Ex-Post Project Evaluation 2015: Package II-5 (Viet Nam)

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JAPAN INTERNATIONAL COOPERATION AGENCY

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Socialist Republic of Viet Nam

FY2015 Ex-Post Evaluation of Technical Cooperation Project

"The Project for Enhancing of Vietnamese Academy of Science and Technology in Water Environmental Protection (Phase 2)" /

"The Project for Strengthening Capacity of Water Environmental Management in Vietnam"

External Evaluator: Tomoo MOCHIDA, OPMAC Corporation

0. Summary

Out of the two technical cooperation projects subject to this ex-post evaluation, the "Project for Enhancing of Vietnamese Academy of Science and Technology in Water Environmental Protection (Phase 2)" (hereinafter referred to as the "Technology Project") aimed to strengthen the scientific and technological base of the Vietnam Academy of Science and Technology / Institute of Environmental Technology (hereinafter referred to as "VAST (IET)"[1]), which was a counterpart (hereinafter referred to as "C/P") organization of the project. The goal of the "Technology Project" was to improve the capacity of the Vietnamese authorities for the protection of the water environment by making scientific and technological contributions to the administration offices, etc. that were concerned with improvement of the water environment. Under the "Project for Strengthening Capacity of Water Environmental Management in Vietnam" (hereinafter referred to as the "Management Project"), technical cooperation was provided to strengthen the capacity of the Ministry of Natural Resources and Environment (hereinafter referred to as "MONRE") for preparing water environment management policy and systems, and to Departments of Natural Resources and Environment (hereinafter referred to as "DONRE") in five target provinces for the enforcement of water environment management, with the aim of disseminating technology to other DONRE across the country.

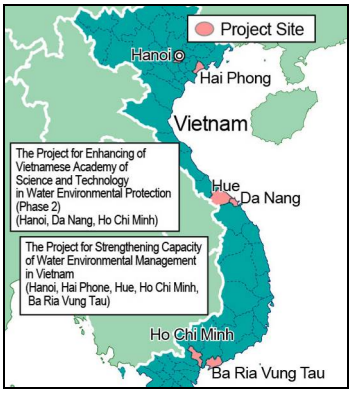
These two projects were fully consistent with Viet Nam's development policies and needs, and with Japan's ODA policy. The implementation plan and approaches were considered appropriate. Therefore, relevance of the projects is high. The "Technology Project" aimed to further strengthen the scientific and technological base of VAST (IET) for improvement of the water environment. The project had largely achieved its purpose (same as the interim project purpose of the projects combined, which is described later) by the time of project completion with all the outputs being accomplished. The "Management Project" strengthened the capacity of MONRE for preparing water environment management policy and systems, and the capacity of DONRE in the five target provinces for the enforcement of management of the water environment. Thus, the "Management Project" had largely achieved its project purpose by the time of project completion. However, the overall goal targeted all DONRE in the country. The ex-post evaluation confirmed that there had been an improvement in the capacity of Vietnamese

[1] VAST (IET) consists of the head office in the northern region and two branch offices in the central and southern regions, respectively.

authorities for the protection of the water environment by means of scientific and technological services, etc. of VAST (IET), and that, to a certain extent, cause-and-effect between the overall goal and project activities could be seen in improvements in the capacity for enforcement at the target DONRE. However, the relationship between activities to disseminate to and deploy technology at other DONRE and a mechanism leading to achievement of the overall goal remained unclear. Therefore, the achievement of the overall goal was not confirmed, particularly if the aspect of the capacity for enforcement at other DONRE was taken into account. Since these projects have to some extent achieved the project purpose and overall goal, the effectiveness and impact of the combined projects are fair. Both the project cost and the cooperation period of the "Technology Project" exceeded the plan. While the cooperation period of the "Management Project" was within the plan, the project cost exceeded the plan. Therefore, the efficiency of these projects combined is fair. No major problems were observed in policy background, or in the organizational, technical and financial aspects of the implementing agency. Therefore, the sustainability of the project effects is high.

In light of the above, these projects are evaluated to be satisfactory.

1. Project Description



Project Locations

A gas chromatograph (GC), which measures the content of various components in a sample, and accessories supported by the "Technology Project"

1.1 Background

With the industrialization and urbanization caused by rapid economic growth in recent years, the quality of water in rivers, lakes and canals in Hanoi, Ho Chi Minh and other major and provincial cities in Viet Nam has been deteriorating. The Government of Viet Nam (GOV) enacted the "Law of Environmental Protection" (hereinafter referred to as "LEP") in 1993 (later revised in 2005 and 2014). Furthermore, MONRE was established in 2002 in order to enhance environmental management at a national level. Later, GOV also pursued institution building for

the enforcement of pollution control measures by setting strategies in the field of environmental management and devising legal instruments. However, these laws and regulations were not effectively enforced. In order to address these issues, Japan International Cooperation Agency (hereinafter referred to as "JICA") provided the "Technology Project" to VAST (IET) as a C/P organization from January 2008 to July 2012. Furthermore, the "Management Project" was extended to MONRE and five target DONRE as C/P organizations from June 2010 to June 2013 with a view to strengthening their capacity for environmental management.

1.2 Project Outline

The two technical cooperation projects subject to the ex-post evaluation were independently carried out, but both of them formed a part of the "Urban Water Environment Management Program (2007-2015)", which aimed to improve water quality and respond to diversified needs for water utilization. As the cooperation periods of these projects partly overlapped, there was collaboration in activities of the projects. Therefore, the two projects were combined together for an integrated evaluation under this ex-post evaluation. The integrated evaluation is designed in such a way that the "Management Project" is structured to be inclusive of the "Technology Project" as shown later in Figure 1. VAST (IET), which had a strengthened scientific and technological base through the "Technology Project", contributed to protection of the environment by MONRE and DONRE; also, to improvement of the capacity of MONRE for the preparation of water environment management policy and systems, and of DONRE of the local governments including the target DONRE, for enforcement of management of the water environment. This was carried out under the "Management Project" and thus the capacity of MONRE and DONRE for management of the water environment was strengthened.

Overall Goal		Enforcement capacity of MONRE and DONRE on water environmental management is strengthened. Note: The overall goal of the combined projects is same as that of the "Management Project" and is inclusive of the overall goal (i.e., the capacity of Vietnamese authorities related to water environment protection will be improved) of the "Technology Project".
Project Purpose		Capacity of MONRE and target DONRE regarding water environmental management is strengthened. Note: The project purpose of the combined projects is same as that of the "Management Project" and the project purpose of the "Technology Project" is regarded as the interim project purpose (i.e., scientific and technological basis of VAST (IET) for the improvement of the water environment will be further strengthened), which contributes to the project purpose.
Output(s)	Technology Project	Output 1: Integrated network system that aims at bringing the VAST (IET) head office and branches (Ho Chi Minh and Da Nang), and thereby ensuring the synergy effects in dealing with nationwide environmental issues, is established and operated.
		Output 2: Scientific and technological level of VAST (IET) head office and branches (Ho Chi Minh and Da Nang) on water environment monitoring / evaluation / countermeasures is enhanced through the effective operation of integrated network system and so forth.
		Output 3: Capacity of VAST (IET) on practical scientific and technological services in the field of water environment is strengthened.

	Management Project	Output 1: MONRE's capacity of making policy and management tools that are more effective and enforceable is strengthened.
		Output 2: Enforcement capacity of target DONRE on basic water pollution control (environmental monitoring, pollution sources inventory, pollution sources inspection) is strengthened.
		Output 3: Target DONRE' capacity of making effective water pollution control measures is strengthened.
		Output 4: Target DONRE' capacity of promoting awareness of public and industrial sectors on water environment is strengthened.
		Output 5: Capacity of MONRE and DONRE on information management and utilization is strengthened.
Total cost (Japanese Side)		Technology Project: 534 million yen Management Project: 670 million yen
Period of Cooperation		Technology Project: January 2008 – July 2012 (out of which the period extended : January 2012 – July 2012) Management Project: June 2010 – June 2013
Implementing Agency		Technology Project: VAST (IET) Management Project: MONRE and five target DONRE
Other Relevant Agencies / Organizations		N.A.
Supporting Agency /Organization in Japan		Technology Project: Ministry of Environment, Kokusai Kogyo Co., Ltd., Sowa Consultants Inc. Management Project: Ministry of Environment, Nippon Koei Co., Ltd.
Related Projects		[Technical cooperation] - Dispatch of experts to MONRE (Environmental Management) (2004-2010) - Enhancing Capacity of Vietnam Academy of Science and Technology in Water Environment Protection (2003-2006) - The Study on Integrated Development Strategy for Danang City and its Neighboring Area in the Socialist Republic of Vietnam (2008-2009) - The Study for Water Environment Management on River Basins in Vietnam (2008-2010) - Project for Capacity Development on Sewerage Management in Ho Chi Minh City (2009-2012) - The Project for Environmental Protection in Halong Bay (2010-2013) - The Project for Strengthening Capacity of Water Environmental Management in River Basin(2015-on-going) [Japanese ODA Loan] - Second Ho Chi Minh City Water Environment Improvement Project (II) (Loan Agreement (hereinafter referred to as "LA") in 2008) - Hue City Water Environment Improvement Project (LA in 2008) - Hai Phong City Environmental Improvement Project (II) (LA in 2009) - Second Hanoi Drainage Project for Environmental Improvement (II) (LA in 2009) - Ho Chi Minh City Water Environment Improvement Project (III) (LA in 2010) [Other multilateral and bilateral cooperation agencies] - Centre national de la recherche scientifique (CNRS): Cooperation with VAST for Environmental Improvement of the Nhue River and the To Lich River (2001-2004) - The World Bank: Red River Delta Rural Water Supply and Sanitation Project (2005-2011) - Canadian International Development Agency: VCEP: Vietnam Canada Environmental Project (VCEP) (1996-On-going), etc.

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement Status of Project Purpose at the Time of the Terminal Evaluation

[Technology Project] Activities leading to the achievement of outputs 1, 2 and 3 had progressed as planned and the project purpose was being achieved during the cooperation period.

[Management Project] Outputs 1 to 5 were likely to be achieved by the end of the project. Although the achievement level differed by output, it was expected that the outputs would contribute to achievement of the project purpose and that the project purpose was highly likely to have been achieved by the end of the project.

1.3.2 Achievement Status of Overall Goal at the Time of the Terminal Evaluation (including other impacts.)

[Technology Project] The prospects that the water quality improvement measures being recommended by VAST (IET) would be applied were considered sufficiently high. The overall goal was highly likely to be achieved after completion of the project.

[Management Project] Information required for confirmation of, or judgement on, the prospects of fulfilling the relevant indicators was not sufficiently available and therefore judgement was deferred on the prospects of achieving the overall goal until necessary information could be obtained.

1.3.3 Recommendations at the Time of the Terminal Evaluation

[Technology Project] The following points are recommended: enhancement of the organizational capacity of VAST (IET) as a whole in order to expedite the building-up of the scientific and technological base in Viet Nam, flexible adjustment of the assignment periods of JICA experts; strengthening of skills for analysing trace substances; improvement of advanced waste water treatment technology; follow-up on methods for the optimal utilization of handbooks and manuals developed, and so on.

[Management Project] The following points are recommended: implementation of the actions proposed by DONRE at the terminal evaluation workshop and of assistance from the Vietnam Environment Administration (hereinafter referred to as “VEA”) of MONRE; continuous updating and improvement of databases by the target DONRE with regard to water quality databases, pollution source inventories and pollution source maps; examination of the possibility of applying those tools to other DONRE by VEA; action on the four challenges described in the “Improvement Plan for Water Pollution Control in

Hanoi" prepared by Hanoi DONRE with the assistance of VEA; examination and improvement of tools for raising awareness and the introduction of these to other DONRE and relevant line ministries by VEA; acceleration of work towards the full scale utilization of water environment information management procedures by VEA; further review of draft laws, regulations and policy documents, and so on.

2. Outline of the Evaluation Study

2.1 External Evaluator

Tomoo Mochida, OPMAC Corporation

2.2 Duration of Evaluation Study

Duration of the Study: October, 2015 – September, 2016

Duration of the Field Study:

January 1, 2016 – January 31, 2016, April 2, 2016 – April 16, 2016

3. Results of the Evaluation (Overall Rating: B[2])

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance to the Development Plan of Viet Nam

At the time of project planning, an achievement of 1000 US dollar per capita Gross Domestic Product (GDP) was targeted in Viet Nam's "Eighth Five-year Socio-economic Development Plan (2006-2010)" and at the same time, the achievement of sustainable growth was aimed at by taking up the environment as a new major issue. In addition, GOV revised "LEP" and improved relevant laws and regulations such as implementation rules and sanctions. Major regulations in the field of the water environment, including the National Technical Standards for surface, ground, industrial waters and so on, were enacted. Furthermore, the Environmental Police was also established under the Ministry of National Security to strengthen enforcement and from 2006, it was decided that a budget should be secured by appropriating at least one percent of government expenditure for environmental protection budgets.

At the time of project completion, in Viet Nam's "Ninth Five-year Socio-economic Development Plan (2011-2015)", the aim was to construct a foundation for an industrialized nation in 2020 through rapid and sustainable development. During the planned period, the preparation of effective and efficient policies, laws and regulations, etc. in the fields of natural resources and environmental protection was set as the direction. Furthermore, this was a time when the government promulgated the "Decree on the Sanction of Administrative

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[3] ③: High, ② Fair, ① Low

Violations in the Domain of Environmental Protection", etc. and also prepared a further revision of "LEP" in order to cope with the complicated and diversified environmental policies and conditions of society, etc.

Both of these projects were deemed to be relevant to the country's water environment management policy from the planning to the completion time.

3.1.2 Relevance to the Development Needs of Viet Nam

The reason why the environment was taken up as a newly-identified major issue at the time of project planning, was because of the industrialization and urbanization triggered by rapid economic growth. In particular, it had become difficult, through the development of infrastructure for water pollution control measures, to keep up with the level of domestic waste water from households and industrial waste water, which were major pollution sources in the water environment. Consequently, waste water that was almost untreated was discharged into rivers, lakes and reservoirs, canals, the sea and so on. Under these conditions, although institutional development such as the establishment of strategic plans and the enactment of laws and regulations proceeded in Viet Nam, these laws and regulations were not effectively enforced. The reason for this is that MONRE did not completely comprehend the specific features behind environmental problems when executing laws and regulations on site and also the capacity of local governments in the field of the environment. In addition, it can be pointed out that there had not been adequate development of the implementation rules and instructions required to enforce the environmental laws and regulations. On the other hand, there were also problems on the part of local governments which were inclined to pursue short-term economic benefits and therefore lacked awareness of environmental protection and compliance with laws and regulations. At the same time, DONRE under local governments were not sufficiently equipped with the amount of qualified human resources, budgets and the experience and technology required for proper environmental protection. Under these circumstances, it was considered important that the water environment be improved with a practical and effective environmental administration and that a system to support environmental administration in the field of science and technology[4] be structured and strengthened.

At the time of project completion, with the aim of sustainable economic development, improvements in the effectiveness and efficiency of policies, laws and regulations concerning natural resources and environmental protection were also required, while economic growth continued at an annual real rate of more than 5%. Where controls over

[4] The "Technology project" was designed and implemented to address the new issues by applying the scientific and technological skills acquired by VAST (IET), for improvement in the capacity of the Vietnamese authorities, etc. relating to management of the water environment in addition to further strengthening of the scientific and technological base formulated during the first phase of the project.

environmental violations were being tightened, measures were required to address issues such as the unclear demarcation of authority and responsibility among ministries and government agencies, regulations that were not enforceable and problems identified through the practical application of the laws and regulations.

Thus, these projects were relevant to the country's development plan and development needs, from the project planning to the completion time.

3.1.3 Relevance to Japan's ODA Policy

In Japan's Country Assistance Program (April 2004), "improvement in lifestyle and the social aspects" was regarded as one of the three priority areas for development. Environmental problems were considered to be an important issue that needed to be urgently addressed for sustainable economic development. In particular, among measures to counter environmental pollution and damage, priority for assistance was given to the improvement of water and air quality. Environmental protection took the position of one of the priority areas for development assistance in JICA's Country Assistance Strategy and its Country Project Implementation Plan in Viet Nam. Consequently, JICA prepared the "Viet Nam Urban Water Environment Management Program". The program goal was set as the "reduction of pollution loads so as to improve water quality in public water bodies and meet the diversified needs for water use in Viet Nam". The concrete outputs of the program were listed as "Output 1: Development of the capacity of the Vietnamese authorities for the overall management of the water environment" (the "Management Project" was found under this output), "Output 2: Development of the capacity of study and research institutes" (the "Technology Project" was found under this output) and "Output 3: Improvement of waste water and pollution treatment facilities and development of the capacity of management agencies". Several projects were being implemented under this program.

