

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.

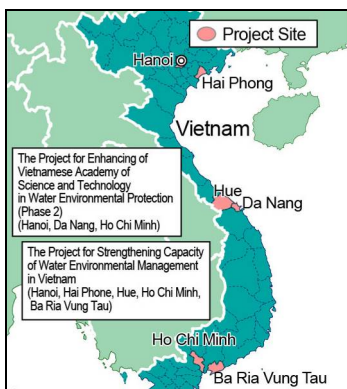
These two projects were fully consistent with Viet Nam’s development policies and needs, and with Japan’s ODA policy. The implementation plan and approaches were considered appropriate. Therefore, relevance of the projects is high. The “Technology Project” aimed to further strengthen the scientific and 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	<p>[Technical cooperation]</p> <ul style="list-style-type: none"> - 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) <p>[Japanese ODA Loan]</p> <ul style="list-style-type: none"> - 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) <p>[Other multilateral and bilateral cooperation agencies]</p> <ul style="list-style-type: none"> - 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: B²)

3.1 Relevance (Rating: ③³)

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 technology⁴ 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 Impact⁵ (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.

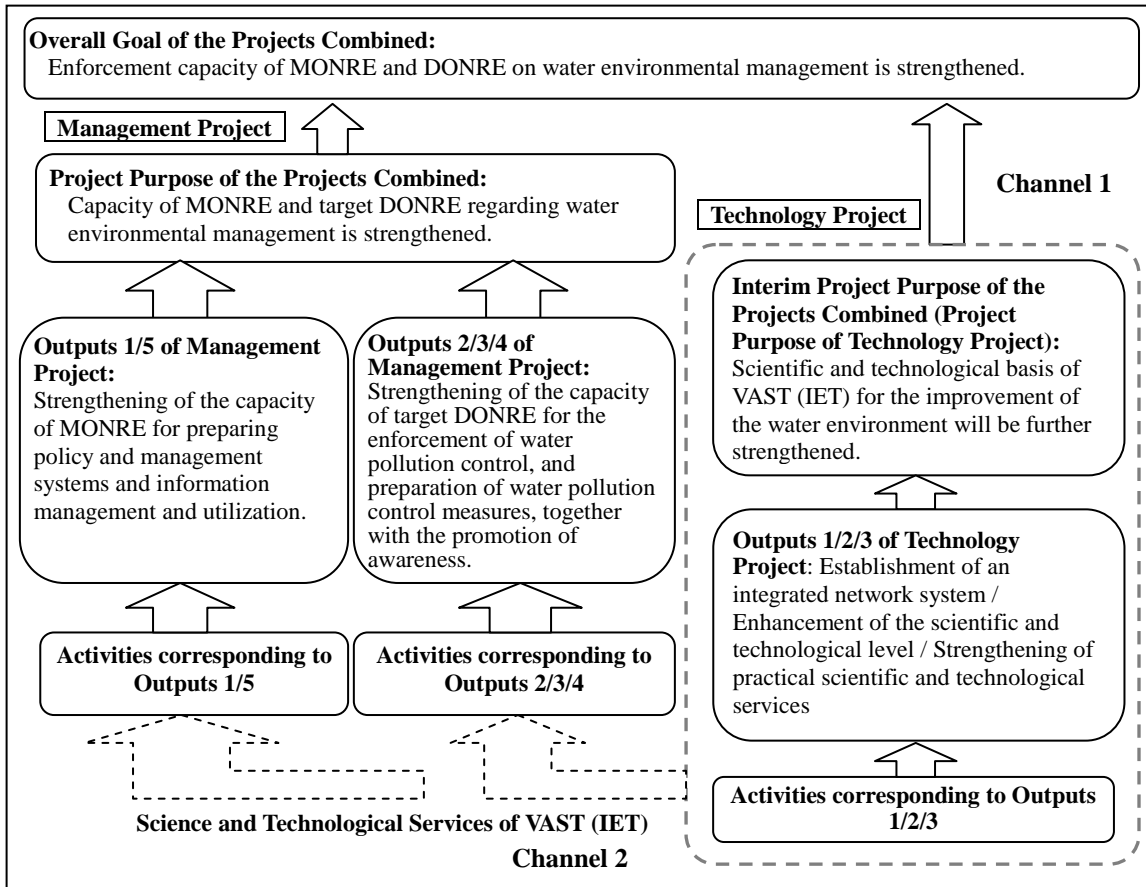


Figure 1: Overall structure of cooperation envisaged in the integrated evaluation

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 set⁶, 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 largely⁷ 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)

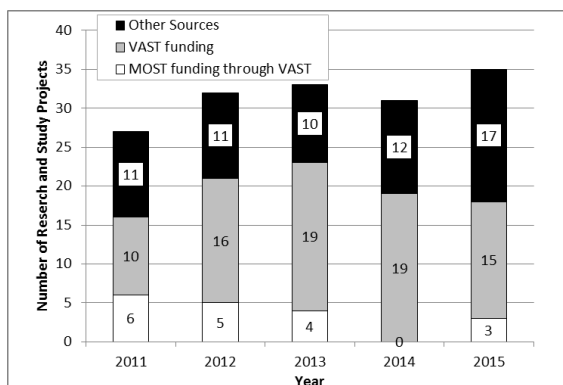
Purpose	Indicators	Actuals
Interim Project Purpose	Indicator 1: Number of studies and research in relation to environment management and their quality	The number of studies and the amount of research approved have been increasing and the ratio of the number of studies and the amount of research approved 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.

