wastewater treatment facilities													
2) To study on implementation process for dissemination of proper management of decentralized wastewater treatment facilities													
2-4 To strengthen community groups for the management of decentralized wastewater treatment and support system for the groups													
1) To study on support system for the community groups for management of decentralized wastewater treatment facilities													
2-5 To support the monitoring (including water quality analysis) of existing facilities for decentralized wastewater treatment													
1) To study on monitoring method of water quality of septic tanks and decentralized wastewater treatment facilities													

Year	2015						2016					
	Term						2nd Year					
	10	11	12	1	2	3	4	5	6	7	8	9
Working Group 3												
3-1 To conduct inventory survey on industries/ key polluters in Vientiane Capital												
1) Make summary of questionnaire results obtained to clear the feature of major water pollution sources												
2) Buildup a trial version of business/industrial database to record contents related with water pollution as well as inspection and monitoring results												
3) Estimate the validity of the ACCESS database system to be applied to the administrative work of Vientiane Capital												
3-2 Through close collaboration with EMSP, to prepare/ improve guidelines/ draft rules for regular inspection of industries, monitoring of water quality from the industries, application for effluent discharge, administrative and technical guidance and regulatory enforcement												
1) Expand contents of Inspection Guideline to cover all of related rules based on inspection												
2) Expand contents of Inspection Guideline to cover industrial waste treatment process												
3) Make a draft rule to cover all of the inspection work in Vientiane Capital												
3-3 To select pilot industries and industry groups/ associations and undertake capacity building activities regarding the operation of guidelines												
1) Practice inspection work to the major industry/business												
2) Promote data collection and consulting work to improve industry/business effluent												
3-4 To train DONRE staff of VC for improvement of analytical skills of water quality including heavy metals, and to support the establishment of sustainable system of water quality monitoring and analysis for public water bodies and industrial discharges												
1) Train DONRE staff of VC for analyzing COD(Cr) , BOD and heavy metals for industrial/business effluent												
2) Train DONRE staff of VC for analyzing water quality components for water environmental monitoring												
Working Group 4												
4- 1. To establish/ strengthen the network of various organizations in the environmental education programs, together with developing educational tools												
1) Application of existing contents & tools prepared by other project												
4- 2. To develop facilitators and resource persons for environmental education to the community (not only school)												
1) Amendment of handbook and development of poster												
2) Training of Trainer												
3) Lecture and practical lessons for students												
4) Student picture competition												
4-3. To support water quality monitoring for public water bodies, rivers and streams and publication of the monitoring results with its interpretation												
1) Preparation & implementation of monitoring by DONRE												
2) Publication of monitoring results												
4- 4. To support regular cleaning activities of canals by the communities disposed by VUDAA providing incentives to the communities												
1) Plan and preparation of framework												
2) Cleaning activity in Hong Phone Thanh												
4-5. To implement the campaign for the load reduction from wastewater and to support cleaning and proper management of septic tanks and decentralized wastewater treatment facilities providing incentives to the communities												
1) Preparation and distribution of pamphlet												
2) Meeting for explanation to target residents												
4- 6. To establish a framework for sustainable environmental education in the formal education and social system in Vientiane Capital												
1) To study a framework for sustainable environmental education in the formal education in Vientiane Capital with the cooperation of DoE and MoE												

Work Breakdown Sheet (WBS) of the 3rd Year
The Project for Urban Water Environment Improvement in Vientiane Capital

■ : Plan
▨ : Actual

Year		2016										2017															
Term		3rd Year																									
Month		10	11	12	1	2	3	4	5	6	7	8	9	10	10	11	12	1	2	3	4	5	6	7	8	9	10
Chief Advisor/ Integrated Wastewater Management	K. ASADA	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	
Project Coordinator	K. KONNO	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	
Environmental Regulations and Enforcement	T. TAKESHIMS	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	
Decentralized Wastewater Treatment	M. NAGAMUCHI	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	
Institutional Strengthening and Financial Analysis	D. IWATA	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	
Environmental Education	T. TOBE	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	
Integrated Wastewater Management 2	Y. Xie	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	
Working Group 1																											
1-2 To plan a viable financial mechanism for the maintenance of the wastewater treatment and consolidate it into the strategy																											
1) Institutional Arrangement (Roles of Entities Concerned, Regulatory Arrangement)																											
i) Lecture on the institutional arrangement for water environment management and sewerage sector in Japan & overseas																											
ii) Workshop to prepare responsible organization of each roles for water environment management and sewerage service																											
2) Financial Arrangement																											
i) Explanation by C/Ps and discussion of cost burden and budget source proposal of each sanitation / sewerage system																											
ii) Integrate cost burden and budget source plan of sewerage system into the wastewater treatment strategy in Vientiane Capital																											
iii) Training C/Ps regarding financial analysis of priority project of wastewater treatment strategy in Vientiane Capital																											
3) Preparation of Action Plan																											
1-3 To formulate the strategy considering site selection, pre F/S and so on for the construction of facilities for waste water treatment in the future																											
1) Preparation of final draft of the strategy																											
2) Selection of facilities for pre F/S																											
3) Data collection for pre F/S																											
4) Preparation of pre F/S																											
1-4 To support public hearing and authorization of the strategy																											
1) Support of public hearing																											
2) Workshop for authorization of the strategy																											
Working Group 2																											
2-1 To prepare/ improve standard designs for toilet facilities with septic tanks and other decentralized wastewater treatment measures																											
1) To study on improvement of the Septic Tank Standard draft for proper implementation																											
2) To study on required performance of decentralized wastewater treatment facilities in Vientiane Capital																											
2-2 To prepare and enforce guidelines/ rules for the proper installation and maintenance of septic tanks and decentralized wastewater treatment facilities in accordance with the standard designs																											
1) To provide support for the rule on wastewater from buildings to be authorized																											
2) To support dissemination of the wastewater system in accordance with the rules/standards																											
2-3 To undertake a study on the improvements of existing facilities for decentralized wastewater treatment and implement training programs																											
1) To study on management method for existing decentralized wastewater treatment facilities																											
2) To study on implementation process for dissemination of proper management of decentralized wastewater treatment facilities																											
2-4 To strengthen community groups for the management of decentralized wastewater treatment and support system for the groups																											
1) To study on support system for the community groups for management of decentralized wastewater treatment facilities																											
2-5 To support the monitoring (including water quality analysis) of existing facilities for decentralized wastewater treatment																											
1) To study on monitoring method of water quality of septic tanks and decentralized wastewater treatment facilities																											

Year Term Month	2016			2017																
	3rd Year																			
	10	11	12	1	2	3	4	5	6	7	8	9	10							
Working Group 3																				
3-1 To conduct inventory survey on industries/ key polluters in Vientiane Capital																				
1) Promote development of "Business Effluent Database"																				
2) Hold a seminar for operation of "Business Effluent Database" the Project has developed so far.																				
3) Proceed a trial version of business/industrial database to record contents related with water pollution as well as inspection and monitoring results																				
4) Estimate the validity of the database system and update necessary corrections as its final work																				
3-2 Through close collaboration with EMSP, to prepare/ improve guidelines/ draft rules for regular inspection of industries, monitoring of water quality from the industries, application for effluent discharge, administrative and technical guidance and regulatory enforcement																				
1) Review and correct Inspection Guideline based on opinions of many related organization																				
2) Expand contents of Inspection Guideline to cover industrial waste treatment process																				
3) Hold a seminar on "Inspection Guideline(ver.2)"																				
4) Propose draft rules for regular inspection																				
3-3 To select pilot industries and industry groups/ associations and undertake capacity building activities regarding the operation of guidelines																				
1) Promote data collection of industry/business effluent																				
2) Promote consultation/assistance to the major industries/businesses to improve effluent quality																				
3-4 To train DONRE staff of VC for improvement of analytical skills of water quality including heavy metals, and to support the establishment of sustainable system of water																				
1) Train DONRE staff of VC for analyzing water quality parameters in order to cover most of regulated components in Lao PDR. (10 parameters : CN,Hg,Phenol,S,Cl2,Cl,Oil,F,Ni,Cr)																				
2) Train DONRE staff of VC for analyzing water quality components for water environmental monitoring																				
3) Train DONRE staff of VC to promote QA(Quality assurance) and QC(Quality control) as a water quality laboratory.																				
Working Group 4																				
4-1 To establish/ strengthen the network of various organizations in the environmental education programs, together with developing educational tools																				
1) Holding seminar on environmental education with related organizations																				
4-2 To develop facilitators and resource persons for environmental education to the community (not only school)																				
1) Adding contents on garbage collection and recycle																				
2) Visiting lecture by DONRE																				
3) Expanding target school for environmental education program																				
4) Student picture competition																				
4-3 To support water quality monitoring for public water bodies, rivers and streams and publication of the monitoring results with its interpretation																				
1) Preparation & implementation of monitoring by DONRE																				
2) Publication of monitoring results																				
4-4 To support regular cleaning activities of canals by the communities disposed by VUDAA providing incentives to the communities																				
1) Monitoring of cleaning activity by residents in Hong Phone Thane																				
2) Cleaning activity event for other canal																				
4-5 To implement the campaign for the load reduction from wastewater and to support cleaning and proper management of septic tanks and decentralized wastewater treatment facilities providing incentives to the communities																				
1) Holding campaign to promote proper desludging																				
4-6 To establish a framework for sustainable environmental education in the formal education and social system in Vientiane Capital																				
1) Arrangement of contents of school textbook and proposal to RIES																				

Appendix 3 Assignment Record of JICA Expert

Record of JICA Expert Assignments

JICA Experts		Project Year	Date	Days	Months	Sub-total			Total
						Year 1	Year 2	Year 3	
Chief Advisor/ Water Environment Planning and Improvement	H. KAMATA	Year 1	14-Oct - 13-Feb	123	4.10	6.13			9.23
			15-Jun - 14-Jul	30	1.00				
			2-Aug - 1-Sep	31	1.03				
		Year 2	15-Oct - 31-Oct	17	0.57	3.10			
			9-Dec - 8-Jan	31	1.03				
			28-Jan - 12-Mar	45	1.50				
		Year 3	-					0.00	
			-						
		Chief Advisor/ Integrated Wastewater Management	K. ASADA	Year 1	14-Oct - 18-Nov	36	1.20	4.33	
14-Dec - 17-Dec	4				0.13				
5-Mar - 3-Apr	30				1.00				
24-May - 19-Jun	27				0.90				
3-Aug - 28-Aug	26				0.87				
24-Sep - 30-Sep	7				0.23				
Year 2	1-Oct - 23-Oct			23	0.77	4.37			
	7-Dec - 25-Dec			19	0.63				
	20-Feb - 4-Mar			14	0.47				
	22-Apr - 28-May			37	1.23				
	8-Aug - 26-Aug			19	0.63				
	12-Sep - 30-Sep			19	0.63				
Year 3	1-Oct - 21-Oct			21	0.70	5.50			
	14-Nov - 23-Dec			40	1.33				
	21-Jan - 10-Feb			21	0.70				
	28-Feb - 2-Mar			3	0.10				
	7-Mar - 24-Mar			18	0.60				
	16-May - 1-Jun			17	0.57				
Environmental Regulations and Enforcement / Water Quality Analysis	T. TAKEISHIMA	Year 1	14-Oct - 12-Nov	30	1.00	3.47			15.50
			5-Mar - 3-Apr	30	1.00				
			13-May - 26-May	14	0.47				
			20-Aug - 18-Sep	30	1.00				
		Year 2	29-Oct - 28-Nov	31	1.03	5.40			
			3-Feb - 4-Mar	31	1.03				
			20-Apr - 27-May	38	1.27				
			20-Jun - 20-Jul	31	1.03				
		Year 3	24-Aug - 23-Sep	31	1.03	6.63			
			10-Oct - 4-Nov	26	0.87				
			28-Nov - 23-Dec	26	0.87				
			25-Jan - 24-Feb	31	1.03				
Decentralized Wastewater Treatment	M. NAGAMOCHI	Year 1	14-Oct - 12-Nov	30	1.00	2.60			10.77
			9-Feb - 10-Mar	30	1.00				
			1-Sep - 18-Sep	18	0.60				
		Year 2	4-Nov - 28-Nov	25	0.83	4.47			
			12-Jan - 10-Feb	30	1.00				
			23-May - 7-Jul	46	1.53				
		Year 3	15-Aug - 16-Sep	33	1.10	3.70			
			4-Jan - 17-Feb	45	1.50				
			13-Mar - 7-Apr	26	0.87				
			7-Aug - 5-Sep	30	1.00				
Institutional Strengthening and Financial Analysis	D. IWATA	Year 1	14-Oct - 31-Oct	18	0.60	3.07			9.47
			13-Mar - 11-Apr	30	1.00				
			15-Jun - 11-Jul	27	0.90				
			14-Sep - 30-Sep	17	0.57				
		Year 2	1-Oct - 2-Oct	2	0.07	2.13			
			21-Oct - 19-Nov	30	1.00				
			12-Jan - 26-Jan	15	0.50				
			22-Jun - 8-Jul	17	0.57				
		Year 3	12-Oct - 18-Nov	38	1.27	4.27			
			16-Feb - 17-Mar	30	1.00				
			29-May - 15-Jul	48	1.60				
			25-Sep - 6-Oct	12	0.40				
Environmental Education	T. TOBE	Year 1	14-Oct - 6-Nov	24	0.80	2.27			9.67
			9-Feb - 27-Feb	19	0.63				
			18-Aug - 11-Sep	25	0.83				
		Year 2	16-Nov - 28-Nov	13	0.43	4.53			
			15-Dec - 29-Dec	15	0.50				
			10-Feb - 25-Mar	45	1.50				
			18-May - 25-Jun	39	1.30				
		Year 3	20-Jul - 12-Aug	24	0.80	2.87			
			21-Nov - 26-Nov	6	0.20				
			19-Jan - 10-Feb	23	0.77				
			23-Feb - 4-Mar	10	0.33				
			9-Mar - 7-Apr	30	1.00				
Integrated Wastewater Management 2	Y. Xie	Year 2	25-Apr - 22-May	28	0.93	1.80			3.00
			1-Aug - 26-Aug	26	0.87				
		Year 3	17-May - 21-Jun	36	1.20			1.20	

Appendix 4 List of Counterparts

Table 1 List of Counterpart (C/P) Personnel as of September 2015

Position in the Project	Organization		Name
Advisory	DHUP, MPWT	Director General	Mr. Khamthavy THAIPHACHANH
Project Director	DPWT, VC	Deputy Director General, Vientiane Capital	Mr. Bounchanh KEOSITHAMMA
Project Manager	DPWT, VC	Deputy Chief, Housing, Urban Planning and Environment Division	Mr. Khammone CHMMANIVONG
Deputy Project Manager	DPWT, VC	Technician, Housing, Urban Planning and Environment Division	Mr. Korlakan SENBOUTTALATH
	PTI, MPWT	Director, Environment and Social Division	Mr. Xayabandith INSISIENGMAY
	PCD, MONRE	Technician, Pollution Control Division	Mr. Sengkeo TASAKETH
	DONRE, VC	Deputy Chief, Water Resource Division	Ms. Khamla THAMMAVONG
Other C/Ps	DHUP, MPWT	Deputy Director, Urban Development Division	Mr. Phouthasom INTHAVONG
	DPWT, VC	Technician, Housing, Urban Planning and Environment Division	Ms. Vankham LUANGKHOT
		Technician, Housing, Urban Planning and Environment Division	Ms. Minaphone CHANTHAVILAY
	DONRE, VC	Technician, Water Resources Division	Ms. Minavanh DUANGMALA
		Technician, Environment Division	Mr. Vilasak VENPASEUTH
	DoIC, VC	Chief, Industrial and Commerce Division	Mr. Sao SENGVONGPHET
	VUDAA, VC	Deputy Chief, Drainage Division	Mr. Khamphet PHONGLASASY
DoES, VC	Technician	Mr. Amnath SOUPIDA	

Table 2 List of Counterpart (C/P) Personnel as of March 2016

Position in the Project	Organization		Name
Advisory	DHUP, MPWT	Director General	Mr. Khamthavy THAIPHACHANH
Project Director	DPWT, VC	Deputy Director General, Vientiane Capital	Mr. Bounchanh KEOSITHAMMA
Project Manager	DPWT, VC	Deputy Chief, Housing, Urban Planning and Environment Division	Mr. Khammone CHMMANIVONG
Deputy Project Manager	DPWT, VC	Technician, Housing, Urban Planning and Environment Division	Mr. Korlakan SENBOUTTALATH
	PTI, MPWT	Director, Environment and Social Division	Mr. Xayabandith INSISIENGMAY
	PCD, MONRE	Technician, Pollution Control Division	Mr. Sengkeo TASAKETH
	DONRE, VC	Deputy Chief, Water Resource Division	Ms. Khamla THAMMAVONG
Other C/Ps	DHUP, MPWT	Deputy Director, Urban Development Division	Mr. Phouthasom INTHAVONG
	DPWT, VC	Technician, Housing, Urban Planning and Environment Division	Ms. Vankham LUANGKHOT
		Technician, Housing, Urban Planning and Environment Division	Ms. Saylom KEOSITHAMMA
	DONRE, VC	Technician, Water Resources Division	Ms. Minavanh DUANGMALA
		Technician, Environment Division	Mr. Vilasak VENPASEUTH

	DoIC, VC	Chief, Industrial and Handicraft Division	Mr. Sao SENGVONGPHET
		Deputy Chief of Industrial and Handicraft Division	Mr. Vongphet RATSABOUTH
	VUDAA, VC	Deputy Chief, Drainage Division	Mr. Khamphet PHONGLASASY
	DoES, VC	Technician	Mr. Amnath SOUPIDA

Table 3 List of Counterpart (C/P) Personnel as of September 2016

Position in the Project	Organization		Name
Advisory	DHUP, MPWT	Director General	Mr. Khamthavy THAIPHACHANH
Project Director	DPWT, VC	Deputy Director General, Vientiane Capital	Mr. Bounchanh KEOSITHAMMA
Project Manager	DPWT, VC	Deputy Chief, Housing, Urban Planning and Environment Division	Mr. Khammone CHMMANIVONG
Deputy Project Manager	DPWT, VC	Technician, Housing, Urban Planning and Environment Division	Mr. Korlakan SENBOUTTALATH
	PTI, MPWT	Director, Environment and Social Division	Mr. Xayabandith INSISIENGMAY
	PCD, MONRE	Technician, Pollution Control Division	Mr. Sengkeo TASAKETH
	DONRE, VC	Deputy Chief, Water Resource Division	Ms. Khamla THAMMAVONG
Other C/Ps	DHUP, MPWT	Deputy Director, Urban Development Division	Mr. Phouthasom INTHAVONG
	DPWT, VC	Technician, Housing, Urban Planning and Environment Division	Ms. Vankham LUANGKHOT
		Technician, Housing, Urban Planning and Environment Division	Ms. Saylom KEOSITHAMMA
		Technician, Housing, Urban Planning and Environment Division	Mr. Thinakon PHIMMAVONG
		Technician, Housing, Urban Planning and Environment Division	Ms. Minaphone CHANTHAVILAY
		Technician, Housing, Urban Planning and Environment Division	Mr. Lathdavanh SIDTHIXAY
	DONRE, VC	Technician, Water Resources Division	Ms. Minavanh DUANGMALA
		Technician, Environment Division	Mr. Vilasak VENPASEUTH
	DoIC, VC	Chief, Industrial and Handicraft Division	Mr. Sao SENGVONGPHET
		Deputy Chief of Industrial and Handicraft Division	Mr. Vongphet RATSABOUTH
	VUDAA, VC	Deputy Chief, Drainage Division	Mr. Khamphet PHONGLASASY
	DoES, VC	Technician	Mr. Amnath SOUPIDA
		Technician	Mr. Phetsalay KEOMANIVONG

Table 4 List of Counterpart (C/P) Personnel as of March 2017

Position in the Project	Organization		Name
Advisory	DHUP, MPWT	Director General	Mr. Khamthavy THAIPHACHANH
Project Director	DPWT, VC	Deputy Director General, Vientiane Capital	Mr. Bounchanh KEOSITHAMMA
Project Manager	DPWT, VC	Deputy Chief, Housing, Urban Planning and Environment Division	Mr. Khammone CHMMANIVONG

Deputy Project Manager	DPWT, VC	Technician, Housing, Urban Planning and Environment Division	Mr. Korlakan SENBOUTTALATH
	PTI, MPWT	Director, Environment and Social Division	Mr. Xayabandith INSISIENGMAY
	PCD, MONRE	Technician, Pollution Control Division	Mr. Sengkeo TASAKETH
	DONRE, VC	Deputy Chief, Water Resource Division	Ms. Khamla THAMMAVONG
Other C/Ps	DHUP, MPWT	Deputy Director, Urban Development Division	Mr. Phouthasom INTHAVONG
	DPWT, VC	Technician, Housing, Urban Planning and Environment Division	Ms. Saylom KEOSITHAMMA
		Technician, Housing, Urban Planning and Environment Division	Mr. Thinakon PHIMMAVONG
		Technician, Housing, Urban Planning and Environment Division	Mr. Lathdavanh SIDTHIXAY
	DONRE, VC	Technician, Water Resources Division	Ms. Minavanh DUANGMALA
		Technician, Environment Division	Mr. Vilasak VENPASEUTH
	DoIC, VC	Deputy Chief of Industrial and Handicraft Division	Mr. Vongphet RATSABOUTH
	VUDAA, VC	Deputy Chief, Drainage Division	Mr. Khamphet PHONGLASASY
		Technical staff	Mr. Sonephet VONGPADITH
DoES, VC	Technician	Mr. Phetsalay KEOMANIVONG	

Appendix 5 Record of Training Acceptance

Plan of Training in Japan

Course Title:	Improvement of capability to cope with wastewater treatment in Vientian Capital		
研修週一次番号:	受入形態	国別研修	
Duration:	2015/7/20 ~ 2015/7/31	Num. of trainees	11 persons
Purpose:	To understand Japanese practices of plan, operation and maintenance of wastewater treatment and strengthen the capability to consider deployment of the wastewater management suite to water environment conservation		
Items:	Strategic Plan of Wastewater Treatment Decentralized Wastewater Treatment Facilities Effluent Control from Business Activities Public Awareness Raising etc.		

Date	Time	Type	Content	Lecturer, Contact Personnel of Visiting Site and so on			Place	Stay
			Activity	Name	Affiliation and Title	Contact Information		
July 19 (Sun)	~							
July 20 (Mon)	~		Departure					
July 21 (Tue)	8:00 ~ 9:00		Arrival (KIX)					JICA Kansai
	14:00 ~ 16:00		Briefing & Orientation					
July 22 (Wed)	10:00 ~ 12:00		Sewerage and Improvement of water pollution (Lecture and Discussion)		Urban Infrastructure Technology Center		Osaka City Sewerage Science Museum	EI Inn Kyoto
	13:30 ~ 15:30							
July 23 (Thu)	9:30 ~ 12:00		Principle of Wastewater Treatment and O&M of STP (Lecture and Visit Toba STP & Lab.)		Water & Sewage Works Bureau, Kyoto City		Toba STP & Water Quality Lab., Kyoto City	EI Inn Kyoto
	13:30 ~ 16:00							
July 24 (Fri)	9:30 ~ 12:00		Johkasou in Japan (Lecture & Site visit)		Jhokasou Unit, Kubota Corporation		Shiga Plant, Kubota Corporation	EI Inn Kyoto
	14:30 ~ 16:00		Sludge Treatment from Jhokasou(Site Visit)		Konan Large Area Administrative Union		Konan Environmental Sanitation Center	
July 25 (Sat)	~		Visit the Culture in Kyoto					EI Inn Kyoto
July 26 (Sun)	~		Moving to Tokyo					JICA Tokyo
	~		(Preparation for Evaluation Meeting)					
July 27 (Mon)	9:00 ~ 11:00		Effluent Control from Business Activities		Drainage Facility Division, Sewerage Bureau, Tokyo Metropolitan Government		Environment Management Division, Sewerage Bu. TWB	JICA Tokyo
	13:30 ~ 15:30		Industrial Wastewater Treatment Facility(Site Visit)		Chubu Plating Industry Cooperative		Cooperative Pollution Control Center	
July 28 (Tue)	9:30 ~ 12:00		Strategic Plan of Wastewater Treatment		International Division, Chiba Prefecture		Chiba Prefectural Office	JICA Tokyo
	14:00 ~ 16:00		Decentralized Wastewater Treatment Facilities (Site Visit)		Sewerage Facility Division, Ichihara city		MWTP of Okatayama Housing Complex, Ichihara City	
July 29 (Wed)	9:30 ~		Public Awareness Raising (Discussion and Site visit)		International Division, Japan Sewage Works Association		Sewage Works Exhibitions(Tokyo Big Sight)	JICA Tokyo
July 30 (Thu)	~		Preparation for presentation					JICA Tokyo
	~		Evaluation meeting of JICA				JICA Tokyo	
July 31 (Fri)	~		Departure for Home					


2015年度ラオス国別研修 首都ビエンチャンにおける汚水処理対策能力の向上 I コース研修員名簿

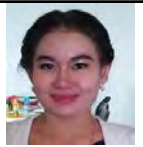



Capacity Improvement for Wastewater Treatment in Vientiane Capital I

(Jul. 21st - Jul. 31st, 2015)

独立行政法人国際協力機構 関西国際センター

Kansai International Center, Japan International Cooperation Agency

No.	Country 国名	Name 氏名	Present Post & Place of Employment 現職・所属先
1		Mr. Phouthasenh ARKHAVONG プッタセン アカヴォン (プッタセン)	Deputy Director General Department of Housing and Urban Planning Ministry of Public Works and Transport (MPWT)
2		Mr. Khamhone CHOMMANIVONG カムモン チョムマニヴォン (カモン)	Deputy Head Housing, Urban Planning and Environment Division Department of Public Works and Transport of Vientiane Capital
3		Mr. Xayabandith INSISIENGMAY サヤバンディトゥ インシシエンマイ (サヤバンディトゥ)	Chief Environmental and Social Division Public Works and Transport Institute (PTI), MPWT
4		Mr. Phouthasom INTHAVONG プタソム インタヴォン (プタソム)	Deputy Chief Urban Development Division Ministry of Public Works and Transport (MPWT)
5		Mr. Khamphet PHONGRATSASY カムペット ボンラッサシ (カンペット)	Project Coordinator VUDAA Vientiane Urban Development Administration Authority (VUDAA), Vientiane Capital
6		Mr. Sao SENGVONGPHET サオ センヴォペット (サオ)	Chief of Section Industry and Handicraft Section Department of Industry and Commerce (DOIC) of Vientiane Capital
7		Ms. Khamla THAMMAVONG カムラ タンマヴォン (カムラ)	Deputy Chief Water Resources Division Department of Natural Resource and Environment (DoNRE) of Vientiane Capital
8		Mr. Sengkeo TASAKETH サンケオ タサケー (サンケオ)	Technical Officer Department of Pollution Control Ministry of Natural Resources and Environment (MoNRE)
9		Mr. Amnath SOUPHIDA アムナ スピダ (アムナ)	Technical Officer Department of Education and Sport of Vientiane Capital Ministry of Education and Sport
10		Mr. Korlakanh SENEBOUTTALATH コーラカン センブッタラット (コーラカン)	Engineer Housing, Urban Planning, and Environment Division Department of Public Works and Transport (DPWT) of Vientiane Capital

11		Ms. Minavanh DOUANGMALA ミナヴァン ドアンマラ (ミナヴァン)	Head of Unit Water Resources Division Department of Natural Resources and Environment (DoNRE) of Vientiane Capital
12		Ms. Vankham LUANGKHOT ヴァンカム ルンコト (ヴァンカム)	Technician Housing, Urban Planning and Environment Division Department of Public Works and Transport (DPWT) of Vientiane Capital
13		Mr. Vilasak VENPASEUTH ヴィラサック ビエパスア (ヴィルサック)	Head of Unit Environmental Division Department of Natural Resources and Environment (DoNRE) of Vientiane Capital
14		Ms. Minaphone CHANTHAVILAY ミナフォン チャンタヴィライ (ミナフォン)	Technician Housing, Urban Planning and Environment Division Department of Public Works and Transport (DPWT) of Vientiane Capital

Appendix 6 List of Provided Equipment

Equipment Provided by JICA

No.	Date of Purchase	Project Year	Equipment (Specification)		Quantity	Section Using / Installation Place	Usage of the Equipment
1	2014/10/10	Year 1	Projector	EB-S03	1	DPWT	Good
2	2014/10/10	Year 1	Water Sampler with Stick	A-500S	1	DoIC	Good
3	2014/10/7	Year 1	pH Meter	B-712	1	DoIC	Good
4	2014/9/29	Year 1	Testing methods for industrial wastewater (JIS K 0102:2013)		1	DONRE	Good
5	2014/9/29	Year 1	Answer book for testing methods for industrial wastewater		1	DONRE	Good
6	2014/9/29	Year 1	Guideline for industrial wastewater		1	DoIC	Good
7	2014/11/4	Year 1	Laptop	ES-471G	2	DPWT/DONRE	Good
8	2014/10/17	Year 1	Printer	MF8280Cw	1	DPWT	Good
9	2014/10/16	Year 1	Refrigerator	7.4Q RT20FGRVDSA/ST	1	DPWT	Good
10	2015/11/11	Year 2	DO Meter	YSI/Nanotech Model 5100	1	DONRE	Good
11	2016/2/1	Year 2	Standard Methods for Examination of Water and Wastewater		1	DONRE	Good
12	2015/12/11	Year 2	Digital Camera	RICOH WG-20	1	DPWT	Good
13	2016/3/11	Year 2	Cutting Machine	HONDA UMK435T	4	Saphangmor and Phonethan Village	Good
14	2016/2/5	Year 2	Heating & Drying Oven	NU30	1	DONRE	Good
15	2016/3/10	Year 2	Flask Washer	TK-11	1	DONRE	Good
16	2016/6/7	Year 2	Combined Refrigerator	R-V550P	1	DONRE	Good
17	2016/6/7	Year 2	Water Bath	VWB 12	1	DONRE	Good
18	2016/6/7	Year 2	Test Tube Mixer	Cat No. 444-1372	1	DONRE	Good
19	2016/6/7	Year 2	Scale Balance	NV2101	1	DONRE	Good
20	2016/6/7	Year 2	Air Pump	DL 40	1	DONRE	Good
21	2016/9/29	Year 2	Regulator for Acetylene Gas		1	DONRE	Good
22	2016/11/28	Year 3	Multi-Parameter Water Quality Meter		1	DONRE	Good
23	2017/3/15	Year 3	Cutting Machine	HONDA UMK435T	2	Khouahang Village and Chantabuly District	Good

Appendix 7 Record of Public Relation

i) Project Logo

WG IV is mainly responsible for making Logo and nickname, because their activity includes public awareness. As a result of having examined four (4) kinds of candidate Logo, the C/Ps decided one Logo as a most suitable one for this Project. It was proposed to Project Director via Project Manager. It was reported at 25h in December Weekly Meeting that the LOGO recommended by major C/Ps which is shown in **Figure 5.3.25**, and nickname of this project “PWEV” were finally approved by Project Director. PWEV is the abbreviation of “Project for Water Environment in Vientiane.