3.1.4 Relevance to Appropriateness of Project Planning and Approach

The projects subject to this ex-post evaluation were designed in such a way that the results of the projects would be disseminated nationwide and that there would be close collaboration between the various projects to be implemented under the "Viet Nam Urban Water Environment Management Program". The "Technology Project" was intended to strengthen environmental protection in the whole of Viet Nam through the VAST (IET) head office in the north and the branch offices in the central as well as the southern regions. Under the "Management Project", the target DONRE, whose capacity for enforcement varied, were selected as models with a view to disseminating the results over the entire country. The project targeted DONRE in major regional cities because it was deemed urgent that the capacity for management of the environment of these DONRE as local administrative bodies

be strengthened in order for problems of the urban environment and industrial pollution to be tackled or prevented. Furthermore, Hanoi, Hai Phong, Ho Chi Minh and Hue, where support for projects such as improvements in the sewage and waste water discharge system was underway or planned to be executed with Japanese ODA loans, were selected as target provinces. By doing this, it was expected that the results of the project would generate collaboration directly with output 3 of the "Viet Nam Urban Water Environment Management Program". Thus, these projects were deemed appropriate in terms of project planning and approach.

These projects were highly relevant to the country's development plan and development needs, as well as to Japan's ODA policy. Project planning and approach were also considered appropriate. Therefore, its relevance is high.

3.2 Effectiveness and Impact[5] (Rating: ②)

3.2.1 Effectiveness

3.2.1.1 Achievement of Project Purpose

For the purpose of analysis of effectiveness under the integrated evaluation, the level of achievement of the project purpose of the projects combined was examined using the level of achievement of the project purpose of the "Management Project". The relationship between these two projects is comprehended that the project purpose of the "Technology Project" contributes directly to achievement of the overall goal of the projects combined (Channel 1) while also contributing indirectly to the project purpose of the "Management Project" (Channel 2), which is the project purpose of the projects combined. As for Channel 2, the action taken by VAST (IET) for MONRE and the target DONRE was in the form of the provision of scientific and technological services, advice and so on. From the viewpoint of a means-and-ends relationship within the framework of the integrated evaluation, these are considered as the inputs and activities for the "Management Project". Thus there is a contribution to the achievement of the outputs, the project purpose (i.e., the project purpose of the projects combined) and the overall goal (i.e., the overall goal of the projects combined) of the "Management Project". Thus, the project purpose of the "Technology Project" is interpreted as an interim project purpose of the project combined, which contributes to the achievement of the project purpose as well as to the overall goal of the projects combined. The overall structure for the integrated evaluation is worked out as in the diagram below:

[5] Sub-rating for Effectiveness is to be put with consideration of Impact.

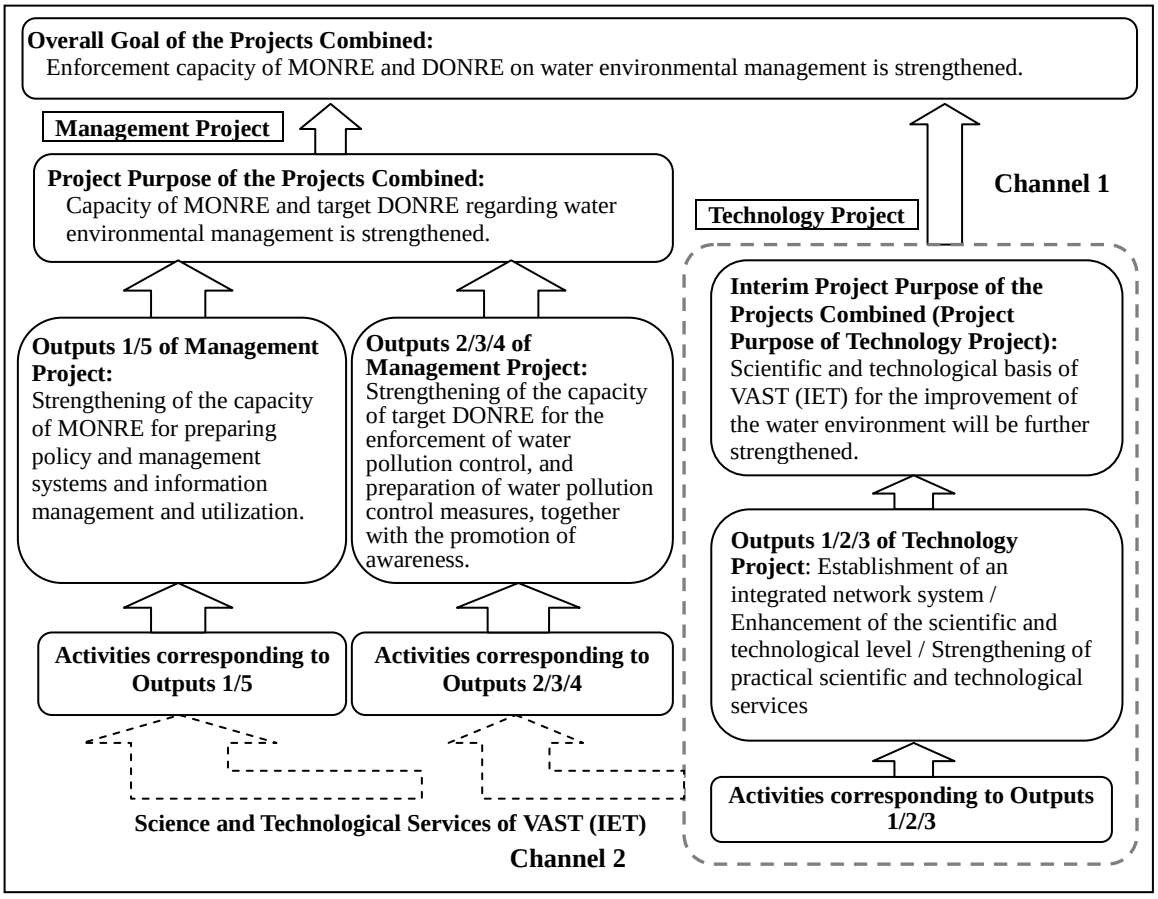


Figure 1: Overall structure of cooperation envisaged in the integrated evaluation

The level of achievement of the "Technology Project", which is the interim project purpose of the projects combined, is firstly evaluated below. Secondly, an examination is made of the level of achievement of the outputs and the project purpose (i.e., the project purpose of the projects combined) of the "Management Project", in which activities were carried out with inputs from the "Technology Project".

Achievement of output 1 to output 3 of the "Technology Project"

Because the target values of the respective indicators corresponding to the outputs and the project purpose were not set[6], the level of achievement was evaluated by examining the tendency revealed in the actual values. The "Technology Project" aimed at strengthening the technical capacity of VAST (IET) for management of the water

[6] The Project Design Matrix (PDM) is a table that summarizes the project. The aim of the "Technology Project" at an output level of the PDM was to establish and operate an "integrated network system" in the PDM. Under the project, indicators were set to measure the development of the "internal operation manual" and operations based on the manual. In the "Management Project", indicators such as "accuracy of monitoring is improved" were also set. However, it was not possible to determine the concrete level of achievement of these outputs and indicators. The formation of common understanding on the achievement level among personnel concerned was considered to have been difficult.

environment and at establishing an integrated network system that would bridge the VAST (IET) head office and its branches, thereby ensuring synergy in dealing with nationwide environmental issues (output 1); at enhancing the scientific and technological level of the VAST (IET) head office and branches for monitoring of the water environment, and for evaluation and taking countermeasures (output 2); at strengthening the capacity of VAST (IET) for practical scientific and technological services in the field of the water environment (output 3). The project was designed so as to further strengthen the scientific and technological base of VAST (IET). It was confirmed that the output had been largely[7] achieved by the time of project completion.

Project purpose of the "Technology Project" (interim project purpose of the projects combined)

Scientific and technological basis of VAST (IET) for the improvement of the water environment will be further strengthened.

Indicators corresponding to the project purpose of the "Technology Project" are shown in Table 1 below. These indicators were basically fulfilled by the completion of the project. At the time of the terminal evaluation, it was confirmed that activities corresponding to outputs 2 and 3 had contributed to the achievement of the project purpose and that these outputs showed synergy. The level of achievement has been analyzed below.

Table 1: Achievement of the project purpose of the "Technology Project"
(interim project purpose of the projects combined)

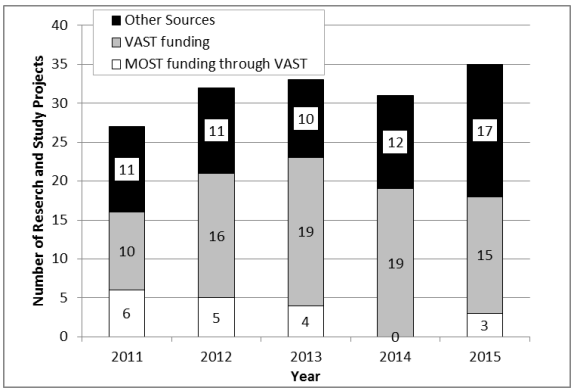
Purpose	Indicators	Actuals
Interim Project Purpose	Indicator 1: Number of studies and research in relation to environment management and their quality	The number of studies and the amount of research approved have been increasing and the ratio of the number of studies and the amount of research approved against the number of studies and the amount of research proposed is equal to or higher than 70%.
	Indicator 2: Number of manuals and handbooks developed and their quality	Three types of manuals and guidelines were developed and revised. They were gratefully received by DONRE, etc.
	Indicator 3: Number of VAST (IET) researchers in water environment management	While the demand for science and technological services increased, the number of contract researchers was adjusted to cope with the need.
	Indicator 4: Number of scientific and technological services by VAST (IET) for government and others	While the preparation of laws and regulations relevant to the environment was progressing and the strengthening of rules and regulations proceeded, the number of services drastically increased in response to the increased needs. In order to cope with the increased needs, VAST (IET) responded not with a large

[7] The project was evaluated to have "largely achieved" its outputs rather than having "achieved" its outputs. This is because management and operation at the branches were not necessarily carried out in accordance with the internal operation manual. For example, a unit to handle administrative affairs was yet to be established.

Purpose	Indicators	Actuals
		increase in the number of researchers but with the utilization of newly introduced analytical equipment and facilities as well as its technical capacity.
	Indicator 5: Number of scientific and technological recommendations by VAST (IET) accepted by authorities	VAST (IET) considered that this indicator was identical with above indicator 1 "Number of studies and research in relation to environment management and their quality". Likewise, the indicator was treated in a similar way under this ex-post evaluation.

Indicator 1/5: Number of studies and research in relation to environment management and their quality

Although the number of studies and the amount of research on environmental management varies every year depending on where funds come from (Figure 2), the total number has generally exhibited a gradually increasing trend. The number of studies and the amount of research sponsored by the Ministry of Science and Technology (hereinafter referred to as "MOST") shows a declining trend, but this number varies depending on the years in question. Because the projects funded by MOST are studies and research projects at the national-level, financial support per project tends to be larger (the budget for studies and research projects shows increases or decreases as shown later in Table 5). As against the number of projects approved, the number of proposed projects was 36 in the year 2011 and the number was 40 in 2012, at the time of project completion. In terms of the number of projects being taken up as against the number of projects being proposed, the ratio is equal to or higher than 70%.



Source: VAST (IET)
Note: The above figures show the number and quality of studies and the amount and quality of research on environmental management proposed by VAST (IET) and approved by governments. Funding sources can be largely categorized into three levels: "MOST funds through VAST (IET) (funds from MOST, other ministries and universities)", "VAST funds", and "others (provincial governments, etc.)."

Figure 2: Number and quality of studies and amount and quality of research on environmental management

Indicator 2: Number of manuals and handbooks developed and their quality

The water quality monitoring handbook, the wastewater treatment guidelines and the appropriate waste water treatment technology manuals for industrial waste water treatment were prepared and/or revised under the project. These documents were prepared and/or revised based on comments from DONRE and using field surveys on the actual

conditions at pollution sources, etc. They were distributed at workshops held at three cities in the country. As there had been no such technical documents of this type, that is, taking into account the actual conditions of Viet Nam, these technical documents were welcomed by relevant organizations.

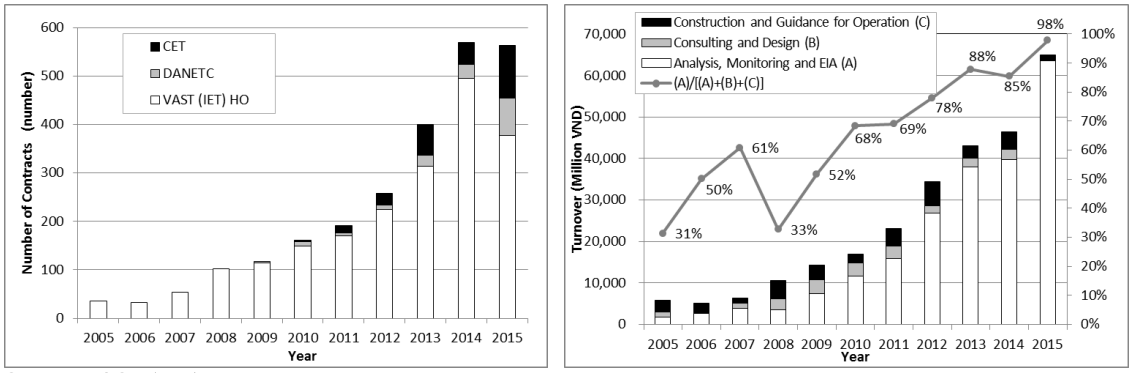
Indicator 3: Number of VAST (IET) researchers in water environmental management

The number of permanent researchers at VAST (IET) was 43 at the start of the project in 2008 and was 45 at the time of project completion. The total number did not change so much, but at the time of project completion, permanent researchers were newly assigned at the branches while the number of permanent researchers at the head office had slightly decreased. The number of contract-based researchers at the time of project completion decreased to 90, compared with that (of 103 persons) at the start of the project. However, the number shows a slight increase in comparison with that of the previous year.

Indicator 4: Number of scientific and technological services by VAST (IET) for government and others

The number of contracts and the amount of turnover of scientific and technological services[8] provided by VAST (IET) to government agencies and others, experienced a sharp increase. An increase in the turnover of services provided by the branches was also significant. The diagram on the right-hand side of Figure 3 classifies the turnovers by type of services. The diagram indicates an increase in the ratio of the turnover of services in the field of "analysis, monitoring and Environmental Impact Assessment (EIA)", which includes water quality analysis and participation in inspection teams. While the development of environmental laws and regulations proceeded and stricter rules and regulations were put in place, it was observed that there was an increase in the number of services in response to the increasing needs for the water quality analysis and so on.

[8] Scientific and technological services include training on water quality analysis and supporting services that complement or reinforce the technological level of recipients.



Source: VAST (IET)
Note: VND is the currency unit in Viet Nam. The reference rate of State Bank of Viet Nam on May 13, 2016 was 21,877 VND/US$.