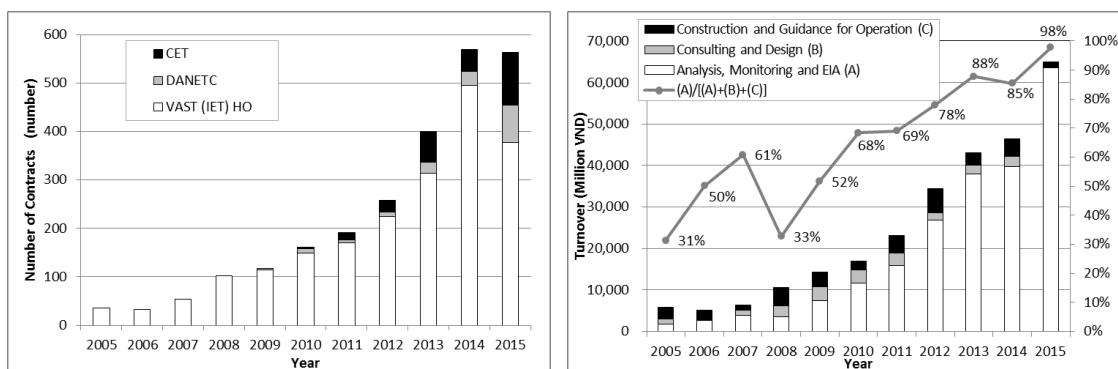
Indicator 3: Number of VAST (IET) researchers in water environmental management

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 services⁸ 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 feedback⁹ 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 smooth¹⁰ 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 survey¹² 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.

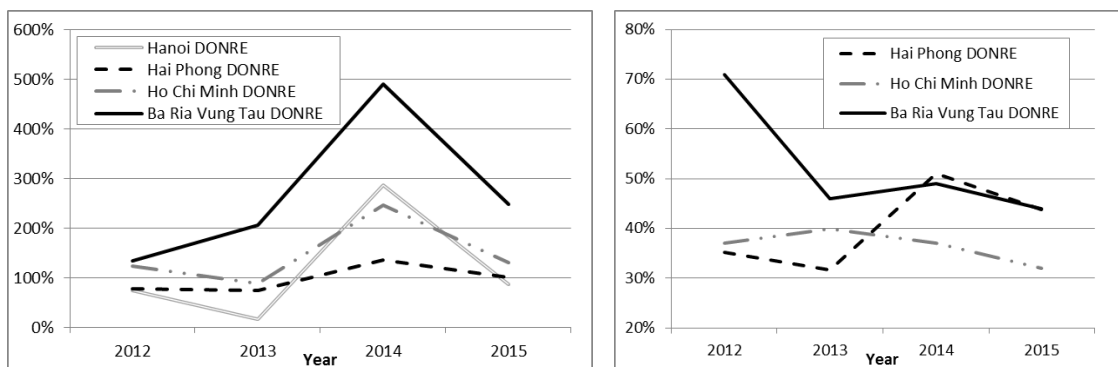
The following show the result of the evaluation based on the data with which DONRE among the target DONRE responded.

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 water¹³ 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 out¹⁶. 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

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 analysis¹⁹ 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 concerned²⁰.

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 planned²². 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 consultants²³.

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 projects²⁴ 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 responsibilities²⁵ 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.

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 analyze²⁷.

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 protection²⁹ 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.

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	<p>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.</p> <p>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.</p> <p>Output 3: Capacity of VAST (IET) on practical scientific and technological services in the field of water environment is strengthened.</p>	<p>Output 1: MONRE’s capacity of making policy and management tools that are more effective and enforceable is strengthened.</p> <p>Output 2: Enforcement capacity of target DONRE on basic water pollution control (environmental monitoring, pollution sources inventory, pollution sources inspection) is strengthened.</p> <p>Output 3: Target DONRE’ capacity of making effective water pollution control measures is strengthened.</p> <p>Output 4: Target DONRE’ capacity of promoting awareness of public and industrial sectors on water environment is strengthened.</p> <p>Output 5: Capacity of MONRE and DONRE on information management and utilization is strengthened.</p>