Figure 1 Project Logo

ii) Project Pamphlet

The project pamphlet developed in 1st Year has been distributed to related authorities and persons in meeting and event.

Implementation Structure of the Project

Abbreviation	Name of Agency
1	DPWT (VC) Department of Public Works and Transport, Vientiane Capital
2	PTI (MPWT) Public Works and Transport Institute, Ministry of Public Works and Transport
3	PCD (MONRE) Department of Pollution Control, Ministry of Natural Resources and Environment
4	DONRE (VC) Department of Natural Resources and Environment, Vientiane Capital
5	DHUP (MPWT) Department of Housing and Urban Planning, Ministry of Public Works and Transport
6	DoIC (VC) Department of Industry and Commerce, Vientiane Capital
7	DoES (VC) Department of Education and Sports, Vientiane Capital
8	VUDAA (VC) Vientiane Urban Development and Administration Agency, Vientiane Capital
9	NREI (MONRE) National Resources and Environment Institute, Ministry of Natural Resources and Environment
10	DAF (VC) Department of Agriculture and Forestry, Vientiane Capital
11	MAF Ministry of Agriculture and Forestry
12	DESIA Department of Environmental and Social Impact Assessment, Ministry of Natural Resources and Environment
13	MoIC Ministry of Industry and Commerce

Basic information

Project Period:
October 2014 to September 2017 (3 years)

Overall Goal:
Water environmental management is continuously implemented.

Project Purpose:
The institutional framework and organizations are strengthened for wastewater treatment in Vientiane capital through participatory approach.

Project Area: Vientiane Capital

Output 1:
Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment.

Output 2:
The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment facilities.

Output 3:
The operation of legal and regulatory framework is strengthened for industrial wastewater.

Output 4:
People's awareness is raised through environmental education.

PWEV Office
Address: Kaoyod Village, Setthathilath Road, Sisattanak District, Vientiane, Lao PDR
Phone: 021-255-658
<http://pwevproject.weebly.com/>
E-mail: pwevproject@gmail.com

THE PROJECT FOR URBAN WATER ENVIRONMENT IMPROVEMENT IN VIENTIANE CAPITAL (PWEV)






Project Background	Project Activities		
<p>The water quality in the drainage canals and marshes has been getting worse due to the increasing discharge of domestic wastewater from urban areas as a result of improved living standards as well as the rapid economic and population growth.</p> <p>Improvement of proper wastewater management system including formulation of management plan, establishment of monitoring systems for pollution sources and river water quality is inevitable.</p> <p>In 2011, Government of Lao requested Government of Japan for a technical cooperation project, "The Project for Urban Water Environment Improvement in Vientiane Capital (PWEV)", to strengthen institutional framework for wastewater management and promote water environment improvement.</p> <p>The project started from October 2014 and the related activities have implemented with cooperation of expert team dispatched by JICA (Japan International Cooperation Agency) and the related departments in Vientiane Capital and government ministries of Lao.</p>	<p>Output 1: Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment.</p> <ul style="list-style-type: none"> To formulate the strategy for the construction of facilities for waste water treatment in the future. To plan a viable financial mechanism for the maintenance of the wastewater treatment. 	<p>Output 3: The operation of legal and regulatory framework is strengthened for industrial wastewater.</p> <ul style="list-style-type: none"> To prepare and improve guidelines for regular inspection of industries, monitoring of water quality from the industries, application for effluent discharge, administrative and technical guidance and regulatory enforcement. 	
 <p>Polluted canal with odor due to the increasing discharge of domestic and industrial wastewater</p>	 <p>Site visit at canals to figure out present situation and issues of water environment</p>	 <p>Sampling and monitoring activity</p>	
	<p>Output 2: The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment facilities.</p> <ul style="list-style-type: none"> To prepare and enforce guidelines for the proper installation and maintenance of septic tanks and decentralized wastewater treatment facilities. 	<p>Output 4: People's awareness is raised through environmental education.</p> <ul style="list-style-type: none"> To develop facilitators and education tools for environmental education. To implement campaigns for load reduction from wastewater and regular cleaning activities of canals by communities and VUDAA. 	
	 <p>Site visit at installed decentralized wastewater treatment facility</p>	 <p>Environmental education in school</p>	

Figure 2 Project Pamphlet

iii) Project Newsletter

To introduce project activities and outputs periodically and continuously, the project newsletter has been also developed by C/Ps and JET as shown in **Table 1**.

Table 1 Project Newsletter

Volume	Time of Issue	Contents
Volume 1	December 2014	<ul style="list-style-type: none"> Project Outline 1st JCC (Joint Coordinating Committee) Meeting
Volume 2	June 2015	<ul style="list-style-type: none"> Weekly Meeting, Lectures and related Activities Seminar on History of Water Pollution in Japan
Volume 3	March 2016	<ul style="list-style-type: none"> Cleaning Activity with Community Participation in Hong Phone Thane
Volume 4	April 2016	<ul style="list-style-type: none"> Environmental Education for Primary Schools in Vientiane Capital
Volume 5	June 2016	<ul style="list-style-type: none"> Seminar on Wastewater Regulation and Technologies Exhibition and Ceremony for Student Picture Competition



THE PROJECT FOR URBAN WATER ENVIRONMENT IMPROVEMENT IN VIENTIANE CAPITAL

PWEV

Newsletter



Vol. 2 - June 2015

By Department of Public Works and Transport, Vientiane Capital with contribution of JICA

Almost 9 months have passed since the technical cooperation project, "The Project for Urban Water Environment Improvement in Vientiane Capital (PWEV)", started. Various activities including site visit, interview with related authorities and technical lectures by JICA Expert Team have implemented in accordance with the work plan approved by JCC meeting held on December, 2014. Weekly meeting including lectures by JICA Expert Team and discussion with Counterparts is also continuously held every Thursday. The seminar on history of water pollution in Japan was also held on 21st May, 2015 to promote the understanding of role and importance for regulations of industrial wastewater. In this newsletter, the weekly meeting, related activities and seminar are introduced.

Weekly Meeting, Lectures and related Activities

Weekly Meeting and Lectures

Weekly meeting with participation of Counterparts and JICA Expert Team is continuously held at PWEV office every Thursday for discussion and lectures on wastewater management and water environment improvement. JICA Expert Team gives some lectures and practical lessons on strategy and financial mechanism for wastewater management, guidelines for industrial wastewater and decentralized wastewater treatment system, and environmental education.



Site Visit and Water Quality Monitoring

Counterparts and JICA Expert Team visited canals, school and communities which installed DEWATS (Decentralized Wastewater Treatment System), and some households to figure out current situation and problems. Water quality monitoring was also conducted in the beginning of April to figure out current water quality of canals and existing DEWATS. Some equipment belong to DONRE was applied for water quality monitoring.



Figure 3 Project Newsletter

iv) Project Homepage

To introduce and disclose project activities, outputs, and water quality monitoring results periodically and continuously, the project homepage was also developed by C/Ps and JET as shown in **Figure 4**. Facebook site was also developed and has been updated by C/Ps as shown in **Figure 5**.

- Homepage: <http://pwevproject.weebly.com/>
- Facebook: <https://www.facebook.com/pwevproject/?fref=ts>



Figure 4 Project Homepage



Figure 5 Project Facebook

v) Press Release for Project

To introduce project activities and outputs, the press release for the project put out through newspaper and TV news periodically in JCC meeting, quarterly meeting, event and seminar.

Table 2 Record of Media Release

	Topic	Time	Media Release		
			Vientiane Times	Vientiane Mai	Lao Television
1	1st JCC Meeting	15th December, 2014	○	○	○
2	Seminar on History of Water Pollution in Japan	21st May, 2015	○	—	○
3	1st Quarterly Meeting	8th August, 2015	○	○	○
4	2nd JCC Meeting	23rd October, 2015	○	○	○
5	2nd Quarterly Meeting	26th February, 2016	○	○	○
6	Environmental Education in Khoualouang School	4th March, 2016	○	○	—
7	Cleaning Activity in Hong Phone Thane	12th March, 2016	○	○	○
8	3rd JCC Meeting	25th May, 2016	○	○	○
9	Cleaning Activity in Hong Phone Thane	18th June, 2016	○	○	○
10	Seminar on Introduction of Wastewater Regulation and Japanese SME's Products and Technologies for Water and Wastewater Management	24th June, 2016	○	○	—
11	4th JCC Meeting	16th December, 2016	○	○	○
12	Environmental Education in Nongbuathong School	17th March, 2017	○	—	○
13	World Water Day Event by DONRE (Thadindengtai Primary School)	24th March, 2017	—	—	○
14	Cleaning Activity in Hong Pasak	25th March, 2017	○	○	○
15	Promotion Event of desludging from Septic Tanks at Thongkhankham Village	29th March, 2017	—	—	○
16	Student Picture Competition on Children's Day Festival at DoES	30th May, 2017	—	—	○
17	Seminar on Environmental Education	7th June, 2017	○	○	○
18	5th JCC Meeting	22nd July, 2017	○	○	○
19	Public Hearing for Strategy of Wastewater Management for VC	16th August, 2017	—	—	○
20	6th JCC Meeting	27th September, 2017	○	○	○

(Vientiane Times: English newspaper, Vientiane Mai: Local newspaper, Lao Television: Lao national television),
(○: press and news coverage, -: no coverage)

Appendix 8 Transition of PDM

1 Project Design Matrix (PDM)

Project Design Matrix (PDM), which summarizes overall goal, project purpose, output, objectively verifiable indicators, activities, input is shown in **Table 1** and **Table 2**. The tentative Project Design Matrix (PDM_0) in **Table 1** was mutually agreed between JICA and Authorities concerned of Lao on June 11th, 2014 before the commencement of the Project, included in “Record of Discussions”. The revised Project Design Matrix (PDM_1) in **Table 2** was prepared through the discussion between JICA Expert Team (JET) and counterparts (C/Ps). PDM_1 was also approved in Joint Coordinating Committee (JCC) meeting held on December 15th, 2014.

PDM was further discussed between C/Ps and JET to respond to the request of the Project Director who would like to periodically monitor water qualities of the public water courses and enlighten the public and high rank officers on the present and transition of water environment. PDM_2 was prepared adding mainly establishment of water quality monitoring and analysis activities and public awareness of the results. PDM_2 presented in **Table 3** was signed on September 22, 2015 between JICA and Lao authority concerned.

Table 1 PROJECT DESIGN MATRIX_0 (PDM_0)

Project Name: The Project for Urban Water Environment Improvement in Vientiane Capital

Duration: July 2014 to July 2017 (36 Months)

Project Site: Vientiane Capital

Target Group: Key staff members of Authorities Concerned, officers of Supporting agencies and Concerned agencies, residents of pilot sites, industrial groups/ associations

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal</p> <p>Water environmental management is continuously implemented.</p>	<ol style="list-style-type: none"> 1. A collaborative coordinating body/ mechanism established by the project is functional continuously, holding regular meeting and making important decisions regarding water environmental management. 2. The technologies/ models introduced by the project are replicated in another area/ site in Vientiane Capital. 3. The number of regular inspection is increased. 4. There is clear evidence that “Strategy for Wastewater Treatment in Vientiane Capital” is referred to during important decision-making discussions among policy makers. 	<ol style="list-style-type: none"> 1. Minutes of Meeting of the body/ mechanism 2. Field visit/ visual observation, interview, relevant report 3. Inspection report, interview 4. Minutes of Meeting, interview 	<ul style="list-style-type: none"> • There is no change in the priority of the government on water environmental management. • The sites for water treatment measures proposed by the plan are secured.
<p>Project Purpose</p> <p>The institutional framework and organizations are strengthened for wastewater treatment in Vientiane capital through participatory approach.</p>	<p>By the end of this Project,</p> <ol style="list-style-type: none"> 1 At least 80% of trainees are applying skills/ knowledge learned during the training organized by the project. 2 A collaborative coordinating body/ mechanism with active participation by the citizens is established by the project and institutionalized/ mainstreamed within the system for water environmental management. 3 “Strategy for Wastewater Treatment in Vientiane Capital”, including proposed zoning, sewerage networks, utilization of EU Pond as a candidate site for Wastewater Treatment Plant, and management system with proper legal framework, planning, monitoring and evaluation for water environmental management in Vientiane Capital is prepared after at least one public hearing and endorsed by the competent authority. 	<ol style="list-style-type: none"> 1 Post-training evaluation report and interview 2 A government order/ gazette for the establishment of the body/ mechanism 3 The plan with a letter of endorsement by the competent authority, report on public hearing 	<ul style="list-style-type: none"> • The financial and human resources of the Lao Government remain for the water environmental management.
<p>Outputs</p> <ol style="list-style-type: none"> 1. Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment. 	<ol style="list-style-type: none"> 1-1 Based on the experience of pilot studies, C/P personnel can explain properly the strengths and weaknesses of various types of decentralized and centralized wastewater treatment methods. 1-2 At least 90% of participants of training programs on decentralized and centralized wastewater treatment measures expressed their overall satisfaction over the training programs. 1-3 Community groups are functional (undertaking regular maintenance, sensitization activities, etc.) for the operation and maintenance of decentralized wastewater treatment measures. 1-4 “Strategy for Wastewater Treatment in Vientiane Capital” is discussed by the collaborative coordinating body/ mechanism at least 5 times with adequate participation by the concerned stakeholders. 	<ol style="list-style-type: none"> 1-1 Interview, field visit/ visual observation and report on pilot study 1-2 Training report/ evaluation sheet 1-3 Interview, field visit/ visual observation and report on pilot study 1-4 The plan itself and workshop report/ Minutes of Meeting 	<ul style="list-style-type: none"> • Trained C/P personnel remain in the project. • Various concerned agencies collaborate to the project. • The interests of local communities to improve water environment remains.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
2. The operation of legal and regulatory framework is strengthened for water environmental management.	2-1 Based on the piloting, a viable guideline/ regulation is prepared/ improved for each step of inspection, monitoring, application for effluent discharge, guidance and regulatory enforcement for proper wastewater treatment and is discussed by the collaborative coordinating body/ mechanism at least 5 times with adequate participation by the concerned stakeholders. 2-2 C/P personnel can explain clearly the guidelines. 2-3 At least 90% of participants of regulatory training programs under the project expressed their overall satisfaction over the training programs.	2-1 The guidelines/ regulations themselves and workshop report/ Minutes of Meeting 2-2 Interview 2-3 Training report/ evaluation sheet	
3. People's awareness is raised through environmental education.	3-1 At least 80% of residents in the target communities have positively changed their behaviors towards the wastewater discharge and management. 3-2 The target communities are continuing cleaning activities of canal and septic tanks. 3-3 At least 20 desludge incidents are observed for the septic tanks in the target communities.	3-1 Field visit/ visual observation, interview and relevant report 3-2 Field visit/ visual observation, interview and relevant report 3-3 Interview and relevant report	
Activities		Inputs	
1-1 To formulate a collaborative coordinating body/ mechanism and to strengthen it 1-2 To prepare/ improve standard designs for toilet facilities with septic tanks and other decentralized wastewater treatment measures 1-3 To undertake a study on the improvements of existing facilities for decentralized wastewater treatment and implement training programs 1-4 To strengthen community groups for the management of decentralized wastewater treatment and support system for the groups 1-5 To support the monitoring (including water quality analysis) of existing facilities for decentralized wastewater treatment 1-6 To conduct inventory survey on industries/ key polluters in Vientiane Capital and to collect/ generate other necessary data for Strategy for Wastewater Treatment for Vientiane Capital 1-7 To plan a viable financial mechanism for the maintenance of the wastewater treatment and consolidate it into the strategy 1-8 To support the formulation of the strategy considering site selection, pre F/S and so on for the construction of facilities for wastewater treatment in the future 1-9 To support public hearing and authorization of the strategy 2-1 To prepare and enforce guidelines/ rules for the proper installation and maintenance of septic tanks and decentralized wastewater treatment facilities in accordance with the standards prepared under Output 1 2-2 Through close collaboration with EMSP, to prepare/ improve guidelines/ rules for regular inspection of industries, monitoring of water quality from the industries, application for effluent discharge, administrative and technical guidance and regulatory enforcement	< Laos Side > 1) Counterparts personnel <ul style="list-style-type: none"> ▪ Project Director ▪ Project Manager ▪ Other Counterpart Personnel 2) Facilities <ul style="list-style-type: none"> ▪ Office space at DPWT ▪ Office equipment and utilities for project operation ▪ Field for environmental education 3) Local operational cost <ul style="list-style-type: none"> ▪ Activity cost of counterpart personnel ▪ Other necessary cost for project operation 4) Others <ul style="list-style-type: none"> ▪ Information as well as support in obtaining medical service; ▪ Credentials or identification cards; ▪ Available data (including maps and photographs) and information related to the Project; 	< Japanese Side > 1) Dispatch of experts <ul style="list-style-type: none"> ▪ Chief Advisor/ Water Environment Planning and Improvement ▪ Environmental Regulations and Enforcement ▪ Project Coordinator ▪ Environmental Education ▪ Decentralized Wastewater Treatment ▪ Integrated Wastewater Management ▪ Institutional Strengthening and Financial Analysis 2) Training of counterpart personnel in Japan and third countries 3) Machinery and equipment <ul style="list-style-type: none"> ▪ Office equipment 	Preconditions <ul style="list-style-type: none"> ▪ C/P personnel are assigned properly and timely. ▪ Adequate budget for local operational cost is secured by the Lao Government.

Activities	Inputs		
2-3 To select pilot industries and industry groups/ associations and undertake capacity building activities regarding the operation of guidelines/ rules 3-1 To establish/ strengthen the network of various organizations in the environmental education programs, together with developing educational tools 3-2 To develop facilitators and resource persons for environmental education 3-3 With active participation of target residents, to implement a pilot project on water quality study using indicatory aquatic species 3-4 To support regular cleaning activities of canals by the communities disposed by VUDAA providing incentives to the communities (reminding rainy season) 3-5 To implement the campaign for the load reduction from wastewater and to support cleaning and proper management of septic tanks and decentralized wastewater treatment facilities providing incentives to the communities 3-6 To mainstream environmental education in the formal education and social system in Vientiane Capital			

Table 2 PROJECT DESIGN MATRIX_1 (PDM_1)

Project Name: The Project for Urban Water Environment Improvement in Vientiane Capital

Duration: 36 Months from October 2014

Project Site: Vientiane Capital

Target Group: Key staff members of authorities concerned, officers of supporting agencies and concerned agencies, residents of pilot sites, industrial groups/ associations

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal</p> <p>Water environmental management is continuously implemented.</p>	<ol style="list-style-type: none"> 1. A collaborative coordinating body/ mechanism established by the project is functional continuously, holding regular meeting and making important decisions regarding water environmental management. 2. The technologies/ models introduced by the project are replicated in another area/ site in Vientiane Capital. 3. The number of regular inspection is increased. 4. There is clear evidence that “Strategy for Wastewater Treatment in Vientiane Capital” is referred to during important decision-making discussions among policy makers. 	<ol style="list-style-type: none"> 1. Minutes of Meeting of the body/ mechanism 2. Field visit/ visual observation, interview, relevant report 3. Inspection report, interview 4. Minutes of Meeting, interview 	<ul style="list-style-type: none"> • There is no change in the priority of the government on water environmental management. • The sites for water treatment measures proposed by the plan are secured.
<p>Project Purpose</p> <p>The institutional framework and organizations are strengthened for wastewater treatment in Vientiane capital through participatory approach.</p>	<p>By the end of this Project,</p> <ol style="list-style-type: none"> 1. At least 80% of trainees are applying skills/ knowledge learned during the training organized by the project. 2. A collaborative coordinating body/ mechanism with active participation by the citizens is established by the project and institutionalized/ mainstreamed within the system for water environmental management. 3. “Strategy for Wastewater Treatment in Vientiane Capital”, including proposed zoning, sewerage networks, utilization of EU Pond as a candidate site for Wastewater Treatment Plant, and management system with proper legal framework, planning, monitoring and evaluation for water environmental management in Vientiane Capital is prepared after at least one public hearing and endorsed by the competent authority. 	<ol style="list-style-type: none"> 1. Post-training evaluation report and interview 2. A government order/ gazette for the establishment of the body/ mechanism 3. The plan with a letter of endorsement by the competent authority, report on public hearing 	<ul style="list-style-type: none"> • The financial and human resources of the Lao Government remain for the water environmental management.
<p>Outputs</p> <ol style="list-style-type: none"> 1. Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment. 	<ol style="list-style-type: none"> 1-1 Through the experience of pilot studies and preparation of “Strategy for Wastewater Treatment in Vientiane Capital”, C/P personnel can explain properly the strengths and weaknesses of various types of decentralized and centralized wastewater treatment methods. 1-2 “Strategy for Wastewater Treatment in Vientiane Capital” is discussed by the collaborative coordinating body/ mechanism at least 5 times with adequate participation by the concerned stakeholders. 	<ol style="list-style-type: none"> 1-1 Interview, field visit/ visual observation and report on pilot study, the plan itself 1-2 The plan itself and workshop report/ Minutes of Meeting 	<ul style="list-style-type: none"> • Trained C/P personnel remain in the project. • Various concerned agencies collaborate to the project. • The interests of local communities to improve water environment remains.
<ol style="list-style-type: none"> 2. The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment facilities. 	<ol style="list-style-type: none"> 2-1 Based on the piloting, a viable guideline/ regulation is prepared/ improved for promoting proper maintenance of septic tanks and decentralized wastewater treatment facilities, and is discussed by the collaborative coordinating body/ mechanism at least 5 times with adequate participation by the concerned stakeholders. 	<ol style="list-style-type: none"> 2-1 The guidelines/ regulations themselves and workshop report/ Minutes of Meeting 	

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
	2-2 C/P personnel can explain clearly the guidelines. 2-3 At least 90% of participants of training programs on decentralized wastewater treatment measures expressed their overall satisfaction over the training programs.	2-2 Interview 2-3 Training report/ evaluation sheet	
3. The operation of legal and regulatory framework is strengthened for industrial wastewater.	3-1 Based on the piloting, a viable guideline/ regulation is prepared/ improved for each step of inspection, monitoring, application for effluent discharge, guidance and regulatory enforcement for proper wastewater treatment and is discussed by the collaborative coordinating body/ mechanism at least 5 times with adequate participation by the concerned stakeholders. 3-2 C/P personnel can explain clearly the guidelines. 3-3 At least 90% of participants of regulatory training programs under the project expressed their overall satisfaction over the training programs.	3-1 The guidelines/ regulations themselves and workshop report/ Minutes of Meeting 3-2 Interview 3-3 Training report/ evaluation sheet	
4. People's awareness is raised through environmental education.	4-1 At least 80% of residents in the target communities have positively changed their behaviors towards the wastewater discharge and management. 4-2 The target communities are continuing cleaning activities of canal and regular maintenance of septic tanks and decentralized wastewater treatment facilities. 4-3 At least 20 desludging activities are observed for the septic tanks in the target communities.	4-1 Field visit/ visual observation, interview and relevant report 4-2 Field visit/ visual observation, interview and relevant report 4-3 Interview and relevant report	
Activities		Inputs	
1-1 To collect necessary data for Strategy for Wastewater Treatment for Vientiane Capital 1-2 To plan a viable financial mechanism for the maintenance of the wastewater treatment and consolidate it into the strategy 1-3 To formulate the strategy considering site selection, pre F/S and so on for the construction of facilities for waste water treatment in the future 1-4 To support public hearing and authorization of the strategy 2-1 To prepare/ improve standard designs for toilet facilities with septic tanks and other decentralized wastewater treatment measures 2-2 To prepare and enforce guidelines/ rules for the proper installation and maintenance of septic tanks and decentralized wastewater treatment facilities in accordance with the standard designs 2-3 To undertake a study on the improvements of existing facilities for decentralized wastewater treatment and implement training programs 2-4 To strengthen community groups for the management of decentralized wastewater treatment and support system for the groups 2-5 To support the monitoring (including water quality analysis) of existing facilities for decentralized wastewater treatment	<Laos Side> 1) Counterparts personnel <ul style="list-style-type: none"> ▪ Project Director ▪ Project Manager ▪ Other Counterpart Personnel 2) Facilities <ul style="list-style-type: none"> ▪ Office space at DPWT ▪ Office equipment and utilities for project operation ▪ Field for environmental education 3) Local operational cost <ul style="list-style-type: none"> ▪ Activity cost of counterpart personnel ▪ Other necessary cost for project operation 4) Others <ul style="list-style-type: none"> ▪ Information as well as support in obtaining medical service; 	<Japanese Side> 1) Dispatch of experts <ul style="list-style-type: none"> ▪ Chief Advisor/ Water Environment Planning and Improvement ▪ Environmental Regulations and Enforcement ▪ Project Coordinator ▪ Environmental Education ▪ Decentralized Wastewater Treatment ▪ Integrated Wastewater Management ▪ Institutional Strengthening and Financial Analysis 2) Training of counterpart personnel in Japan and third countries	Preconditions <ul style="list-style-type: none"> ▪ C/P personnel are assigned properly and timely ▪ Adequate budget for local operational cost is secured by Lao Government

Activities	Inputs	
<p>3-1 To conduct inventory survey on industries/ key polluters in Vientiane Capital</p> <p>3-2 Through close collaboration with EMSP, to prepare/ improve guidelines/ rules for regular inspection of industries, monitoring of water quality from the industries, application for effluent discharge, administrative and technical guidance and regulatory enforcement</p> <p>3-3 To select pilot industries and industry groups/ associations and undertake capacity building activities regarding the operation of guidelines/ rules</p> <p>4-1 To establish/ strengthen the network of various organizations in the environmental education programs, together with developing educational tools</p> <p>4-2 To develop facilitators and resource persons for environmental education</p> <p>4-3 With active participation of target residents, to implement a pilot project on water quality study using indicatory aquatic species</p> <p>4-4 To support regular cleaning activities of canals by the communities disposed by VUDAA providing incentives to the communities (reminding rainy season)</p> <p>4-5 To implement the campaign for the load reduction from wastewater and to support cleaning and proper management of septic tanks and decentralized wastewater treatment facilities providing incentives to the communities</p> <p>4-6 To establish a framework for sustainable environmental education in the formal education and social system in Vientiane Capital</p>	<ul style="list-style-type: none"> ▪ Credentials or identification cards; ▪ Available data (including maps and photographs) and information related to the Project; 	<p>3) Machinery and equipment</p> <ul style="list-style-type: none"> ▪ Office equipment

Table 3 PROJECT DESIGN MATRIX_2 (PDM_2)

Project Name: The Project for Urban Water Environment Improvement in Vientiane Capital

Duration: 36 Months from October 2014

Project Site: Vientiane Capital

Target Group: Key staff members of authorities concerned, officers of supporting agencies and concerned agencies, residents of pilot sites, industrial groups/ associations