Figure 3: Yearly trend of number of contracts concerning scientific and technological services (left) and the amount of turnover by service type (right)

Achievement of output 1 to output 5 of the "Management Project":

The project was carried out with reciprocal feedback[9] on the following activities (a) and (b): (a) technical assistance in response to issues faced by the target DONRE and their capacity levels for the enforcement while these levels varied (technical assistance, in particular, environmental monitoring, pollution source inventories and pollution source inspections, preparation of water pollution control measures, and the promotion of awareness in the public and industrial sectors under outputs 2, 3 and 4); and (b) development of the capacity of MONRE for the preparation of policy and management tools and development of the capacity of MONRE and DONRE for strengthening the management and utilization of information (under outputs 1 and 5). Through the feedback, the project aimed to strengthen the capacity of MONRE for the preparation of policy and management systems and to strengthen the capacity of the target DONRE for enforcing water pollution control. All the outputs except output 3 and part of output 5 were largely achieved. In these processes, VAST (IET) provided MONRE and the target DONRE with scientific and technological services during activities. As for the outputs, there was no confirmation of the fulfillment of the following indicators: submission of a draft outline for water pollution control measures to the Hanoi People's Committee, for indicator 3-3 of output 3; and information management through the office in charge, for output 5. With regard to indicator 3-3, although a draft outline for water pollution control measures were completed, it was based on "LEP" of 2005. This "LEP" was later revised and the draft outline was not submitted to the Hanoi People's Committee as it had been based on the "LEP" of 2005. However, the Hanoi DONRE was able to improve its capacity for water

[9] Several examples were raised as methods of feedback: MONRE received comments on draft policy documents from the target DONRE, MONRE staff participated in workshops organized by the target DONRE, etc.

pollution control measures through the preparation of the draft outline. Therefore, although the final draft outline was not submitted to the Hanoi People's Committee, it is deemed that this simple fact does not prevent a judgement that the capacity of the Hanoi DONRE for preparing effective water pollution control measures was strengthened through the project activities. On the other hand, although the indicators concerning output 5 were fulfilled, at the time of project completion it became clear that communication was neither sufficient nor smooth[10] for the relevant departments in MONRE and the target DONRE. Judging the level of achievement of output 5 from a comprehensive viewpoint, it is hard to come to the evaluation that management of information through the Center for Environmental Information and Data (hereinafter referred to as "CEID"), the unit in charge at VEA, was strengthened.[11]

Project purpose of the Management Project (project purpose of the projects combined)

Capacity of MONRE and target DONRE regarding water environmental management is strengthened.

It is considered that the project purpose was achieved based on verification through self-evaluation on the capacity of MONRE for policy and system-making and on the capacity for enforcement of the target DONRE.

Table 2: Achievement of the project purpose under the integrated evaluation

Item	Indicator	Actual
Project Purpose	MONRE conducts self-evaluation on their own capacity of policy and system making regarding water environmental management.	All the respondents in MONRE indicated that there had been an improvement in their capacity during the project cooperation period by answering the question, "How much was the capacity of MONRE strengthened by the project?" As a result, this indicator was seen to be fulfilled.
	Target DONRE conduct self-evaluation on their own enforcement capacity of water environmental management.	All the respondents in MONRE and the target DONRE indicated that there had been an improvement in the capacity of DONRE by answering the question "How much was the capacity of DONRE strengthened by the project". The terminal evaluation report does not incorporate the response from the Ho Chi Minh DONRE, but it is assumed that they also improved their capacity based on the result of the ex-post evaluation.

As described above, the project largely achieved its purpose.

[10] As an example of insufficient communications, it was pointed out at the time of the ex-post evaluation that although MONRE needed a lot of information from DONRE, information was not sent to MONRE on a regular basis.

[11] At the time of the ex-post evaluation, it was learned that the respective departments of MONRE and the relevant offices of the target DONRE communicated directly with each other. Therefore, it was evaluated that the level of achievement of output 5 did not impose large obstacles on enhancement of the capacity for enforcement.

3.2.2 Impact

3.2.2.1 Achievement of Overall Goal

In analyzing “effectiveness”, the level of achievement of the overall goal of the projects combined was evaluated using the level of achievement of the overall goal of the “Management Project”. It is considered that the overall goal of the “Technology Project” (i.e., the capacity of Vietnamese authorities related to water environment protection will be improved) has been incorporated into the overall goal of the “Management Project”. Concerning the project purpose of the “Technology Project” (i.e., the interim project purpose of the projects combined), two channels were identified as indicated in the aforementioned Figure 1: Channel 1 is the path through which the “Technology Project” contributes directly to the achievement of the overall goal while Channel 2 is the path through which the “Technology Project” contributes to the achievement of the overall goal through the “Management Project”. The indicator corresponding to the overall goal of the “Technology Project” is regarded as indicator 1, which is to measure the achievement of the overall goal of the projects combined, while the three indicators, which were set up to judge the achievement of the overall goal of the “Management Project”, are treated as indicators 2 to 4 accordingly. The fulfillment of these indicators was examined as described below.

Overall Goal of the Management Project (overall goal of the projects combined)

Enforcement capacity of MONRE and DONRE on water environmental management is strengthened.

Table 3: Achievement of the Overall Goal

Overall Goal	Indicator	Actual
Overall Goal	Indicator 1: Number of water quality improvement measures applied by related organizations.	Services are being extended to MONRE/VEA and Environmental Monitoring Centers of local governments by VAST (IET) and are accepted or applied.
	Indicator 2: The rate of levying environmental protection charge for waste water increases.	A longer-term trend should have been reviewed. However, judging from the available short-term data, the ratio of the amount of the environmental protection charges actually collected against the amount planned shows an increasing trend.
	Indicator 3: The rate for industries to follow orders/administrative guidance increases.	A longer-term trend should have been reviewed. However, judging from the available short-term data, the ratio of the number of enterprises that violated regulations against the number of enterprises inspected shows an increasing trend.
	Indicator 4: The rate for industries to comply with the effluent standards increases.	Because the relevant data was only available from one province, it was not incorporated in this report.

Indicator 1: Number of water quality improvement measures applied by related organizations

Because no targeted values were set for indicator 1, it is impossible to examine the level of achievement quantitatively. According to the results of the beneficiary survey[12] carried out under the "Technology Project", C/P as well as Non-C/P responded that the recipients of scientific and technological services from VAST (IET) included MONRE/VEA (water sampling and analysis) at the central government, environmental monitoring centers at local governments (water sampling and water quality analysis) and so on. Scientific and technological services were extended not only to the target DONRE under the "Management Project" but also to DONRE in such provinces as Nghe An Province in the North Central Coast region and Tien Giang Province in the Mekong River Delta region. Furthermore, since Non-C/P, not only at the VAST (IET) head office but also at the branch offices, pointed out that they provided services to provincial governments, it is understood that services were being extended on a nation-wide scale. As for responses from recipients of the services, it was pointed out that participants in the training courses had applied for the technology for which they had received training during the courses for use in their own activities. The capacity of relevant organizations was reinforced by providing scientific and technological services such as water sampling and water quality analysis while development of the capacity of the relevant organizations was conducted through training. Furthermore, advice on technical aspects was provided from VAST (IET) to MONRE for the revision of the National Technical Regulations on the Environment, etc.

As for the effectiveness of the project and the development of the project purpose after the completion of the "Technology Project", the ratio of the proposals being approved has been maintained at a level of about 70% in terms of the number and quality of studies and the amount and quality of research on environmental management (Figure 2). This trend is considered to be a manifestation of the improvement in quality. Use of manuals and handbooks relating to management of the water environment was confirmed at the VAST (IET) head office and branch offices at the time of the ex-post evaluation, but the use of the documents was limited at the DONRE visited by the evaluator. One of the reasons of this limited use of the documents was found to be that VAST (IET) does not have the executive authority for use of the monitoring manual. On the other hand, because VAST

[12] In the beneficiary survey under the "Technology Project", a total of 21, consisting of 15 C/P and 6 Non-C/P, was selected at VAST (IET) head office and a total of 12, consisting of 6 C/P and 6 Non-C/P, was chosen at the branch offices through a purposive sampling method. Face-to-face interviews were conducted based on a questionnaire prepared in advance. Out of the respondents, 16 were male and 17 were female. Non-C/P received technology transfers from C/P in terms of methodologies and analysis technology (water sampling and analysis, interpretation of analysis results), techniques for the operation of equipment, the preparation of reports and research proposals and so on.

(IET) prepared and distributed technical documents having taken into account on-site needs, it can be said that VAST (IET) was able to boost awareness of itself on the part of governments as well as the industrial sector. At the same time, this signified an improvement in the capacity of VAST (IET) for the provision of scientific and technological services. The number of permanent researchers at VAST (IET) did not greatly change after project completion. According to VAST (IET), they have been asked to slash the number of permanent employees, who are subject to payments out of government budgets, by 10% towards 2021. As the demand for scientific and technological services has increased, response to the needs has been made by adjusting the number of contract-based researchers. Furthermore, according to the beneficiary survey conducted during the ex-post evaluation, the introduction of analytical equipment also contributed to reduction of labor and time for analysis. As VAST (IET) has faced difficulties in making a large increase in the number of researchers, the fact that it has coped with a demand increase by increasing its productivity is evaluated as a major accomplishment of the "Technology Project. "

As described above, development of the capacity of the Vietnamese authorities for protection of the water environment has been carried out by VAST (IET) on a nationwide scale. However, under the "Management Project", channels for nationwide dissemination and deployment in the development of capacity for enforcement were not clear as these activities were not incorporated in the project activities. This was in spite of the fact that the target DONRE whose capacity for enforcement was different, were selected as models for nationwide dissemination. For the target DONRE, causal relationships were, to some extent, confirmed by the use of alternative indicators but it was difficult to confirm the development of the capacity for enforcement on a nation-wide scale.

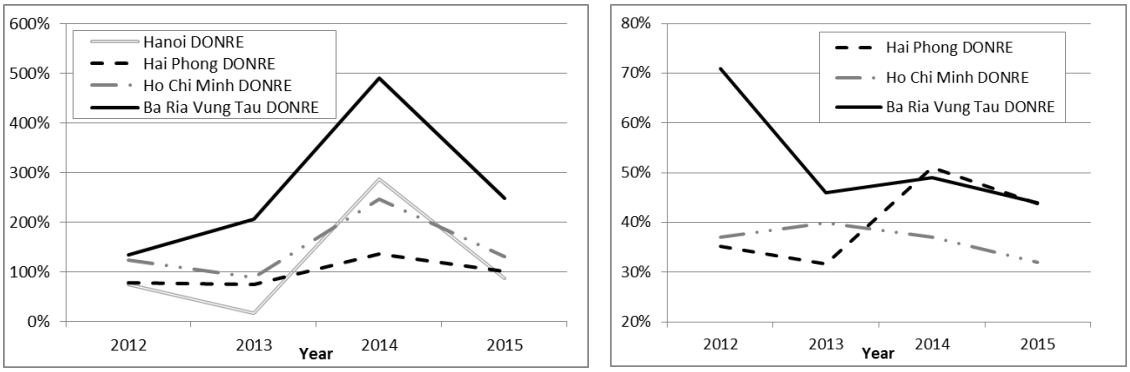
The following show the result of the evaluation based on the data with which DONRE among the target DONRE responded.

Indicator 2: The rate of levying environmental protection charge for waste water increases.

As seen from Figure 4 (left), the rate of levying environmental protection charges for waste water[13] varies by year but largely shows an increasing trend. Because this rate is affected by various factors, including changes in the unit rate of the water protection

[13] The environmental protection charges are collected based on the "Decree on Environmental Protection Charges for Waste Water" and refer not only to industrial waste water but also to household waste water. The original indicator, the rate of levying an environmental protection charge for waste water, can be defined as "the rate (%) of the number of entities that pay the charges over the number of entities that should pay the charges. " However, it is difficult to identify the number of entities that should pay the charges. Therefore, as an alternative indicator, the rate of the amount of environmental protection charges actually collected over the amount of environmental protection charges planned to be collected was calculated.

charges, it is difficult to clarify a causal relationship with enhancement in the capacity for enforcement. However, based on the interviews with the target DONRE, the following causal relationship is envisaged. In calculating the environmental protection charges, DONRE check the volume and quality of waste water declared by enterprises and then determine the amount of the environmental protection charges. In this process, DONRE collect water samples, conduct water quality analysis, check flows of waste water in treatment facilities, and then calculate the amount of environmental protection charge to be paid. It was explained that know-how for these activities had been improved through implementation of the "Management Project". In addition, at the target DONRE where the Pollution Source Inventory (hereinafter referred to as "PSI") was being utilized, the identification of pollution sources by the use of PSI is one of the contributing factors in an increase in the collection rate of environmental protection charges.



Source: Respective target DONRE
Note 1: Some target DONRE experienced big changes in the collection rate of environmental protection charges in 2013 and 2014 because of a revision of the unit charge rates and the calculation method from July 2013 which was due to effectuation of the revised "Decree on Environmental Protection Charges for Waste Water" and also because of differences in the timing of application of the said decree at the respective target DONRE.
Note 2: The number of enterprises subject to inspection is affected by the inspection results of the previous year as well as the budget for the reference year. As it is difficult to specify the sector, violations are not limited to the water environment sector.

Figure 4: Rate of levying environmental protection charges (left) and the rate of the number of enterprises that violate regulations over the number of enterprises subject to inspection (right)

Indicator 3: The rate for industries to follow orders/administrative guidance increases.

An alternative indicator was set to examine the rate of the number of enterprise that violated regulations over the number of enterprises on which inspections were conducted.[14] As shown in Figure 4 (right), although the data shows an increase or

[14] Violations include those concerning the quantity and quality of waste water discharged, waste water discharged without treatment, the quantity and quality of air pollution discharged, air pollution discharged without treatment, EIA and so on. The original indicator was the rate (%) of the number of entities that followed orders over the number of entities that received orders. However, it was difficult to ascertain the number of orders / amount of administrative guidance that DONRE made to enterprises and also difficult to grasp the number of enterprises that responded to such orders and improved conditions. Therefore, an alternative indicator was introduced for the analysis.

decrease depending on the years in question, an improving trend can be observed. It was pointed out that the reasons behind this improvement were, among others, a toughening of laws and regulations including an increase in the amount of fines, activities for the raising of awareness, an increase in the awareness of local people and so on. As for the specific contribution made by the "Management Project", an increase in the effectiveness of inspections was pointed out. Although it is hard to verify a causal relationship between improvements of the indicator and inspections, development in the capacity for inspections was carried out through the project activities. The following concrete examples were given to explain the development of capacity for inspection: understanding of inspection activities, preparation work for inspections including the preparation of an inspection plan, understanding of waste water discharge systems, pinpointing of violations committed by enterprises and so on.[15]

At the time of the ex-post evaluation, the effectiveness and development of the outputs after completion of the "Management Project" were examined. At MONRE, following revision of "LEP", revision and new enactment of sub-laws (Decrees, Decisions, Circulars etc.) were continued to be carried out[16]. Basic technology such as water quality monitoring, water quality analysis and inspections are primarily required for management of the water environment. Laboratories at four target DONRE but not at the Ho Chi Minh DONRE where a laboratory does not exist, acquired and updated accreditation under the Viet Nam Laboratory Accreditation Scheme (hereinafter referred to as "VILAS"). Hue DONRE where a laboratory was newly established acquired accreditation in July 2016 (refer to Columns 1 and 2 below).[17]

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[15] The beneficiary survey was conducted under the "Management Project", and a total of 55 people were interviewed through a face-to-face interview method and a group interview method. Interviewees were C/P and Non-C/P from MONRE, the target DONRE (5 from MONRE, 12 from Hanoi, 9 from Hai Phong, 6 from Hue, 6 from Ho Chi Minh and 6 from Ba Ria Vung Tau) and non-target DONRE (2 from Hung Yen, 5 from Da Nang and 4 from Long An). There were 28 male and 27 female interviewees. In addition, a total of 13 enterprises was chosen in Hanoi (7 enterprises) and Ho Chi Minh city (6 enterprises) and a total of 24 local people was selected through a purposive sampling method for face-to-face questionnaire-based interviews. 12 males and one female were interviewed at enterprises, on average being in their 30s. With regard to local personnel, 13 males and 11 females were interviewed, on average being in their 40s. Interviewees at enterprises commented that the DONRE process of checking, inspection and activities to increase the awareness of enterprises of environmental issues was effective while it was also good to take different measures for enterprises that comply with environmental protection laws / regulations and those that do not comply, to provide updated information on laws and regulations on a web-site, to increase coordination between checking and inspections, to request more training courses and so on. Meanwhile local people mentioned the strengthening of awareness-raising activities, the importance of organizing training, the enhancement of inspections on enterprises and so on.

[16] The "Management Project" supported revision of the "Decree on the Handling of Law Violations in the Domain of Environmental Protection" (117/2009/ND-CP). The revised decree, the "Decree on the Sanction of Administrative Violations in the Domain of Environmental Protection" (179/2013/ND-CP), took effect in December 2013, which was after completion of the project. It was pointed out that due to revision of the decree, the amount of fines for violations increased significantly and that the definition / criteria and the level of violations were clearly stated. The revised decree made it easier for enterprises and local officials to comply with and apply regulations in addition to increased transparency of the law and regulations.

[17] Information was updated in September 2016 after completion of the field survey.

[Column 1: Acquisition of VILAS Accreditation]

Target DONRE under the "Management Project" acquired VILAS accreditation and periodically updated their status. It is evaluated that they have maintained and developed their technology level. VAST (IET) head office and Ho Chi Minh City branch office (CET) also acquired VILAS accreditation under the "Technology Project" and updated their status.