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal</p> <p>Water environmental management is continuously implemented.</p>	<ol style="list-style-type: none"> 1. A collaborative coordinating body/ mechanism recommended in the project is functional continuously, holding regular meeting and making important decisions regarding water environmental management. 2. The technologies/ models introduced by the project are replicated in another area/ site in Vientiane Capital. 3. The number of regular inspection is increased. 4. There is clear evidence that “Strategy for Wastewater Treatment in Vientiane Capital” is referred to during important decision-making discussions among policy makers. 	<ol style="list-style-type: none"> 1. Minutes of Meeting of the body/ mechanism 2. Field visit/ visual observation, interview, relevant report 3. Inspection report, interview 4. Minutes of Meeting, interview 	<ul style="list-style-type: none"> • There is no change in the priority of the government on water environmental management. • The sites for water treatment measures proposed by the plan are secured.
<p>Project Purpose</p> <p>The institutional framework and organizations are strengthened for wastewater treatment in Vientiane capital through participatory approach.</p>	<p>By the end of this Project,</p> <ol style="list-style-type: none"> 1. At least 80% of trainees are applying skills/ knowledge learned during the training organized by the project. 2. Roles of the relevant authorities for water environmental management are identified and active participation of the citizens in water environment improvement is continued. 3. “Strategy for Wastewater Treatment in Vientiane Capital”, including proposed zoning, sewerage networks, utilization of EU Pond as a candidate site for Wastewater Treatment Plant, and management system with proper legal framework, planning, monitoring and evaluation for water environmental management in Vientiane Capital is prepared after at least one public hearing and endorsed by the competent authority. 	<ol style="list-style-type: none"> 1. Post-training evaluation report and interview 2. Post-training evaluation report, interview, and relevant report 3. The plan with a letter of endorsement by the competent authority, report on public hearing 	<ul style="list-style-type: none"> • The financial and human resources of the Lao Government remain for the water environmental management.
<p>Outputs</p> <ol style="list-style-type: none"> 1. Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment. 2. The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment 	<ol style="list-style-type: none"> 1-1 Through the experience of pilot studies and preparation of “Strategy for Wastewater Treatment in Vientiane Capital”, C/P personnel can explain properly the strengths and weaknesses of various types of decentralized and centralized wastewater treatment methods. 1-2 “Strategy for Wastewater Treatment in Vientiane Capital” is discussed at least 5 times with adequate participation by the concerned stakeholders. 2-1 Based on the piloting, a viable guideline is prepared/ improved for promoting proper maintenance of septic tanks and decentralized wastewater treatment facilities, and is discussed at least 5 times with adequate participation by the concerned stakeholders. 2-2 C/P personnel can explain clearly the guidelines. 	<ol style="list-style-type: none"> 1-1 Interview, field visit/ visual observation and report on pilot study, the plan itself 1-2 The plan itself and workshop report/ Minutes of Meeting 2-1 The guidelines/ regulations themselves and workshop report/ Minutes of Meeting 2-2 Interview 	<ul style="list-style-type: none"> • Trained C/P personnel remain in the project. • Various concerned agencies collaborate to the project. • The interests of local communities to improve water environment remains.

facilities.	2-3 At least 90% of participants of training programs on decentralized wastewater treatment measures expressed their overall satisfaction over the training programs.	2-3 Training report/ evaluation sheet	
3. The operation of legal and regulatory framework is strengthened for industrial wastewater.	3-1 Based on the piloting, a viable guideline is prepared/ improved for each step of inspection, monitoring, application for effluent discharge, guidance and regulatory enforcement for proper wastewater treatment and is discussed at least 5 times with adequate participation by the concerned stakeholders. 3-2 C/P personnel can explain clearly the guidelines. 3-3 At least 90% of participants of regulatory training programs under the project expressed their overall satisfaction over the training programs. 3-4 Water quality monitoring system was established and continuous monitoring and analysis activities are observed.	3-1 The guidelines/ regulations themselves and workshop report/ Minutes of Meeting 3-2 Interview 3-3 Training report/ evaluation sheet 3-4 Field visit/ visual observation, interview and relevant report	•
4. People's awareness is raised through environmental education.	4-1 At least 80% of residents in the target communities have positively changed their behaviors towards the wastewater discharge and management. 4-2 The target communities are continuing cleaning activities of canal and regular maintenance of septic tanks and decentralized wastewater treatment facilities. 4-3 At least 20 desludging activities are observed for the septic tanks in the target communities. 4-4 Water quality monitoring results are published by HP and the HP is periodically renewed.	4-1 Field visit/ visual observation, interview and relevant report 4-2 Field visit/ visual observation, interview and relevant report 4-3 Interview and relevant report	
Activities		Inputs	
1-1 To collect necessary data for Strategy for Wastewater Treatment for Vientiane Capital 1-2 To plan a viable financial mechanism for the maintenance of the wastewater treatment and consolidate it into the strategy 1-3 To formulate the strategy considering site selection, pre F/S and so on for the construction of facilities for waste water treatment in the future 1-4 To support public hearing and authorization of the strategy 2-1 To prepare/ improve standard designs for toilet facilities with septic tanks and other decentralized wastewater treatment measures 2-2 To prepare guidelines/ rules for the proper installation and maintenance of septic tanks and decentralized wastewater treatment facilities in accordance with the standard designs and to support the operation of the guideline in the pilot areas 2-3 To undertake a study on the improvements of existing facilities for decentralized wastewater treatment and implement training programs 2-4 To strengthen community groups for the management of decentralized wastewater treatment and support system for the groups	<Laos Side> 1) Counterparts personnel ▪ Project Director ▪ Project Manager ▪ Other Counterpart Personnel 2) Facilities ▪ Office space at DPWT ▪ Office equipment and utilities for project operation ▪ Field for environmental education 3) Local operational cost ▪ Activity cost of counterpart personnel ▪ Other necessary cost for project operation 4) Others ▪ Information as well as support in obtaining medical service;	<Japanese Side> 1) Dispatch of experts ▪ Chief Advisor/ Water Environment Planning and Improvement ▪ Environmental Regulations and Enforcement ▪ Project Coordinator ▪ Environmental Education ▪ Decentralized Wastewater Treatment ▪ Integrated Wastewater Management ▪ Institutional Strengthening and Financial Analysis 2) Training of counterpart	Preconditions ▪ C/P personnel are assigned properly and timely ▪ Adequate budget for local operational cost is secured by Lao Government

<p>2-5 To support the monitoring (including water quality analysis) of existing facilities for decentralized wastewater treatment</p> <p>3-1 To conduct inventory survey on industries/ key polluters in Vientiane Capital</p> <p>3-2 Through close collaboration with EMSP, to prepare/ improve guidelines/ draft rules for regular inspection of industries, monitoring of water quality from the industries, application for effluent discharge, administrative and technical guidance and regulatory enforcement</p> <p>3-3 To select pilot industries and industry groups/ associations and undertake capacity building activities regarding the operation of guidelines</p> <p>3-4 To train DONRE staff of VC for improvement of analytical skills of water quality including heavy metals, and to support the establishment of sustainable system of water quality monitoring and analysis for public water bodies and industrial discharges</p> <p>4-1 To establish/ strengthen the network of various organizations in the environmental education programs, together with developing educational tools</p> <p>4-2 To develop facilitators and resource persons for environmental education</p> <p>4-3 To support water quality monitoring for public water bodies, rivers and streams and publication of the monitoring results with its interpretation</p> <p>4-4 To support regular cleaning activities of canals by the communities disposed by VUDAA providing incentives to the communities.</p> <p>4-5 To implement the campaign for the load reduction from wastewater and to support cleaning and proper management of septic tanks and decentralized wastewater treatment facilities providing incentives to the communities</p> <p>4-6 To establish a framework for sustainable environmental education in the formal education and social system in Vientiane Capital</p>	<ul style="list-style-type: none"> ▪ Credentials or identification cards; ▪ Available data (including maps and photographs) and information related to the Project; 	<p>personnel in Japan and third countries</p> <p>3) Machinery and equipment</p> <ul style="list-style-type: none"> ▪ Office equipment 	
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**Appendix 9 Record of Joint Coordinating
 Committee**

MINUTES OF MEETING
OF THE FIRST JOINT COORDINATING COMMITTEE
FOR
THE PROJECT FOR URBAN WATER ENVIRONMENT
IMPROVEMENT IN
VIENTIANE CAPITAL
IN THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

牧本小枝

Saeda MAKIMOTO
Senior Representative
Laos Office
Japan International Cooperation Agency,
Japan



Keophilavanh APHAILATH
Vice Governor

Vientiane Capital
Lao People's Democratic Republic

VIENTIANE CAPITAL, DECEMBER 15, 2014.

1. Introduction

The Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched JICA Expert Team (hereinafter referred to as “JET”) on 14th October 2014, to commence the Project for Urban Water Improvement in Vientiane Capital in Lao PDR (hereinafter referred to as “the Project”).

The Joint Coordinating Committee for the Project was held on 15th in December, 2014 at the Meeting room at DPWT, Vientiane Capital. This is the first JCC meeting held to discuss contents of the Project. Meeting was chaired by Vice Governor of Vientiane Capital and attended by DHUP and PTI in MPWT, DPWT in Vientiane Capital, and other relevant organization.

2. Opening Remarks

On behalf of Vientiane Capital, Mr. Keophilavanh APHAILATH, a chairperson of JCC meeting welcomed all participants in the meeting. The chairman made opening remarks with brief introduction of the project background including its goal and main purpose which mainly aims to strengthen the capacity on urban water environment in Vientiane Capital. and the 1st JCC started at 8:30. Participants of the meeting are listed in the attachment 1.

3. Starting Remark

Following the opening remarks, JICA Senior Representative, Ms. Saeda Makimoto made a starting remark. In the remark, Ms, Makimoto pointed out that this Technical Cooperation Project aims to strengthen the capacity of Vientiane Capital for improving the urban water environment based on the Master plan of urban water environment in Vientiane city formulated in 2011, followed by sincere appreciation to Lao side for their cooperation.

4. Presentation of Project Outline

4.1 Mr. Bounchanh KEOSITHAMMA, the Deputy Director General, DPWT

He introduced background and main purpose and outline of the Project briefly.

4.2 Dr.Asada, co-chief advisor of the project

He explained the contents of the Project including overall project implementation schedule, institutional arrangement, JICA Expert Team, basic policy, undertakings of Laos side, project outputs including 1st year work plan of each output, project activities. With regard to outputs, he explained 4 outputs by dividing original output 2 into new output 2 and 3, in order to make clearer of the activity of original output 2, while Record of Discussion shows 3 outputs.

Working Group I to IV is in charge of each output which is shown below.

- Output 1: Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment.

- Output 2: The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment facilities.
- Output 3 The operation of legal and regulatory framework is strengthened for industrial wastewater.
- Output 4: People's awareness is raised through environmental education

4.3 Ms. Hiroko KAMATA, Chief advisor of the Project

She presented supplementary explanation with regard to the relationship among 4 outputs and request from JET.

5. Comments and Confirmation on the Work Plan

The chairman requested the relevant authorities to make comments especially on the first year activities, after he summarized the presentations emphasizing the necessity of the project. Many participants agreed that the water quality of public water body worsens because of economic growth and it is necessary to strengthen capacity of local and central organizations to improve urban water environment.

Major comments during the meeting are summarized below.

5.1 DPWT, VET: Mr. Khammone

All the members recognize the growing threat of water pollution problems and comments from all the participants are desired in this meeting for more clear understandings of ideas of policy, issues, and the first year activities.

5.2 PTI, MPWT : Mr. Xayabandith

It is nice that there are specific goals to strengthen capacity of organizations in Vientiane Capital and some concerning Ministries. As we may know problems from wastewater are being worsened due to the growth and new developments of the Capital. Not only capacity improvement but also sustainability of the project as a results are important. 4 working groups including planning and design, inspection, monitoring, and education can't be separated and coordination mechanism is required. The project is the big chance and new carnage for the Capital.

5.3 DHUP, MPWT : Phouthasom

Implementation structure is coordinative and appropriate, but Project Director should be added in the structure.

5.4 DONRE: Ms.Khamla

Water quality control is included in the project, but the activities are not overlapping with the other project, as laboratory works are not included. DONRE can support the Project well as laboratory works assisted by the other project can be utilized.

5.5 District Representative

Everybody understands that wastewater is discharged to public water bodies without proper treatment and it produces adverse effect to the environment. Public understanding of policy and laws are inevitable, and the project should focus on 4 districts. Decentralized Wastewater Treatment facilities are also required for the community. The project is well designed.

5.6 DoIC: Mr. Sao

There is wastewater discharging from industrial factory and household causing the problems in Thatluang marsh, thus, wastewater treatment and canal dredging are needed. Improvement of drainage is also required, as development is going on in That Luang Marsh.

5.7 DoFA

Treated wastewater is reused in Japan. 4 districts have 2 main points of discharging wastewater to marsh. Wastewater treatment is proposed to be constructed together with agriculture linkage (sludge can be used as fertilizers).

5.8 DPWT: Mr. Bouchanh

Implementation structure and CPs are finally approved by JCC. Project implementation budget also required. Once the project is approved, budget for the activities can be applied. DPWT will prepare the application. Coordination of 4 working groups is inevitable and cooperation of the authorities concerned is also required.

The next phase is expected not only the study but also the construction of facilities.

5.9 JICA Representative: Ms.Kishiue

Since the most of CP members are assigned to 4 Work Groups and the assignments of JET are mostly short-term, it is suggested that the operational plan of each group be prepared to make sure that all the activities in the first year become feasible. Ms. Kishiue also requested the clarification on project target areas; 4 main districts or 9 all districts of Vientiane Capital, since the some of CP mentioned that project focus is on 4 main districts. It is important that all of us to have same understanding of the project.

6. Conclusion by Mr. Chairman

- (1) The meeting has mutually approved 4 outputs of the project to be implemented in the first year and assigned the project to develop more action plans for further implementation.
- (2) The coordination mechanism has to be strengthened since this project involved many organizations
- (3) DPWT should make an official requests for official acceptance of this project to Vientiane Capital. Once the project is approved by the Governor of Vientiane Capital, the counterpart fund might be able to be allocated.
- (4) Concerning studies on waste water should be conducted in 4 urban centered districts and after that, expanded to suburb areas.

- (5) Final outputs of the project are very important, since this project is expected to make an improvement related policy, regulations as well as identification specification and location of treatment plants preparing for the next project which might be supported by JICA or any others international organizations.

Mr. Chairman thanked creative and frank comments and suggestions made by the members to the Project and closed the 1st JCC meeting at 11:00.

List of Participants for the Project

No	Name and Surname	Organization	Function
1	Mr. Keophilavanh APHAILATH	Vientiane Capital	Vice Governor
2	Mr. Phouthaphone KOTPANVA	Xaysetha District	Vice District Governor
3	Mr. Davan THONNAVONGSA	Sisattanak District	Vice District Governor
4	Mr. Bounmy XAYYAVONG	Sikottabong District	Vice District Governor
5	Ms. Keomany THANASOK	MOFA	Chief of Division
6	Mr. Bounthanong THONGSOULIN	MOIC	Deputy Director
7	Mr. Somphone SODA	MOES	Technician
8	Mr. Noupheuak VIRABOUTH	DHUP, MPWT	Deputy Director General
9	Mr. Phouthasom INTHAVONG	DHUP, MPWT	Deputy, Urban Development,
10	Mr. Xayabandith INSISIENGMAY	PTI, MPWT	Deputy, Environment and Social Division
11	Ms. Daoluang HONGLIKITH	NREI, MONRE	Technician
12	Mr. Bounchanh KEOSITHAMMA	DPWT	Deputy Director General
13	Mr. Khammone CHOMMANIVONG	DPWT	Deputy of Water supply and Environment Unit
14	Mr. Bounlanh KANKHAMVONGSA	DPWT	Head of Housing, Town Planning and Environment Division
15	Mr. Korlakan SENBOUTTALATH	DPWT	Technician
16	Ms. Vanhkham LUANGKOT	DPWT	Technician, Water supply and Environment Unit
17	Mr. Bounsom SONGVILAY	DONRE	Deputy Director General
18	Ms. Khamla THAMMAVONG	DONRE	Deputy Water Resources Division
19	Mr. Vilasak VENPASEUTH	DONRE	Technician, Water Resources Division
20	Ms. Manivanh DOUANGMALA	DONRE	Technician, Water Resources Division
21	Mr. Longkavanh NINTHALATH	DOES	Deputy Chief Division
22	Mr. Amnath SOUPHIDA	DoES	Technician
23	Mr. Sao SENGVONGPHET	DoIC	Chief of Industrial and Commerce Division
24	Mr. Sengphet PHOMMASONE	DOIC	
25	Mr. Sengmouang SITHIVOHAN	DOFA	Head of Unit
26	Ms. Saeda MAKIMOTO	JICA	Senior Representative
27	Ms. Akito KISHIUE	JICA	PFA
28	Mr. Viengsavanh SISOMBATH	JICA	Programme Officer
29	Ms. Hiroko KAMATA	JICA	Chief Advisor
30	Mr. Kazuhiro ASADA	JET	Co-Chief Advisor
31	Mr. Sonemany XAYYALATH	JET	Project Coordinator
32	Mr. Sailom PHETPHOUJUANG	JET	Administration Assistant
33	Mrs. Monsinh MILAYSONE	JET	Administration Assistant

MINUTES OF MEETING
OF
THE SECOND JOINT COORDINATING COMMITTEE MEETING
FOR
THE PROJECT FOR URBAN WATER ENVIRONMENT
IMPROVEMENT
IN
VIENTIANE CAPITAL
IN
THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

牧本 小枝

Saeda MAKIMOTO
Senior Representative
Laos Office
Japan International Cooperation Agency,
Japan

Keophilavanh APHAILATH

Keophilavanh APHAILATH
Vice Governor
Vientiane Capital
Lao People's Democratic Republic

MERCURE HOTEL, VIENTIANE CAPITAL, OCTOBER 23, 2015.

1. Introduction

The Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched JICA Expert Team (hereinafter referred to as “JET”) on 14th October 2014, to commence the Project for Urban Water Improvement in Vientiane Capital in Lao PDR (hereinafter referred to as “the Project”).

The Second Joint Coordinating Committee (JCC) for the Project was held on 23rd in October, 2015 at Mercure Hotel, Vientiane Capital to report the Project activities of the first year, and preparation of the second year activities. The meeting was chaired by Mr. Keophilavanh APHAILATH, Vice Governor of Vientiane Capital and attended by DHUP and PTI in MPWT, DPWT in Vientiane Capital, and other relevant organizations. Participants of the JCC meeting are listed in the attachment 1.

2. Opening Remarks

On behalf of Vientiane Capital, Mr. Keophilavanh APHAILATH, welcomed all participants in the meeting. The chairman made opening remarks with brief introduction of the project background including its goal and main purpose, which is to report the activities of the first year and necessary issues for second year onward of the Project for Urban Water Environment Improvement in Vientiane Capital.

3. Starting Remark

Following the opening remarks, JICA Senior Representative, Ms. Saeda MAKIMOTO made a starting remark. In the remark, she pointed out that the water environment issue was one of the highest priority for Vientiane Capital, and that the work plan for second year would focus on strategy of wastewater treatment, standard designs, guideline, role and responsibility of the relevant authorities, and the quarterly meeting, and hoped the second year activities would be carried out along with the work plan and JICA would also provide continuous support to the project with the best efforts.

4. Presentation of first year Project implementation

4.1 Mr. Xayabandith INSISIENGMAY, Deputy Project Manager

He introduced the project activities that were implemented in the first year and the work plan for second year as well as Project Background, Goal, Objective and Output, Institutional Arrangement, JICA Expert Team, and Issues and Proposals.

4.2 Ms. Hiroko KAMATA, Chief advisor of the Project

She explained Key Issues in Second Year such as transforming our world: the 2030 Agenda for Sustainable Development Goal (SDG), Trend of Water Quality in Vientiane Capital. Key Issues to be clear in this JCC and the main points to be solved for second year are design standards of septic tank and DEWATS, strategy for wastewater treatment, promotion of desludging from septic tank, factory inspection guideline, cost burden and the legal framework for wastewater management of Vientiane Capital.

4.3 Mr. Kazuhiro ASADA, Co-Chief Advisor of the Project

He explained amended PDM (PDM_2) signed by DPWT and JICA on September 22nd,

2015. Main points of amendment are addition of activity 3-4: support of water quality analysis of DONRE and establishment of water quality monitoring system of public water bodies of Vientiane Capital and publication of monitoring results to the public.

5. Comments

The chairman requested the relevant authorities to make comments especially on the topics such as the proposed work plan for second year, C/Ps member, and the strategy of wastewater as: area preservation for facilities of DEWATS/CWATS, standard design for septic tank (Draft), and cost burden in Vientiane Capital.

5.1 Mr. Khamphone KEODALAVONG, Department of Industry and Handcraft, MOIC

The legislation, regulation, inspection guideline, role and responsibilities should be proposed using the existing ones already approved by MOIC. Improvement and revision should be made based on the existing ones and would be proposed to high level for approval. The enforcement of the documents depends on each department concerned,

The comparison of Thailand, Vietnam, and Malaysia for sewerage budget system is good, but the 120,000 Kip per household per month for wastewater charge is very high for Vientiane Capital and some governmental subsidy is required. The awareness campaign is agreed with strong support in order to advertise from center level to community level.

5.2 Ms. Darounny VILAYTHONG, Department of Social Impact Assessment, MONRE

Activity 3-4 proposed to include more methodology such as method of water sampling on site, method of water quality analysis and evaluation of the results to establish the new laboratory center in Vientiane Capital and raise public awareness of present situation of water environment of Vientiane Capital.

For the cost burden, we propose to discuss with relevant sector for coordination concerning environment tax or billing with water charge.

5.3 Mr. Phetsamone DALALOM, Deputy of Pollution Control, MONRE

The legislation and regulation must follow the Government Decree No. 03, the revise version in MONRE. Wastewater charge at 120,000 Kip per household per month is very high. We should discuss together to find appropriate way and also need to discuss more in detail for the O&M of wastewater management.

5.4 Mr. Bounthong KEOHANAM, DHUP, MPWT

The septic tank standard is already existing. DPWT will be responsible for installation and design drawing of septic tank. Based on wastewater strategy, DEWATS system will be established. In other countries, subsidy system is established by government. However, in Lao PDR there is no this kind of system. We should find the appropriate way together. Wastewater fee of 120,000 Kip per household per month is very expensive, therefore the government should support to find the way.

5.5 Mr. Bounsom SONGVILAY, DONRE, Vientiane Capital

According to work plan, Activity 3-4 is agreed and we propose to JICA to support continuously for DONRE staff on water quality analysis. For the DEWATS construction, we propose to do pilot project first, then extend to other districts. The wastewater fee should be discussed together, then submit to high ranking for consideration. The survey for checking of wastewater discharge from factory was not completed yet. The cost for wastewater treatment of factory or business owner will be paid more than household. We propose to continue capacity building to CPs on wastewater management, and then CPs will train the staff in their own organization.

5.6 Mr. Sinakhone P, Chief of Cabinet, MOES

The work plan is mainly agreed, especially the working group 4 focusing on education and awareness campaign on water environment, cleaning activity in canals and others. We propose to check and make analysis in factory, business owner and public canal to avoid water pollution. Septic tank must be followed by the national standard. Before assign the legislation, regulation must be agreed with department concern.

5.7 Ms. Kamata HIROKO, JICA Expert

She proposes to the meeting to provide comments on the topics need to be solved especially the standard of septic tank, enforcement of installing the septic tank in the building, promotion of desludging from septic tank, transportation of extracted sludge to KM32, adequate disposal site and the construction of wastewater treatment facility and others

5.8 Mr. Xayabandith INSISIENGMAY, PTI, MPWT

He explained that the legislation and regulation to be proposed would be based on the existing ones, and make an update or improve in order to use based on current situation. 120,000 Kip per household per month is quiet high because it includes everything. Only for O&M of wastewater treatment system, just about 34,000 Kip per household per month is estimated. We proposed the rest shall be the government subsidy.

5.9 Mr. Bounchanh KEOSITHAMMA, DPWT, Vientiane Capital

The legislation and regulation must be clear and can be used properly together with wastewater charge. Wastewater charge at 120,000 Kip per household per month is just a sample. The responsible for wastewater management would be identified which organization is involved. The awareness campaign in water environment should be advertised continuously.

5.10 Mr. Khamphet PHONGRASASY, VUDAA, Vientiane Capital

- (1) Extracted sludge transportation company should be registered in an Association (to be set up)
- (2) Business owners and their equipment should be qualified
- (3) Provide the guideline on sewerage classification to them

6. Conclusion

- (1) The meeting generally accepted the plan of operation and agreed with the comments discussed in the meeting;
- (2) DPWT is mainly responsible for septic tank and DEWATS in Vientiane Capital;
- (3) VUDAA is mainly responsible for desludging, transportation, and disposing the sludge of septic tank;
- (4) Identify the strategy of wastewater: area preservation for facilities of DEWATS/CWATS will be surveyed again, then it shall be submitted to high ranking for approval;
- (5) Standard design for septic tank (Draft) is responsible of DPWT;
- (6) 120,000 Kip per household per month as wastewater charge is just a sample. Regarding the cost burden in Vientiane Capital, proposal shall be prepared together with JICA Expert Team. Calculation should be conducted with precise cost estimation later, and the proposal shall be submitted to high ranking officials for approval;
- (7) Regarding budget for administration work for CPs, we propose CPs to make the budget plan, and then submit to DPI for approval, and
- (8) The quarterly meeting will be continued and chaired by Project Director.

7. Closing Remark, Mr. Keophilavanh APHAILATH, Vientiane Vice Governor, Chairman

- (1) As the time has passed, but some of participants did not give any comment yet. So please write your comment to the project and I would like to add some conclusions;
- (2) First of all, I would like to express my compliment on the project for first year implementation. From the report I can see the meaningful and successful on training in abroad together with data inventory and Wastewater Strategy Plan.
- (3) Toward the 2nd year, the Team is divided into 4 working groups and each group has done its efforts to make the project moving with good progress. Once again, I express my compliment.
- (4) With your comments, we found the new point of view. We have to search for the way out together, especially for the existing legislations from related organizations. But the regulation, which will be set up is to cover the activities related to wastewater discharge. Wastewater standard will be based on the existing standard, regulation, law. For this project, they will consider their own regulation. I would like to ask you to contribute data and information to the project.
- (5) For some comments on wastewater tariff, we calculated that by assuming an investment cost without any subsidies, and we have to collect from you 120,000 Kip/household/month. Therefore, we need to find out subsidization from somewhere else. How much government would subsidize? How much resident would contribute? What's about business unit, and what kind of

- factory? We need to clarify.
- (6) At present, Vientiane Capital has promote new challenges with 5 slogans as bellows:
 - A) Stay in peace
 - B) Build up VC
 - C) Develop VC
 - D) Make VC go for civilization
 - E) Make VC move forward
 - (7) Last week, Vientiane Capital announced the draft of the decree on Clean up Vientiane with 8 items as below;
 - A) Clean up the Air.
 - B) Clean up the Water.
 - C) Reduce noise pollution.
 - D) Reduce the odors.
 - E) Clean up the Roads.
 - F) Clean up the Houses.
 - G) Clean up the Offices.
 - H) Green and Clean up the Public Parks
 - (8) We still need to do feasibility study of wastewater tariff with 120,000 Kip/household/month as well as clarification of the scale of wastewater treatment plant.
 - (9) One thing, I want to tell why drainage canal has an unpleasant smell. It's, because of insufficient septic tanks in urban. When it is over loaded, it will drain out without any treatment. How do we solve this problem? How the study team will solve this problem? But if we put septic tanks like what Mr. Bounthong said, that will be good, but now we have only insufficient septic tanks.
 - (10) With regard to car wash, road wash, pho shops, they sell and eat inside, but they wash on the roadside. I would request to vice district governor to be more attention on that.
 - (11) The tariff collection is our duty and we must do it.
 - (12) Basically, I agree with the 2nd year work plan and will be implemented by 4 working groups with 4 frameworks. However there is something that we still need to improve and will be discussed more in quarterly meeting. If you agree.
 - (13) I'd like to express my sincere thanks to you, working team. The participants' comments today will make us do a good job on the second year work plan. Special thanks to JICA. VC received so many assistants such as: Bus, water supply (At present the demand for water supply is 300,000m³/day, while our capacity is only 180,000m³/day and JICA is helping us to improve Chinaimo for another 40,000m³/day), waste disposal station for VUDAA, Chiba prefecture's

assistance on water analysis, and Saitama City's continuous support on water supply. MPWT is getting Urban Management Regulation. Therefore, I'd like to thank Ms. Makimoto, Senior Representative with her support in this meeting.

- (14) Finally, I wish God bless all of you and wish you are healthy and successful in your duty and now I'd like to close the meeting officially. Thank you

List of Participants of the JCC Meeting

No	Name and Surname	Organization	Position
1	Mr. Keophilavanh APHAILATH	VEC	Vice Governor
2	Mr. Bounchanh KEOSITHAMMA	DPWT	Deputy Director General, Project Director
3	Mr. Khammone CHOMMANIVONG	DPWT	Deputy Chief, Housing, Urban Planning and
4	Mr. Xayabandith INSISIENGMAY	PTI	Chief of Environmental and Social Division
5	Mr. Phouthasom INTHAVONG	DHUP	Deputy Chief, Division of Urban Development
6	Mr. Khamphet PHONGRASASY	VUDAA	Chief of Drainage Division
7	Mr. Korlakanh SEBOUTTALATH	DPWT	Technical Staff
8	Mr. Sengkeo TASAKETH	PCD	Chief, Water Environment Division
9	Mr. Sao SENGVONGPHET	DOIC	Chief of Industrial and Handicraft Division
10	Ms. Khamla THAMMAVONG	DONRE	Deputy Chief, Water Resources Division
11	Ms. Vankham LUANGKHOT	DPWT	Technical Staff
12	Mr. Vilasak VENPASEUTH	DONRE	Technical Staff
13	Ms. Minavanh DOUANGMALA	DONRE	Technical Staff
14	Ms. Saylom KEOSITHAMMA	DPWT	Technical Staff
15	Mr. Bounthong KEOHANAM	DHUP	Director of Urban Development Division
16	Mr. Khamphet INTHIDETH	PTI	Deputy Director General
17	Mr. Phetsamone DALALOM	PCD	Deputy of Pollution Control Department
18	Ms. Darounny VILAYTHONG	NREI	Head of Planning and Administration Division
19	Mr. Phouvong ONESYSALEUM	DESIA	
20	Mr. Khamphone KEODALAVONG	MOIC	Director of Industry and Handicraft Division
21	Mr. Bounlam KHONESAVANH	MAF	Head of Division
22	Mr. Sinakhone P	MOES	Chief of Cabinet
23	Mr. Bounlanh KANEKHAMVONGSA	DPWT	Chief of , Housing, Urban Planning
24	Mr. Bounsom SONGVILAY	DONRE	Deputy Director of DONRE
25	Mr. Phoudone MEKSAVANH	VUDAA	Vice President
26	Mr. Khamming SOUNDALA	DOIC	Deputy Director Office
27	Mr. Kham Phout	DAF	
28	Mr. Phouthone SENGDVONG	DOES	Education Service Deputy
29	Mr. Bounlay ONEVONGSA	DPI	
30	Mr. Phetsamay NATPHASOUK	District	Chanthaboury District Governor
31	Mr. Khamheng DOUANGSYLY	District	Sikhottabong District Governor
32	Mr. Phouthaphone	District	Saysettha District Governor
33	Mr. Bounmek VILAYSONG	District	Sisattanak District Governor
34	Ms. Saeda MAKIMOTO	JICA	Senior Representative
35	Mr. Toru OGURA	JICA	JICA Representative
36	Mr. Kingsada SIPHANHTHONG	JICA	Project Assistant
37	Ms. Hiroko KAMATA	JET	Chief Advisor/Water Environment Planning and
38	Mr. Kimihiro KONNO	JET	Project Coordinator
39	Ms. Khouan VILAYPHANH	JET	Administrative Assistant
40	Mr. Kazuhiro ASADA	JET	(Co-Chief Advisor)/ Integrated Wastewater
41	Mr. Daizo IWATA	JET	Institutional Strengthening and Financial Analysis
42	Mr. Sonemany XAYYALATH	JET	Project Coordinator
43	Mr. Kalathone KOUAYKESONE		Interpreter

ບົດບັນທຶກກອງປະຊຸມ

ຄະນະກຳມະການປະສານງານຮ່ວມປີທີ 2

ສຳຫຼັບ

ໂຄງການ ປັບປຸງສິ່ງແວດລ້ອມນ້ຳໃນຕົວເມືອງ

ນະຄອນຫຼວງວຽງຈັນ

ທີ່ໂຮງແຮມເມັກຄີວ, ນະຄອນຫຼວງວຽງຈັນ, ວັນທີ 23 ຕຸລາ 2014

1. ການນຳສະເໜີ

ອົງການຮ່ວມມືສາກົນປະເທດຍີ່ປຸ່ນ (ເຊິ່ງເອີ້ນຕໍ່ໄປວ່າ:ອົງການໄຈກາ)ໄດ້ຈັດສິ່ງທົມຊ່ຽວຊານຂອງອົງການໄຈກາ(ເຊິ່ງເອີ້ນຕໍ່ໄປວ່າ: ເຈັດທ໌) ໃນວັນທີ່ 14 ເດືອນ ຕຸລາ 2014, ເພື່ອເລີ່ມລົງມືຈັດຕັ້ງປະຕິບັດ ໂຄງການປັບປຸງສິ່ງແວດລ້ອມນ້ຳໃນຕົວເມືອງ ນະຄອນຫຼວງວຽງຈັນ (ເຊິ່ງເອີ້ນຕໍ່ໄປວ່າ “ໂຄງການ”).

ກອງປະຊຸມຄະນະກຳມະການປະສານງານຮ່ວມປີທີ 2 ຂອງໂຄງການນີ້ໄດ້ຈັດຂຶ້ນໃນວັນທີ 23 ເດືອນ, ຕຸລາ 2015, ເວລາ 8:30 ໂມງ ທີ່ໂຮງແຮມ ແມັກຄິວ, ນະຄອນຫຼວງວຽງຈັນ, ເຊິ່ງເປັນກອງປະຊຸມລາຍງານການຈັດຕັ້ງປະຕິບັດວຽກໃນ 1 ປີຜ່ານມາ ແລະ ສະເໜີແຜນວຽກໃນປີທີ 2 ຂອງໂຄງການ. ໂດຍພາຍໃຕ້ການເປັນປະທານຂອງ ທ່ານຮອງເຈົ້າຄອງນະຄອນຫຼວງວຽງຈັນ, ມີບັນດາແຂກທີ່ຖືກເຊີນຈາກ ກົມເຄຫາແລະຜັງເມືອງ, ສະຖາບັນໂຍທາແລະຂົນສົ່ງ, ກະຊວງໂຍທາທິການແລະຂົນສົ່ງ, ພະແນກໂຍທາທິການແລະຂົນສົ່ງນະຄອນຫຼວງ ມີບັນດາອົງການຈັດຕັ້ງທີ່ກ່ຽວຂ້ອງຂອງລັດ ແລະ ອົງການໄຈກາປະຈຳລາວເຂົ້າຮ່ວມຢ່າງພ້ອມພຽງ. ຕາມລາຍຊື່ທີ່ຕິດຄັດໃນເອກະສານຊ້ອນທ້າຍ 1.

2. ພິທີກ່າວເປີດກອງປະຊຸມ

ຕາງໜ້າໃຫ້ຝ່າຍນະຄອນຫຼວງວຽງຈັນ, ທ່ານ ແກ້ວພິລາວັນ ອາໄພລາດ, ເປັນປະທານກອງປະຊຸມຄັ້ງນີ້ໄດ້ກ່າວຕ້ອນຮັບຜູ້ແທນທີ່ມາເຂົ້າຮ່ວມປະຊຸມ ແລະ ກ່າວເປີດກອງປະຊຸມຢ່າງເປັນທາງການ. ທ່ານໄດ້ກ່າວໂດຍຫຍໍ້ກ່ຽວກັບຄວາມເປັນມາຂອງໂຄງການ, ຈຸດປະສົງຂອງໂຄງການ, ວຽກທີ່ໄດ້ຈັດຕັ້ງປະຕິບັດໃນປີຜ່ານມາ ແລະ ຂໍ້ຫຍຸ້ງຍາກທີ່ພົບເຫັນໃນການຈັດຕັ້ງປະຕິບັດໂຄງການໃຫ້ທີ່ປະຊຸມຮັບຊາບໂດຍຫຍໍ້.

3. ຄຳຄິດເຫັນຈາກຕາງໜ້າໄຈກາ

ທ່ານ ນາງ ຊາເອດະ ມາກິໂມໂຕະ, ຮອງຫົວໜ້າ ອົງການໄຈກາປະຈຳລາວ ໄດ້ກ່າວຊົມເຊີຍຕໍ່ຄູ່ຮ່ວມງານທີ່ສືບຕໍ່ໃຫ້ຄວາມຮ່ວມມືໂຄງການນີ້ຕະລອດມາ, ດັ່ງທີ່ເຮົາຮູ້ແລ້ວວ່າການແກ້ໄຂບັນຫາສິ່ງແວດລ້ອມນ້ຳໃນຕົວເມືອງແມ່ນເປັນໂຄງການບຸລິມະສິດ ແລະ ລັດຖະບານລາວກໍ່ໃຫ້ຄວາມສຳຄັນ ເພາະເປັນການກຳນົດແຜນຍຸດທະສາດນ້ຳເປື້ອນໃນນະຄອນຫຼວງວຽງຈັນໃນອານາຄົດ ແລະ ແຜນວຽກປີທີ 2 ນີ້ຈະໄດ້ລົງເລິກກ່ຽວກັບການຮ່າງແຜນຍຸດທະສາດ, ມາດຕະຖານການອອກແບບ ແລະ ຄຸ້ມຄອງຕິດຕາມກວດກາລວມທັງການກຽມກອງປະຊຸມໂຕມາດ, ຫວັງຢ່າງຍິ່ງວ່າທິມງານຈະປະຕິບັດວຽກຕາມແຜນທີ່ວາງໄວ້ ແລະ ໄຈກາຍັງສືບຕໍ່ໃຫ້ການຊ່ວຍເຫຼືອໂຄງການນີ້ຕໍ່ໄປ.

4. ການນຳສະເໜີວຽກທີ່ໄດ້ຈັດຕັ້ງປະຕິບັດໃນ 1 ປີຜ່ານມາ

4.1. ທ່ານ ໄຊຍະບັນດິດ ອິນສີຊຽງໃໝ່, ຮອງຫົວໜ້າໂຄງການ

ທ່ານໄດ້ນຳສະເໜີວຽກທີ່ໄດ້ຈັດຕັ້ງປະຕິບັດໃນ 1 ປີຜ່ານມາ ແລະ ແຜນປີທີ 2 ຂອງໂຄງການໂດຍມີຫົວຂໍ້ທີ່ສະເໜີດັ່ງນີ້: ຄວາມເປັນມາຂອງໂຄງການ, ເປົ້າໝາຍ, ຈຸດປະສົງ ແລະ ຄວາມຄາດຫວັງ, ພາກສ່ວນທີ່ກ່ຽວຂ້ອງ, ຄູ່ຮ່ວມງານ, ທິມງານຊ່ຽວຊານໄຈກາ, ໜ້າວຽກທີ່ໄດ້ຈັດຕັ້ງປະຕິບັດໃນໄລຍະ 1 ປີຜ່ານມາ, ບັນຫາ ແລະ ຂໍ້ສະເໜີຄຳຄິດເຫັນ ແລະ ແຜນວຽກປີທີ 2 ຂອງໂຄງການ ໃຫ້ທີ່ປະຊຸມຮັບຊາບ

4.2. ທ່ານ ນາງຮິຣຸໂກະ ກາມາຕະ, ຫົວໜ້າທີມທີ່ປຶກສາໂຄງການ

ທ່ານໄດ້ອະທິບາຍເນື້ອໃນ ແລະ ບັນຫາສາຄັນຂອງໂຄງການທີ່ຈະຕ້ອງໄດ້ປັບປຸງແກ້ໄຂໃນປີທີ 2 ໂດຍສະເພາະແມ່ນ: ການອອກແບບມາດຕະຖານຊຸມວິດຖ່າຍ ແລະ ລະບົບບໍາບັດນໍ້າເປື້ອນ, ການສົ່ງເສີມການດູດວິດພາກຄົວເຮືອນ, ການກໍານົດບ່ອນໄປຖິ້ມອາຈົມໃຫ້ລະອຽດ, ກໍານົດຍຸດທະສາດນໍ້າເປື້ອນ, ພາກສ່ວນທີ່ຮັບຜິດຊອບນໍ້າເປື້ອນ, ຄຸ້ມຄອງກວດກາໂຮງງານ, ຄ່າໃຊ້ຈ່າຍນໍ້າເປື້ອນ ແລະ ການປັບປຸງບັນດາກິດລະບຽບທີ່ກ່ຽວຂ້ອງກ່ຽວກັບການຄຸ້ມຄອງນໍ້າເປື້ອນໃຫ້ເປັນຮູບປະທໍາ ແລະ ມີຄວາມຊັດເຈນຂຶ້ນກວ່າເກົ່າ.

4.3. ທ່ານ ກາຊຸຣິໂຣະ ອາຊາຕະ, ຫົວໜ້າທີມທີ່ປຶກສາຮ່ວມໂຄງການ

ທ່ານໄດ້ອະທິບາຍການດັດແກ້ເອກະສານອອກແບບໂຄງການທີ່ໄດ້ເຊັນຮ່ວມກັນລະຫວ່າງພະແນກຍທຂ ນະຄອນຫຼວງວຽງຈັນ ແລະ ໄຈກາໃນຄັ້ງວັນທີ 22 ກັນຍາ 2015, ເຊິ່ງການດັດແກ້ຄັ້ງນີ້ແມ່ນເພີ່ມກິດຈະກຳ 3-4 ການສະໜັບສະໜູນການກວດກາຄຸນນະພາບນໍ້າຂອງພະແນກຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມນະຄອນຫຼວງ ແລະ ການສ້າງຕັ້ງລະບົບຖານຂໍ້ມູນ, ການຕິດຕາມຄຸນນະພາບນໍ້າສາທາລະນະໃນນະຄອນຫຼວງວຽງຈັນ ແລະ ການຕິດຕາມຜົນ.

5. ການປະກອບຄໍາຄິດເຫັນ

ທ່ານປະທານໄດ້ສະເໜີໃຫ້ຜູ້ເຂົ້າຮ່ວມກອງປະຊຸມປະກອບຄໍາຄິດເຫັນໄລ່ກອງປະຊຸມໂດຍອີງໄລ່ຫົວຂໍ້ຂອງກອງປະຊຸມຂ້າງເທິງ, ການກໍານົດພື້ນທີ່ສໍາຫຼັບໄວ້ກໍ່ສ້າງລະບົບບໍາບັດນໍ້າເປື້ອນແບບລວມສູນ ແລະ ແບບບໍ່ລວມສູນ, ການອອກແບບມາດຕະຖານຊຸມວິດຖ່າຍ (ສະບັບຮ່າງ) ແລະ ການຄິດໄລ່ລາຄານໍ້າເປື້ອນໃນນະຄອນຫຼວງວຽງຈັນ ແລະ ອື່ນໆ.

5.1. ທ່ານ ຄໍາພອນ ແກ້ວດາລາວົງ, ຕາງໜ້າຈາກພະແນກອຸດສະຫະກຳ ແລະ ຫັດຖະກຳ, ກະຊວງອຸດສະຫະກຳ ແລະ ການຄ້າ

ບັນດານິຕິກຳ, ລະບຽບການ, ຄຸ້ມຄອງຕິດຕາມກວດກາ, ມາດຕະຖານເຕັກນິກ ແລະ ພາລະບົດບາດແມ່ນໃຫ້ນຳໃຊ້ສິ່ງທີ່ມີແລ້ວທີ່ກະຊວງອະນຸມັດແລ້ວ, ສ່ວນການຈັດຕັ້ງປະຕິບັດແມ່ນມອບໃຫ້ພະແນກການທີ່ກ່ຽວຂ້ອງຮັບຜິດຊອບ, ໃນກໍລະນີຈະມີການປັບປຸງ ແລະ ດັດແກ້ເພື່ອໃຫ້ສອດຄ່ອງກັບວຽກໂຕຈິງຂອງໂຄງການນັ້ນແມ່ນໃຫ້ທາງໂຄງການດຳເນີນການໄດ້ໂດຍອີງໄລ່ຂໍ້ມູນທີ່ມີຢູ່ແລ້ວຫລັງຈາກນັ້ນຈຶ່ງນຳສະເໜີໃຫ້ຂັ້ນເທິງຮັບຊາບຕໍ່ໄປ, ການສົມທຽບລະບົບນໍ້າເປື້ອນຈາກປະເທດໄທ, ຫວຽດນາມ ແລະ ມາເລເຊຍ ແມ່ນເຫັນດີ ແຕ່ວ່າການເກັບຄ່ານໍ້າເປື້ອນ 120,000 ກີບຕໍ່ເຮືອນຕໍ່ເດືອນເຫັນວ່າສູງຫຼາຍ, ສະເໜີໃຫ້ລັດຖະບານຫາທາງຖືມຸມຊ່ວຍ, ການປູກຈິດສຳນຶກດ້ານສິ່ງແວດລ້ອມນໍ້າແມ່ນກະຊວງເຫັນດີ ແລະ ຈະສະນັບສະໜູນຢ່າງເຕັມທີ່ເພື່ອໂຄສະນາໃຫ້ທົ່ວເຖິງ ແລະ ຂະຫຍາຍລົງສູ່ແຂວງ ແລະ ເມືອງຕໍ່ໄປໃນອານາຄົດ.

5.2. ທ່ານນາງ ດາລຸນນີ ວິໄລທອງ, ພະແນກປະເມີນຜົນກະທົບສິ່ງແວດລ້ອມ ແລະ ສັງຄົມ, ກະຊວງຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ

ໜ້າວຽກ 3-4 ຢາກສະເໜີໃຫ້ມີຫຼາຍຂັ້ນຕອນກວ່ານີ້ເຊັ່ນ: ວິທີການເກັບຕົວຢ່າງນໍ້າພາກສະໜາມ, ຂັ້ນຕອນການວິໄຈນໍ້າ ແລະ ການປະເມີນຜົນຂອງການວິໄຈ ເພາະວ່າໃນອານາຄົດແມ່ນຈະໄດ້ເຮັດໃນຂັ້ນນະຄອນຫຼວງ

ສ່ວນການເກັບຄ່ານໍ້າເປື້ອນແມ່ນສະເໜີໃຫ້ປະສານງານກັບພາກສ່ວນກ່ຽວຂ້ອງຕື່ມໂດຍສະເພາະການເກັບຄ່າອາກອນສິ່ງແວດລ້ອມ ຫຼື ຈະລວມເຂົ້າກັບບິນນໍ້າປາປາ

5.3. ທ່ານ ເພັດສະໜອນ ດາລາລິມ, ຮອງຫົວໜ້າກົມຄວບຄຸມມົນລະພິດ

ດ້ານນິຕິກຳ ແລະ ກົດໝາຍສິ່ງແວດລ້ອມແມ່ນປະຕິບັດຕາມລັດຖະບັນຍັດເລກທີ 03 ສະບັບປັບປຸງ ໂດຍກົມສິ່ງເສີມຂອງກະຊວງຊັບພະຍາກອນທຳມະຊາດແລະສິ່ງແວດລ້ອມ, ການເກັບຄ່ານໍ້າ 120,000 ກີບຕໍ່ຄົວເຮືອນຕໍ່ເດືອນແມ່ນແພງຫຼາຍ ອາດຈະມີການຫາລືເພື່ອຫາທາງອອກຮ່ວມກັນ ແລະ ຫາລືລາຍລະອຽດກ່ຽວກັບການຄຸ້ມຄອງໃນການນຳໃຊ້ ແລະ ບຳລຸງຮັກສາລະບົບນໍ້າເປື້ອນ.

5.4 . ທ່ານບຸນທິງ ແກ້ວຫານາມ, ຫົວໜ້າພະແນກພັດທະນາຕົວເມືອງ, ກົມເຄຫາ ແລະ ຜັງເມືອງ

ແບບມາດຕະຖານຂຸມວິດຖ່າຍ ເຫັນວ່າມີແບບມາດຕະຖານແລ້ວ ໄດ້ເຫັນດີໃຫ້ພະແນກ ຍທຂ ນະຄອນຫຼວງຮັບຜິດຊອບເລີຍ, ແຜນຍຸດທະສາດນໍ້າເປື້ອນແມ່ນໃນອານາຄົດຈະຫັນມາໃຊ້ລະບົບ DEWATS ແມ່ນເຫັນດີ, ໃນຕ່າງປະເທດແມ່ນລັດຖະບານຖືມຸມ, ແຕ່ວ່າໃນລາວແມ່ນບໍ່ມີງົບປະມານໃນສ່ວນນີ້ ສະນັ້ນຈິ່ງສະເໜີໃຫ້ພິຈາລະນາຕາມຄວາມເໝາະສົມ, ຄ່ານໍ້າເປື້ອນ 120,000 ກີບ/ແມັດກ້ອນ/ຄົວເຮືອນ ແມ່ນເຫັນວ່າແພງຫຼາຍ ສະນັ້ນລັດຖະບານຕ້ອງຫາທາງອອກຊ່ວຍ.

5.5 . ທ່ານບຸນຊິມ ຊິງວິໄລ, ພະແນກຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ ນະຄອນຫຼວງວຽງຈັນ

ຕາມແຜນວຽກ 3-4 ແມ່ນເຫັນດີ, ສະເໜີໃຫ້ສືບຕໍ່ຝຶກອົບຮົມການວິໄຈນໍ້າໃຫ້ແກ່ພະແນກຊັບພະຍາກອນທຳມະຊາດແລະສິ່ງແວດລ້ອມ, ກ່ຽວກັບການສ້າງລະບົບບຳບັດນໍ້າເປື້ອນແມ່ນເຫັນດີໃຫ້ທົດລອງເມືອງໃດເມືອງໜຶ່ງກ່ອນ, ຫຼັງຈາກນັ້ນຈິ່ງຂະຫຍາຍລົງສູ່ເມືອງຕໍ່ໄປ, ການເກັບຄ່ານໍ້າເປື້ອນແມ່ນໃຫ້ຄົ້ນຄ້ວາຮ່ວມກັນ ແລ້ວສະເໜີໃຫ້ຂັ້ນເທິງຕໍ່ໄປ, ການສຳຫຼວດການປ່ອຍນໍ້າເປື້ອນອອກຈາກໂຮງງານແມ່ນຍັງບໍ່ທັນໄດ້ເກັບກຳເທື່ອວ່າແຕ່ລະໂຮງງານນັ້ນປ່ອຍນໍ້າເປື້ອນອອກຫຼາຍໜ້ອຍປານໃດ, ອາດຈະເກັບຄ່ານໍ້າເປື້ອນຈາກພາກຫົວໜ່ວຍທຸລະກິດຫຼາຍກ່ວາພາກຄົວເຮືອນ, ສ່ວນການສ້າງຄວາມເຂັ້ມແຂງໃຫ້ແກ່ພາກສ່ວນທີ່ກ່ຽວຂ້ອງໃນການຄຸ້ມຄອງນໍ້າເປື້ອນແມ່ນໃຫ້ສືບຕໍ່ ແລະ ລົງເຜີຍແຜ່ໃຫ້ໜ່ວຍງານຂອງໃຜລາວຕໍ່ໄປ.

5.6 . ທ່ານສິນະຄອນ, ຫົວໜ້າຫ້ອງວ່າການ, ກະຊວງສຶກສາທິການ ແລະ ກິລາ

ໂດຍລວມແມ່ນເຫັນດີຕາມແຜນໂດຍສະເພາະແມ່ນວຽກກຸ່ມ 4 ທີ່ກ່ຽວຂ້ອງກັບສຶກສາ, ການສ້າງຈິດສຳນຶກໃນການອານາໄມຮອງນໍ້າສາທາລະນະ, ກິດຈະກຳການອານາໄມຄອງ ແລະອື່ນໆ ສະເໜີໃຫ້ເຮັດການວິໄຈນໍ້າກ່ອນປ່ອຍລົງສູ່ຄອງສາທາລະນະ ເພື່ອຫຼີກລຽງມົນລະພິດທາງນໍ້າ, ອ່າງຂຸມວິດຕ້ອງໃຫ້ໄດ້ມາດຕະຖານ ແລະ ຄິດໄລ່ຕາມຈຳນວນພົນທີ່ໃຊ້, ກ່ອນຈະອອກບັນດານິຕິກຳ ແລະ ລະບຽບການຕ້ອງໃຫ້ເຫັນດີຈາກພາກສ່ວນທີ່ກ່ຽວຂ້ອງເສຍກ່ອນ.

5.7. ທ່ານນາງ ກາມາຕະ ຣິດໂກະ, ຊ່ຽວຊານໄຈກາ

ສະເໜີໃຫ້ຜູ້ເຂົ້າຮ່ວມມີຄຳເຫັນໃຫ້ດີກັບຫົວຂໍ້ທີ່ກຳລັງປຶກສາໂດຍສະເພາະແມ່ນ ພາກສ່ວນທີ່ຮັບຜິດຊອບໃນການອອກແບບມາດຕະຖານຂຸມວິດຖ່າຍ, ຂໍ້ບັງຂັບໃນການຕິດຕັ້ງ, ການສົ່ງເສີມການດູດວິດ, ສະຖານທີ່ຈັດເກັບທີ່ຫຼັກ 32 ແລະ ການກໍ່ສ້າງລະບົບບາບັດ ແລະ ອື່ນໆ

5.8. ທ່ານ ໄຊຍະບັນດິດ ອິນສີຊຽງໃໝ່, ຮອງຫົວໜ້າໂຄງການ

ທ່ານໄດ້ອະທິບາຍຕໍ່ກອງປະຊຸມຕື່ມໂດຍສະເພາະແມ່ນບັນດານິຕິກຳ ແລະ ລະບຽບການທີ່ກ່ຽວຂ້ອງແມ່ນໄດ້ສັງລວມຈາກພາກສ່ວນທີ່ກ່ຽວຂ້ອງທີ່ມີຢູ່ແລ້ວເພື່ອນຳມາຜັນຂະຫຍາຍ ແລະ ສ້າງລະບຽບການຄຸ້ມຄອງນໍ້າເປື້ອນເພື່ອໃຫ້ສາມາດນຳໃຊ້ໄດ້ກັບສະພາບຄວາມເປັນຈິງໃນປັດຈຸບັນ, ລາຄານໍ້າເປື້ອນ 120,000 ກີບຕໍ່ຄອບຄົວຕໍ່ເດືອນແມ່ນຂ້ອນຂ້າງແພງຍ້ອນວ່າພວກເຮົາໄດ້ຄິດໄລ່ລາຄາລວມທັງໝົດ ແຕ່ຖ້າຫາກວ່າຄິດໄລ່ສະເພາະຄ່າບຳລຸງຮັກສາແມ່ນປະມານ 34.000 ກີບ/ຄົວເຮືອນ/ເດືອນ ດັ່ງນັ້ນສ່ວນທີ່ເຫຼືອແມ່ນຊ່ວຍໃຫ້ລັດທະບານຖິ້ມຂົນໃຫ້ ຫຼືໃນຮູບແບບອື່ນໆ.

5.9 . ທ່ານ ບຸນຈັນ ແກ້ວສີທຳມະ, ຮອງຫົວໜ້າພະແນກ ຍທຂ ນະຄອນຫຼວງວຽງຈັນ

ການສ້າງນິຕິກຳຕ້ອງໃຫ້ມີຄວາມຊັດເຈນ ແລະ ສາມາດນຳໄປປະຕິບັດໄດ້, ການເກັບຄ່ານໍ້າເປື້ອນ 120,000 ກີບຕໍ່ຄົວເຮືອນຕໍ່ເດືອນເປັນພຽງຕົວຢ່າງ, ສິ່ງສຳຄັນຕ້ອງກຳນົດພາກສ່ວນທີ່ຮັບຜິດຊອບໃຫ້ຊັດເຈນ, ການກຳນົດພື້ນທີ່ ແລະ ການສ້າງຄວາມເຂັ້ມແຂງປຸກຈິດສຳນຶກຕ້ອງປະຕິບັດຢ່າງຕໍ່ເນື່ອງ.