Name of Organization	Year in which VILAS was acquired (number of parameters accredited for water quality analysis)⇒ Most Recent Year in which VILAS was updated (number of parameters accredited for water quality analysis)	Year in which VIMCERTS was received
VAST (IET) head office	2009 (48) ⇒2015 (110)	2015
DANETC (branch office of VAST (IET) in Da Nang city)	Not accredited	2015
CET (branch office of VAST (IET) in Ho Chi Minh city)	2010 (22) ⇒2015 (36)	2014
Hanoi DONRE	2007 (about 50) ⇒2013 (16)	2015
Hai Phong DONRE	2008 (19)	2014
Hue DONRE	2016 (41)	2014
Ba Ria Vung Tau DONRE	2004 (20) ⇒2015 (24)	2014

Note 1: The data at VAST (IET) head office is a sum of the data at two laboratories that received support under the "Technology Project". No laboratory exists at the Ho Chi Minh DONRE.
Note 2: VIMCERTS is issued by MONRE. It certifies that a company is competent to operate the environmental monitoring services in accordance with Decree 127/2014.
Note 3: The Hanoi DONRE had their accreditation annulled once in 2012 and got accredited again in 2013.
Note 4: Ba Ria Vung Tau DONRE experienced a decrease in the number of parameters accredited due to malfunctions of equipment. However, the number of parameters increased once again after they updated accreditation with the equipment introduced under the "Management Project".

Some of the target DONRE did not update PSI, but utilized them in a limited manner,[18] for example using information from PSI that had been prepared during the project cooperation period. With regard to output 3, it was confirmed at the time of the ex-post evaluation that the draft outline of water pollution control measures, which was expected to be submitted to the Hanoi People's Committee, had yet to be modified based on "LEP" revised in 2014. However, the Hanoi DONRE uses relevant parts of the inspections and inventories in the draft outline of the water pollution control measures for their reference. Activities for the promotion of awareness (relating to output 4) were also carried out at the time of the ex-post evaluation. With regard to output 5, it was not confirmed whether or not the draft of the "water environmental information procedure in terms of collection, management and utilization" had been institutionalized. However, at the time of the ex-post evaluation, a circular was being prepared for issuance, which would regard CEID as the unit for the consolidation of information and reports on environmental protection from DONRE.

[18] It was pointed out that the reasons behind the limited use of PSI were financial burdens required to update PSI and difficulties in using the software concerned. One of the target DONRE also pointed out the necessity of establishing a legal basis in order to introduce PSI.

[Column 2: Results of Analysis on Sample Water]

The table on the right shows the results of water quality analysis at the target DONRE and non-target DONRE where water samples were brought for the analysis. The analysis aims to find out whether or not the result falls within an acceptable range. The results of the analysis[19] were received from four target DONRE and three non-target DONRE. It is judged that the target DONRE revealed that they maintained a relatively high capacity for water quality analysis.

The number of parameters that falls within the acceptable range	No. of target DONRE under the "Management Project"	No. of non-target DONRE
All the 7 parameters	2	0
6 parameters	0	1
5 parameters	1	0
4 parameters or less	1	2

Note: There is a limitation over comparison of the results of the analysis. They are: (1) the judgement is based on the results of one-time analysis; (2) all the water samples were prepared on the same day but the starting time of the analysis was different depending on DONRE, which may have led to quality changes of the water samples; and (3) different DONRE used different methods to analyze same parameters.

With regard to strengthening of the capacity for enforcement, effectiveness was confirmed for the target DONRE where the causal relationship between effectiveness and the project activities was recognized to some extent. However, the causal relationship between dissemination / deployment activities for other DONRE and the achievement of the overall goal was not clear. The project achieved its overall goal to a limited extent.

3.2.2.2 Other Impacts

The beneficiary survey at VAST (IET) revealed that VAST (IET) provided scientific and technological services not only to MONRE and DONRE but also to a wide range of organizations such as the Environmental Police (training courses on equipment for water quality analysis), enterprises (water sampling and water quality analysis, monitoring of waste water), universities (monitoring technology), hospitals (technology for the installation of waste water treatment systems), private enterprises such as industrial parks (training courses on water quality analysis, etc.) and manufacturers (technology for the installation of waste water treatment systems, etc.), thereby contributing to capacity development of the organizations concerned[20].

Since these projects have achieved the project purpose and to some extent the overall goal, the effectiveness and impact of the projects are fair. For the project purpose, capacity development of MONRE as well as the target DONRE has been achieved. As for the overall goal, strengthening of capacity for enforcement of MONRE and the target DONRE was partly

[19] Water quality analysis was requested for the following basic parameters: Chemical Oxygen Demand (COD), Nitrate Nitrogen, Ammonia Nitrogen, Phosphate Phosphorus, Chloride, Lead and Cadmium. If a result is about 3% away from the acceptable range, it is considered to be within the acceptable range.

[20] Referring to the effectiveness of the "Technology Project", Vietnam Academy of Science and Technology (hereinafter referred to as "VAST") commented on achievements VAST (IET) made at the time of the incident, which took place in the provinces of the central region due to serious water pollutions caused by a steel company in 2016. According to VAST, VAST (IET) played a key role in finding out the cause of fish death by making use of their analytical skills improved and equipment provided under JICA supported-projects including "Technology Project".

confirmed with the related indicators. However, although the development of capacity for protection of the water environment through the "Technology Project" was confirmed at a nation-wide level, there was difficulty in confirming dissemination effects from the viewpoint of the development of the capacity for enforcement on the part of DONRE.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

Inputs	Plan	Actual (at project completion) [note]
(1) Experts	[Technology Project] 4 long-term experts, short-term experts [Management Project] 2 long-term experts, 2 short-term experts Short-term team (7 persons)	[Technology Project] 11 short-term experts (80 MM expected at the terminal evaluation) [Management Project] 2 long-term experts (72.0 MM) Short-term expert team consisting of 17 experts (135.9 MM)
(2) Trainees received	[Technology Project] 2 to 3 persons per year [Management Project] Training in Japan every year	[Technology Project] Training in Japan: 9 persons Study tour in Japan: 5 persons Study tour in Thailand: 8 persons [Management Project] Training in Japan: 37 persons in total for 3 times
(3) Equipment	[Technology Project] Atomic Absorption Spectrophotometer, Gas Chromatograph Mass Spectrometer (GC-MS), etc. [Management Project] Minimum equipment necessary for project activities	[Technology Project] Atomic Absorption Spectrophotometer, Gas Chromatograph Mass Spectrometer (GC-MS), etc. 1,264,781US$ [Management Project] Main equipment: Multi-parameter water quality analyzer, Atomic Absorption Spectrophotometer instrument and its parts, Decomposition analysis kit for Kjeldahl nitrogen, etc. 340,200 US$
(4) Others	[Management Project] - Workshops in Viet Nam (Hanoi, provinces (north, central and southern regions)) - Local consultants	[Management Project] - Workshops in Viet Nam - Activity cost in Viet Nam (local consultants, sub-contracts, operating expenses) 1,172,510US$
Japanese Side Total Project Cost	[Technology Project] 390 million yen [Management Project] 641 million yen	[Technology Project] 534 million yen [Management Project] 670 million yen
Vietnamese Side Operational Expenses	[Technology Project] Allocation of C/P and other staff, preparation of land, buildings, project offices, and other supplementary facilities and equipment, C/P fund [Management Project] Assignment of C/P, office space and facilities at MONRE and the target DONRE, necessary expenses	[Technology Project] Allocation of C/P and other staff, preparation of land, buildings, project offices, and other supplementary facilities and equipment, C/P fund 7,665 million VND in total [Management Project] Assignment of C/P, office space and facilities at MONRE and the target DONRE, operating expenses: 1,407 million VND in total[21]

* MM stands for man month.
Note: At the time of the terminal evaluation in the case of the "Technology Project".

[21] Depending on the province, the appropriation of the C/P budgets was different. As one of the reasons behind the different degrees of their engagement in the project, it was pointed out that local governments were not signatories of the agreement concluded for the project between JICA and the Vietnamese side. It is also thought that a delay in the approval of the project documents by GOV affected the timing of outlays of the C/P budgets.

3.3.1.1 Elements of Inputs

Under the "Technology Project", all the Japanese experts were dispatched on a short-term basis. In the case of the "Management Project", long-term experts took charge of activities relating to aspects of policy (output 1) and information management (output 5) while a short-term expert team carried out technology transfers relating to the respective technical fields (outputs 2 to 4). In the plan, both types of experts were expected to work in harmony like two wheels of a single vehicle. However, due to a delay in the procurement procedures of the short-term expert team, its mobilization was delayed by more than half a year. At the same time, as they were affected by differences in contractual arrangements with JICA, both types of experts did not necessarily carry out their respective tasks in a well-coordinated manner, especially at the beginning of the project. The short-term expert team was required to carry out a wide scope of activities in distantly-located provinces in a shorter period of time than originally planned[22]. The short-term expert team accomplished their tasks by increasing the number of experts together with the employment of local experts as well as through sub-contractual arrangements with local consultants[23].

In terms of the supply of equipment, equipment was provided to the VAST (IET) head office as well as the two branch offices under the "Technology Project". In the case of the "Management Project", equipment was delivered to the Hue DONRE where assistance was originally planned for the establishment and operation of a laboratory. Later, having also received requests from other DONRE, equipment was additionally supplied to all five DONRE although the amount of the assistance differed according to the DONRE. As for additional equipment, it was pointed out that delivery of equipment was not necessarily well-coordinated with the implementation of training on how to operate the equipment, partly due to a delay in the procurement procedures.

The "Management Project" improved the laboratories at the Hue DONRE as well as at the Ba Ria Vung Tau DONRE by making use of the two branch offices of VAST (IET). In this respect, the effects of good collaboration between these two projects[24] were observed.

[22] At the time when the "Management Project" was formulated, it was scheduled that the project would be carried out initially for three years and then would run into the next phase after realization of the effects had been confirmed.

[23] Not only Japanese experts but also Vietnamese C/P bore large workloads. Vietnamese C/P who had a more limited amount of resources for use were recipients of technology transfer. At some target DONRE visited by the evaluator during the ex-post evaluation, it was pointed out that at the time of the preparatory survey or the detailed planning survey, a detailed study should have been carried out to comprehend the real conditions where the availability of local resources (human, time and financial resources) would be limited during the cooperation period of the project. Comments were also made regarding the expectations of long-term engagement for enhancement of the capacity for management of the water environment. Under the "Management Project", basically similar types of activities were carried out at the respective target DONRE in consideration of developing models while taking into account differences in the capacity, approaches and issues, and diversity among the target DONRE. However, in the interviews with the target DONRE, some pointed out that it was important to further narrow down and focus on high-priority areas for technology transfer, which would meet their needs.

[24] Other than these examples, a number of occasions when there was collaboration between the projects were

In addition, JICA Senior Volunteers were dispatched to the branch offices of VAST (IET) for a certain period of time. Good interactions between a JICA Senior Volunteer and short-term experts of the "Technology Project" at Ho Chi Minh branch office were reported, based on the demarcation of their roles and responsibilities[25] at the office.

3.3.1.2 Project Cost

The actual project cost of the "Technology Project" amounted to 534 million yen against the planned amount of 390 million yen. Meanwhile, the actual project cost of the "Management Project" was 670 million yen against the planned amount of 641 million yen. The actual project costs of both projects exceeded the original plans (137% against the plan in the case of the "Technology Project" and 105% against the plan in the case of the "Management Project")[26]. In the case of the "Technology Project", the procurement of spare parts, etc. was carried out during the extended cooperation period of the project. In the case of the "Management Project", it is assumed that the provision of additional equipment and an extended period of experts dispatched due to the equipment provision would partly explain the increase in the project costs.

3.3.1.3 Period of Cooperation

The period of cooperation of the "Management Project" was as planned, but the period exceeded the plan in the case of the "Technology Project" by 15%. Under the "Technology Project", the period of cooperation was extended in order to identify the ways in which spare parts were to be secured. Although the project cooperation period exceeded the plan, VAST (IET) claimed that the extension contributed to improvements in the sustainability of the project effects.

Both the project cost and the project cooperation period exceeded the plan in case of the "Technology Project" while the project cooperation period fell within the plan but the project cost exceeded the plan in the case of the "Management Project". Therefore, efficiency of the project is fair.

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confirmed. For example, under the "Technology Project", guidelines and manuals were prepared for DONRE as prospective users. In addition, in order to strengthen the capacity of VAST (IET) in a manner consistent with the needs of DONRE, short-term experts dispatched under the "Technology Project" participated in the preparatory survey for the "Management Project" at the time of the project formulation of the latter.

[25] For example, short-term experts were normally stationed in Hanoi. They made short visits to CET and provided spot-type assistance for limited purposes. On the other hand, a JICA Senior Volunteer dispatched to CET provided assistance for laboratory operations and analytical technology, contributing to the smooth application of VILAS by CET.

[26] The actual costs of these projects are more or less at the same level. However, differences are found in the fact that the inputs were concentrated on VAST (IET) in the case of the "Technology Project" while the inputs were distributed across MONRE and the target DONRE in the case of the "Management Project".

3.4 Sustainability (Rating: ③)

3.4.1 Related Policy and Institutional Aspects for the Sustainability of Project Effects

After about 10 years had passed since the last revision of "LEP", "LEP" was revised again in 2014 in order to address issues identified through practical application of the law, such as unclear sharing of authority and responsibilities among government agencies and regulations that were not backed up with practical measures; also to accommodate complicated and diversified environmental policies and changes that had taken place in the condition of society. In the revised law, the development and application of science and technology activities were again prioritized, including pollution control technology, environmental monitoring and so on. Furthermore, the revised law also streamlined authority and responsibilities among ministries such as MONRE, and People's Committees. Following this revision of the law, many relevant laws and regulations were scheduled to be revised or newly enacted. Re-revision of the "Decree on the Sanction of Administrative Violations in the Domain of Environmental Protection", the revision of which was supported by the "Management Project", is one such example. The sustainability is considered to be high in the related policy and institutional aspects.

With regard to the "Technology Project", it was envisaged that the existence and/or establishment of public and private research institutes, which might to a certain extent compete with VAST (IET), was expected to have some impact on the role of VAST (IET) at the time of the terminal evaluation. At the time of the ex-post evaluation, the evaluator learned of the existence of such competitors, particularly at the branch office in Ho Chi Minh City. On the other hand, it was also confirmed that the number of contracts concerning scientific and technological services provided by VAST (IET) had steadily increased despite the presence of such competitors. Meanwhile, it was discovered that VAST (IET), being different from other institutes in the field of water quality analysis, also dealt with the items or parameters that other institutes found it difficult to analyze[27].

3.4.2 Organizational Aspects of the Implementing Agency for the Sustainability of Project Effects

It was expected that the organizational capacity for the carrying out of planned activities in order to achieve the objectives for management of the water environment, which had been acquired through the "Management Project", would be maintained through daily implementation at the relevant departments within MONRE and the target DONRE. This was also confirmed at the time of the ex-post evaluation. With regard to the "Technology

[27] As a reason behind this statement, VAST (IET) pointed out the level of the equipment and facilities for analysis and the research skills of the researchers. It was learned on visits to some DONRE at the time of the ex-post evaluation that although they had laboratories and conducted water quality analysis, they still asked VAST (IET) to also carry out water quality analysis.

Project", as of January 2016, VAST, to which VAST (IET) belongs, concluded Memoranda of Understanding with 19 local governments including Da Nang city and Quang Ninh province and instituted a mechanism to discern local needs for assistance on a regular basis. Furthermore, VAST (IET) provides MONRE with advice on the technical aspects of policies upon request from MONRE. Forms of employment for researchers are basically classified into permanent and contract-based. There are two permanent researchers, particularly at CET, one of the branch offices. The ratio of permanent researchers at CET is low if compared with the ratios of those at the head office and DANETC. While VAST (IET) was required to cut back on the number of permanent researchers, it can be seen that adjustment of the number of contract-based researchers has been made in order to cope with the increases in demand for water quality analysis and so on. One future issue will be to provide incentives for research to contract-based researchers, whose payment would be based on earned values, while at the same time, enhancing the capacity for research at the branches from now on.