5.10. ທ່ານຄຳເພັດ ພິງລາຊະສີ, ອົງການ ອພບ ນະຄອນຫຼວງວຽງຈັນ

- (1) ສະມາຄົມບໍລິການດູດວິດຈະຕ້ອງຖືກສ້າງຕັ້ງຂຶ້ນ
- (2) ຫົວໜ່ວຍທຸລະກິດ ແລະ ອຸປະກອນຮັບໃຊ້ຕ້ອງມີຄວາມຊັດເຈນຂຶ້ນ
- (3) ມີການສະໜອງຄູ່ມືກ່ຽວກັບນໍ້າເປື້ອນຫຼາຍຂຶ້ນ

6. ຜົນສະຫຼຸບ

- (1) ກອງປະຊຸມເຫັນດີຮັບຮອງເອົາແຜນວຽກປີທີ 2 ຂອງໂຄງການ ແລະ ການດັດແກ້ເອກະສານອອກແບບໂຄງການ ແລະ ສະມາຊິກຄູ່ຮ່ວມງານຂອງໂຄງການ
- (2) ສະເໜີພະແນກ ຍທຂ ນະຄອນຫຼວງວຽງຈັນ ເປັນຜູ້ຮັບຜິດຊອບຫຼັກໃນການຄຸ້ມຄອງນໍ້າເປື້ອນໃນນະຄອນຫຼວງວຽງຈັນ
- (3) ອົງການ ອພບ ແມ່ນຮັບຜິດຊອບໃນການຄຸ້ມຄອງການດູດວິດ ແລະ ສະຖານທີ່ເກັບ
- (4) ກຳນົດແຜນຍຸດທະສາດກ່ຽວກັບການຄຸ້ມຄອງນໍ້າເປື້ອນ, ການຈັດຫາພື້ນທີ່ເພື່ອກໍ່ສ້າງໂຮງງານບຳບັດນໍ້າເປື້ອນໃນອານາຄົດ ແລະ ອື່ນໆຕ້ອງໃຫ້ມີການສຳຫຼວດຄັກແນ່
- (5) ການອອກແບບມາດຕະຖານເຕັກນິກຂຸມວິດຖ່າຍ ແລະ ລະບຽບການ (ສະບັບຮ່າງ)

- (6) ການເກັບຄ່າບໍລິການນໍ້າເບື້ອນຈາກພາກຄົວເຮືອນ 120,000 ກີບຕໍ່ຄົວເຮືອນຕໍ່ເດືອນແມ່ນເປັນພຽງຕົວຢ່າງ, ມອບໃຫ້ໂຄງການໂດຍຮ່ວມມືກັບຊ່ຽວຊານຍີ່ປຸ່ນຄິດໄລ່ຕາມຄວາມເໝາະສົມ ແລະສະເໜີໃຫ້ຂັ້ນເທິງພິຈາລະນາຕໍ່ໄປ
- (7) ງົບປະມານເຂົ້າໃນການບໍລິຫານວຽກງານການຄຸ້ມຄອງນໍ້າເບື້ອນແມ່ນໃຫ້ພະແນກ ຍທຂ ຂຶ້ນແຜນແລ້ວສະເໜີໃຫ້ພາກສ່ວນທີ່ກ່ຽວຂ້ອງພິຈາລະນາຕໍ່ໄປ
- (8) ກອງປະຊຸມປະຈຳແຕ່ລະໄຕມາດແມ່ນໃຫ້ດຳເນີນການຕາມປົກກະຕິໂດຍພາຍໃຕ້ການເປັນປະທານຂອງຫົວໜ້າຊື້ນໍ້າໂຄງການ

7. ພິທີກ່າວປິດກອງປະຊຸມ, ທ່ານແກ້ວພິໄລວັນ ອາໄພລາດ, ຮອງເຈົ້າຄອງນະຄອນຫຼວງວຽງຈັນ

- (1) ກອງປະຊຸມໃກ້ຈະຮອດເວລາປິດແລ້ວແຕ່ຍັງມີບາງທ່ານຍັງບໍ່ທັນໄດ້ປະກອບຄໍາເຫັນ, ດັ່ງນັ້ນສະເໜີໃຫ້ທ່ານຂຽນຄໍາເຫັນແລ້ວສົ່ງມາໃຫ້ທາງໂຄງການຕື່ມ ແລະ ຂ້າພະເຈົ້າຂໍສັງລວມດັ່ງນີ້:
- (2) ກ່ອນອື່ນຂ້າພະເຈົ້າຂໍສະແດງຄວາມຊົມເຊີຍຕໍ່ການຈັດຕັ້ງປະຕິບັດໂຄງການໃນປີຜ່ານມາ, ອີງຕາມບົດລາຍງານເຫັນວ່າໄດ້ຮັບຜົນດີ, ມີການໄປຝຶກອົບຮົມທີ່ຕ່າງປະເທດ, ການສ້າງຖານຂໍ້ມູນ ແລະ ການກຳນົດແຜນຍຸດທະສາດນໍ້າເບື້ອນ
- (3) ສໍາຫຼັບປີທີ່ 2 ນີ້ໄດ້ແບ່ງອອກເປັນ 4 ກຸ່ມ, ຄາດວ່າແຕ່ລະກຸ່ມຈະປະຕິບັດວຽກໃຫ້ສໍາເລັດຕາມການມອບໝາຍ ເພື່ອໃຫ້ໂຄງການມີຄວາມຄືບໜ້າ, ຂ້າພະເຈົ້າຂໍຊົມເຊີຍ
- (4) ອີງຕາມຄວາມຄິດຄໍາເຫັນຂອງບັນດາທ່ານ, ພວກເຮົາມີທາງອອກຮ່ວມກັນໄດ້ໂດຍອີງໄສບັນດານິຕິກຳທີ່ມີຢູ່ແລ້ວຈາກບັນດາພາກສ່ວນທີ່ກ່ຽວຂ້ອງ ແລະ ລະບຽບການຄຸ້ມຄອງການປ່ອຍນໍ້າເບື້ອນແມ່ນອີງໄສມາດຕະຖານທີ່ມີຢູ່ແລ້ວ, ໃນກໍລະນີນັກລົງທຶນຕ້ອງການເອກະສານທີ່ກ່ຽວຂ້ອງເພື່ອກໍ່ຕັ້ງຫົວໜ່ວຍທຸລະກິດຕ້ອງໄດ້ໄປພົວພັນເອົາເອກະສານນໍາກະຊວງທີ່ກ່ຽວຂ້ອງນັ້ນໆ, ໂດຍສະເພາະກະຊວງອຸດສະຫະກຳແລະການຄ້າແມ່ນເອກະສານການປະເມີນຜົນກະທົບເບື້ອງຕົ້ນ, ຈາກນັ້ນຈຶ່ງມາພົວພັນກັບກະຊວງໂຍທາເລື່ອງການອອກແບບ ແລະ ກວດກາພື້ນທີ່, ສໍາຫຼັບໂຄງການນີ້ຈະມີການສ້າງລະບຽບການຄຸ້ມຄອງນໍ້າເບື້ອນ ສະນັ້ນຈຶ່ງສະເໜີໃຫ້ທຸກພາກສ່ວນສະໜອງຂໍ້ມູນ ແລະ ໃຫ້ການສະໜັບສະໜູນໃຫ້ຄວາມຮ່ວມມືນໍາໂຄງການນີ້ດ້ວຍ
- (5) ບາງຄຳຄິດເຫັນກ່ຽວກັບຄ່າບໍລິການນໍ້າເບື້ອນແມ່ນພວກເຮົາຄິດໄລ່ມູນຄ່າການລົງທຶນໂດຍບໍ່ໄດ້ລວມມູນຄ່າການຖົມຂຸມຈາກລັດຖະບານ ດັ່ງນັ້ນຈະຕົກຢູ່ຄອບຄົວປະມານ 120.000 ກີບຕໍ່ຄົວເຮືອນຕໍ່ເດືອນ, ຍ້ອນມັນແພງຄືແນວນັ້ນພວກເຮົາຈຶ່ງຕ້ອງການເງິນຖົມຂຸມຈາກແຫຼ່ງອື່ນໆ ເງິນຖົມຂຸມຈາກລັດຖະບານ, ເງິນປະກອບສ່ວນຈາກຜູ້ຢູ່ອາໄສ, ຫົວໜ່ວຍທຸລະກິດ ແລະ ປະເພດໂຮງງານອຸດສະຫະກຳຕ່າງໆ , ສະນັ້ນຕ້ອງໃຫ້ມີຄວາມຊັດເຈນໃນເລື່ອງນີ້.
- (6) ປັດຈຸບັນນະຄອນຫຼວງວຽງຈັນກຳລັງປະກາດໃຊ້ຄ່າຂ້ວນ 5 ຮ່ວມຄື:
 - 1. ຮ່ວມຢູ່

2. ຮ່ວມສ້າງ
3. ຮ່ວມພັດທະນາ
4. ຮ່ວມກໍ່ສ້າງ
5. ຮ່ວມກ້າວ

(7). ອາທິດຜ່ານມານະຄອນຫຼວງວຽງຈັນໄດ້ຮ່າງຂໍ້ຕົກລົງກ່ຽວກັບ 8 ສໍໂດຍມີລາຍລະອຽດດັ່ງນີ້:

1. ອາກາດສະອາດ
2. ນໍ້າສະອາດ
3. ສຽງບໍ່ເນືອງນັ້ນ
4. ກິນສະອາດ
5. ເສັ້ນທາງສະອາດ
6. ເຮືອນສະອາດ
7. ຫ້ອງການສະອາດ
8. ສວນສາທາລະນະສະອາດ

(8). ພວກເຮົາຍັງຈະໄດ້ສຶກສາຄວາມເປັນໄປໄດ້ໃນການເກັບຄ່າບໍລິການນໍ້າເປື້ອນ 120.000 ກີບຕໍ່ຄົວເຮືອນຕໍ່ເດືອນຕື່ມໂດຍອີງໄສ່ຂະໜາດຂອງລະບົບບໍາບັດນໍ້າເປື້ອນແຕ່ລະປະເພດ

(9). ອີກປະການໜຶ່ງທີ່ຢາກແລກປ່ຽນກັບບັນດາທ່ານວ່າເປັນຫຍັງຄອງລະບາຍນໍ້າຈຶ່ງມີກິນເໝັນ, ຍ້ອນຊຸມວິດຖ່າຍໃນຕົວເມືອງບໍ່ພຽງພໍ ແລະ ເວລາວິດເຕັມເຮັດໃຫ້ໄຫຼລົ້ນອອກມາແລ້ວໄຫຼລົງສູ່ຄອງໂດຍບໍ່ໄດ້ຜ່ານການບໍາບັດ, ເຮົາຈະແກ້ໄຂບັນຫານີ້ໄດ້ແນວໃດ, ທີມງານສຶກສາຈະມີວິທີແກ້ໄຂແນວໃດ, ຖ້າເຮົາໃຊ້ຊຸມວິດຖ່າຍແບບດຽວກັບທ່ານບຸນທົງແນະນໍາແມ່ນເປັນການດີ, ແຕ່ວ່າໃນປັດຈຸບັນຊຸມວິດຖ່າຍຍັງບໍ່ທັນພຽງພໍ

(10). ສ່ວນຮ້ານລ້າງລົດ, ຮ້ານເຜີແມ່ນໄດ້ປ່ອຍນໍ້າເປື້ອນລົງສູ່ຄອງເໝືອນກັນ, ສະນັ້ນຈຶ່ງສະເໜີໃຫ້ທ່ານຮອງເຈົ້າເມືອງແຕ່ລະເມືອງເອົາໄຈໄສ່ໃນບັນຫານີ້ຕື່ມອີກ

(11). ການເກັບຄ່າບໍລິການນໍ້າເປື້ອນແມ່ນໜ້າທີ່ຂອງພວກເຮົາ, ສະນັ້ນພວກເຮົາຕ້ອງພ້ອມກັນປະຕິບັດ

(12). ໂດຍລວມແມ່ນເຫັນດີຕາມແຜນວຽກປີທີ່ 2 ເຊິ່ງໄດ້ແບ່ງອອກເປັນ 4 ກຸ່ມຕາມແຕ່ລະໜ້າວຽກ, ເຖິງຢ່າງໃດກໍຕາມຈະຕ້ອງໄດ້ມີການປັບປຸງເຊິ່ງລາຍລະອຽດແມ່ນຈະໄດ້ຫາລືໃນກອງປະຊຸມປະຈໍາໄຕມາດຕໍ່ໄປ

(13). ຂ້າພະເຈົ້າຂໍສະແດງຄວາມຊົມເຊີຍ ແລະ ຂອບໃຈຕໍ່ບັນດາແຂກທີ່ເຂົ້າຮ່ວມ, ທີມງານໂຄງການແລະການປະກອບຄໍາຄິດເຫັນຂອງທຸກທ່ານໃນມື້ນີ້, ເຊິ່ງຈະເປັນຜົນດີໃຫ້ແກ່ການຈັດຕັ້ງປະຕິບັດວຽກປີທີ່ 2 ຂອງໂຄງການ, ພິເສດແມ່ນຂອບໃຈນໍາໄຈກາທີ່ໃຫ້ການຊ່ວຍເຫຼືອຫຼາຍກິດຈະກໍາລວມໄປເຖິງນໍ້າປາປານໍາ, ເຊິ່ງປັດຈຸບັນຄວາມຕ້ອງການຊົມໃຊ້ນໍ້າກວມ 300.000 ແມັດກ້ອນຕໍ່

ວັນ, ແຕ່ກໍາລັງການຜະລິດພຽງແຕ່ 180.000 ແມັດກ້ອນຕໍ່ວັນ, ສະນັ້ນໄຈກາໄດ້ໃຫ້ການຊ່ວຍເຫຼືອເພື່ອຂະຫຍາຍໂຮງງານຈີນາຍໂມ້ປະມານ 40.000 ແມັດກ້ອນຕໍ່ມື້, ສະຖານນີເກັບຂີ້ເຫຍື້ອຂອງ ອພບ, ໂຄງການວິໄຈນໍ້າຊີບະ ແລະ ໂຄງການຮ່ວມມືຈາກເມືອງໄຊຕະມະ, ອີກເທື່ອໜຶ່ງຂ້າພະເຈົ້າຂໍສະແດງຄວາມຂອບໃຈມາຍັງທ່ານນາງມາກິໂມໂຕະ ຕາງໜ້າອົງການໄຈກາປະຈໍາລາວທີ່ໄດ້ໃຫ້ກຽດເຂົ້າຮ່ວມກອງປະຊຸມໃນຄັ້ງນີ້

(14). ສຸດທ້າຍນີ້ຂໍອອຍພອນໃຫ້ທຸກທ່ານຈົ່ງມີສຸຂະພາບແຂງແຮງ, ປະສົບຜົນສໍາເລັດໃນໜ້າທີ່ວຽກງານ ແລະ ຂໍປິດກອງປະຊຸມຄັ້ງນີ້ຢ່າງເປັນທາງການ, ຂໍຂອບໃຈ.

List of Participants of the JCC Meeting

No	Name and Surname	Organization	Position
1	Mr. Keophilavanh APHAILATH	VEC	Vice Governor
2	Mr. Bounchanh KEOSITHAMMA	DPWT	Deputy Director General, Project Director
3	Mr. Khammone CHOMMANIVONG	DPWT	Deputy Chief, Housing, Urban Planning and
4	Mr. Xayabandith INSISIENGMAY	PTI	Chief of Environmental and Social Division
5	Mr. Phouthasom INTHAVONG	DHUP	Deputy Chief, Division of Urban Development
6	Mr. Khamphet PHONGRASASY	VUDAA	Chief of Drainage Division
7	Mr. Korlakanh SEBOUTTALATH	DPWT	Technical Staff
8	Mr. Sengkeo TASAKETH	PCD	Chief, Water Environment Division
9	Mr. Sao SENGVONGPHET	DOIC	Chief of Industrial and Handicraft Division
10	Ms. Khamla THAMMAVONG	DONRE	Deputy Chief, Water Resources Division
11	Ms. Vankham LUANGKHOT	DPWT	Technical Staff
12	Mr. Vilasak VENPASEUTH	DONRE	Technical Staff
13	Ms. Minavanh DOUANGMALA	DONRE	Technical Staff
14	Ms. Saylom KEOSITHAMMA	DPWT	Technical Staff
15	Mr. Bounthong KEOHANAM	DHUP	Director of Urban Development Division
16	Mr. Khamphet INTHIDETH	PTI	Deputy Director General
17	Mr. Phetsamone DALALOM	PCD	Deputy of Pollution Control Department
18	Ms. Darounny VILAYTHONG	NREI	Head of Planning and Administration Division
19	Mr. Phouvong ONESYSALEUM	DESIA	
20	Mr. Khamphone KEODALAVONG	MOIC	Director of Industry and Handicraft Division
21	Mr. Bounlam KHONESAVANH	MAF	Head of Division
22	Mr. Sinakhone P	MOES	Chief of Cabinet
23	Mr. Bounlanh KANEKHAMVONGSA	DPWT	Chief of , Housing, Urban Planning
24	Mr. Bounsom SONGVILAY	DONRE	Deputy Director of DONRE
25	Mr. Phoudone MEKSAVANH	VUDAA	Vice President
26	Mr. Khamming SOUNDALA	DOIC	Deputy Director Office
27	Mr. Kham Phout	DAF	
28	Mr. Phouthone SENGDVONG	DOES	Education Service Deputy
29	Mr. Bounlay ONEVONGSA	DPI	
30	Mr. Phetsamay NATPHASOUK	District	Chanthaboury District Governor
31	Mr. Khamheng DOUANGSYLY	District	Sikhottabong District Governor
32	Mr. Phouthaphone	District	Saysettha District Governor
33	Mr. Bounmek VILAYSONG	District	Sisattanak District Governor
34	Ms. Saeda MAKIMOTO	JICA	Senior Representative
35	Mr. Toru OGURA	JICA	JICA Representative
36	Mr. Kingsada SIPHANHTHONG	JICA	Project Assistant
37	Ms. Hiroko KAMATA	JET	Chief Advisor/Water Environment Planning and
38	Mr. Kimihiro KONNO	JET	Project Coordinator
39	Ms. Khouan VILAYPHANH	JET	Administrative Assistant
40	Mr. Kazuhiro ASADA	JET	(Co-Chief Advisor)/ Integrated Wastewater
41	Mr. Daizo IWATA	JET	Institutional Strengthening and Financial Analysis
42	Mr. Sonemany XAYYALATH	JET	Project Coordinator
43	Mr. Kalathone KOUAYKESONE		Interpreter

MINUTES OF MEETING
OF
THE THIRD JOINT COORDINATING COMMITTEE MEETING
FOR
THE PROJECT FOR URBAN WATER ENVIRONMENT
IMPROVEMENT
IN
VIENTIANE CAPITAL
IN
THE LAO PEOPLE'S DEMOCRATIC REPUBLIC



Yusuke MURAKAMI
Chief Representative
Laos Office
Japan International Cooperation Agency,
Japan



Keophilavanh APHAILATH
Vice Governor
Vientiane Capital
Lao People's Democratic Republic

VIENTIANE PLAZA HOTEL, VIENTIANE CAPITAL, MAY 25, 2016.

1. Introduction

The Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched JICA Expert Team (hereinafter referred to as "JET") on 14th October 2014, to commence the Project for Urban Water Improvement in Vientiane Capital in Lao PDR (hereinafter referred to as "the Project").

The Third Joint Coordinating Committee (JCC) for the Project was held on 25th in May, 2016 at Vientiane Plaza Hotel, Vientiane Capital to report the Project activities of the last 3 months, the situation of the CBS (community Based Sanitation) in Thongkhankham village, and Mid-term evaluation of the project. The meeting was chaired by Mr. Keophilavanh APHAILATH, Vice Governor of Vientiane Capital and attended by representatives of DHUP and PTI in MPWT, DPWT in Vientiane Capital and other relevant organizations. Participants of the JCC meeting are listed in the attachment 1.

2. Opening Remarks

On behalf of Vientiane Capital, Mr. Keophilavanh APHAILATH, welcomed all participants in the meeting. The chairman made opening remarks with brief introduction of the project background, project activity in the last 3 months and topic to be considered such as CBS in Thongkhankham issue, area selection for sewerage facility, Mid-term evaluation, budget for Lao side, and other relevant activities in order to achieve the project goal

3. Starting Remarks

Following the opening remarks, JICA Chief Representative, Mr. Yusuke MURAKAMI made starting remarks. In the remarks, he pointed out that the project already passed one year and half and the mid-term review was implementing with 3 components such as project performance, 5 criteria of relevance, effectiveness, efficiency, impact, and sustainability, and recommendation. He expressed the appreciation for receiving the mission and kind cooperation to the mid-term review from the Lao's side.

After summarizing the agenda of the meeting and emphasizing the importance to understand and share the milestone of Project progress among the JCC members, and to confirm the rest of activities and issues to be tackled for achievement of the Project purpose, he expressed JICA's continuous support to the project with the best efforts and closed with JICA's appreciation to the organizations and officers concerned for being supportive and committed partners.

4. Presentation of DEWATS in Thongkhankham village

4.1 Mr. Xayabandith INSISIENGMAY, Deputy Project Manager

He introduced the project activities for CBS in Thongkhankham village, such as findings of main problem and present situation, and new arrangement for community based operation with maintenance charge to be collected from users

4.2 Mr. Kazuhiro ASADA, Chief advisor of the Project

He explained the lesson learned from Thongkhankham case and requested the confirmation of institutional arrangement for wastewater management in Vientiane Capital, and proposed the new arrangement for community based operation based on Interpretation of “Prime Ministerial Decision on Management and Development of water Supply Sector (No.37/PM of 30 September,1999) ” for Wastewater Management System

5. Comments

The Chairman requested the relevant authorities to make comments especially on the new arrangement for community based operation of CBS in Thongkhankham village, as Mr. xayyabandith mentions now the collecting fee for maintenance is 8,000 Kip/month/household. He also mentioned that collecting fee per month was proposed to increase to 12,000 Kip and households who get good income should pay more than the other, as revolving fund for maintenance was required for the CBS.

5.1 Mr. Khamthavy THAIPHACHANH, Director of DHUP

The management system was going well from the beginning to the last 3 years. After the maintenance man of committee left from thongkhankham village, no one was replaced him for O&M. MPWT will support new arrangement linking with BORDA in order to train the new committee for O&M. It will be difficult for the committee to manage the CBS themselves, so district authority required to be involved and community fund required as well for future sustainability. Based on the law, Nam papa should deal with wastewater management and sanitation. However, in Thongkhankham case, if no other government sector was involved, only community manage will be difficult. They can do only operation but they have no budget for repair. As Mr. Chairmen mentioned, they should have revolving fund for maintenance in the future.

5.2 Mr. Thanongsinh SENGTHAVONG, DPI

He mentioned the role of MOF that supporting and financial arrangement should be the role of MPI instead of MOF in new arrangement.

5.3 Mr. Phouthon SUVANTHONG, Chanthabouly District

He agreed with the project implantation especially for the CBS in Thongkhankham and the District will closely support for this activity in Thongkhankham village and will explain the participation of the District to the community.

5.4 Mr. Phetsamone DALALOY, PCD

He proposed to do the pilot project for sustainable management, as PCD had completed LPPE Project and also proposed to draft the legislation and policy on wastewater management to support this project.

6. Presentation of Mid-term Evaluation

6.1 Mr. Yutaka FUKASE, Leader, Joint Mid-Term Review Team

He explained the Mid-term evaluation briefly. Main proposes is to analyze and

discuss the achievement of the project in term of 5 criteria: relevance, effectiveness, efficiency, impact, and sustainability and recommendation for sustainable capacity development of the institutional framework and organizations to be strengthened for wastewater treatment in Vientiane capital through participatory approach

6.2 Mr. Jun TOTSUKAWA, Evaluation Analysis, Joint Mid-Term Review Team

He explained the result of the Mid-term evaluation on achievement of the output as focus on (Output 1) Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment, (Output 2) The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment facilities, (Output 3) The operation of legal and regulatory framework is strengthened for industrial wastewater., (Output 4) People's awareness is raised through environmental education by using 5 criteria as: relevance, effectiveness, efficiency, impact and sustainability

6.3 Mr. Somchaivang DETHOUDOM, Local Leader, Joint Mid-Term Review Team

He explained the Recommendation from the Evaluation and Conclusion as the details below:

- 1) The Project meets the technical needs as well as the policy direction of the Lao government.
- 2) In the remaining half period of the Project, it is required to accelerate the Project activities and technical transfer with sufficient time which enables to co-work with the C/P and the experts.
- 3) The degree of the progress will determine the achievement of the Project purpose, and the sustainability accordingly.

7. Project Activities of the last 3 months

Mr. Korlakanh SENBOTTALATH, DPWT, presented the Project Activities of the last 3 months to the meeting mainly focusing on the details below:

- 1) On-going Studies for alternatives of Centralized Wastewater Treatment System (CWTS) and Decentralized Wastewater Treatment System (DEWATS)
- 2) Technical standard and desludging practice of septic tank
- 3) Inventory survey on industries/ key polluters, Guideline for factory inspection, and water quality analysis for public water bodies
- 4) Environmental education, cleaning activities of canals, and other public relations

He also explained the planned activities of the next 3 months.

7.1 Mr. Chairman

The chairman requested the relevant authorities to make comments on the project activities mainly focusing on area selection for wastewater treatment facility in Vientiane Capital.

7.2 Mr. Bounsom SONGVILAY, Director of DONRE

He mentioned the water quality analysis from factory and public canal that arranged by DONRE laboratory and supported by JICA. DONRE will charge for water analysis services in order to maintain the laboratory room in the near future. For DEWATS Thongkham, he agreed as pilot project for future sustainability, and for area selection of centralize wastewater treatment facility he agreed to find government land that is suitable, low cost, and effectiveness.

7.3 Mr. Xayyabandith INSISIENMAY, Deputy Project Manager

He explained the layout of alternatives of CWTS in plan A, B, C and he also mentioned that important thing is to select the area first and the technology will come later

7.4 Mr. Somboun NAKAVONGSA, VUDDA

He explained that one of the candidate sites for treatment, Sikottabong Park with area of 3.5ha is now used by VUDDA and controlled by DONRE. VUDDA planned to construct the wastewater treatment facility as well, but the budget is limited. If this project wanted to continue, VUDDA will support and there is no effect with the old donor

7.5 Mr. Bounlan KANKHAMVONGSA, DPWT

He mentioned that the building permission with drawing and design is included the septic tank drawing based on the number of people in the household. If possible, he requests the project to draft the new regulation on septic tank management in household, restaurant, hotel etc. For the wastewater treatment in Sikottabong Park, if not effect with other project, he proposed to the project keep going.

7.6 Mr. Khamphet PHONGRASASY, VUDDA

He explained Nahai project that they will collect all sludge from septic tank in Vientiane Capital in near future and will finish the draft of regulation on septic tank management including the responsibility of service provider in the next month. He also proposed DPWT to include the septic tank standard with building permission in order to easy to follow.

7.7 Mr. Khamthavy THAIPHACHANH, Director of DHUP

He mentioned that construction cost of the wastewater treatment plans in Vientiane Capital by the study of JICA and Korea is very high. As he had discussion with Mr. Asada that we should find the suitable system, suitable technology with low cost but effective and low cost of operation and maintenance, and agreed to treat in central area first and conserve the area for the required sites in the future, then budget arrangement will come later. He also explained the sample in Xiengmay case that they pump water from the Mae Ping River to clean the canal in dry season. It is possible in Vientiane Capital as well. There is other option that we would think

about.

7.8 Mr. Khammone CHOMMANIVONG, Project Director

He explained project implementation of last 3 months and focused on the area selection and budget arrangement of Lao side and proposed to high ranking officer to make the consideration.

7.9 Mr. Yusuke MURAKAMI, JICA Chief Representative

He commented on the strategy and guideline for decentralize and centralize wastewater treatment facility to be developed by this project and asked Lao side to support the documents. The communication between Lao side and JICA expert team was made by holding weekly meeting, quarterly meeting. He proposed to Lao side to make more effort to provide the necessary budget for this project.

7.10 Mr. Kazuhiro ASADA, Chief advisor of the Project

He mentioned that according to the National Strategy of wastewater and sanitation in Vientiane Capital, centralize system will be constructed after 2030. If we can promote the small scale system, it may possible to construct before 2030. Anyhow, the important thing is to find out the finger in the future and to preserve the land for treatment site. When the development take place some more, the available land becomes far away, and then construction cost of the sewerage system becomes higher, when you want to construction the system. At the same time, we consider the improvement of water environment in dry season. As Mr. Khamthavy said to stop smell in dry season, it is one of the options to get the water from the Mekong River to clean the canal.

8. Conclusion by the chairman

- 1) CBS system in Thongkhankham becomes more effective, good structure of management for O&M. As technical aspect, DEWATS can serve about 3,000 people. Before construction of Centralize system, we can use this system to solve the present situation where suitable site in Vientiane Capital and we have to identify clearly in strategy plan which area for DEWATS and which area for individual treatment.
- 2) The mid-term evaluation by 5 criteria: relevance, effectiveness, efficiency, impact and sustainability is good to learn and share the idea together in order to achieve the project goal, as CPs come from different organization.
- 3) As we know MoU is signed by MPWT but the implementation of the project is by DPWT, so the budget plan should be prepared by PTI and submitted to MPI, but now project budget is borrowed from DPWT. Anyhow, we proposed to Lao side to coordinate with department concerned to arrange the budget in time
- 4) Wastewater treatment strategy includes the treatment of black water by septic tank in household. It is difficult to manage, so we should have long term

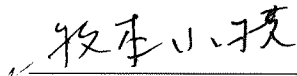
planning for strategy, use suitable technology, and proposed to have other meeting for considering on this issue only.

- 5) Septic tank standard is under the building permission that is issued by DPWT. It needs to be revised because the existing one of 15 articles does not cover enough.
- 6) The Communication for improving the progress of work is agreed to follow JICA proposal of holding the weekly and quarterly meeting.

List of Participants of the JCC Meeting

No	Name and Surname	Organization	Position
1	Mr. Keophilavanh APHAILATH	VEC	Vice Governor
2	Mr. Dethsongkham THAMMAVONG	DPWT	Director General,
3	Mr. Khammone CHOMMANIVONG	DPWT	Deputy Chief, Housing, Urban Planning and
4	Mr. Xayabandith INSISIENGMAY	PTI	Chief of Environmental and Social Division
5	Mr. Phouthasom INTHAVONG	DHUP	Deputy Chief, Division of Urban Development
6	Mr. Khamphet PHONGRASASY	VUDAA	Chief of Drainage Division
7	Mr. Korlakanh SEBOUTTALATH	DPWT	Technical Staff
8	Mr. Sengkeo TASAKETH	PCD	Chief, Water Environment Division
9	Mr. Vongphet LATHSABOUTH	DOIC	Deputy chief of Industrial and Handicraft Division
10	Ms. Khamla THAMMAVONG	DONRE	Deputy Chief, Water Resources Division
11	Ms. Vankham LUANGKHOT	DPWT	Technical Staff
12	Mr. Vilasak VENPASEUTH	DONRE	Technical Staff
13	Ms. Minavanh DOUANGMALA	DONRE	Technical Staff
14	Ms. Saylorom KEOSTHAMMA	DPWT	Technical Staff
15	Mr. Khamthavy THAIHPACHANH	DHUP	Director of DHUP
16	Mr. Khamphet INTIHIDETH	PTI	Deputy Director General
17	Mr. Phetsamone DALALOM	PCD	Deputy of Pollution Control Department
18	Mr. Somchaivanh DETHOUDOM	DIA.VC	Joint Evaluation Team Member
19	Mr. Bounlanh KANEKHAMVONGSA	DPWT	Chief of , Housing, Urban Planning
20	Mr. Bounsom SONGVILAY	DONRE	Deputy Director of DONRE
21	Mr. Somboun AKKHAVONG	VUDAA	Vice President
22	Mr. Takashi KURIHARA	EOJ	Second Secretary
23	Mr. Yukata FUKASE	JICA HQ	Leader
24	Mr. Masami TSUJI	JICA HQ	Environment Policy
25	Ms. Maroko FURUKAWA	JICA HQ	Cooperation Planning
26	Mr. Jun TOTSUKAWA	Sano Planning	Evaluation Analysis
27	Mr. Thanongsinh	DPI	Head of Division
28	Mr. Phouthone SOUVANTHONG	District	Chanthaboury District Governor
29	Mr. Khamheng DOUANGSYLY	District	Sikhottabong District Governor
30	Mr. Chanthaneth VORLACHAK	Village	Thongkankham
31	Mr. Bounmek VILAYSONG	District	Sisattanak District Governor
32	Mr. Yusuke MURAKAMI	JICA	Chief Representative
33	Ms. Saeda MAKIMOTO	JICA	Senior Representative
34	Mr. Toru OGURA	JICA	JICA Representative
35	Mr. Tatsuya TOBE	JET	Environment Education
36	Mr. Masayuki NAGAMOCHI	JET	Decentralize Wastewater Treatment
37	Mr. Kimihiro KONNO	JICA	Project Coordinator
38	Ms. Khouan VILAYPHANH	JET	Administrative Assistant
39	Mr. Kazuhiro ASADA	JET	(Co-Chief Advisor)/ Integrated Wastewater
40	Mr. Tadashi TAKESHIMA	JET	Environmental Regulation and Enforcement
41	Mr. Sonmany XAYYALATH	JET	Project Coordinator
42	Ms. Vinat SAYAVONG		Interpreter

MINUTES OF MEETING
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THE PROJECT FOR URBAN WATER ENVIRONMENT
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IN
VIENTIANE CAPITAL
IN
THE LAO PEOPLE'S DEMOCRATIC REPUBLIC



Yusuke MURAKAMI
Chief Representative
Laos Office
Japan International Cooperation Agency,
Japan



Keophilavanh APHAILATH
Vice Governor
Vientiane Capital
Lao People's Democratic Republic

CITY HALL, VIENTIANE CAPITAL, DECEMBER 16, 2016.

1. Introduction

The Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched JICA Expert Team (hereinafter referred to as “JET”) on 14th October 2014, to commence the Project for Urban Water Improvement in Vientiane Capital in Lao PDR (hereinafter referred to as “the Project”).

The fourth Joint Coordinating Committee (JCC) for the Project was held on 16th in December, 2016, at 8:30 AM in City hall, Vientiane Capital to report the progress of the Project activities of the second year and work plan of the third year activities. The meeting was chaired by Mr. Keophilavanh APHAILATH, Vice Governor of Vientiane Capital and attended by representatives of DHUP and PTI in MPWT, DPWT in Vientiane Capital, and other relevant organizations. Participants of the JCC meeting are listed in the attachment 1.

2. Opening Remarks

On behalf of Vientiane Capital, Mr. Keophilavanh APHAILATH welcomed all participants in the meeting. The chairman made opening remarks with brief introduction of the progress activities in the second year such as the preparation of wastewater treatment strategy in Vientiane Capital, area selection for facilities, roles and responsibilities, the management, the design of septic tank and decentralized system, the management of factory discharge, water quality analysis, the related regulations, and the awareness raising and environment education.

3. Starting Remarks

Following the opening remarks, JICA Chief Representative, Mr. Yusuke MURAKAMI made starting remarks. At first, he took this opportunity to express his sincere appreciation to all of the stakeholders of the Project for the continuous and generous support to the implementation of the Project. This three-year Project commenced in October 2014 is now in the final year. The draft of work plan for the third year would be presented and discussed for authorization as one of today’s agenda. Today’s main agenda is report of progress for each component. During the progress report, the outline of wastewater management strategy in component 1 will be presented. This strategy includes very important contents of candidate sites for construction of wastewater treatment plants, collection areas for wastewater treatment, type of wastewater treatment facilities, estimation of construction cost and tariff, and roles and responsibilities of the related organizations. He is confident that the study tours to Vietnam in November and to Thailand in this week will be useful for the consideration of formulation of wastewater management strategy. Especially it is paramount of importance to secure the candidate lands for future construction of wastewater treatment plants in component 1. In addition the terminal evaluation will be scheduled in May next year, six months prior to the completion of the Project, and next JCC will be held during the evaluation. Today’s JCC is a very good opportunity to understand and share the milestone of the Project progress among our JCC members, and to confirm the necessary activities and issues to be tackled for the achievement of the Project purpose. We wish today’s JCC will be a fruitful meeting through constructive discussion.

4. Presentation of second year Project implementation and third year plan

4.1 Mr. Korlakanh SENBOTTALATH, WG 1 Leader

He introduced the project activities that were implemented in the second year for WG 1 and the work plan for the third year as the topics of: the preparation of wastewater treatment strategy in Vientiane Capital, candidate site for wastewater treatment facilities, type of technologies, the preparation for the roles and responsibilities of wastewater management and financial arrangement.

4.2 Mr. Xayyabandith INSISIENGMAY, WG 2 Leader

He explained and reported the progress of activities in the second year for WG 2 and the work plan for the third year, such as: the preparation of septic tank standard and Decentralized Wastewater Treatment System (DEWATS), the septic tank design for household, the design of DEWATS for business owners of restaurant, hotel, apartment etc., the process of issue, the building permission, and the monitoring system and explained the pilot project of DEWATS in Thongkhankham village especially the establishment of new committee for management, operation and maintenance, the promotion of desludging, financial arrangement, and water quality analysis.

4.3 Mr. Sengkeo TASAKETH, WG 3 Leader

He explained and reported the progress of activities in the second year for WG 3 and the work plan for the third year such as: the factories survey and data collection, business effluent database, inspection guideline, training on water quality analysis to DONRE staff, the result of water quality analysis from factories, and the type of technology for inorganic wastewater treatment facility.

4.4 Ms. Khamla THAMMAVONG, WG 4 Leader

She explained and reported the progress of activities in the second year for WG 4 and the work plan for the third year such as: amendment of Side-Reader and development of Poster for environment education in school, teaching materials, training of trainer (ToT), student picture competition on water environment conservation, cleaning activity event, and the result of water quality analysis in public canal, and also presented the CPs proposed budgets for the Project implantation in the third year such as: per-diem, fuel, material for laboratory and additional stuff for laboratory room.

4.5 Dr. Kazuhiro Asada, Chief Advisor

He summarized meeting schedule of stakeholder meetings, public hearings, seminars, and workshops to be held in the third year, and requested continuous cooperation of the relevant authorities.

5. Comments

The chairman requested the relevant authorities to make comments for the topics above in order to prepare the wastewater management strategy of Vientiane Capital in the future such as: the area selection for facilities, the type of technology, the septic tank and DEWATS arrangement, the factory management and the awareness raising and environment education.

5.1 Mr. Phouthasenh ARKHAVONG, Deputy Director of DHUP.

1. This project is related to Housing and Urban Planning, so he requested the Project to join the plan together before approval.
2. Short term planning for wastewater treatment should be clear and certify in each phase and also budget plan are required.
3. The regulation for wastewater management should be proposed in connection with the building permission in order to force and explain to other area in whole country.

5.2 Ms. Vanhmany PHIMMASONE, Deputy Director of DOIC.

1. Proposed the Project to prepare the implementation plan in each phase including budget, time and how to pay back from the user.
2. The wastewater treatment from factory must be certified in technical aspect for them to follow the standard.
3. Proposed to train the personnel from DOIC on chemical treatment system.

5.3 Mr. Bounchanh KEOSITHAMMA, Deputy Director of DPWT.

1. Proposed for DPWT to involve the standard designs for CWATS before submission for MPWT's approval.
2. The selection area for CWATS as mentioned in plan 1, 2, 3 is already approved by Vientiane Capital Governor in order to preserve the area and departments concerned are requested to survey and get more information and report to Governor.
3. Proposed to use an appropriate technology based on the real situation, in order to get effectiveness and low cost.

5.4 Mr. Khamphet PHONGLASASY, VUDDA.

1. More detailed design for septic tank should be proposed, because the simple septic tanks are still using in some area.
2. Proposed to promote desludging from septic tank and the role and responsibility of the authorities for enforcement.
3. Proposed to check the building permission about drawing design, the approval, rechecking after construction, and water quality analysis from septic tank based on national environment standard.

5.5 Mr. Bounpanh, DPI.

1. DPI arranged some budgets to contribute the Project 2 times. It was around 50 million kip at the 1st time and is around 80 million kip at the 2nd time.
2. Proposed to the Project to advertise and raise awareness on environment to

business, hotel, restaurant and other owners.

5.6 Mr. Phavanh SIHAVONG, DONRE.

1. For the area selection: DONRE will coordinate with concerned divisions in order to collect the data following the agreement of Vientiane Capital Governor.
2. Proposed to increase staff for water quality analysis, since there is not enough personnel.
3. Proposed to the Project to continue training of DONRE staff to reach 30 parameters as planned.
4. Proposed to identify and clear the role for wastewater discharge and revenue.

5.7 Mr. Langkhone, NUOL.

1. At present, we don't have the specific personnel for wastewater and wastewater management. They are the new tasks and we don't have any expert to control yet.
2. Every year we have engineering student to study on wastewater in Vientiane Capital, so we proposed to collaboration together and in the discussion topic today, if you want the student to help for collecting the data, we are welcome.

5.8 Mr. Xayyabandith and Mr. Korlakanh, Project representative

1. Ability to pay is 63,000 LAK/HHs according to JICA survey, so it's enough to pay for O&M cost, but construction cost should be subsidized by Government. It might be prepared by grant aid, loan or others as shown by the plans of 1, 2, 3.
2. Proposed septic tank design is for new construction of residential house only and under the building permission; DEWATS or other appropriate facility should be used by business owners such as hotel, restaurant, apartment, school, temple and small community based on the real situation of each area.
3. Collecting the data and preparing the sample designs for organic and inorganic treatment system for wastewater treatment of factory is in process as presented.

5.9 Mr. Toru OGURA, JICA

1. The study tour on wastewater management has already done in Viet Nam and Thailand. The information and knowledge gained by the study tour hoped to be used for formulation of the strategy of wastewater treatment and guidelines in Vientiane Capital.
2. Final evaluation would be taken place in the next year to evaluate the Project achievement and identify the further activities of the project in the rest period.
3. The role and responsibility are also discussed in the national strategy prepared by DWS. The contents of the national strategy shall be checked, as it would influence to the strategy for Vientiane Capital.

5.10 Mr. Khamthavy THAYPHACHANH, Director of DHUP.

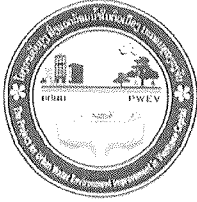
1. At first, he expressed his sincere appreciation to project team for the successful of previous project implementation.
2. He proposed to departments concerned and CPs to understand and together participate in this project according to the each role and responsibility, because many organizations are involved in wastewater management.
3. This project is for capacity strengthens of wastewater treatment management in order to achieve the project goal and become sustainable. Wastewater management issue must be considered for management plan, followed the general regulation from each organization, and specified to adopt the regulation based on the real situation, for instance water quality monitoring, wastewater discharge from factory will be followed the DOIC regulation.
4. The role and responsibility of each organization for wastewater management must be defined clearly, because it is not clear enough now, for example the role of DHUP and DWS should be defined clearly and some others organization are the same.
5. The wastewater management required to be identified in the strategy including management plan, framework. At present it seems all stakeholders understand wastewater management strategy in Vientiane Capital and this lesson learn will be extended to the other provinces as well.
6. DHUP would like to thank all of you and project team to make this project successful, even though some other tasks are not clear. In this year continuous study is proposed and we are confident that wastewater management will take into consideration for Vientiane Capital, thank you.

6. Conclusion and closing from Mr. Chairman.

At first, he expressed his sincere appreciation to the report of successful project implementation of the project team and agreed with the work plan for the third year project as the detail below:

1. The meeting reported project activities in the second year and work plan for the third year, especially the planning and designing of structural and ecological measures for wastewater treatment for household, business owner and industry, the management of septic tank and decentralize wastewater treatment facility, the monitoring of wastewater discharge from factory by dividing the level of management, and the awareness on environment education.
2. In the dissuasion, the meeting interested us especially in wastewater tariff, therefore, more detailed study is proposed to project team in this year and has some comment below:
 - Construction cost shall be subsidized by government or others
 - Operation and maintenance costs shall be included in water supply bill or others.





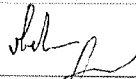
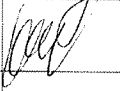





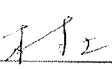
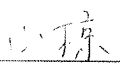
- Based on economic at present, the wastewater tariff could not be charged yet, but we have to plan for wastewater charge in the future.
 - Centralized treatment facility is required and wastewater charge form each type of building should be considered by each type such as: factory, slaughter, hotel, restaurant and others.
3. This meeting accepted the third year project plan,
 4. This strategy will be presented to Governor of Vientiane Capital by agreeing with counterparts and stakeholders.
 6. This meeting was good lesson learn, good information to project team and CPs in order to improve and revise the document concerned and putting in legislations to make a guideline for wastewater management following to the development plan of Vientiane Capital until 2020.
 7. Finally, he very much appreciated to JICA for continuous support to the project in Vientiane Capital and many projects were successful and at the end, he would like to wish you all are good health, successful and happiness and closed this meeting with his thanks.




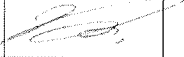


ລາຍຊື່ຜູ້ເຂົ້າຮ່ວມກອງປະຊຸມຄະນະປະສານງານຮ່ວມ ປີທີ 3, ຄັ້ງທີ 1
ໂຄງການປັບປຸງສິ່ງແວດລ້ອມນ້ຳໃນຕົວເມືອງນະຄອນຫລວງວຽງຈັນ

Joint Committee Meeting
The 1st of the 3rd year
Project for Urban Water Environment Improvement in Vientiane Capital
16 / 12 / 2016

No.	Name	Organization	Position	Contract No.	Signature
1	Mr. Keophilavanh APHAYLATH	VTE Cap.	Vice Governor		
2	Mr. Khamthavy THAYPHACHANH	DHUP, MPWT	Director General	51696358	
3	Mr. Khamphet INTHIDETH	PTI	Deputy Director General	28291989	
4	Mr. Somlith PHANNAVONG	PCD, MONRE	Deputy Director General		
5	Mr. Khamphone KEODALAVONG	MOIC	Director of Industry and Handicraft Division		
6	Mr. Dethsongkham THAMMAVONG	DPWT, VC	Director General		
7	Mr. Soulivanh KOMMAHASAY	DPWT, VC	Deputy Director General		
8	Mr. Bounlan KANKHAMVONGSA	DPWT, VC	Chief of Housing, Urban Planning and Environment Division		
9	Mr. Somboun AKKHAVONG	VUDAA, VC	Deputy Director		
10	Mr. Bounsom SONGVILAY	DONRE, VC	Deputy Director General		
11	Mrs. Vanmany ^{Phimmassane} SAYASAN	DOIC, VC	Deputy Director General	22233255	
12	Mr. Southany SAYASAN	DOES, VC	Deputy Director General		
13	Mr. Bounphanh	DPI, VC		94804086	
14	Mr. Bounma Phattkanan	DOIC, VC	Projector	22204434	
15	Mr. Bounchanh KEOSITHAMMA	DPWT	Deputy Director General, Vientiane Capital DPWT Project Director	5552-6271	

16	Mr. Khammone CHOMMANIVONG	DPWT	Deputy Chief, Housing, Urban Planning and Environment Division Project Manager	5550-5594	
17	Mr. Xayabandith INSISIENGMAY	PII	Chief of Environmental and Social Division Deputy Project Director	5677-1805	
18	Mr. Korlakanh SENBOUTTALATH	DPWT	Technical Staff	2240-6855	
19	Mr. Phouthasom INTHAVONG	DHUP	Deputy Chief, Division of Urban Development	5540-8339	
20	Ms. Khamla THAMMAVONG	DONRE	Deputy Chief, Water Resources Division	2223-2929	
21	Mr. Vongphet RATSABOUTH	DOIC	Deputy Chief of Industrial and Handicraft Division	5566-9694	
22	Mr. Khamphet PHONGRATSASY	VUDAA	Chief of Drainage Division	2222-7104	
23	Mr. Phetsalay KEOPHILAVONG	DOES	Technical Staff	5541-3589	
24	Mr. Vilasak VENPASEUTH	DONRE	Technical Staff	2880-0224	
25	Mr. Sengkeo TASAKETH	PCD, MONRE	Water Environment Division	9171-1155	
26	Mr. Thinnakone PHIMMAVONG	DPWT	Technical Staff	2282-9099	
27	Ms. Minavanh DOUANGMALA	DONRE	Technical Staff	5686-0303	
28	Mr. Lathdavanh SIDTHIXAY	DPWT	Technical Staff	9777-9855	
29	Ms. Saylom KEOSITHAMMA	DPWT	Technical Staff	5404-4448	
30	Mr. Takashi KURIHARA	EOJ	Second Secretary		
31	Mr. Yusuke MURAKAMI	JICA	Senior Representative	5552-0723	
32	Mr. Toru OGURA	JICA	JICA Representative	5552-6891	



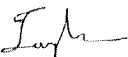
33	Mr. Kingsada SIPHANTHONG	JICA	Project Assistant	5569-8218	
34	Mr. Kazuhiro ASADA	JET	Chief Advisor Integrated Wastewater Management I	5457-4880	
35	Mr. Kimihiro KONNO	JET	Project Coordinator	5939-5768	合野
36	Mr. Tadashi TAKESHIMA	JET	Environmental Regulations and Enforcement	5497-7434	竹島
37	Mr. Sonemany XAYYALATH	JET	Project Coordinator	9555-3335	
38	Ms. Khouan VILAYPHANH	JET	Administrative Assistant	5611-2097	
39	Mr. Vinut SAYAVONG		Interpreter	2220-4217	

40 Mr Bounma.
Phatthanasinh DICT.VI

22

ກອງປະຊຸມ.....

(16 ທັນວາ 2016).

ລ/ດ	ຊື່ ແລະ ນາສະກຸນ	ຕຳແໜ່ງ	ພາກສ່ວນ	ເບີຕິດຕໍ່	ລາຍເຊັນ
41.	ທ. ພອນ ທະ ສາມ ພັດ ດາ 5/1/1971	ປ. ທາງເຕັກນິກ	ເອເມັດ-ໄຊ ເຮີ	222298911	
42.	ທ. ວິໄສ ວິ ພິມະສາທ	ຮຽນພັດທະນາ	ພິມະສາ ເອ. ພວ	22233755	 x
43.	ທ. ລັງການ ໄຊຍະວິ Mr. Langkhan Jayvong	ອຳນວຍການ	ສະໜອງສະໜອງ ສາດ: ມ/ຊ	22407407	
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ບົດບັນທຶກກອງປະຊຸມ

ຄະນະກຳມະການປະສານງານຮ່ວມປີທີ 3, ຄັ້ງທີ 1.

ສຳຫຼັບ

ໂຄງການ ປັບປຸງສິ່ງແວດລ້ອມນ້ຳໃນຕົວເມືອງ

ນະຄອນຫຼວງວຽງຈັນ.

ທີ່ຫ້ອງປະຊຸມຫ້ອງວ່າການປົກຄອງ ນະຄອນຫຼວງວຽງຈັນ, ວັນທີ 16 ທັນວາ 2016

1. ການນໍາສະເໜີ.

ອົງການຮ່ວມມືສາກົນປະເທດຍີ່ປຸ່ນ (ເຊິ່ງເອີ້ນຕໍ່ໄປວ່າ: ອົງການໄຈກາ)ໄດ້ຈັດສິ່ງທີມຊ່ຽວຊານ (ເຊິ່ງເອີ້ນຕໍ່ໄປວ່າ: ເຈັດທ໌) ໃນວັນທີ 14 ເດືອນ ຕຸລາ 2014, ເພື່ອເລີ່ມລົງມືຈັດຕັ້ງປະຕິບັດໂຄງການ ປັບປຸງສິ່ງແວດລ້ອມນໍ້າໃນຕົວເມືອງ ນະຄອນຫຼວງວຽງຈັນ (ເຊິ່ງເອີ້ນຕໍ່ໄປວ່າ “ໂຄງການ”).

ກອງປະຊຸມຄະນະກຳມະການປະສານງານຮ່ວມປີທີ 3 ຄັ້ງທີ 1 ຂອງໂຄງການໄດ້ຈັດຂຶ້ນໃນວັນທີ 16 ທັນວາ 2016, ເວລາ 8:30 ໂມງ ທີ່ຫ້ອງວ່າການປົກຄອງ ນະຄອນຫຼວງວຽງຈັນ, ເຊິ່ງເປັນກອງປະຊຸມລາຍງານຄວາມຄືບໜ້າການຈັດຕັ້ງປະຕິບັດວຽກຂອງໂຄງການໃນໄລຍະຜ່ານມາ ແລະ ສະເໜີແຜນວຽກໃນປີທີ 3 ຂອງໂຄງການ. ໂດຍພາຍໃຕ້ການເປັນປະທານຂອງ ທ່ານ ແກ້ວພິລາວັນ ອາໄພລາດ, ຮອງເຈົ້າຄອງນະຄອນຫຼວງວຽງຈັນ, ມີບັນດາແຂກທີ່ຖືກເຊີນຈາກ ກົມເຄຫາ ແລະ ຜັງເມືອງ, ສະຖາບັນໂຍທາ ແລະ ຂົນສົ່ງ, ກະຊວງໂຍທາທິການ ແລະ ຂົນສົ່ງ, ພະແນກໂຍທາທິການ ແລະ ຂົນສົ່ງ ນະຄອນຫຼວງວຽງຈັນ, ມີບັນດາອົງການຈັດຕັ້ງທີ່ກ່ຽວຂ້ອງຂອງລັດ ແລະ ອົງການໄຈກາ ປະຈຳລາວເຂົ້າຮ່ວມຢ່າງພ້ອມພຽງ. ຕາມລາຍຊື່ທີ່ຕິດຄັດໃນເອກະສານຊ້ອນທ້າຍ 1.

2. ພິທີກ່າວເປີດກອງປະຊຸມ.

ຕາງໜ້າໃຫ້ຝ່າຍນະຄອນຫຼວງວຽງຈັນ, ທ່ານ ແກ້ວພິລາວັນ ອາໄພລາດ, ປະທານກອງປະຊຸມຄັ້ງນີ້ໄດ້ກ່າວຕ້ອນຮັບແຂກຜູ້ແທນທີ່ມາເຂົ້າຮ່ວມປະຊຸມ ແລະ ກ່າວເປີດກອງປະຊຸມຢ່າງເປັນທາງການ. ທ່ານໄດ້ກ່າວໂດຍຫຍໍ້ກ່ຽວກັບຜົນໄດ້ຮັບຂອງໂຄງການທີ່ໄດ້ຈັດຕັ້ງປະຕິບັດໃນໄລຍະຜ່ານມາໂດຍສະເພາະແມ່ນການກະກຽມແຜນຍຸດທະສາດນໍ້າເປື້ອນໃນນະຄອນຫຼວງວຽງຈັນ, ການກຳນົດພື້ນທີ່, ພາລະບົດບາດ ແລະ ຄວາມຮັບຜິດຊອບນໍ້າເປື້ອນ, ການຄຸ້ມຄອງ ແລະ ອອກແບບຊຸມວິດຖ່າຍ ແລະ ລະບົບບໍາບັດແບບບໍ່ລວມສູນ, ການຄຸ້ມຄອງໂຮງງານ ແລະ ວິໄຈຄຸນນະພາບນໍ້າ ລວມທັງລະບຽບການທີ່ກ່ຽວຂ້ອງ ແລະ ກິດຈະກຳສ້າງຈິດສຳນຶກກ່ຽວກັບສິ່ງແວດລ້ອມສຶກສາ.

3. ຄຳຄິດເຫັນຈາກຕາງໜ້າໄຈກາ.

ທ່ານ ຢຸຊູເກະ ມຸລາກາມິ, ຕາງໜ້າອົງການໄຈກາປະຈຳລາວ ໄດ້ກ່າວວ່າ: ກ່ອນອື່ນທ່ານໄດ້ກ່າວຊົມເຊີຍຕໍ່ຄູ່ຮ່ວມງານທີ່ສືບຕໍ່ໃຫ້ຄວາມຮ່ວມມືໂຄງການນີ້ຕະລອດມາ, ດັ່ງທີ່ເຮົາຮູ້ແລ້ວວ່າໂຄງການໄດ້ເລີ່ມມາແຕ່ປີ 2014 ແລະ ນີ້ກໍ່ເປັນປີສຸດທ້າຍ ເຊິ່ງຈະໄດ້ນໍາສະເໜີຄວາມຄືບໜ້າຂອງໂຄງການ, ປຶກສາຫາລື ແລະ ຮັບຮອງແຜນວຽກປີທີ 3 ຂອງໂຄງ. ການປະຊຸມຄັ້ງນີ້ແມ່ນຈະໄດ້ລາຍງານຄວາມຄືບໜ້າຂອງໂຄງການ ແລະ ການກະກຽມແຜນຍຸດທະສາດນໍ້າເປື້ອນ ໂດຍສະເພາະແມ່ນການຄັດເລືອກພື້ນທີ່, ປະເພດລະບົບບໍາບັດ, ມູນຄ່າກໍ່ສ້າງ, ການເກັບຄ່າບໍລິການ ແລະ ພາລະບົດບາດຂອງພາກສ່ວນທີ່ກ່ຽວຂ້ອງ. ເຊິ່ງການໄປທັດສະນະສຶກສາທີ່ປະເທດຫວຽດນາມ ແລະ ໄທ ຈະຊ່ວຍໃນການກຳນົດຍຸດທະສາດນໍ້າເປື້ອນໃນອານາຄົດ ແລະ ຈະໄດ້ມີການປະເມີນທ້າຍພາກໂຄງການໃນເດືອນ ພຶດສະພາ ເຊິ່ງກອງປະຊຸມຄະນະກຳມະການປະສານງານຮ່ວມກໍ່ຈະໄດ້ຈັດໃນຊ່ວງນີ້ເຊັ່ນດຽວກັນ.

4. ການນໍາສະເໜີວຽກທີ່ໄດ້ຈັດຕັ້ງປະຕິບັດໃນໄລຍະຜ່ານມາ

4.1. ທ່ານ ກໍລະກັນ ແສນບຸດຕະລາດ, ຫົວໜ້າກຸ່ມ 1

ທ່ານໄດ້ນໍາສະເໜີວຽກທີ່ໄດ້ຈັດຕັ້ງປະຕິບັດໃນໄລຍະຜ່ານມາ ແລະ ແຜນວຽກປີທີ 3 ຂອງໂຄງການ ໂດຍມີຫົວຂໍ້ທີ່ນໍາສະເໜີດັ່ງນີ້: ການກະກຽມແຜນຍຸດທະສາດນໍ້າເປື້ອນສໍາຫຼັບນະຄອນຫຼວງວຽງຈັນ, ການ ຄັດເລືອກພື້ນທີ່ສໍາຫຼັບອ່າງບໍາບັດນໍ້າເປື້ອນ, ທາງເລືອກຂອງເຕັກໂນໂລຊີ, ການກະກຽມພາລະບົດບາດ, ຄວາມຮັບຜິດຊອບ ແລະ ກົນໄກທາງດ້ານການເງິນ ໃຫ້ທີ່ປະຊຸມຮັບຊາບ.

4.2. ທ່ານ ໄຊຍະບັນດິດ ອິນສິຊຽງໃໝ່, ຫົວໜ້າກຸ່ມ 2

ທ່ານໄດ້ອະທິບາຍໂດຍລວມວຽກທີ່ໄດ້ຈັດຕັ້ງປະຕິບັດໃນໄລຍະຜ່ານມາ ແລະ ແຜນວຽກປີທີ 3 ຂອງ ໂຄງການໂດຍຫຍໍ້ຄື: ການກະກຽມຮ່າງມາດຕະຖານຊຸມວິດຖ່າຍ ແລະ ລະບົບບໍາບັດນໍ້າເປື້ອນແບບບໍ່ລວມ ສູນ (ລະບົບດີວັດ), ການອອກແບບຊຸມວິດຖ່າຍສະເພາະພາກຄົວເຮືອນ, ການອອກແບບລະບົບບໍາບັດນໍ້າ ເປື້ອນແບບບໍ່ລວມສູນ ສະເພາະພາກຫົວໜ່ວຍທຸລະກິດເຊັ່ນ: ຮ້ານອາຫານ, ໂຮງແຮມ, ເຮືອນຫ້ອງແຖວ ອື່ນໆ, ຂັ້ນຕອນການອອກໃບອະນຸຍາດປຸກສ້າງ ແລະ ການຕິດຕາມກວດກາ, ນອກຈາກນັ້ນຍັງໄດ້ນໍາສະເໜີ ໂຄງການຕົວແບບໃນການບໍລິຫານຄຸ້ມຄອງລະບົບບໍາບັດນໍ້າເປື້ອນແບບບໍ່ລວມສູນ (ດີວັດ) ບ້ານທີ່ງຸ່ມຄໍາ ໂດຍສະເພາະແມ່ນການແຕ່ງຕັ້ງຄະນະກຳມະການຮັບຜິດຊອບ, ການດຳເນີນງານ ແລະ ການບໍາລຸງຮັກສາ, ການສົ່ງເສີມການດູດວິດ, ການບໍລິຫານທາງດ້ານການເງິນ ແລະ ການເກັບຕົວຢ່າງນໍ້າໄປວິໄຈຕົ້ມອີກ.