3.4.3 Technical Aspects of the Implementing Agency for the Sustainability of Project Effects

MONRE has continued to apply experience and technology gained from the "Management Project" for revisions of the sub-laws of "LEP" and so on. The utilization of experience and technology is also expected to continue. Basic technology such as that for water quality monitoring, water quality analysis and inspections are used in the daily activities at the target DONRE and this use is expected to continue. Some target DONRE have introduced new software for PSIs, and either have gone on to update or plan to update the information. Activities for the promotion of awareness were conducted even before implementation of the project. These activities are expected to continue after project completion.

As for the "Technology Project", the need for science and technological services is also expected to expand from now on. It is expected that properly-maintained advanced level equipment for analysis, analytical technology and quality assurance / quality control for analysis will meet the need. The sustainability of technology can be seen in the acquisition and subsequent updating of laboratory accreditations, the number of studies and the amount of research, the number of contracts for scientific and technological services and so on. However, the technology gap between the head office and the branches at VAST (IET) is thought to have been large.[28] VAST (IET) submitted applications for JICA Senior Volunteers even after project completion, involved its staff at the branch (CET) in Ho Chi Minh City in the activities carried out in the south, and sent staff for overseas training.

[28] As for data on research papers, for example, those by researchers at the head office accounted for most of the research papers in the field of water environment while the number of research papers by researchers at the branches was small. The availability of equipment for analysis and the number of researchers are thought to have caused this large technological gap.

Regarding the maintenance of equipment provided under the "Management Project", although there were problems with some equipment, which had been frequently used, most of the equipment was being well maintained and utilized. As for the equipment supported by the "Technology Project", maintenance and utilization are considered to have been more or less good. Some spare parts need to be procured from abroad, but inquiries about availability are made through domestic agents without any problems. The sustainability of both of the projects is considered to be high in the technical aspects.

3.4.4 Financial Aspects of the Implementing Agency for the Sustainability of Project Effects

Budgetary data were obtained from only a limited number of the target DONRE. The monitoring center at one target DONRE received revenue from services provided, such as water quality analyses at the center, in addition to government budgets. At the monitoring center at Ba Ria Vung Tau, the amount of service revenue has tended to increase as was the case with government budgets. Furthermore, the amount of the budgets for environmental protection[29] has also tended to increase. Study and research budgets and receipts and expenditures for the scientific and technological services of VAST (IET) are shown in Table 4 below. Part of the receipts is being utilized for repairs and repurchase of equipment. In the case of the "Technology Project", financial sustainability is considered to be basically high.

Table 4: Receipts and expenditures of VAST (IET) in the field of study/research and services

Unit: Million VND

Calendar Year	Study and Research						Science and Technological Services					
	2010	2011	2012	2013	2014	2015	2010	2011	2012	2013	2014	2015
Receipts	13,440	12,390	20,143	21,205	15,215	12,544	16,966	23,080	34,410	43,031	46,437	64,985
Expenditures	13,440	12,390	20,143	21,205	15,215	12,544	16,966	23,073	34,295	42,914	46,325	64,863
Net	0	0	0	0	0	0	0	7	115	117	112	122

Source: VAST (IET)

As for the "Management Project", information on financial conditions of the target DONRE were partly obtained. It was found out that in addition to government budgets, target DONRE that were equipped with laboratories also received revenue from services such as water quality analyses. It was also confirmed that the equipment had been

[29] The trend of the budgets for environmental protection is shown in the table below. Every year, one percent (1%) of the national budget is appropriated for the budget for environmental protection. Due to an increase in such charges as fees for EIA and the environmental protection charges, the amount of the budget in 2015 recorded a large increase in comparison with that in the previous year.

Unit: Billion VND

Calendar Year	2013	2014	2015
Budgets for Environmental Protection	9,772	9,980	11,400
Out of which: central government	1,172	1,450	1,700
Out of which: local governments	8,600	8,530	9,700

Source: Ministry of Finance obtained through MONRE

maintained in a relatively good condition. From these observations, it can be seen that no major problems have been observed.

Therefore, no major problems were observed in the background to policy and in the organizational, technical or financial aspects of the implementing agency. Therefore, sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

Out of the two technical cooperation projects subject to this ex-post evaluation, the "Technology Project" aimed to strengthen the scientific and technological base of VAST (IET), which was a C/P organization of the project. The goal of the "Technology Project" was to improve the capacity of the Vietnamese authorities for the protection of the water environment by making scientific and technological contributions to the administration offices, etc. that were concerned with improvement of the water environment. Under the "Management Project", technical cooperation was provided to strengthen the capacity of MONRE for preparing water environment management policy and systems, and to DONRE in five target provinces for the enforcement of water environment management, with the aim of disseminating technology to DONRE across the country.

These two projects were fully consistent with Viet Nam's development policies and needs, and with Japan's ODA policy. The implementation plan and approaches were considered appropriate. Therefore, relevance of the projects is high. The "Technology Project" aimed to further strengthen the scientific and technological base of VAST (IET) for improvement of the water environment. The project had largely achieved its purpose (same as the interim project purpose of the projects combined) by the time of project completion with all the outputs being accomplished. The "Management Project" strengthened the capacity of MONRE for preparing water environment management policy and systems, and the capacity of DONRE in the five target provinces for the enforcement of management of the water environment. Thus, the "Management Project" had largely achieved its project purpose by the time of project completion. However, the overall goal targeted all DONRE in the country. The ex-post evaluation confirmed that there had been an improvement in the capacity of Vietnamese authorities for the protection of the water environment by means of scientific and technological services, etc. of VAST (IET), and that, to a certain extent, cause-and-effect between the overall goal and project activities could be seen in improvements in the capacity for enforcement at the target DONRE. However, the relationship between activities to disseminate to and deploy technology at other DONRE and a mechanism leading to achievement of the overall goal remained unclear. Therefore, the achievement of the overall goal was not confirmed, particularly if the aspect of the capacity for enforcement at other DONRE was taken into

account. Since these projects have to some extent achieved the project purpose and overall goal, the effectiveness and impact of the combined projects are fair. Both the project cost and the cooperation period of the “Technology Project” exceeded the plan. While the cooperation period of the “Management Project” was within the plan, the project cost exceeded the plan. Therefore, the efficiency of these projects combined is fair. No major problems were observed in policy background, or in the organizational, technical and financial aspects of the implementing agency. Therefore, the sustainability of the project effects is high.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

Recommendations to VAST (IET)

There exists a large gap between the VAST (IET) head office and the branches in terms of their technological capacity. In order to provide a high-level scientific and technological service and to promote studies and research on a nation-wide scale, it is necessary that there is a further strengthening of the organizational and operational aspects, and of the scientific and technological base of the branches under the guidance of the VAST (IET) head office (i.e. strengthening of the administrative management and operation of the branches and technology transfer from the head office to the branches).

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

[Common for both projects]

Implementation of project activities with a conscious effort to collaborate with other relevant projects: After having their capacity enhanced by the “Technology Project”, the branches of VAST (IET) provided the target DONRE of the “Management Project” with technological guidance and, as a result, there has been collaboration between the two projects in such fields as water quality analysis and the maintenance and operation of laboratory equipment. It is recommended that JICA and the Implementing Agencies examine ways in which collaboration among projects may be enhanced when a program is formulated and ways in which the entire structure of a program may be shared among the parties concerned; and also that methods of collaboration may be studied and implemented at the activity-level of projects under a program, thereby contributing to further enhancement of collaboration.

Set-up of easy-to-understand PDM indicators: For some outputs and indicators of the PDM of the projects, it is difficult to understand the concrete states of achievements which are meant to be being indicated. When JICA and the Implementing Agencies set indicators for a project aiming to assist Implementing Agencies in strengthening their organizational, institutional and operational aspects, it is thought that they should be able to enhance a common understanding among personnel concerned by utilizing indicators which reflect the organizational and institutional features of the agencies concerned. For example, under the "Technology Project", the establishment and operation of an integrated network system was pursued at the output-level. However, through the interviews that were conducted at the time of the ex-post evaluation, it was seen that this network was not necessarily understood in a proper manner. It is thought that the understanding of personnel concerned would be enhanced by using terms that are easier to understand. It is considered important to select indicators and data that can be collected through the daily routine activities of Implementing Agencies and that can be measured quantitatively and objectively.

["Management Project"]

Set-up of an appropriate overall goal: The overall goal was set for DONRE across the country. However, if causal relationships with project activities to enhance the capacity of the target DONRE are taken into account, one can see that the target had been placed at quite a high level. In addition, the indicators corresponding to the overall goal are not clear in terms of the causal relationship with the project activities. It was not certain either if the relevant data could be collected, even at the time of the terminal evaluation. At the interim of the project cooperation period, JICA and the Implementing Agencies should examine whether the achievement level of the overall goal is appropriate, whether or not it is easy to collect data for the indicators by using data available, and whether a causal relationship with the project activities is clear.

Continuous commitment to address long-term issues with a simplification of the project scope: Although the original cooperation period of the "Management Project" was relatively short (i.e. three years), a wide range of project activities was carried out at the five target DONRE located in the north, central and southern regions. As many activities were implemented within a short period of time, the workloads of experts as well as C/P increased. On the other hand, the project was one of the projects in the "Viet Nam Urban Water Environment Management Program". Considering that this program was comprised of various projects, at the time of project formulation, JICA and the Implementing Agencies could have narrowed down the contents of the technology transfer to be carried out within the cooperation period of the project, as well as making simplifications to the project scope and implementation system, then selecting DONRE so as to respond to their needs. In addition, when a long-term approach is required for issues

like environmental problems, the Vietnamese side would like a long-term commitment on the part of JICA to any concerned program.

Promotion of direct engagement of local governments in the project: As the amount of the C/P budgets of local governments differed from province to province, and the extent to which local governments were engaged in the "Management Project" was different depending on the province. As seen from the Vietnamese signatory of the initial agreement with JICA, one of the issues of the project was that active involvement in the project was limited to the central government only at the time when an agreement was concluded. In formulating a new project where local governments are expected to play a large role during and after implementation, it is important that the role that local governments are expected to play in the project is clearly stipulated and that their commitment is confirmed. This can be done, for example, by requesting them to sign an agreement concurrently with the conclusion of the agreement with JICA. This would promote the direct engagement of local governments, which will play a central role in local administration, during the cooperation period and enhance sustainability after project completion.

Consideration of a balance among provinces and attention to the respective needs of provinces: Where assistance was extended to more than one province under the "Management Project", at the beginning of the project, only a limited number of the target DONRE was assisted with equipment. However, after other DONRE realized that they were not recipients of equipment, equipment was strongly demanded. The needs for additional support in terms of equipment to other DONRE were decided through on-site surveys. However, due to a delay in the procedures, the timing of the operation training of equipment did not necessarily match the timing of the installation of equipment. When support is extended to more than one organization at the same level or rank of government organizations, it is important for JICA and the Implementing Agencies to review and examine whether or not the extent of support among the different organizations of the same rank is balanced. Then, support that matches the needs of the respective organizations should be extended for the smooth implementation of an entire project.

Attachment

Summary of PDM of the "Technology Project" and the "Management Project"

Item	Technology Project	Management Project
Overall Goal	The capacity of Vietnamese authorities related to water environment protection will be improved (the overall goal of "Technology Project" has been included in the overall goal of the combined projects).	Enforcement capacity of MONRE and DONREs on water environmental management is strengthened (the overall goal of the combined projects).
Project Purpose	Scientific and technological basis of VAST (IET) for the improvement of the water environment will be further strengthened (the interim project purpose of the combined projects).	Capacity of MONRE and target DONRE regarding water environmental management is strengthened (the project purpose of the combined projects).
Outputs	Output 1: Integrated network system that aims at bringing the VAST (IET) head office and branches (Ho Chi Minh and Da Nang), and thereby ensuring the synergy effects in dealing with nationwide environmental issues, is established and operated. Output 2: Scientific and technological level of VAST (IET) head office and branches (Ho Chi Minh and Da Nang) on water environment monitoring / evaluation / countermeasures is enhanced through the effective operation of integrated network system and so forth. Output 3: Capacity of VAST (IET) on practical scientific and technological services in the field of water environment is strengthened.	Output 1: MONRE's capacity of making policy and management tools that are more effective and enforceable is strengthened. Output 2: Enforcement capacity of target DONRE on basic water pollution control (environmental monitoring, pollution sources inventory, pollution sources inspection) is strengthened. Output 3: Target DONRE' capacity of making effective water pollution control measures is strengthened. Output 4: Target DONRE' capacity of promoting awareness of public and industrial sectors on water environment is strengthened. Output 5: Capacity of MONRE and DONRE on information management and utilization is strengthened.

Socialist Republic of Viet Nam

FY2015 Ex-Post Evaluation of Technical Cooperation Project

"The Project for Environmental Protection in Halong Bay"

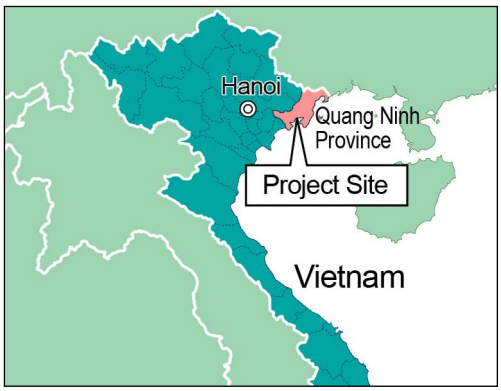
External Evaluator: Junko FUJIWARA, OPMAC Corporation

0. Summary

The intention of this project was to strengthen the implementation capacity on management of natural resources and environment for sustainable tourism in the Halong area by the end of the project period. Pollution would thereby be prevented together with the prevention on destruction of natural resources and the environment in Halong Bay and its vicinity.

The project relevance is high as project implementation was in line with Viet Nam's development plan and development needs, as well as with Japan's ODA policy. The project largely achieved its purpose by implementing the planned activities through achieving the five outputs: 1) improvement in the organizational and institutional coordinating function for the management of natural resources and environment; 2) enhancement of environmental monitoring, environmental inspection skills, and capacity for administrative guidance; 3) development of appropriate measures for land use management in coastal areas; 4) strengthening the capacity for preparing measures for sustainable tourism, and; 5) implementation of environmental education and raising of public awareness, and dissemination of such results. Although numerous efforts to control the occurrence of pollutants were made to prevent pollution and the destruction of natural resources and environment, it was difficult to confirm the effects that were expected after the project at the time of this ex-post evaluation. Therefore, it is concluded that the effectiveness and impacts of the project are fair. The project cost was slightly higher than planned, while the period of the cooperation was as planned, so the efficiency of the project is deemed to be fair. The sustainability of the effects realized by this project is high. The direction of policy, the institutional, organizational, technical and financial aspects are at a level to enable the project effects to last after completion of the project.

In light of the above, this project is evaluated to be satisfactory.



Project Location

Tuan Chau Port where tourist ships are anchored.

1. Project Description

1.1 Background

Halong Bay, which belongs to Quang Ninh Province, is located in the north of Viet Nam, and forms a unique seascape of numerous islets and precipitous rocks. It was designated as a UNESCO World Natural Heritage Site in 1994[1] and is one of the most famous tourist spots in Viet Nam having been visited by as many as 2.5 million domestic and international tourists in recent years. The province as a whole, however, is designated as one of the major industrial development areas in the northern part of the country having large-scale coal production and traffic importance. The area surrounding Halong Bay has experienced rapid industrialization and an expansion in urban areas where coal mine development and the construction of cement factories, brick factories, and power plants were observed. There have been serious adverse environmental impacts caused by the discharge of water and waste from coal mines and factories, together with increasing domestic waste water and solid waste from the expanding urban areas and the growing number of tourist facilities. Furthermore, there has also been mangrove deforestation, soil erosion into the sea, uncontrolled land reclamation and the discharge of water, oil and waste from vessels.

With this background, this project commenced with the objective of strengthening the capacity for implementing the management of natural resources and environment for sustainable tourism in the Halong area.

[1] Out of ten selection criteria explained in the "Operational Guidelines for the Implementation of the World Heritage Convention", Halong Bay was considered to meet two: '(vii) to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance', and; '(viii) to be outstanding examples representing major stages of the earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features'. It was added to UNESCO's World Heritage List second to the Complex of Hue Monuments (cultural heritage) in Viet Nam.