4.3. ທ່ານ ແສງແກ້ວ ຕາສະເກດ, ຫົວໜ້າກຸ່ມ 3

ທ່ານໄດ້ອະທິບາຍໂດຍລວມວຽກທີ່ໄດ້ຈັດຕັ້ງປະຕິບັດໃນໄລຍະຜ່ານມາ ແລະ ແຜນວຽກປີທີ 3 ຂອງ ໂຄງການໂດຍຫຍໍ້ຄື: ການລົງສາຫຼວດ ແລະ ເກັບກາຂໍ້ມູນໂຮງງານ, ການສ້າງຖານຂໍ້ມູນຄຸ້ມຄອງໂຮງງານ, ການສ້າງຄູ່ມືການກວດກາໂຮງງານ, ການເຝິກອົບຮົມດ້ານການກວດກາຄຸນນະພາບນໍ້າໃຫ້ແກ່ ພະນັກງານ ຂອງພະແນກຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ ນວ, ຜົນການວິໄຈນໍ້າເປື້ອນຈາກໂຮງງານ ແລະ ເຕັກໂນໂລຊີບໍາບັດນໍ້າເປື້ອນທີ່ເປັນພິດຈາກໂຮງງານ ໃຫ້ແກ່ທີ່ປະຊຸມຮັບຊາບ.

4.4. ທ່ານ ນາງຄາຫຼ້າ ທາມະວິງ, ຫົວໜ້າກຸ່ມ 4

ທ່ານໄດ້ອະທິບາຍໂດຍຫຍໍ້ກ່ຽວກັບວຽກທີ່ໄດ້ຈັດຕັ້ງປະຕິບັດໃນໄລຍະຜ່ານມາໂດຍສະເພາະແມ່ນ ກິດຈະກຳປຸກຈິດສຳນຶກດ້ານສິ່ງແວດລ້ອມສຶກສາ ແລະ ແຜນວຽກປີທີ 3 ຂອງໂຄງການຄື: ກິດຈະກຳ ສິ່ງແວດລ້ອມສຶກສາໃນໂຮງຮຽນ, ການອອກແບບສຶກສາສອນ, ແຜນພາບ, ການເຝິກອົບຮົມໃຫ້ແກ່ຄູ່ເຝິກໃນ ໂຮງຮຽນເປົ້າໝາຍ, ການລົງສອນຕົວຈິງໃນໂຮງຮຽນເປົ້າໝາຍ, ກິດຈະກຳແຂ່ງຂັນແຕ້ມຮູບຂອງນ້ອງ ນັກຮຽນ, ກິດຈະກຳອານາໄມຄອງນໍ້າຕົວແບບ (ຮ່ອງໂພນທັນ) ແລະ ຜົນການວິໄຈຄຸນນະພາບນໍ້າຮ່ອງ ສາທາລະນະ.

ນອກນັ້ນທີມງານໂຄງການຝ່າຍລາວຍັງໄດ້ສະເໜີໃຫ້ພິຈາລະນາງົບປະມານເພື່ອປະກອບສ່ວນເຂົ້າໃນ ການດຳເນີນໂຄງການໃນປີທີ 3 ໂດຍສະເພາະແມ່ນອັດຕາກິນ, ນໍ້າມັນລົດ, ອຸປະກອນຮັບໃຊ້ຫ້ອງທົດລອງ ແລະ ພະນັກງານປະຈຳຫ້ອງທົດລອງຕົ້ມອີກ.

4.5 ທ່ານ ກາຊຸຣິໂຣ ອາຊາດະ, ຫົວໜ້າທີມງານທີ່ປຶກສາ.

ທ່ານໄດ້ອະທິບາຍແຜນການກະກຽມຈັດກອງປະຊຸມຂອງໂຄງການໃຫ້ທີ່ປະຊຸມຮັບຊາບໂດຍສະເພາະແມ່ນການຈັດກອງປະຊຸມຮັບຟັງສຽງຈາກສາທາລະນະ, ການຈັດສຳມະນາ ແລະ ກອງປະຊຸມອື່ນໆ ທີ່ຈະໄດ້ຈັດຂຶ້ນໃນປີສຸດທ້າຍຂອງໂຄງການ ແລະ ທ່ານຍັງໄດ້ສະເໜີໃຫ້ພາກສ່ວນທີ່ກ່ຽວຂ້ອງສືບຕໍ່ໃຫ້ຄວາມຮ່ວມມືໃຫ້ໂຄງການນີ້ສຳເລັດຕາມແຜນທີ່ວາງໄວ້.

5. ການປະກອບຄຳຄິດເຫັນ

ທ່ານປະທານໄດ້ສະເໜີໃຫ້ຜູ້ເຂົ້າຮ່ວມກອງປະຊຸມປະກອບຄຳຄິດເຫັນໄສ່ກອງປະຊຸມໂດຍອີງໄສ່ 4 ຫົວຂໍ້ຂ້າງເທິງ ເພື່ອກະກຽມຍຸດທະສາດນໍ້າເປື້ອນສຳຫຼັບນະຄອນຫຼວງວຽງຈັນເຊັ່ນ: ການກຳນົດພື້ນທີ່ ແລະ ທາງເລືອກຂອງເຕັກໂນໂລຊີ, ການຄຸ້ມຄອງຂຸມວິດຖ່າຍ ແລະ ລະບົບບຳບັດນໍ້າເປື້ອນແບບບໍ່ລວມສູນ, ການຄຸ້ມຄອງໂຮງງານ ແລະ ການປຸກຈິດສຳນຶກດ້ານສິ່ງແວດລ້ອມສຶກສາ.

5.1. ທ່ານ ພຸດທະເສນ, ຮອງຫົວໜ້າກົມເຄຫາ ແລະ ຜັງເມືອງ.

1. ໂຄງການດັ່ງກ່າວແມ່ນຕິດພັນກັບວຽກຜັງເມືອງ ສະນັ້ນສະເໜີໃຫ້ເອົາເຂົ້າໃນແຜນດຽວກັນ ກ່ອນມີການຮັບຮອງແຜນດັ່ງກ່າວ.
2. ການວາງແຜນໄລຍະສັ້ນ ໃນເຂດພື້ນທີ່ຮັບນໍ້າເພື່ອໄປບຳບັດ ແມ່ນສະເໜີໃຫ້ມີແຜນລະອຽດ ເປັນແຕ່ລະໄລຍະ ແລະ ແຜນງົບປະມານ.
3. ລະບຽບການຄຸ້ມຄອງການປ່ອຍນໍ້າເປື້ອນ ແມ່ນສະເໜີໃຫ້ເອົາເຂົ້າໃນແຜນຂໍອະນຸຍາດປຸກສ້າງ ເຊິ່ງເປັນແຜນບັງຄັບທີ່ຕ້ອງປະຕິບັດ ແລະ ໃຫ້ລົງເຜີຍແຜ່ໃນເຂດພື້ນທີ່ອື່ນໆ ໃນຂອບເຂດທົ່ວປະເທດ.

5.2. ທ່ານນາງ ວັນມະນີ ພິມມະສອນ, ຮອງຫົວໜ້າພະແນກອຸດສະຫະກຳ ແລະ ການຄ້າ ນວ.

1. ສະເໜີໃຫ້ໂຄງການກະກຽມແຜນການດຳເນີນງານໃນແຕ່ລະໄລຍະໃຫ້ລະອຽດພ້ອມງົບປະມານທີ່ໃຊ້ຈ່າຍໃນແຕ່ລະໄລຍະ, ໂດຍລະບຸໄລຍະເວລາ ແລະ ວິທີການຈ່າຍຄືນຂອງປະຊາຊົນ.
2. ການບຳບັດນໍ້າເປື້ອນໃນໂຮງງານຕ້ອງມີການຢັ້ງຢືນທາງດ້ານເຕັກນິກ ເພື່ອຮັບຮອງມາດຕະຖານ.
3. ສະເໜີໃຫ້ຊ່ວຍສ້າງບຸກຄະລາກອນທາງດ້ານເຄມີໃຫ້ແກ່ພະນັກງານພະແນກອຸດສະຫະກຳ ແລະ ການຄ້າຕື່ມອີກ.

5.3. ທ່ານ ບຸນຈັນ ແກ້ວສີທຳມະ, ຮອງຫົວໜ້າພະແນກໂຍທາທິການ ແລະ ຂົນສົ່ງ ນວ.

1. ສະເໜີໃຫ້ພະແນກ ຍທຂ ນວ. ມີສ່ວນຮ່ວມໃນການຮັບຮອງການອອກແບບມາດຕະຖານຂອງລະບົບບຳບັດນໍ້າເປື້ອນແບບລວມສູນກ່ອນຈຶ່ງມອບໃຫ້ຂັ້ນກະຊວງຮັບຮອງຕື່ມ.

2. ຈຸດພື້ນທີ່ທີ່ຈະກຳນົດເປັນບ່ອນບຳບັດນໍ້າເປື້ອນຕາມແຜນທີ 1, 2 ແລະ 3 ແມ່ນທ່ານເຈົ້າຄອງໄດ້ອອກແຈ້ງການຂໍສະຫງວນພື້ນທີ່ໄວ້ແລ້ວ ແລະ ໄດ້ມອບໃຫ້ພາກສ່ວນທີ່ກ່ຽວຂ້ອງລົງໄປເອົາຂໍ້ມູນ ແລະ ປັກຫຼັກໝາຍຢ່າງລະອຽດ ແລ້ວລາຍງານໃຫ້ທ່ານເຈົ້າຄອງຊາບ.
3. ສະເໜີໃຫ້ມີການນຳໃຊ້ເຕັກໂນໂລຊີທີ່ເໝາະສົມກັບສະພາບຄວາມເປັນຈິງ, ມີປະສິດທິພາບ ແລະ ລາຄາບໍ່ແພງ.

5.4 . ທ່ານ ຄຳເພັດ ພິງລາຊະສີ, ອພບ.

1. ສຳຫຼັບມາດຕະຖານຂຸມວິດ ແມ່ນສະເໜີໃຫ້ມີການກຳນົດລະອຽດ ເພາະຂຸມວິດຖ່າຍທີ່ມີຢູ່ແລ້ວມີບາງເຂດຍັງໃຊ້ຂຸມແທ້ງສ້າງຢູ່.
2. ສະເໜີໃຫ້ມີການສົ່ງເສີມການດູດວິດ ແລະ ມີມາດຕະການແບບບັງຄັບ ໂດຍມີການກຳນົດພາລະບົດບາດ ແລະ ພາກສ່ວນຮັບຜິດຊອບຢ່າງລະອຽດ.
3. ສະເໜີໃຫ້ມີການກວດກາການອອກໃບອະນຸຍາກປຸກສ້າງເຊັ່ນ: ການກວດກາແບບ, ການອະນຸມັດແບບ, ການກວດກາຄືນຫຼັງການກໍ່ສ້າງ ແລະ ການກວດກາຄຸນນະພາບນໍ້າຈາກຂຸມວິດ ໂດຍອີງໄສ່ມາດຕະຖານສິ່ງແວດລ້ອມແຫ່ງຊາດ.

5.5 . ທ່ານ ບຸນປັນ, ພະແນກແຜນການ ແລະ ການລົງທຶນ ນວ.

1. ໃນໄລຍະຜ່ານມາ ພະແນກແຜນການ ແລະ ການລົງທຶນ ນວ. ກໍ່ໄດ້ເຫັນຄວາມສຳຄັນຂອງໂຄງການນີ້ ແລະ ໄດ້ຈັດສັນງົບປະມານເພື່ອສືບທົບໃຫ້ແກ່ການຈັດຕັ້ງປະຕິບັດໂຄງການໂດຍໄດ້ເບີກຈ່າຍງົບປະມານຄັ້ງທີ 1 ຈຳນວນ 50 ລ້ານກີບ ແລະ ຄັ້ງທີ 2 ຈຳນວນ 80 ລ້ານກີບ.
2. ສະເໜີໃຫ້ໂຄງການລົງເຜີຍແຜ່ ແລະ ປຸກຈິດສຳນຶກດ້ານສິ່ງແວດລ້ອມສຶກສາໃຫ້ພາກຫົວໜ່ວຍທຸລະກິດເຊັ່ນ: ໂຮງແຮມ, ຮ້ານອາຫານ ອື່ນໆຕື່ມ.

5.6 ທ່ານ ຜາວັນ ສີຫາວິງ, ພະແນກຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ ນວ.

1. ການກຳນົດພື້ນທີ່: ພະແນກຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ ນວ. ຈະປະສານໄປຫາໜ່ວຍງານທີ່ກ່ຽວຂ້ອງເພື່ອລົງເກັບກຳຂໍ້ມູນ ຕາມແຈ້ງການຂອງທ່ານເຈົ້າຄອງນະຄອນຫຼວງວຽງຈັນວາງອອກ,
2. ການວິໄຈຄຸນນະພາບນໍ້າ: ດ້ານບຸກຄະລະກອນແມ່ນຍັງບໍ່ພຽງພໍ ສະເໜີໃຫ້ມີການບັນຈຸພະນັກງານຕື່ມອີກ.
3. ສະເໜີໃຫ້ໂຄງການສືບຕໍ່ສ້າງຄວາມເຂັ້ມແຂງໃຫ້ແກ່ພະນັກງານທ້ອງຖິດລອງ ໃຫ້ສາມາດວິໄຈໄດ້ 30 ຄ່າຕາມແຜນທີ່ວາງໄວ້.
4. ດ້ານລະບຽບການປ່ອຍນໍ້າເປື້ອນ ແລະ ການເກັບຄ່າບໍລິການ ແມ່ນສະເໜີໃຫ້ມີການກຳນົດພາລະບົດບາດໃຫ້ຈະແຈ້ງ.

5.7 . ທ່ານ ລັງກອນ, ອາຈານມະຫາວິທະຍາໄລແຫ່ງຊາດ, ຄະນະວິສະວະກຳສາດ.

1. ປັດຈຸບັນແມ່ນພວກເຮົາຂາດບຸກຄະລາກອນສະເພາະດ້ານ ແລະ ວຽກຄຸ້ມຄອງນໍ້າເປື້ອນເປັນວຽກໃໝ່

ແລະ ຍັງບໍ່ທັນມີຊ່ຽວຊານສະເພາະເທື່ອ.

2. ທຸກໆປີມີນັກຮຽນຄະນະວິສະວະກຳສາດ ໄດ້ສຶກສາຄົ້ນຄວ້າ ກ່ຽວກັບ ລະບົບນໍ້າເປື້ອນໃນ
ນະຄອນຫຼວງວຽງຈັນ, ສະນັ້ນສະເໜີໃຫ້ມີການຮ່ວມມືນຳກັນ ແລະ ໃນບັນດາຫົວຂໍ້ທີ່ປຶກສາຫາລື
ມື້ນີ້ ຖ້າຫາກວ່າ ຕ້ອງການໃຫ້ນັກຮຽນວິສະວະກຳ ຊ່ວຍເກັບກຳຂໍ້ມູນໃຫ້ ແມ່ນທາງພວກເຮົາຍິນດີ
ຊ່ວຍ.

5.8. ທ່ານ ໄຊຍະບັນດິດ ແລະ ທ່ານ ກໍລະກັນ, ຕາງໜ້າທີມງານໂຄງການ.

ທ່ານໄດ້ອະທິບາຍ ແລະ ຕອບຄຳຖາມໂດຍມີລາຍລະອຽດດັ່ງນີ້:

1. ສຳຫຼັບໄລຍະເວລາໃນການຈ່າຍຄືນຂອງໂຄງການແມ່ນ 30 ປີ, ໂດຍອີງໄສ່ລາຍໄດ້ຂອງປະຊາຊົນໃນ
ນະຄອນຫຼວງວຽງຈັນ, ຈາກການສຳຫຼວດຂອງ ໄຈກາ ແມ່ນປະຊາຊົນສາມາດຈ່າຍໄດ້ປະມານ
63.000 ກີບ/ຄົວຄົວ ສະນັ້ນແມ່ນພຽງພໍສຳຫຼັບຄຳດຳເນີນງານ ແລະ ບຳລຸງຮັກສາ, ສ່ວນມູນຄ່າ
ກໍ່ສ້າງແມ່ນລັດຖະບານຕ້ອງຖືມູນໃຫ້, ອາດຈະເປັນໃນຮູບແບບຊ່ວຍເຫຼືອລ້າ ຫຼື ກູ້ຢືມ ແລະ ອື່ນໆ
ຕາມທີ່ໄດ້ມີການແບ່ງໄລຍະການກໍ່ສ້າງອອກເປັນ 3 ໄລຍະດັ່ງໄດ້ນຳສະເໜີ.
2. ສ່ວນການອອກແບບຂຸມວິດຖ່າຍນັ້ນແມ່ນໄດ້ອອກແບບສະເພາະພາກຄົວເຮືອນຕັ້ງໃໝ່ ແລະ ໃຫ້
ນອນຢູ່ໃນມາດຕະຖານຂອງການຂໍອະນຸຍາດປຸກສ້າງ, ສ່ວນພາກຫົວໜ່ວຍທຸລະກິດເຊັ່ນ: ໂຮງແຮມ,
ຮ້ານອາຫານ, ເຮືອນຫ້ອງແຖວ, ອາພັດເມັ້ນ, ໂຮງຮຽນ, ວັດ ແລະ ຊຸມຊົນຂະໜາດນ້ອຍແມ່ນອາດ
ຈະນຳໃຊ້ລະບົບບຳບັດນໍ້າເປື້ອນແບບບໍ່ລວມສູນ (ລະບົບດີວັດ) ໂດຍອີງຕາມສະພາບເງື່ອນໄຂພື້ນທີ່
ຕົວຈິງ.
3. ສ່ວນການບຳບັດນໍ້າເປື້ອນຈາກໂຮງງານແມ່ນທາງທີມງານຊ່ຽວຊານ ໄດ້ດຳເນີນການສຳຫຼວດ ແລະ
ເກັບກຳຂໍ້ມູນ ແລະ ໄດ້ກຳນົດແບບບຳບັດນໍ້າເປື້ອນໂຮງງານ ຈາກທາດອົງຄະທາດ ແລະ ທາດອະນົງ
ຄະທາດ ດັ່ງທີ່ໄດ້ນຳສະເໜີ.

5.9. ທ່ານ ໂຕລູ ໂອກຸລະ, ຕາງໜ້າໄຈກາ

1. ການໄປທັດສະນະສຶກສາກ່ຽວກັບການຄຸ້ມຄອງນໍ້າເປື້ອນ ແມ່ນຈະຊ່ວຍໃຫ້ທີມງານມີຂໍ້ມູນໃນການ
ກຳນົດແຜນຍຸດທະສາດນໍ້າເປື້ອນໃນນະຄອນຫຼວງວຽງຈັນ.
2. ການປະເມີນທ້າຍໂຄງການ ແມ່ນຈະຊ່ວຍປະເມີນ ແລະ ກຳນົດແຜນການຄຸ້ມຄອງນໍ້າເປື້ອນໃນອານາ
ຄິດ.
3. ພາລະບົດບາດ ແລະ ຄວາມຮັບຜິດຊອບລະຫວ່າງນໍ້າປາປາ ແລະ ນໍ້າເປື້ອນ ຕ້ອງໃຫ້ມີຄວາມຊັດເຈນ
ແລະ ກະຈ່າງແຈ້ງ.

5.10. ທ່ານ ຄໍາທະວີ ໄທພະຈັນ, ຫົວກົມເຄຫາ ແລະ ຜັງເມືອງ.

1. ກ່ອນອື່ນທ່ານໄດ້ສະແດງຄວາມຊົມເຊີຍຕໍ່ຜົນສໍາເລັດຂອງໂຄງການ ທີ່ທາງທົມງານໄດ້ຈັດຕັ້ງປະຕິບັດແຕ່ເລີ່ມຕົ້ນໂຄງການຈົນຮອດປັດຈຸບັນ.
 2. ສະເໜີໃຫ້ທຸກພາກສ່ວນທີ່ກ່ຽວຂ້ອງທໍາຄວາມເຂົ້າໃຈ ແລະ ໃຫ້ມີສ່ວນຮ່ວມນໍາກັນ ໂດຍເຮັດວຽກຕາມພາລະບົດບາດ ແລະ ຄວາມຮັບຜິດຊອບຂອງໃຜລາວ ເພາະວ່າວຽກຄຸ້ມຄອງນໍ້າເປື້ອນເປັນວຽກທີ່ມີຫຼາຍຂະແໜງການທີ່ຮັບຜະດຊອບຮ່ວມກັນ.
 3. ໂຄງການນີ້ເປັນໂຄງການສ້າງຄວາມເຂັ້ມແຂງໃຫ້ແກ່ບັນດາພາກສ່ວນທີ່ກ່ຽວຂ້ອງໃນການຄຸ້ມຄອງສິ່ງແວດລ້ອມນໍ້າໃນຕົວເມືອງນະຄອນຫຼວງວຽງຈັນ, ສະນັ້ນ ເພື່ອໃຫ້ໂຄງການນີ້ສໍາເລັດຕາມແຜນການທີ່ກໍານົດໄວ້ ແລະ ໃຫ້ເກີດຄວາມຍິນຍົງນັ້ນ, ບັນຫາການຄຸ້ມຄອງນໍ້າເປື້ອນ ຕ້ອງໄດ້ມີການວາງແຜນລະບົບການຄຸ້ມຄອງ, ນໍາໃຊ້ລະບຽບການຂອງຂະແໜງການທີ່ກ່ຽວຂ້ອງທີ່ເປັນອັນລວມ ແລ້ວມາຜັນຂະຫຍາຍເປັນອັນສະເພາະ ເພື່ອໃຫ້ແທດເໝາະກັບວຽກຕົວຈິງເຊັ່ນ: ການຕິດຕາມຄຸນນະພາບນໍ້າ, ການປ່ອຍນໍ້າເປື້ອນອອກຈາກໂຮງງານ ຕ້ອງໄດ້ປະຕິບັດຕາມລະບຽບຂອງພະແນກອຸດສະຫະກໍາ ແລະ ການຄ້າ.
 4. ການແບ່ງພາລະບົດບາດ ແລະ ຄວາມຮັບຜິດຊອບຂອງແຕ່ລະຂະແໜງການທີ່ກ່ຽວຂ້ອງ ຕ້ອງໃຫ້ຊັດເຈນ ແລະ ຈະແຈ້ງ, ເພາະວ່າ ປັດຈຸບັນພາລະບົດບາດຍັງບໍ່ທັນຈະແຈ້ງ, ຍົກຕົວຢ່າງ ກົມເຄຫາ ແລະ ຜັງເມືອງ ແລະ ກົມນໍ້າປະປາ ຕ້ອງໄດ້ແບ່ງພາລະບົດບາດ ແລະ ຄວາມຮັບຜິດຊອບຢ່າງລະອຽດ ແລະ ພາກສ່ວນອື່ນໆກໍ່ເຊັ່ນດຽວກັນ.
 5. ການຄຸ້ມນໍ້າເປື້ອນຕ້ອງມີການກໍານົດຍຸດທະສາດ, ມີການວາງແຜນໃນການຄຸ້ມຄອງ ແລະ ກອບໜ້າວຽກ, ເຊິ່ງປັດຈຸບັນເຫັນວ່າມີຫຼາຍພາກສ່ວນເຂົ້າໃຈກ່ຽວກັບຍຸດທະສາດນໍ້າເປື້ອນໃນນະຄອນຫຼວງວຽງຈັນ ແລະ ໃນອະນາຄົດຈະຂະຫຍາຍບົດຮຽນນີ້ລົງສູ່ແຂວງອື່ນໆໃນຂອບເຂດທົ່ວປະເທດ.
 6. ໃນນາມກົມເຄຫາ ແລະ ຜັງເມືອງ ຂໍສະແດງຄວາມຊົມເຊີຍຕໍ່ບັນດາທ່ານທີ່ໄດ້ທຸ່ມເທເຮັດໃຫ້ໂຄງການນີ້ປະສົບຜົນສໍາເລັດ, ສ່ວນບັນຫາຕ່າງໆທີ່ຍັງບໍ່ທັນຈະແຈ້ງ ແມ່ນສະເໜີໃຫ້ສືບຕໍ່ດໍາເນີນການໃນປີສຸດທ້າຍນີ້ ແລະ ແນ່ນອນວ່າການຄຸ້ມຄອງນໍ້າເປື້ອນຕ້ອງມີທາງອອກສໍາຫຼັບນະຄອນຫຼວງວຽງຈັນຂອງພວກເຮົາ, ຂໍຂອບໃຈ.
6. ຜ່ານການລາຍງານ, ປະກອບຄໍາຄິດເຫັນຢ່າງກົງໄປກົງມາ ກອງປະຊຸມໄດ້ມີຄວາມເປັນເອກະພາບປະທານກອງປະຊຸມໄດ້ມີຄວາມເປັນເອກະພາບດັ່ງນີ້:
- ທ່ານປະທານໄດ້ຄວາມຊົມເຊີຍຕໍ່ການລາຍງານຜົນການຈັດຕັ້ງປະຕິບັດໂຄງການໃນໄລຍະຜ່ານມາ ແລະ ເຫັນດີຕາມແຜນວຽກປີສຸດທ້າຍຂອງໂຄງການ ເຊິ່ງປະກອບດ້ວຍດັ່ງລາຍລະອຽດຕໍ່ໄປນີ້:
1. ກອງປະຊຸມໄດ້ລາຍງານການຈັດຕັ້ງປະຕິບັດວຽກປີທີສອງຂອງໂຄງການ ແລະ ນໍາສະເໜີແຜນວຽກປີທີສາມ ໂດຍສະເພາະແມ່ນການວາງແຜນ ແລະ ອອກແບບໂຄງສ້າງ ລະບົບບໍາບັດນໍ້າເປື້ອນ ໃນ

ຕົວເມືອງນະຄອນຫຼວງວຽງຈັນ, ສ້າງລະບຽບການຄຸ້ມຄອງຂຸມວິດຕ່າຍ ແລະ ລະບົບບໍາບັດນໍ້າເປື້ອນແບບບໍ່ລວມສູນ, ສ້າງລະບົບການຕິດຕາມ ກວດກາ ການປ່ອຍນໍ້າເປື້ອນ ຈາກໂຮງງານ ໂດຍມີການແບ່ງຂັ້ນຄຸ້ມຄອງ ຈາກພາກສ່ວນທີ່ກ່ຽວຂ້ອງຢ່າງລະອຽດ, ປຸກຈິດສໍານຶກໃຫ້ສັງຄົມໃນການຄຸ້ມຄອງນໍ້າເປື້ອນໃນຕົວເມືອງ.

2. ຜ່ານການປຶກສາຫາລືເຫັນວ່າ: ກອງປະຊຸມມີຄວາມສົນໃຈເລື່ອງການເກັບຄ່ານໍ້າເປື້ອນ, ດັ່ງນັ້ນຈຶ່ງຂໍສະ ເໜີໃຫ້ທີມງານໂຄງການມີການຄົ້ນຄວ້າຄືນໃນລາຍລະອຽດຕື່ມອີກ, ເຊິ່ງທ່ານໄດ້ມີຄໍາເຫັນຕໍ່ໄປວ່າ:
 - ສໍາຫຼັບມູນຄ່າກໍ່ສ້າງ: ອາດຈະໄດ້ຮັບການອຸປະຖໍາຈາກລັດຖະບານ ຫຼື ແຫຼ່ງງົບປະມານອື່ນໆ
 - ສໍາຫຼັບຄ່າດໍາເນີນງານ ແລະ ບໍາລຸງຮັກສາ: ຄ່ານໍ້າເປື້ອນຄວນມີການເກັບໃນບິນດຽວກັນກັບບິນເກັບຄ່ານໍ້າປະປາ ຫຼື ແຫຼ່ງອື່ນໆ
 - ຖ້າອີງໄສ່ເສດຖະກິດໃນປັດຈຸບັນແມ່ນພວກເຮົາຍັງບໍ່ທັນໄດ້ກໍານົດການຈ່າຍຄ່ານໍ້າເປື້ອນເທື່ອ ແຕ່ພວກເຮົາກໍ່ຕ້ອງໃຫ້ມີແຜນຈ່າຍຄ່ານໍ້າເປື້ອນໄວ້ໃນອະນາຄົດ.
 - ອີງໄສ່ຄວາມຈໍາເປັນ ໃນການບໍາບັດນໍ້າເປື້ອນແບບລວມສູນກໍ່ຄວນມີ ແລະ ຄວນມີການເກັບຄ່ານໍ້າເປື້ອນ ສ່ວນຮູບແບບການເກັບຈາກອາຄານແຕ່ລະປະເພດເຊັ່ນ: ໂຮງງານ, ໂຮງຂ້າສັດ, ໂຮງແຮມ, ຮ້ານອາຫານ ແລະ ອື່ນໆນັ້ນ ຕ້ອງໄດ້ມີການແບ່ງລາຄາຕາມປະເພດຜູ້ຊົມໃຊ້ນໍ້າຄັກແນ່ ຫຼື ປະເພດຄົວເຮືອນ ແລະ ໃຫ້ມີການຄົ້ນຄວ້າລະອຽດຈະແຈ້ງຕື່ມ.
3. ກອງປະຊຸມຄັ້ງນີ້ໂດຍລວມແມ່ນເຫັນດີຕາມແຜນທີ່ກໍານົດໄວ້.
4. ຍຸດທະສາດນໍ້າເປື້ອນນີ້ຈະໄດ້ນໍາສະເໜີຕໍ່ເຈົ້າຄອງນະຄອນຫຼວງວຽງຈັນ ແຕ່ຕ້ອງຜ່ານການກວດກາ ແລະ ເຫັນດີຈາກຄູ່ຮ່ວມງານ ແລະ ພາກສ່ວນທີ່ກ່ຽວຂ້ອງກ່ອນ.
5. ກອງປະຊຸມຄັ້ງນີ້ຈະເປັນບົດຮຽນ ແລະ ເປັນຂໍ້ມູນໃຫ້ແກ່ທີມງານຂອງພວກເຮົາທີ່ຈະນໍາໄປປັບປຸງ ແລະ ແກ້ໄຂບັນດາເອກະສານ ແລະ ອາດຈະໄດ້ຮັບຮອງເປັນນິຕິກໍາ ເພື່ອໃຊ້ເປັນເຄື່ອງມືໃນການຄຸ້ມຄອງສິ່ງແວດລ້ອມນໍ້າ ຕາມແຜນພັດທະນານະຄອນຫຼວງວຽງຈັນ ຮອດປີ 2030 ໃຫ້ປະກົດຜົນເປັນຈິງ.
6. ສຸດທ້າຍນີ້ຂໍສະແດງຄວາມຂອບໃຈນໍາອີງການໄຈກາ ທີ່ໃຫ້ການຊ່ວຍເຫຼືອນະຄອນຫຼວງວຽງຈັນ ເຊິ່ງມີຫຼາຍໂຄງການທີ່ຮັບຜົນສໍາເລັດ ແລະ ຂໍອວຍພອນທຸກທ່ານຈົ່ງມີສຸຂະພາບແຂງແຮງ, ປະສົບຜົນສໍາເລັດໃນໜ້າທີ່ວຽກງານ ແລະ ຂໍປິດກອງປະຊຸມຄັ້ງນີ້ຢ່າງເປັນທາງການ, ຂໍຂອບໃຈ.