1.2 Project Outline

Overall Goal		Pollution and destruction to natural resources and the environment is prevented in the Halong Bay (World Heritage) and its vicinity: Halong City, Cam Pha Town and Hoanh Bo District, Yen Hung District, and Van Don District of Quang Ninh Province.
Project Purpose		Implementation capacity for natural resources and environmental management for sustainable tourism in the Halong area is strengthened.
Outputs	Output 1	Roles of related organizations and institutional coordination for natural resources and the environment management in Quang Ninh Province are improved.
	Output 2	Environmental monitoring, inspection, administrative guidance in the Halong area are enhanced by DONRE and related organizations.
	Output 3	Appropriate measures for land use management on coastal areas of Halong Bay are developed for better balance between the environment and development in the Halong area.
	Output 4	Capacity for preparing measures for sustainable tourism in the Halong area is strengthened.
	Output 5	Effective environmental education and public awareness are implemented and the outputs are shared with other areas.
Total cost (Japanese Side)		Approximately 346 million yen
Period of Cooperation		March 2010 to February 2013
Implementing Agency		Provincial People's Committee, Department of Natural Resources and Environment, and relevant organizations in Quang Ninh Province
Other Relevant Agencies / Organizations		N/A
Supporting Agency / organization in Japan		Ministry of the Environment, Overseas Environmental Cooperation Center, University of Kitakyushu, Nippon Koei Co., Ltd.
Related Projects		- "Environment Improvement Master Plan for Halong Bay" (Development Study) (1997 to 1999) - "Project for Institutional Development for Green Growth Implementation and Strengthening of Environmental Management System towards Sustainable Conservation for the Halong Bay" (Project Formulation Survey) (FY2015 to FY2016 (planned)) - "Ha Long City Water Environment Improvement Project (E/S)" (ODA loan) (L/A signed in July 2015)

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement Status of Project Purpose at the Time of the Terminal Evaluation

It was assessed in the Terminal Evaluation conducted in November 2012 that the objective verifiable indicators (OVIs) had been either already observed or were likely to be observed. As a result of the analysis based on the situation at the time of the terminal evaluation, it was thought that the project purpose was likely to be achieved by the end of the project period.

1.3.2 Achievement Status of Overall Goal at the Time of the Terminal Evaluation

Although some facts indicating the contribution of the project to the overall goal were confirmed, it was judged too early to assess the prospects of the achievement of the overall goal as there was not sufficient evidence to prove the likelihood of achievement.

1.3.3 Recommendation at the Time of the Terminal Evaluation (including other impacts)

The following seven recommendations were made at the time of the Terminal Evaluation:

- "The Environmental Protection for Sustainable Tourism Strategy" (EPSTS) should be formulated in a holistic manner;
- In the preparation of EPSTS, it is recommended that more effort is made to ensure good collaboration among WGs and that attention is paid to links between the outputs of WGs.
- Such exercises as prioritizing the individual actions and plans comprised in EPSTS, and focusing on the core parts of the proposals of EPSTS would be particularly useful.
- In the course of the preparation of EPSTS, it is advisable that QN PPC's existing and planned plans/programs are fully taken into account to ensure synergy. In this regard, it is also advisable that the measures/plans proposed by the project are reflected in or incorporated into the relevant Master Plans in the development sectors.
- It is strongly recommended that priority measures in EPSTS be duly incorporated into the QN PPC new development strategies including the "Green Growth Strategy", and that there is QN PPC commitment for their implementation
- It is recommended that the inter-organizational network drives proactive participation on the part of stakeholders from the viewpoint of a bottom-up approach.
- It is highly recommended that preparation for the organization of a kind of standing committee should be made as soon as possible. This committee should take over the tasks undertaken by the Committee for Environmental Management (hereinafter as "CEM") in order to ensure the implementation of EPSTS.

The relevant officials of Quang Ninh Province confirmed in an interview in this ex-post evaluation that all the above recommendations had been implemented after the project ended.

In other words, EPSTS was finalized through close collaboration and cooperation among relevant people in the project. The development strategy of Quang Ninh Province reflected EPSTS with the aim of sustainable tourism and environmental conservation. The People's Committee of Quang Ninh Province showed a strong commitment and took leadership in promoting the Green Growth Strategy. A Committee for Green Growth was organized as a standing committee for promoting the province's overall strategy.

2. Outline of the Evaluation Study

2.1 External Evaluator

Junko FUJIWARA, OPMAC Corporation

2.2 Duration of Evaluation Study

Duration of the Study: October 2015 – September 2016

Duration of the Field Study: January 3 - 31, 2016, and April 2 - 16, 2016

2.3 Constraints during the Evaluation Study

The effects of the project outputs and sustainability were assessed in this ex-post evaluation through a questionnaire survey with the implementing agency followed by interviews to confirm answers. There were also beneficiary surveys[2] targeting 16 relevant project officials, ten tourists, ten local people, four tourist boat owners and seven local enterprises as reference for identifying whether or not there was any achievement in the project output and the degree of achievement, together with the extent to which the contribution had been made against the project purpose.

Due to time constraints and budget limitations, a sufficient number of samples enabling quantitative analysis were not secured in the beneficiary survey. The results are therefore referred to in this evaluation as qualitative information for reference.

[2] The beneficiary survey was conducted from 7 to 12 January 2016. The number of valid responses was 47. The Evaluator asked officials of the implementing agency, prior to the survey implementation, if the contents of the survey questionnaire were appropriate and revised them according to their replies. Eight males and eight females, were selected as recommended by the implementing agency, out of whom nine were from the Department of Natural Resources and Environment (hereinafter as "DONRE"), one from the Environmental Police Department, Provincial Police (hereinafter as "EP"), one from the Halong City People's Committee, one from the Viet Nam National Coal Mineral Industry Group, one from the Hoanh Bo District People's Committee, one from the Halong Bay Management Department (hereinafter as "HBMD"), one from the Provincial Women's Union (hereinafter as "WU"), and one from the Provincial Youth Union (hereinafter as "YU"). The breakdown of tourists, local people, tourist boat owners and local enterprises were: 19 females, 12 males; and by age, one in their 20s, eight in their 30s, ten in their 40s, six in their 50s, five in their 60s and one in their 70s. The survey with relevant project officials, local people and local enterprises was conducted within Halong City. Local enterprises were selected from the list owned by the implementing agency, whereas the survey for tourists and tourist boat owners was conducted in the sea port for Halong Bay world heritage tours.

3. Results of the Evaluation (Overall Rating: B[3])

3.1 Relevance (Rating: ③[4])

3.1.1 Relevance to the Development Plan of Viet Nam

In the "Five-year Socio-economic Development Plan 2006 - 2010", the national development plan of Viet Nam on which the planning of the project was based, environmental issues were one of three pillars along with economic and social issues. The development plan of the Red Delta Region where Quang Ninh Province is located put emphasis on environmental conservation with sustainable economic growth to be secured. On the other hand, the Quang Ninh Province's "Five-Year Socio-economic Development Plan (2006 to 2010)" prioritized the sustainable implementation of economic, industrial and tourism development as target development issues. Along with the development of the tourism and the coal industry (major income resources of the province), the conservation of the world heritage site, which was exposed to environmental destruction caused by the said industry development, was emphasized.

At the time of the ex-post evaluation of this project, policy direction continued to be the same at both national and provincial levels. One of twelve strategies in the national-level policy, the "Socio-economic Development Strategy for the Period of 2011 - 2020", was 'environmental conservation and improvement, and a positive and effective response to climate change', while the "Five-year Socio-economic Development Plan for the 2011 – 2015 Period" took over the mission of the "8th Five-year Socio-economic Development Plan 2006 - 2010." At provincial level, plans related to the sustainable development and environmental conservation of Halong Bay area were introduced such as the "Halong Bay World Heritage Comprehensive Management Plan (2011 to 2015)", the "Quang Ninh Province Climate Change Plan", and the "Land Use Plan and Five-Year Land Use Plan at District Level from 2011 to 2015."

In light of the above, at its completion, the project was found to be relevant to Viet Nam's national development plan and to the Quang Ninh Province sector development plan.

3.1.2 Relevance to Development Needs of Viet Nam

Quang Ninh Provincial People's Committee and JICA implemented a development study "Environment Improvement Master Plan for Halong Bay" (Development Study) (1997 to 1999) aiming at harmonization between the natural environment and economic development, utilizing environmental measures such as organizational and infrastructure development. However, at the time of project planning, it was apparent that there was no single common environmental conservation policy which had been developed by the province due to the fact

[3] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[4] ③: High, ② Fair, ① Low

that collaboration and coordination among the relevant authorities did not go well. It was confirmed that it was necessary to enhance the capacity of environmental management in terms of manpower and technology. It was also confirmed that the development and implementation of a land use policy with a good balance between development and the environment was needed.

The implementing agency confirmed at the time of project completion that there was still a need for strong and consistent organizational sustainability in terms of strengthening environmental management skills and organizational capacity. It was also confirmed that there was a similar need in the area of tourism development where there should be a good balance between sustainable economic development and environmental conservation.

To summarize, from project planning to completion, the development strategy formulated and implemented at provincial level required 1) environmental management skills, 2) organizational capacity development, and 3) land use policy development skills. Therefore, relevance with development needs at the time of project completion is confirmed.

3.1.3 Relevance to Japan's ODA Policy

This project was relevant to Japan's Assistance Policy as 'environmental conservation' was among those highly prioritized areas described in the country assistance policy of the Government of Japan toward Viet Nam (2009). The project was also categorized in the "Urban Water Environment Management Program" of JICA. The program aimed at 'improvement of water quality in public water areas and the reduction of pollution levels in order to meet the variable needs of water use in Viet Nam', for which the output 'improvement in the capacity of the Ministry of Natural Resources and Environment (hereinafter as "MONRE") and provincial DONREs dealing with the management of the urban water environment' was set. The project, which was concerned with environmental management skills in the region centering on the Halong Bay water area thus contributed to the accomplishment of the above program.

3.1.4 Relevance to Appropriateness of Project Planning and Approach

The Committee for Environmental Management, CEM, comprised of DONRE and other relevant departments, was established under the project and was chaired by the Vice Chairman of the Quang Ninh Provincial People's Committee[5]. Four working groups were

[5] 21 people from following the 19 organizations joined CEM: the JICA Viet Nam Office, MONRE, the Quang Ninh Provincial People's Committee, DONRE, thet Department of Planning and Investment (hereinafter "DPI"), the Department of Finance, the Department of Culture, Sport and Tourism (hereinafter "DOCST"), the Department of Construction, the Department of Education and Training (hereinafter "DOET"), the Department of Transportation, the Department of Industry and Trade, the Department of Agriculture and Rural Development, HBMD, EP, YU, WU, the Halong City People's Committee, the Hoanh Bo District People's Committee, and the Cam Pha City People's Committee.

organized with the departments concerned to jointly implement activities[6]. The Project Management Board (hereinafter "PMB") was organized with five DONRE staff members on the initiative of the province, to collaborate and cooperate with CEM and working groups.

While DONRE was mainly involved in project activities to strengthen their capacity for the fulfilment of their duties, there was also enhancement in the capacity for coordination among the relevant authorities involved in environmental conservation. These had certain budgets and responsibilities allocated from the province, and there was enhancement of their cooperation system. The approach was found to be effective as a collaboration system for implementing 'environmental conservation for sustainable tourism.'

In summary, this project was highly relevant to Viet Nam's development plan and development needs, as well as to Japan's ODA policy. Therefore its relevance is high.

3.2 Effectiveness and Impact[7] (Rating: ②)

3.2.1 Effectiveness

3.2.1.1 Project Output

A hearing from the implementing agency confirmed that all five outputs had been achieved at the end of the project.

Output 1 ('improvement in the roles of related organizations and institutional coordination for the management of natural resources and environment in Quang Ninh Province'): In addition to the accomplishment of the quantitative indicators and implementation of activities such as 'CEM providing more than 40 comments, recommendations as well as administrative guidance for each working group', 'the dissemination of environmental conservation strategies through seminars, etc.', a qualitative improvement in the coordination function was confirmed in this ex-post evaluation. This included the coordination skills of DONRE and relevant organizations through activities conducted during the project period for the elaboration of documents relevant to environmental conservation, and the stipulation of regulations etc. Organizational collective efforts were confirmed as PMB and working group members stayed in touch with each other, coordinated and discussed, advocated to the Provincial People's Committee and to CEM members.

Output 2 ('Enhancement by DONRE and related organizations of environmental monitoring, inspection and administrative guidance in the Halong area'): Following the

[6] 13 organizations sent 26 people to participate in the project's working groups: DONRE, DPI, DOCST, DOET, HBMD, EP, YU, WU, the Halong City People's Committee, the Hoanh Bo District People's Committee, the Cam Pha City People's Committee, the Yen Hung District People's Committee, and the Viet Nam National Coal Mineral Industry Group.

[7] Sub-rating for effectiveness is to be put with consideration of impact.

achievement of the quantitative indicators: 'to formulate an environmental monitoring plan', 'to achieve more than 80% of the figure indicated in the environmental monitoring plan', 'to implement inspections including administrative guidance for at least 80% of disclosed violation acts causing environmental pollution', it was confirmed in this ex-post evaluation that qualitative skills had been improved. These skills were in the elaboration of documents and administrative guidelines related to environmental conservation, the implementation of environmental monitoring, and the disclosure of legal violations by entrepreneurs through environmental checks and inspections.

Output 3 ('Development of appropriate measures for management of land use of coastal areas of Halong Bay for a better balance between the environment and development in the Halong area.'): As defined in its indicator, relevant measures for land use and the restriction on reclamation were examined and submitted to CEM and accepted by them, the importance of measures for the prevention of abusive land use, the conservation of coastal area, and the development of surrounding areas having been shared[8].

Output 4 ('Strengthening of the capacity for preparing measures for sustainable tourism in the Halong area.'): Not only was their indicator 'three measures under each strategy are submitted to Quang Ninh Province' achieved, it was confirmed that quality of the content was concrete and viable enough to obtain the approval of the Provincial People's Committee.

Output 5 ('Implementation of effective environmental education and public awareness and the sharing of the outputs with other areas.'): Effective environmental education and PR activities such as mobile environmental education, eco-fairs and eco-classes were implemented. It was confirmed that these were shared with DONRE of Hanoi City, Hai Duong Province, Bac Kan Province, and Tay Nguyen Province, and non-pilot areas of the Quang Ninh Province.

3.2.1.2 Achievement of Project Purpose

The achievement of the project purpose was considered and judged according to the results of three the indicators set for the project. The indicators and their actual results are shown in Table 1.

[8] Countermeasures for coastal area conservation, land zoning, and land use management were integrated in the "Coastal Environment Protection Corridor", a spacious corridor on the coast of Halong Bay. The corridor works as a buffer zone for active land use management between the land-side development area and the Halong Bay sea area aiming at the environmental protection of Halong Bay. It also ensures the conservation of biodiversity and ecosystems, and sustainable tourism.

Table 1: Achievement of Project Purpose

Project Purpose	Indicator	Actual
Implementation capacity for natural resources and the environmental management for sustainable tourism in the Halong area is strengthened.	Number of measures implemented is increased by 2013.	− Measures taken in action played an important role that contributed to the decision making and the elaboration of plans for the province − Numerous countermeasures were raised although the total number was not counted.
	More than 40 suggestions, recommendations, and solutions are proposed by WGs to CEM by 2013.	− More than 40 viable and effective suggestions, recommendations, and solutions had been assessed by PMB and submitted to CEM by the end of the project.
	More than 20% staff in related organizations evaluated their capacity on sustainable tourism and environmental management to be improved by 2013 compared with the level of 2010 when the project started.	− Beneficiary surveys were conducted in 2010 and 2012 that targeted DONRE, DOCST, HBMD, tourist boat owners and people in the tourism industry. A improvement in capacity of more than 20% was confirmed. − The questionnaire referred to experiences and skills in policy making, planning, and tourism development policy.

Each of the three indicators set for the project purpose was accomplished within the project period as described above. In addition, project effects became clear as model activities were piloted and their outputs confirmed. This helped raise awareness not only among project relevant organizations but also at the Quang Ninh Provincial People's Committee. Therefore the project achieved its purpose.

3.2.2 Impact

3.2.2.1 Achievement of Overall Goal

The achievement of the overall goal was also considered and judged according to the result of the indicators set for the project. The indicators are shown in the following table.

Table 2: Overall Goal and Indicators

Overall Goal	Indicator
Pollution and destruction to natural resources and the environment is prevented in the Halong Bay (World Heritage) and its vicinity: Halong City, Cam Pha Town and Hoanh Bo District, Yen Hung District, and Van Don District of Quang Ninh Province.	1. Environmental data in Halong Bay and its vicinity (water environment, biodiversity, and satisfaction level of tourists) are improved by 2015 compared with those in the level of 2010.
	2. The practice in the Halong area is recognized to be effective at the national level by 2015.
	3. CEM functions continuously after the project as an authorized / official organization for integrated environmental protection of the Halong Bay and its vicinity.

Actual results of each indicator are described below.

(1) Improvement in environmental data for Halong Bay and its vicinity (Indicator #1)

■ Water Environment

Quang Ninh Province made a forecast of the water quality in the province in the "State of Environment Quang Ninh Province (2010)". This forecast was based on its findings concerning the environmental quality of the coastal water area from 2006 to 2010 and on analyses for the causes of environmental pollution.

Table 3: Forecast of the Water Quality of the Halong Bay Area (as of 2010)

Indicator	**Forecast**
Sea water pH	− No big change in sea water pH, ranging from 7.5 to 8.5, within the permissible limits of regulation.
Total Suspended Solids (TSS)	− A tendency for TSS to decrease, within the permissible limits of regulation, fluctuating around 15-30mg/l, lower in the dry season than in the rainy season.
Chemical Oxygen Demand (COD)	− In coastal areas of Ha Long, Cam Pha: a reduction on the content of COD to lower than the previous period (before 2010). − In the core area of the Halong Bay World Natural Heritage site, little fluctuation, within the permissible limits of regulation
Oil	− Oil content in the ports, especially the ports for coal remaining locally polluted, ranging from 0.1 to 0.2 mg/l.

Source: the State of Environment Quang Ninh Province (2010)

Note: "pH" is an indicator of solutions. A value of 7 represents neutrality; higher numbers represent increasing alkalinity and lower numbers increasing acidity. "Total Suspended Solids" are those particles with diameter of 2mm and less which float or are suspended in water. TSS include fine particles clay comprised of minerals with less settleability, zoo- and phytoplankton and their corpses, fragments, adhering micro-organisms, organic matters from wastewater and industrial discharge liquor, and metallic sediments. "Chemical Oxygen Demand" indicates the amount of water-dissolved oxygen consumed by organic contaminants dissolved or suspended in water when decomposing.

Table 4 shows data for the quality of ocean water in the Halong Bay area from 2010 to 2015. Compared with 2010 (project commencement year), values for each parameter stayed more or less the same, which were within the range anticipated in the SoE (See Table 3). Figures for sea water pH and TSS remained as anticipated throughout the five years. Those for oil were within the range of forecast from 2010 to 2013 (2014 and 2015 measured over 0.2ml). Data for COD was not available except for 2013 and after, which made it impossible to confirm a circular trend.

Table 4: Water Quality in the Halong Bay Area

Parameter	Environmental Monitoring Parameters in Halong Bay Area						Allowable Value		
	2010 (Project start year)	2011	2012	2013 (Project end year)	2014	2015 (Ex-Post Evaluation)	Aquaculture, aquatic creatures protection area	Seaside resort, water sport area	Other area
pH	7-8.3	7.6	8.0	7.9	7.5	7.8	6.5-8.5	6.5-8.5	6.5-8.5
DO (mg/l)	7.1	7.8	7.4	7.9	6.7	6.5	≥5	≥4	-
TSS (mg/l)	33.7	35.1	29.6	22.9	28.6	23.5	50	50	-
COD (mg/l)	-	-	-	-	8.45	12.88	3	4	-
Ammonia (NH4+) (mg/l)	-	0.10	0.15	0.23	0.19	0.12	0.1	0.5	0.5
Zinc (Zn) (mg/l)	0.02	0.04	0.04	0.04	0.04	0.04	0.05	1.0	2.0
Manganese (Mn) (mg/l)	-	0.07	0.08	0.04	0.05	0.03	0.1	0.1	0.1
Iron (Fe) (mg/l)	-	0.09	0.08	0.13	0.12	0.19	0.1	0.1	0.3
Mineral oil (mg/l)	0.036	0.018	0.01	0.042	0.32	0.23	Not detectable	0.1	0.2
Coliform (MPN/100ml)	-	103	154	234	289	176	1,000	1,000	1,000
T-N	-	-	-	-	10.38	10.67	-	-	-
T-P	-	-	-	-	0.22	0.12	-	-	-
Clarity	-	1.9	2.0	2.1	1.4	1.5	-	-	-
Salinity	-	24.2	26.2	24.8	25.5	27.8	-	-	-
Turbidity	-	11.3	12.2	13.3	10.7	9.6	-	-	-

Source: "Environmental Status Report for Quang Ninh Province, 2011-2015", QCVN10:2008/BTNMT (National Technical Regulation on Coastal Water Quality)

Note: "Dissolved Oxygen (DO)" refers to the level of free, non-compound oxygen present in water. In general, DO reaches a saturation value in pure river water. As the number of organisms increase due to severer water contamination, larger amounts of oxygen are consumed as aerobic microbes discompose organic matter, and thus the DO level declines. "mg/l" is a unit that describes the degree of concentration of contaminants and their content. "MPN (most probable number)" is often used for indicators of relatively low concentration such as environmental water.

Compared with Viet Nam's Technical Regulation on Coastal Water Quality, the parameters that indicated water quality in the coastal areas of Halong and the Cam Pha area at the time of the ex-post evaluation were less than the upper limit of the standard except for COD and oil[9]. Water contamination caused by organic matter was continuously observed and eutrophication was a possible reason for the COD figure being far above the standard.

Efforts on the part of Quang Ninh Province such as pollutant control, technological innovation and waste treatment against adverse impacts caused by development works (e.g. coal development, leveling and reclamation works on coastal areas, marine transport, a growing number of tourists, population increase, urbanization, the effects of climate change etc.) were key to improvements in the quality of the environment of the coastal area. These improvements were also achieved through a ban on sea transshipment in

[9] QCVN10:2008/BTNMT (National Technical Regulation on Coastal Water Quality). This standard has three categories: 1) aquaculture, aquatic creature's protection areas; 2) seaside resorts, water sports areas, and; 3) other areas. For this Project, the first category was applied to the Halong Bay world natural heritage area, the second to coastal tourism spots, and the last to the coastal areas of Halong and Cam Pha. The environmental monitoring parameters shown in Table 4 are those measured at the environmental monitoring points in Halong Bay that are not only part of the natural heritage area.

Halong Bay[10], a change in the ports for tourist boats[11] and a complete resettlement of the floating population[12]. The fact that DONRE and other relevant organizations of the province jointly implemented this project as a whole and selected sustainable tourism development and green growth strategy is considered to have been a large contribution in sustaining and improving the quality of the water environment.

■ Biodiversity

The Institute of Marine Environment and Resources and HBMD conducted aquatic ecosystem surveys in 2007 and 2008, since which there has been no comprehensive data collection on the same scale. Therefore no quantitative data was available for this ex-post evaluation.

According to the "Environmental Report for Quang Ninh Province (2011 to 2015)", a degradation of biodiversity in the province had been caused by decrease and loss of habitat, over-exploitation, pollution and biological contamination. Direct causes were: exploitation of biological resources, forest fires, conversion of patterns of land use, environmental pollution, and intrusion of alien species. Indirect causes were: population pressure and migration and the promotion of development works in accordance with macroeconomic policy. "Environment Planning in Halong Bay to 2020; Vision to 2030" was one of the development policies implemented by Quang Ninh Province, targeting areas of mangroves, seagrass beds and coral reefs, the number of near-extinct, rare and precious species 'not to be at a level lower than 2010', in 2020. There is no target for 2015.

To summarize, it was impossible to measure the degree of improvement in biodiversity by 2015 in this ex-post evaluation due to the absence of a provincial strategy and policy that targeted the said year.

■ Satisfaction level of tourists

Quang Ninh Province has actively encouraged private investment into their activities for the promotion of environmental sustainability and to promptly respond to tourists' needs[13] while sustaining the activities relevant to the project in various ways (See 3.4).

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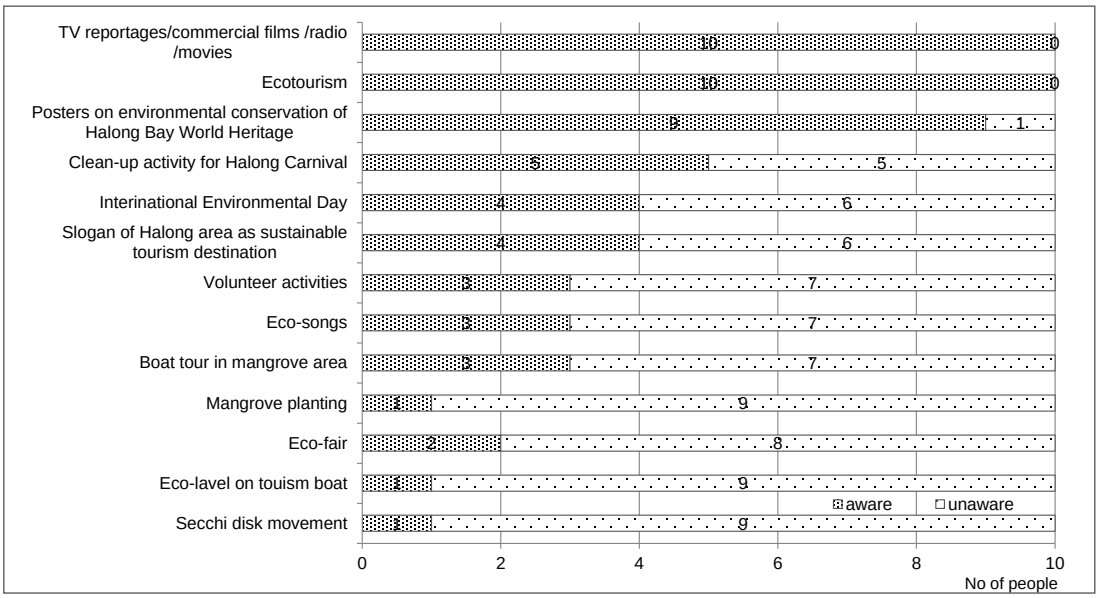
[10] "Decision to prohibit the transport of materials in Halong bay including coal, cement, clinker and other dry bulk that disperse dust into the environment" (2013). Clinker refers to semi-decomposed mineral substances burned in high heat. Dry bulk carriers are designed to transport unpackaged bulk cargo such as iron ore, coal, grains, salt, aluminum mass, and copper ore in their cargo holds.

[11] The new port was opened in January 2016.

[12] "Policy to relocate residents of the water villages from the Halong Bay World Heritage site".

[13] As of January 2016, the tourism hub of the World Heritage site has been completely moved from Bai Chay port to Thuan Chau port, which is an example that reflects the province's efforts. A private investment as big as 10,000 billion VND was poured into these new port facilities. The quality of the tourist boat services has been much

Figure 1 shows to what extent tourists, who were targeted under the beneficiary survey in this ex-post evaluation, were aware of the environmental conservation activities in Halong Bay. It was found that there was a high awareness of 'visual' media such as TV commercials, radio programs and posters, as well as 'participatory' activities such as ecotourism and clean-up campaigns. When asked if they had become more aware of environmental conservation after their trip to Halong Bay, all ten tourists surveyed responded that they had. This implies that the activities in Halong Bay have been an opportunity to change awareness for the environment on the part of tourists. "I used to litter before", "I became more aware of choosing the right places and ways to throw out garbage", "I became more interested in environmental issues", "I began to discuss environmental conservation with other people", "I now choose specific places for smoking" were some of the comments received. Some of those interviewed were even willing to donate money for conservation.



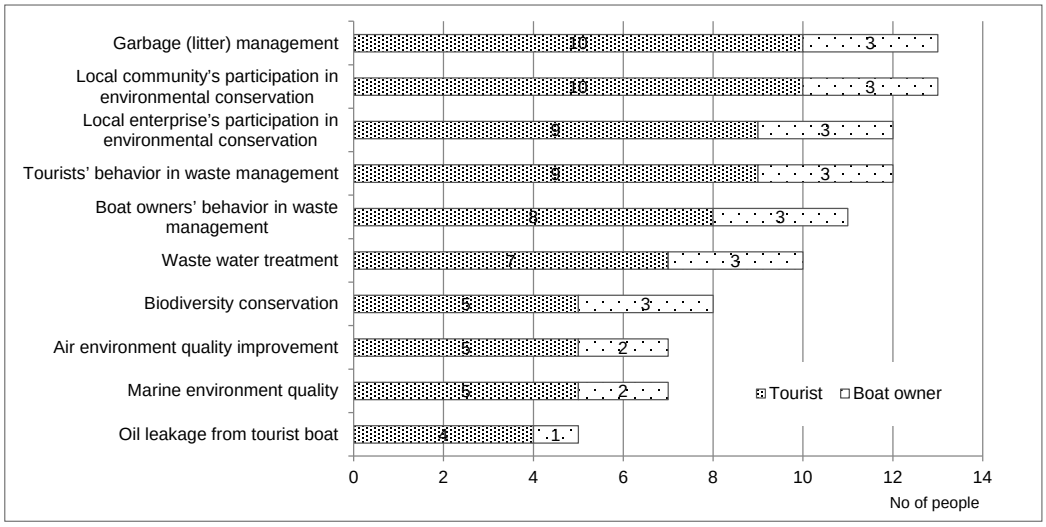
Source: Beneficiary survey results
Note: Number of respondents was ten in total (tourists). They gave multiple answers from given choices including 'other.'

Figure 1: Tourists' Recognition of the Environmental Protection Activities in Halong Bay (reference)

Figure 2 shows the results of the survey dealing with the 'space for improvement in the Halong Bay tourism area'. This was taken by ten tourists and four boat owners who were also targeted in the beneficiary survey of this ex-post evaluation. More opinions were

improved in Thuan Chau port where their boats can be refueled at other facilities. Operation licenses at the former port, Bai Chay, will no longer be updated as this was the site of environmental pollution due to deteriorated facilities.

heard regarding garbage and litter, than those regarding wastewater, biodiversity or the marine environment. The misbehavior in garbage management on the part of tourists and boat staff were particularly noted. By paying environmental fees as an official duty, awareness among the boat owners interviewed in the beneficiary survey was raised and their behaviors towards environmental protection[14] changed. Raising awareness among tourists and boat staff to a greater extent is recommended.



Source: Beneficiary survey results
Note: The number of respondents was 14 in total (ten tourists and four boat owners). They gave multiple answers from given choices including 'other.'

Figure 2: Space for Improvement in the Halong Bay Tourist Area (reference)

In light of the above, although it is still deemed necessary to pay thorough attention to raising the awareness of tourists and to provide instructions to people in the tourist industry, the province's efforts are highly evaluated. Therefore positive impacts on 'tourists satisfaction' by the project have been confirmed to a certain extent.

(2) Recognition of practices in the Halong Area at national level (Indicator #2)

The "Quang Ninh Province Socio-Economic Development Plan", which is currently under implementation from 2016, integrates the environmental protection plan. According to the hearing with the implementing agency, the plan was initiated by Quang Ninh Province, the idea of integrating environmental protection into the development plans of other sectors coming from their experiences of the project implementation.

[14] This is in accordance with the decision to regulate the management of tourist boats (approved in 2011 and replaced with another decision for implementation). The tourist boat service management is now carried out by the Quang Ninh Provincial People's Committee, while before it was the responsibility of the Quang Ninh Provincial Department of Transportation. This gives more comprehensive management by a stronger authority. The Provincial People's Committee promotes the modernization of tourist boats and fishing boats.

The implementation of this project was one of the turning points for the province in its shift to green growth strategy. The government of Viet Nam, ministries and other provinces regard Quang Ninh as a model province to visit and learn from. Provinces such as Phu Quoc and Quang Nam have taken and applied the corridor concept. As the efforts of Quang Ninh are recognized and disseminated in provinces which have similar geographic features, effectiveness is judged as high.

At national level, the "law on sea and islands natural resources and environment," was approved in 2015. The law introduces strategies to exploit, use and protect the sea and islands natural resources and environment in a sustainable manner; manage shores and islands, and; survey share information about the sea and islands natural resources and environment. The People's Committee and DONRE of Quang Ninh Province provided comments on its draft such as synthetic management of natural resources, and protection corridor of sea and islands based on their experiences in the project. Thus, the effects of this project are indirectly disseminated to the nation.

In light of the above, it is judged that practices in the Halong Area have obtained recognition at the national level.