ລາຍຊື່ຜູ້ເຂົ້າຮ່ວມກອງປະຊຸມຄະນະປະສານງານຮ່ວມ ປີທີ 3, ຄັ້ງທີ 1
ໂຄງການປັບປຸງສິ່ງແວດລ້ອມນ້ຳໃນຕົວເມືອງນະຄອນຫລວງວຽງຈັນ

Joint Committee Meeting
The 1st of the 3rd year
Project for Urban Water Environment Improvement in Vientiane Capital
16 / 12 / 2016

No.	Name	Organization	Position	Contract No.	Signature
1	Mr. Keophilavanh APHAYLATH	VTE Cap.	Vice Governor		
2	Mr. Khamthavy THAYPHACHANH	DHUP, MPWT	Director General	55676358	
3	Mr. Khamphet INTHIDETH	PTI	Deputy Director General	28294989	
4	Mr. Somlith PHANNAVONG	PCD, MONRE	Deputy Director General		
5	Mr. Khamphone KEODALA VONG	MOIC	Director of Industry and Handicraft Division		
6	Mr. Dethsongkham THAMMAVONG	DPWT, VC	Director General		
7	Mr. Soulivanh KOMMAHASAY	DPWT, VC	Deputy Director General		
8	Mr. Bounlan KANKHAMVONGSA	DPWT.V C	Chief of Housing, Urban Planning and Environment Division		
9	Mr. Somboun AKKHAVONG	VUDAA, VC	Deputy Director		
10	Mr. Bounsom SONGVILAY	DONRE, VC	Deputy Director General		
11	Mrs. Vanmany ^{Phimmasane} SAYASAN	DOIC, VC	Deputy Director General	22233285	
12	Mr. Southany SAYASAN	DOES, VC	Deputy Director General		
13	Mr. Bounpomb	DPI.VC		90809086	
14	Mr. Bounma Phattkanon	DIC, VC	Projector	22204434	
15	Mr. Bounchanh KEOSITHAMMA	DPWT	Deputy Director General, Vientiane Capital DPWT Project Director	5552-6271	

16	Mr. Khammone CHOMMANIVONG	DPWT	Deputy Chief, Housing, Urban Planning and Environment Division Project Manager	5550-5594	
17	Mr. Xayabandith INSISIENGMAI	PTI	Chief of Environmental and Social Division Deputy Project Director	5677-1805	
18	Mr. Korlakanh SENBOUTTALATH	DPWT	Technical Staff	2240-6855	
19	Mr. Phouthasom INTHAVONG	DHUP	Deputy Chief, Division of Urban Development	5540-8339	
20	Ms. Khamla THAMMAVONG	DONRE	Deputy Chief, Water Resources Division	2223-2929	
21	Mr. Vongphet RATSABOUTH	DOIC	Deputy Chief of Industrial and Handicraft Division	5566-9694	
22	Mr. Khamphet PHONGRATSASY	VUDAA	Chief of Drainage Division	2222-7104	
23	Mr. Phetsalay KEOPHILAVONG	DOES	Technical Staff	5541-3589	
24	Mr. Vilasak VENPASEUTH	DONRE	Technical Staff	2880-0224	
25	Mr. Sengkeo TASAKETH	PCD, MONRE	Water Environment Division	9171-1155	
26	Mr. Thinnakone PHIMMAVONG	DPWT	Technical Staff	2282-9099	
27	Ms. Minavanh DOUANGMALA	DONRE	Technical Staff	5686-0303	
28	Mr. Lathdavanh SIDTHIXAY	DPWT	Technical Staff	9777-9855	
29	Ms. Saylom KEOSITHAMMA	DPWT	Technical Staff	5404-4448	
30	Mr. Takashi KURIHARA	EOJ	Second Secretary		
31	Mr. Yusuke MURAKAMI	JICA	Senior Representative	5552-0723	
32	Mr. Toru OGURA	JICA	JICA Representative	5552-6891	

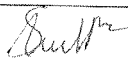
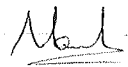
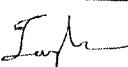
33	Mr. Kingsada SIPHANTHONG	JICA	Project Assistant	5569-8218	
34	Mr. Kazuhiro ASADA	JET	Chief Advisor Integrated Wastewater Management I	5457-4880	
35	Mr. Kimihiro KONNO	JET	Project Coordinator	5939-5768	合野
36	Mr. Tadashi TAKESHIMA	JET	Environmental Regulations and Enforcement	5497-7434	竹島
37	Mr. Sonemany XAYYALATH	JET	Project Coordinator	9555-3335	
38	Ms. Khouan VILAYPHANH	JET	Administrative Assistant	5611-2097	
39	Mr. Vinut SAYAVONG		Interpreter	2220-4217	

40 Mr. Bouma
Phakkamasink DICT.VI.

22

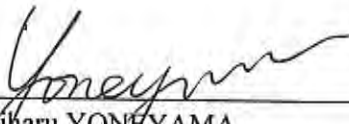
ກອງປະຊຸມ.....

(16 ທັນວາ 2016).

ລ/ດ	ຊື່ ແລະ ນາສະກຸນ	ຕຳແໜ່ງ	ພາກສ່ວນ	ເບີຕິດຕໍ່	ລາຍເຊັນ
41.	ທ. ພອນ ສິມສານ ອຸປະກອນ ກົມຄຸ້ມຄອງ	ວິ. ຫົວໜ້າ ກົມຄຸ້ມຄອງ	ເສບທອດ - ຜູ້ ຊື່	22229891	
42.	ທ. ວິໄສ ພິມສານ	ຮຸກຮ້າຍ ທີ່ ບໍ່ແມ່ນ	ພະແນກ ອ.ຄ. ມວ	22233855	 x
43.	ທ. ລັງກອນ ໄຊຍະບຸ Mr. Langkorn Jayabou	ອຸປະກອນ ກົມຄຸ້ມຄອງ	ສະໜັບສະໜູນ ອາວ; ມ/ຊ	22407404	
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(A)

MINUTES OF MEETING
OF
THE 6th JOINT COORDINATING COMMITTEE MEETING
FOR
THE PROJECT FOR URBAN WATER ENVIRONMENT
IMPROVEMENT
IN
VIENTIANE CAPITAL
IN
THE LAO PEOPLE'S DEMOCRATIC REPUBLIC



Yoshiharu YONEYAMA
Chief Representative
Laos Office
Japan International Cooperation Agency,
Japan



Keophilavanh APHAILATH
Vice Governor
Vientiane Capital
Lao People's Democratic Republic

MOUANGTHANH HOTEL, VIENTIANE CAPITAL, SEPTEMBER 27, 2017.

1. Introduction

The Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched JICA Expert Team (hereinafter referred to as “JET”) on 14th October 2014, to commence the Project for Urban Water Improvement in Vientiane Capital in Lao PDR (hereinafter referred to as “the Project”).

The 6th Joint Coordinating Committee (JCC) for the Project was held on September 27, 2017, at 8:30 AM in Mouangthanh Hotel, Vientiane Capital to report of the Project activities for 3 years, The meeting was chaired by Mr. Keophilavanh APHAILATH, Vice Governor of Vientiane Capital and attended by representatives of DHUP and PTI, DPWT in Vientiane Capital, and other relevant organizations. Participants are listed in the attachment 1.

2. Opening Remarks

On behalf of Vientiane Capital, Mr. Keophilavanh APHAILATH welcomed all participants in the meeting. The chairman made opening remarks with brief introduction of the activities based on 4 outputs, such as preparation of wastewater management strategy in Vientiane Capital, preparation of technical design, regulation and guideline for septic tank and DEWATS, management of factory discharge, water quality analysis, and related regulation, and the awareness raising through environmental education and the process of approval for strategy of wastewater management for Vientiane Capital.

3. Starting Remarks

Following the opening remarks, JICA Chief Representative, Mr. Yoshiharu YONEYAMA, made starting remarks. At first, he took this opportunity to express his sincere appreciation to all the stakeholders of the Project for the continuous and generous support to the implementation of the Project until approval of this strategy. As you may know the project has been conducted from 2014 to 2017 and till now we have completed preparation of the draft of wastewater management strategy in Vientiane Capital and the wastewater management strategy will be approved as we expected. Before closing remarks, he expressed appreciation once again to DHUP, PTI, DPWT, DONRE and other organizations and officers concerned and committee partners.

4. Presentation of third year Project implementation

4.1 Mr. Korlakanh SENBOTTALATH, WG1 Leader

He presented the 3 years project activities based on the following 4 outputs, plan for the proposals of the strategy.

- 1) Capacity is strengthened for planning and designing of structural and ecological measures for wastewater treatment.
- 2) The operation of legal and regulatory framework is strengthened for septic tanks and decentralized wastewater treatment facilities.
- 3) The operation of legal and regulatory framework is strengthened for industrial wastewater.
- 4) People's awareness is raised through environmental education.

And then he explained the plan in the future such as the process of getting approval for this strategy.

4.2 Mr. Xayyabandith INSISIENGMAI, Deputy Project Manager.

He briefly explained the success of this project and specifics of the next step about how to arrange for approving of this strategy and then following by this strategy as sustainable.

5. Comments

5.1 Mr. Bounchanh KEOSITHAMMA, Deputy Director of DPWT

He explained again about the project objective and requested the participants to share the comments as detail below:

1. The wastewater management strategy in Vientiane Capital related to many organizations involved. The management rule, guideline, role and responsibility, pond conservation and others must be included to this strategy, if not overlaps with other rules, and then propose to MPWT to review. Discharge water quality must follow the national environment standard and this is challenge for related organizations.
2. Proposed to JICA to make pilot project for onsite treatment facility. The location might be inside of DPWT or other suitable location in order to certify that BOD, COD, etc. follow the national environment standard. *HC*

3. For wastewater from processing industry, we propose JICA to support a pilot project for wastewater treatment with low cost, easy for O&M and having high effectiveness.
4. The capacity building for staff is very important. The project has supported DONRE Laboratory by improving and installing some analysis tools, training of water quality analysis skill both inside laboratory and on site, and sending DONRE laboratory staff to train on water quality analysis and laboratory management in Thailand.
5. The awareness raising campaign on environment for community and common educational school are successful and reality, and is proposed to keep continued.
6. Proposed JICA to make final report all expenditure for this project, if there is some budget still remains, please continue to support for more pilot projects.

5.2 Mr. Khamthavy THAIPHACHANH, DHUP, MPWT

This project is very important for drafting the strategy of wastewater management in Vientiane Capital based on 4 outputs of the project and one important thing is capacity building for all related organizations in wastewater management. Wastewater management related many organizations and this project helps to identify the role and responsibility on wastewater management based on the real situation and draft the rules, guideline and water quality in factory including rule for on-site treatment, in order to manage the wastewater in the future. The one important thing is to implement this strategy in effective manner in the future based on the current situation and thank you to expert team and Lao team to draft this strategy.

5.3 Representative of Vientiane Capital people's council

First of all, he praised JICA for supporting this project, as there are many things important for urban wastewater management. He also pointed out that the agenda of session of Vientiane Capital people's council is divided into 2 sessions;

1. Ordinary session.
2. Extraordinary session which will be held on 2 Oct 2017. He recommended to submit the strategy to this extraordinary session for urgent consideration and get approval for this strategy.

5.4 Representative of industry and handicraft department.

Once this strategy get approval, all related organizations must follow, but each type of wastewater discharged from industrial is already indicated in the provisions of the *ref*

law on processing industry. Since the establishment of the wastewater treatment facility for factory is very costly, some factories have low standard wastewater treatment facility, when we compared the volume of wastewater discharge from factories is smaller than discharge from household. However, role and responsibility regarding wastewater management must be identified and complied with relevant rules and real situation.

5.5 Mr. Bounchanh KEOSITHAMMA, DPWT

Even though Industry and Handicraft Department has already issued wastewater management rule, but usually complaints are came from industries. Therefore, in the future we should share our roles and responsibilities among related wastewater management sectors and the most important thing is to follow the national environment standard.

5.6 Mr. Korlakanh SENBOTTALATH, DPWT.

We have coordinated and cooperated with department of industry and handicraft in order to make wastewater management guideline preparing in the project comply with the existing rules and we are also having counterpart member from DOIC.VC as supporting agency joining and working with the project in order to discuss and draft of this strategy.

5.7 Mr. Khamthavy THAYPHACHANH, DHUP.

The wastewater issues within Vientiane Capital and solutions are identified in this strategy. For wastewater issues outside of Vientiane Capital area especially wastewater from factory is covering by the processing industry law but must clarify role and responsibility more clearly.

5.8 Mrs. Vanhmany PHIMMASONE, DDG of DOIC

1. Proposed JICA to support the pilot project of wastewater treatment plant in factory
2. Proposed to capacity building to business owner on wastewater management in factory in order to control the wastewater discharge in proper way.

5.9 Mr. Kazuhiro ASADA, Chief advisor, JET

At first he would like to thank you to the project team to implement this project in 3 years and wish to Lao counterpart to continue implement the remaining tasks of environment in order to achieve the target goal. *MA*

5.10 Representative of JICA Laos

1. This strategy will be submitted to Vientiane Capital level and related organizations for getting approval and after approved, hope that all related organizations will follow this strategy.
2. For the pilot project of treatment facility, we are now implementing in corroboration with private company. Recently, the septic tank and on-site treatment do not meet the national environment standard. Therefore, there is only aerobic treatment system that can meet the national environment standard which is now implementing as a pilot project.


5.11 Representative of VCOM

1. VCOM staff is also one of the counterpart members for this project and participate project activities. Wastewater management should be identified the role and responsibility clearly.
2. The public canal cleaning budget is limited, so the cleaning cannot cover all canals.
3. When this strategy was approved, the important thing is to disseminate to all related parties to understand thoroughly.
4. VCOM will continue to do the cleaning activity regularly and proposed to all related organization participation.
5. Proposed to JICA support more budget on wastewater management.

5.12 Representative of WSD

This strategy is complied with the national strategy from WSD, especially wastewater management plan and the phase of implementation, I would like to propose to JICA to continue supporting for the pilot project in order to certify for provincial level in the near future.

5.13 Mr. Tadashi TAKESHIMA, JET

The inspection guideline for factory is one of the references for factory owner consisting of 41 pages and other technical parts. The guideline provides inspector with their reference for the real inspection works. This project also made surveying the wastewater treatment facility and guidance for future wastewater management. There are many kinds of treatment facilities depending on type of factory. 

5.14 Mr. Phetsalay, DOES

The project activities are agreed, especially the awareness campaign on environmental education, training of trainer and teachers in 4 target schools in second year and 10 schools in third year, as the result is very effective. Students could understand very well, and in the near future we will include this lesson to the formal curriculum "world around us", and more detail will be discussed with MOES again.

5 Conclusion and closing remarks by Mr. Chairman.

At first, he expressed his sincere appreciation to the project team for successful implementation of this project and made summarize below:

- 1) The meeting agreed to support this strategy (Draft) and before submitting to Vientiane Capital level, requested to discuss with WSD and DHUP to agree all contents in order to avoid overlapping
- 2) Requested JICA to support the pilot project for new standard model in the future.
- 3) Requested JICA to report the completion of the project including budget, output and threat of the project then submit to Vientiane Capital level.

Finally, he would like to wish you all are good health and requested JICA to continue support for the next project. *Phf*



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ລາຍຊື່ຜູ້ເຂົ້າຮ່ວມກອງປະຊຸມ
 ຄະນະກຳມະການ ປະສານງານຮ່ວມ ຄັ້ງທີ VI
 The 6th Joint Coordinating Committee Meeting
 Attendance List 27 / 09 / 2017

No.	Name	Organization	Position	Contract No.	Signature
1	Mr. Keophilavanh APHAYLATHI	VTE Capital	Vice Governor		
2	Mr. Bounchanh KEOSITHAMMA	DPWT.VC	Deputy Director General Project Director	2222 2207	
3	Ms. Saïya Saïroungkhom	DPWT.VC	Vice head of person office	97102007	
4	Mr. Soukhet Vong	DONRE.VC	Secretary	9666908	
5	Mr. Khamphet Inthavuthi	PTI.MPWT	DDG, PTI	25291181	
6	Mr. Vilay Sam Phommajit	VTE Capital	Vice Director General of the project	54588239	
7	Mr. THONG DAM	VTE Capital	Secretary	55502083	
8	Ms. Sivanh Khomsavanh	PCD.MONRE	Technical	55440554	
9	Ms. Somphana DEITHOU	DOWS.MPWT	Deputy Director	52525462	
10	Mr. Som Boun ARUNVONG	VCOMS DGE.VC		22212416	
11		VCOMS.VC			
12		DOES.VC			
13	Ms. Ampolone Phommavong	DOIC.VC	Chief of section	19804475	

14	Miss sou bent boumyavong	DOH.VC	Technical staff	55401844	Smit
15	Mr. Alongkone Sibphet	NPPL	Deputy Technical Director	22235785	Alongkone
16	Mr. Bounlan KANKHAMVONGSA	DPWT	Chief of Urban Housing & Environment Office	2222 2207	Bounlan
17	Mr. Khammone CHOMMANIVONG	DPWT	Project Manager	5550-5594	Khammone
18	Mr. Xaynbandith NSISIENGMAI	PII	Deputy Project Director	5677-1805	Xaynbandith
19	Mr. Phouthasom INTHAVONG	DHUP	Counterpart	5540-8339	Phouthasom
20	Mr. Korlakanh EBOUTTALATH	DPWT	Counterpart	2240-6855	Korlakanh
21	Mr. Thinnakone PHIMMAVONG	DPWT	Technical Staff	2282 9099	Thinnakone
22	Ms. Saylom Keosithamma	DPWT	Counterpart	5404-4448	Saylom
23	Ms. Vankhan APHAYLATH	DPWT	Counterpart	2814-0767	Vankhan
24	Mr. Sonephet VONGPADIT	VCOMS	Technical Staff	5510 2088	Sonephet
25	Mr. Sengkeo TASAKEITH	PCD, MONRE	Counterpart	9171-1155	Sengkeo
26	Ms. Khamla THAMMAVONG	DONRE	Counterpart	2223-2929	Khamla
27	Ms. Minavanh DOUANGMALA	DONRE	Technical Staff	5686 0303	Minavanh
28	Mr. Vilasak Venpaseuth	DONRE	Counterpart	2880-0224	Vilasak
29	Mr. Vongphet RATSABOUTH	DOIC	Counterpart	55669694	Vongphet
30	Mr. Phetsalay KEOPHILAVONG	DOES	Technical Staff	5541 3589	Phetsalay
31	Mr. Takashi KURIHARA	EOJ	Second Secretary		Takashi
32	Mr. Yoshiharu YONEYAMA	JICA	Chief Representative	5552-0723	Yoshiharu
33	Mr. Toru OGURA	JICA	Project Formulation Advisor	5552-6891	Toru
34	Mr. Kingsada SIPHANTHONG	JICA	Project Assistant	5569-8218	Kingsada
35	Mr. Hiroshi NOMURA	JICA	Planning Advisor to Cabinet Office	5915-1355	Hiroshi

36	Mr. Kazuhiro ASADA	JET	Chief Advisor/ Integrated Wastewater Management	54574880	
37	Mr. Kimihiro KONNO	JET	Project Coordinator	5939-5768	分室
38	Mr. Tadashi TAKESHIMA	JET	Environmental Regulations and Enforcement	54977434	竹島
39	Mr. Masayuki NAGAMUCHI	JET	Decentralized Wastewater Treatment	5418-5177	水島
40	Mr. Daizo IWATA	JET	Institutional Strengthening and Financial Analysis	28022998	水島
41	Mr. Tatsuya TOBE	NSC			
42	Mr. Sonemany XAYYALATH	JET	Project Coordinator	9555-3335	
43	Ms. Khoun VILAYPHANH	JET	Administrative Assistant	56112097	
44	Mr. Vinut		Interpreter		
45	Mr. Vitadeth Phosuthi	DPWT	Technical Staff		Vus
46	Ms. Thongleam KHOUKOUADOM	DPWT	Director of Division	94964635	T/K
47	Mr. Bourthom Chanthaphone			55859096	
48	Mr. Khambavy			55676558	
49	Mr. Vilay Phanh	DPWT	Deputy Chief	55990000	Pha
50	Mr. Pholthuanh Bousphala	Interpreter	LNCEI	55990086	Te
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**Appendix 10 Self-assessment after having
participated to the Project**

Self-assessment after having participated to the project
Result summary OUTPUT 1

1. Please rate your level of overall attainment as of today

Rating		Reason of evaluation
Excellent	0	Excellent and Good
Good	9	- To understand wastewater management strategy and related references (3 C/Ps)
Moderate	1	- To lean financial plan of strategy and wastewater management
Not satisfactory	0	- To understand how to prepare F/S of sewerage plan
Poor	0	- To understand strategy is difficult for DONRE staff (2 C/Ps)
No answer	1	- Contribution to the project was limited due to own assigned duties.
Total	11	Moderate - To be not able to catch up project activities due to not participate full time

2. What do you think your capacity has been developed regarding the subject of OUTPUT 1 so far?

Please write situations before and after your participation

Before the Project has begun
<ul style="list-style-type: none"> - Knowledge of wastewater management was limited. (5 C/Ps) - Lack of knowledge on how to make wastewater management plan (4 C/Ps) - Do not understand financial analysis and financial plan for wastewater management - Do not know neighboring countries experience of wastewater treatment
After you participated the Project
Developed capacity <ul style="list-style-type: none"> - Planning approach to make wastewater management strategy, CEWATS plan, and F/S (7 C/Ps) - Financial plan for wastewater management (2 C/Ps) - Estimation of FIRR of water environmental improvement - O&M, calculation of construction cost, tariff collection way, and role and responsibility for wastewater management

3. What kind of field do you think you can make use of your attained knowledge and experience during this Project?

- Roles and responsibility of organizations and collaboration among them (4 C/Ps)
- Implementation of strategy (3 C/Ps)
- Planning method of treatment facilities (3 C/Ps)
- Financial plan including tariff collection (2 C/Ps)
- FIRR for wastewater treatment facilities
- Reservation of treatment sites

4. What do you think you should do to attain higher goal of the Project regarding OUTPUT 1?

- Implementation of strategy in collaboration for planning, legislation, action plan, land reservation, and budget arrangement (8C/Ps)
- Preparation of detail work plan

Self-assessment after having participated to the project
Result summary OUTPUT 2

1. Please rate your level of overall attainment as of today

Rating		Reason of evaluation
Excellent	2	Excellent and good
Good	6	- To improve septic tank standard design including regulations or guideline for operation and maintenance (6 C/Ps)
Moderate	2	
Not satisfactory	0	- To improve Decentralized Wastewater Treatment System (3 C/Ps)
Poor	0	- To monitor water quality from septic tank (3 C/Ps)
No answer	1	Moderate
Total	11	- Pilot project in order to ensure the water quality from new septic tank is not over.

2. What do you think your capacity has been developed regarding the subject of OUTPUT 2 so far?

Please write situations before and after your participation

Before the Project has begun
- Knowledge of wastewater and existing treatment was insufficient. (6 C/Ps) - Lack of knowledge and understanding how to design and how to treat wastewater (4 C/Ps) - Awareness campaign was not go through the public
After you participated the Project
Developed capacity - Wastewater treatment method, design and maintenance (8 C/Ps) - Management and technical operation system of DEWATS (4 C/Ps)

3. What kind of field do you think you can make use of your attained knowledge and experience during this Project?

- To extent of facility plan, such as new septic tank and DEWATS (6 C/Ps)
- Community based O&M (4 C/Ps)
- Water quality monitoring (3 C/Ps)
- Experience of the Project

4. What do you think you should do to attain higher goal of the Project regarding OUTPUT 2?

- Pilot project in order to experiment new septic tank design to ensure standards requirement (4 C/Ps)
- Water quality analysis of septic tank and DEWATS effluents as a reference data for design of septic tank standard (2 C/Ps)
- Develop monitoring guidelines (2 C/Ps)
- Design and facility plan to meet new standards(3 C/Ps)
- Awareness campaign to public in order to have them understood and having good cooperation
- Preparation of detail work plan

Self-assessment after having participated to the project

Result summary OUTPUT 3

1. Please rate your level of overall attainment as of today

Rating		Reason of evaluation
Excellent	2	Excellent and good
Good	5	- To prepare inspection guidelines (6 C/Ps)
Moderate	2	- To prepare Effluent database (5 C/Ps)
Not satisfactory	0	- To establish sampling and water quality analysis system for industrial
Poor	0	wastewater (3 C/Ps)
No answer	2	Moderate
Total	11	- Not fully participated in activities of output 3 (2 C/Ps)

2. What do you think your capacity has been developed regarding the subject of OUTPUT 3 so far?

Before the Project has begun
<ul style="list-style-type: none"> - Discharge was not examined in the past factory inspection. - Insufficient knowledge on industrial discharge (6 C/Ps) - There was no guideline for factory inspection. (2 C/Ps) - No experience on inventory and database (2 C/Ps) - Parameters of water quality analysis in DONRE laboratory were limited. (2 C/Ps)
After you participated the Project
<p>Developed capacity</p> <ul style="list-style-type: none"> - Sampling and monitoring skill (4 C/Ps) - Understanding of importance of wastewater treatment (2 C/Ps) - Understanding of treatment methods of industrial wastewater (3 C/Ps) - Understanding of roles and importance of effluent database (4 C/Ps) - Skill of water quality analysis and preparation of manual for Laboratory - Preparation of inspection guidelines

3. What kind of field do you think you can make use of your attained knowledge and experience during this Project?

- Usage of effluent database (5 C/Ps)
- Working way of JICA experts (4 C/Ps)
- Identification of factory's category to prepare monitoring plant (2 C/Ps)
- Wastewater management and usage of effluent guidelines (2 C/Ps)
- Water quality analysis and specific guidelines for Laboratory
- Roles of related sectors

4. What do you think you should do to attain higher goal of the Project regarding OUTPUT 3?

- Continue use of database program, follow up and study database, and improve it (5 C/Ps)
- Strengthen of related organization to monitor factory effluent (2 C/Ps)
- Improvement of regulations to cater for the actual situation
- Continuous research and study for new techniques appropriated for present situation

Self-assessment after having participated to the project

Result summary OUTPUT 4

1. Please rate your level of overall attainment as of today

Rating		Reason of evaluation
Excellent	3	Excellent and good
Good	5	- To focused on environmental education to schools and communities (6 C/Ps)
Moderate	1	- Canal cleaning activities (3 C/Ps)
Not satisfactory	0	- Completed all target activities as planned (3 C/Ps)
Poor	0	Moderate
No answer	2	- Regularly activities did not conducted thoroughly and no monitoring results
Total	11	

2. What do you think your capacity has been developed regarding the subject of OUTPUT 4 so far?

Please write situations before and after your participation

Before the Project has begun
<ul style="list-style-type: none"> - Raising awareness to the public was not much (4 C/Ps) - Never joined this kind of activities before (5 C/Ps) - Primary understanding only - Lack of analysis tools
After you participated the Project
Developed capacity <ul style="list-style-type: none"> - Planning technique and execution of awareness campaign to public and school (5 C/Ps) - Establishment of related sectors networks education of water environment (3C/Ps) - Encouragement of community participation in canal cleaning activity (2C/Ps) - Development of approach way and tools (2C/Ps)

3. What kind of field do you think you can make use of your attained knowledge and experience during this Project?

- Awareness campaign to community, primary school (2 C/Ps)
- Work with working group, project coordination with various sectors (2C/Ps)
- Activities arrangement to promote school student (3 C/Ps)
- Development of environmental education tools for water environmental protection (2 C/Ps)
- Lessons and experiences from participation with project will be extended (3C/Ps)
- Monitoring , cleaning canal and environmental education shall be conducted continuously.
- Encouraging communities participation in canal cleaning activities

4. What do you think you should do to attain higher goal of the Project regarding OUTPUT 4?

- Support and contribute to the project activities for sustainable implementation (5 C/Ps)
- Proposal of learning outside class courses on environment
- Attention to the development of responsible organization networks for school activities (4C/Ps)
- Regularly activities shall be conducted and promote the event through medias (2 C/Ps)
- Develop curriculum on Environment for higher education level
- Raising awareness from village level by encouraging community participation in canal cleaning by themselves continuously and regularly