(3) Continuity of CEM (Indicator #3)

It was confirmed that CEM, the project's steering committee, no longer existed at the time of the ex-post evaluation. According to the implementing agency, a permit could not be obtained from Quang Ninh Province for operation at the provincial level after the project, and it was succeeded by DONRE. The Committee for Green Growth, which was established as the steering committee for the Green Growth Strategy of Quang Ninh Province to promote the province's strategy, took over after two years.

In light of the above, CEM did not continue after the project but the Committee for Green Growth is now promoting environmental management and protection in a more comprehensive manner than CEM. Therefore the indicator is judged to have been achieved.

To summarize, the project has achieved its overall goal at a limit level. Under the first indicator, 'improvement of the environmental parameter by 2015', water quality improvement and improvements in the satisfaction level of tourists were achieved to a certain extent. However, it was difficult to measure the degree of improvement in biodiversity at the time of this ex-post evaluation. The second indicator was achieved as other provinces in a similar situation replicated the successful implementation of the Halong area. Although CEM did not continue, the Committee for Green Growth, the body promoting the province's Green Growth Strategy continues to promote

environmental conservation in a more inclusive position than CEM. Therefore the third indicator is judged to have been accomplished.

3.2.2.2 Other Impacts

Various positive impacts on the natural environment were achieved under the project together with other indirect impacts. Meanwhile no negative impact was confirmed during or after project implementation. There is little likelihood of a negative impact after this ex-post evaluation. Resettlement and land acquisition were not applicable in this project.

In light of above, since this project has to some extent achieved the project purpose and overall goal, the effectiveness and impact of the project are fair.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

The project inputs (plan and actual) are summarized in the table below.

Table 5: The Project Inputs (Plan and Actual)

Inputs	Plan	Actual
(1) Experts	Chief Advisor/Environment Management, Environment Monitoring and Analysis, Pollution Source Management (inspection and guidance), Land Use Management, Sustainable Tourism, and Environmental Education & PR (72 man-months in total)	Chief Advisor/Environment Management, Environment Monitoring and Analysis, Pollution Source Management (inspection and guidance), Land Use Management, Sustainable Tourism, and Environmental Education & PR (74.1 man-months in total)
(2) Trainees received	Training in Japan, in-country or in third countries	Training program in japan: 1) Natural Resources / Environment Management 2) Water Resource Monitoring/Pollution Source Management 3) Land Use Management 4) Sustainable Tourism, Eco-tourism and Environmental Education Period: January, March, November 2011, and June 2012 Participants: 35 people (437 days in total)
(3) Equipment	Equipment (including vehicles, office equipment and that for environmental monitoring)	GIS software, GPS, vehicles, office equipment, spare parts and reagents for water quality analysis
(4) (Others)	Hiring of local consultants and others	Operational expenses borne by the Japanese side (hiring of local experts and other expenses at USD 673,532)
Japanese Side Total Project Cost	340 million yen in total	346 million yen in total
Viet Nam Side Operational Expenses	Assignment of counterpart personnel, maintenance of facilities and equipment (budget allocation for office space and equipment, and running cost of equipment procured under the project.	Assignment of counterpart personnel (31 people), facility provision (project office), operational expenses borne by Vietnamese side (USD 328,100)

Source: Ex-ante evaluation sheet (2009) and project completion report (February 2013)

3.3.1.1 Elements of Inputs

The inputs of the project were provided by both the Japanese and Vietnamese sides almost as planned. The working volume of experts increased by 2.8 man-months[15]. According to the questionnaire survey followed by interviews with Vietnamese officials, there was no problem in the quantity and quality of inputs provided by the Japanese side.

3.3.1.2 Project Cost

As shown above, the total project cost was 346 million yen in contrast to 340 million yen, which is higher than planned (102%). The increase was mainly because of the working volume of dispatched experts which was judged as an essential input in order to achieve the effects of activities within the project period.

3.3.1.3 Period of Cooperation

According to the information provided by JICA, the project was originally planned from October 2009 for a period of three years. In actual, the project started in March 2010 and lasted until February 2012. Although a six months' delay was observed, no problem was confirmed and there neither was an extension in the cooperation period. Thus the actual period of cooperation was as planned (100%).

In summary, although the project period was within the plan, the project cost exceeded the plan. Therefore, efficiency of the project is fair.

3.4 Sustainability (Rating: ③)

3.4.1 Related Policy and Institutional Aspects for the Sustainability of Project Effects

The Quang Ninh Province's "Five-Year Socioeconomic Development Plan" prioritized both tourism development and environmental protection, and this did not change even after the project. Strategies and plans implemented during the project period were still implemented after the project, or integrated into succeeding strategies and plans with the same direction. It was also confirmed that plans formulated in the project were also continued in a manner that reflected their contents.

[15] The increase in working volume was extended by the addition of four experts for the following reasons: 1) Chief Advisor/Environment Management expert worked on collaboration with the yen-loan project, elaboration of recommendations for producing the effects of JICA's "Urban Water Environment Management Program", collation of concrete proposals, and development of recommendations for the next phase. 2) Land Use Management expert: same as the above. 3) Sustainable Tourism expert supported and gave instructions for additional activities in application of the eco-label, to reflect the idea of 'programs and development strategies for sustainable tourism' in the 'Quang Ninh Province Tourism Development Plan (2011-2015)' and its elaboration. 4) EE & PR: The expert extended his technical assistance for Output 5, to collaborate with and obtain synergy effects with other activities, also establishing the environmental education association (EEA).

3.4.2 Organizational Aspects of the Implementing Agency for the Sustainability of Project Effects

The organization and role of the implementing agency and its relations with higher authorities were enhanced by the project implementation. Coordination skills were strengthened, as were awareness of and efforts for environmental issues. This has not changed after the project completion.

According to the interview with the implementing agency in this ex-post evaluation, leaders of the Provincial People's Committee and the relevant departments of DONRE were paying more attention to environmental issues. They had also strengthened organizational and systematic coordination skills. DONRE staff members involved in the project were allocated in important positions in their departments after project completion. Project management skills were improved through the project activities, and other staffs were influenced in positive ways, as know-how was shared. The function and role of CEM, which was established in this project, were taken over by the Committee of Green Growth for the implementation of the "Quang Ninh Province Green Growth Strategy."

In light of the above, the organizational structure necessary for sustaining the effects brought by the project is considered to be fully established and maintained.

3.4.3 Technical Aspects of the Implementation Agency for the Sustainability of Project Effects

The activities conducted in the project were carried out regularly by DONRE and other relevant organizations. Work continues on activities such as routine maintenance and improvement of skills even after the project. The main skill areas introduced through the project activities and their present situation are confirmed below:

(1) Environmental monitoring, environmental checks and inspection skills

Environmental monitoring, environmental checks and inspections are regularly implemented as routine work by the departments of DONRE and relevant organizations[16]. Skill development has been targeted through training during project implementation, the results having been disseminated up to the present time. Training opportunities provided by DONRE and MONRE and opportunities for learning through participation in conferences and meetings are provided for staff members so that they can maintain their technical capacity.

Laboratory equipment and analytical instruments provided during project implementation

[16] DONRE: Environmental Monitoring Analysis Center (40 persons), Sub-Department of Environmental Protection (25 persons), Inspection Department (3 persons), Department of Water Quality, Mineral Resources and Climate Change (5 persons), HBMD (7 persons), Division of Natural Resources and Environment at District Level (10 persons in total)

for environmental monitoring were being well operated at the time of ex-post evaluation. The number of monitoring points in Halong Bay increased to as many as 40, out of which 27 were connected online for data transfer with DONRE at any time. Data is disclosed on the website, and disseminated locally.

(2) Land use management skills

Skills learned through the project are maintained. Geographical information systems (GIS) and satellite images are presently used to determine and analyze current land use and its transitions, which is used as a basis for solutions of disputes on land use[17].

The corridor concept and its methodology was initiated by land use management experts through project implementation, and applied and introduced at provincial level in Quang Ninh. After the project, this was succeeded by the "Socio-Economic Development Plan (2016 to 2020)", the "Environmental Protection Plan to 2020 in the vision of 2030", and the "Tourism Development Plan to 2020 in the vision of 2030".

(3) Skills for sustainable tourism development

Measures submitted during project implementation were reflected in the above policies and plans[18]. A project for wastewater treatment in the coastal area, and activities for natural environment conservation in tourism spots, ports and fishing grounds were approved by Quang Ninh Province and some of them are already in practice.

DONRE has been examining possible measures to obtain budget for updating the tourism resource database in new projects. The database was developed during project implementation, for which there has been no budget allocation to update its software since project completion On the other hand, information accumulated in the database has been utilized by reflecting and integrating the contents into the province database. Eco-label activity piloted during project implementation, for which there was an increased work volume for one of the Japanese experts, was still under consideration for effective use after project completion[19].

(4) Skills for environmental education and PR

Knowledge for the implementation of pilot activities under the project (mobile

[17] Planning Division (10 persons) and Sub-Department of Environmental Protection (25 persons from DONRE, and the Division of Natural Resources and Environment at District Level (10 persons in total).

[18] Tourism Resource Development Division of DOCST, HBMD, and the Department of Culture, Sports and Tourism at District level.

[19] The implementing agency found at the time of the ex-post evaluation that eco-label should function with a license system that requires approval and indicators. It is necessary for practical realization that cooperation is secured among relevant departments, that there is an introduction of regulations, and a raising of awareness for tourists. The implementing agencies were still working on coordination even after project completion.

environmental education, eco-lectures[20], etc.,) has been gained and skills and experiences accumulated and utilized in such events as World Environmental Day, World Water Day, Biodiversity Conservation Day and Earth Hour Day[21]. A high level of communication skills are needed for these activities as a wide variety of people are targeted in the events. DONRE and other relevant organizations try to maintain and improve their skills through events and activities for which they establish committees for careful preparation.

Results of some model activities which were shared with all areas in Quang Ninh Province, for which the high level and effects had been confirmed, were passed on at the time of the ex-post evaluation. Mobile environmental education, eco-fairs and eco-classes, which were integrated with other activities, were continued. Environmental education is now part of the "School Environmental Program." On the other hand, secchi disk movement[22] is no longer continued at present. This was introduced on boats owned by fishermen, who moved to land. DONRE did not confirm whether or not tourist boat owners still continue and sustain their activities.

To summarize (1) to (4) above, the technical sustainability of the implementing agency is judged as high. There were some activities for which DONRE was still examining the necessary actions, i.e., updating of databases and the application of eco-labels, as necessity for each activity was confirmed. There has been no change in direction and it is judged there is no problem in the longer-term. It is recommended as an immediate task that continual improvements are made on equipment for environmental monitoring, environmental checks and inspections. It is also desirable that there is continuing creation of learning opportunities through training and ground practices as staff members involved in activities are numerous and personnel changes can occur at any time.

3.4.4 Financial Aspects of the Implementation Agency for the Sustainability of Project Effects

Table 6 shows the budget allocated for environmental protection in Quang Ninh Province. From 2012 to 2015, there was a stable procurement of the budget for DONRE. Total expenditure on the part of provincial departments except DONRE, also for cities, districts

[20] Lectures conducted on environmental problems caused by climate change on coastal area and islands in Viet Nam, biodiversity, environmental issues and waste treatment in Quang Ninh Province. Participants take exams and a training certificate is given to successful candidates.

[21] DONRE, WU, YU, District People's Committee and departments, Farmers' Association, Vietnamese Fatherland Front and Vietnamese Veterans' Association are involved.

[22] One of the project activities. The "secchi disk" refers to a circular plate with a diameter of 30 cm to measure the clarity of seawater. The disk, with a sinker on its bottom, is lowered into the water in a horizontal state by rope from a ship until it is no longer visible. This depth indicates the clarity of the seawater. By introducing and disseminating "secchi disks" for tourist boats in Halong Bay, it was expected that it would be possible to accumulate data on the degree of seawater turbidity in the bay over a wide area and for long term, thus raising awareness of the environment of fishermen, tourist boat staff and tourists.

and communes exceeded the budget allocated to DONRE[23].

Table 6: Budget for Environmental Protection in Quang Ninh Province (2012 – 2015)

Unit: billion VND

Breakdown of budget		2012	2013	2014	2015
DONRE budget *					
	Budget	29,880	34,184	33,000	36,626
	Expenditure	13,459	13,611	13,881	15,591
Expenditure in the whole of Quang Ninh Province for environmental protection (except DONRE)					
	Provincial level	163,795	104,701	21,000	52,246
	Cities, districts and communes	644,168	662,529	579,464	441,548
	Total	807,963	767,230	600,464	493,794

Source: information provided by DONRE of Quang Ninh Province
Note: Figures of DONRE budget reflect only those allocated from the Quang Ninh Provincial People's Committee.

It is mandatory in Viet Nam as stipulated in a resolution at national level that provinces and government organizations should allocate at least 1 % of their budget for environmental protection. The Provincial Congress in Quang Ninh also approved a provincial resolution to order its departments and others to allocate as much as 3 % of the total provincial budget for environmental protection from 2016 to 2020.

The equipment provided under the project was mainly for laboratory tests and analysis used for environmental monitoring. The operational and maintenance cost was not so high as to create a financial burden.

Other financial sources are: environmental fees collected mainly at coal mines which is worth 300 billion VND spent for environmental load mitigation; 18 % of revenue from Halong Bay tourism, which is spent on protecting the environment and maintaining world heritage, and private investments which the provincial government continues to actively encourage. Some investors have shown interest in implementing projects in such areas as Cam Pha Town and Van Don District where further development can be expected. Quang Ninh Province encourages all tourist boats and fishing ships (both large and small types) to be equipped with advanced facilities, and the quality of tourist boat service in Thuan Chau port are improving.

In light of the above, the provincial budget is expected to be sufficient, and that allocation for environmental protection is also expected to be fair. Therefore no specific problems have been found in the financial sustainability of the project effects.

[23] The expenditure at provincial level was on a decline as emergency response such as for flood damage and other natural disasters is more prioritized than routine operations under orders at the national level. Quang Ninh Province has been asking the central government to decentralize their authority in order to allow each province to decide how to use their budget by themselves.

To summarize, no major problems have been observed in the policy background or in the organizational, technical, financial aspects of the implementing agency. Therefore, sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The intention of this project was to strengthen the implementation capacity of management of natural resources and the environment for sustainable tourism in the Halong area by the end of the project period. Pollution would thereby be prevented together with the destruction of natural resources and the environment in Halong Bay and its vicinity.

The project relevance is high as project implementation was in line with Viet Nam's development plan and development needs, as well as with Japan's ODA policy. The project largely achieved its purpose by implementing the planned activities through achieving the five outputs: 1) improvement in the organizational and institutional coordinating function for the management of natural resources and the environment; 2) enhancement of environmental monitoring and inspection skills, and capacity for administrative guidance; 3) development of appropriate measures for land use management in coastal areas; 4) strengthening the capacity for preparing measures for sustainable tourism, and; 5) the implementation of environmental education and the raising of public awareness and dissemination of results. Although numerous efforts to control the occurrence of pollutants were made to prevent pollution and the destruction of natural resources and the environment, it was impossible to confirm the effects that were expected after the project at the time of this ex-post evaluation. Therefore, it is concluded that the effectiveness and impacts of the project are fair. The project cost was slightly higher than planned, while the period of cooperation was as planned, so the efficiency of the project is deemed to be fair. The sustainability of the effects realized by this project is high. The direction of policy, the institutional, organizational, technical and financial aspects will enable the project effects to last after completion of the project.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

None.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

Long-term assistance through several different schemes

This project was implemented following the “Environment Improvement Master Plan for Halong Bay.” The loan agreement for the “Ha Long City Water Environment Improvement Project” (E/S) was signed in 2015 and work is continuing on studies and designs. Furthermore, the “Project for Institutional Development for Green Growth Implementation and Strengthening of Environmental management System towards Sustainable Conservation for the Halong Bay” for which Quang Ninh Province DPI is the implementing agency, has been under implementation since 2015. However, these studies and projects were started and completed individually and several months to ten years passed have in between. Efforts taken and recommendations made in the previous projects have not necessarily been taken up and neither have the project effects been efficiently and synergistically realized.

In order for Japanese cooperation projects to secure an important position in the regional development of partner countries, the advantages and superiority of Japanese cooperation should be confirmed. Specific components that properly meet development needs should be included in the projects and a long-term and flexible response towards change in development needs is required. It is recommended that JICA provides assistance to a target area through multiple schemes in a seamless manner to make its cooperation highly effective and sustainable.