

**Office of Natural Resources and Environmental Policy and Planning
Regional Environmental Office 8
Provincial Office of Natural Resources and Environment in REO8
Ministry of Natural Resources and Environment
The Kingdom of Thailand**

**The Project for Strengthening
Environmental Management and Linkages
among Central, Regional, Provincial and
Local Levels in the Kingdom of Thailand**

Completion Report

Main Report

February 2016

JAPAN INTERNATIONAL COOPERATION AGENCY

ORIENTAL CONSULTANTS GLOBAL CO., LTD.

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Abbreviations

4R	Refuse, Reduce, Re-use, Recycle
ADT	Advisory Team
AGE	Advisory Group on Environment
C/P	Counterpart
CA	Capacity Assessment
CD	Capacity Development
CDI	Capacity Development Intervention
CEM	Community-based Environmental Management
COD	Chemical Oxygen Demand
D/S	Disposal Site
DEQP	Department of Environmental Quality Promotion
DGR	Department of Ground Water Resources
DMCR	Department of Marine and Coastal Resources
DMR	Department of Mineral Resources
DNP	Department of National Parks, Wildlife and Plants Conservation
DO	Dissolved Oxygen
EF	Environment Fund
EGAT	Electricity Generating Authority of Thailand
EM	Effective Micro-organism
EQMP	Environmental Quality Management Plan
ESZ	Environmentally Sensitive Zone
GIS	Geographic Information System
GPS	Global Positioning System
IEC	Information, Education and Communication
JCC	Joint Coordinating Committee
JET	JICA Expert Team
JICA	Japan International Cooperation Agency
KPI	Key Performance Indicator
LA	Local Administration
M&E	Monitoring and Evaluation
MNRE	Ministry of Natural Resources and Environment
MOI	Ministry of Interior
N-EQMP	National Environmental Quality Management Plan
NESDP	National Economic Social Development Plan
NGO	Non-governmental Organization
NIDA	National Institute of Development Administration
NPWPCD	National Parks, Wildlife and Plant Conservation Department
ONEP	Office of Natural Resources and Environmental Policy and Planning

OPS	Office of Permanent Secretary
P/R	Progress Report
PAO	Provincial Administration Office
PCD	Pollution Control Department
PCM	Project Cycle Management
PDCA	Plan, Do, Check, Act
PDM	Project Design Matrix
P-EQMP	Provincial Environmental Quality Management Plan
pH	Potential Hydrogen
PNREMP	Provincial Natural Resources and Environmental Management Plan
PO	Plan of Operations
PONRE	Provincial Office of Natural Resources and Environment
PP	Pilot Project
QGIS	Quantum Geographic Information System
R/D	Record of Discussion
REO	Regional Environmental Office
REO8	The Eighth Regional Environmental Office
R-EQMP	Regional Environmental Quality Management Plan
RFD	Royal Forest Department
SDM	Sub-District Municipality
SWM	Solid Waste Management
SWOT	Strength, Weaknesses, Opportunities, Threats
TAO	Tambon Administration Office
TFT	Task Force Team
THB	Thai Baht
TICA	Thailand International Cooperation Agency
TOC	Table of Contents
WG	Working Group

1. Introduction

1.1 Background of the Project

The Kingdom of Thailand (hereinafter referred to as “Thailand”) approved the Enhancement and Conservation of the National Environmental Quality Act (hereinafter referred to as “the Act”) in 1992. It aimed to mitigate environmental stresses which have been continuously occurring since the 1980s. Based on the Act, the Office of Natural Resources and Environmental Policy and Planning (hereinafter referred to as “ONEP”), and the Ministry of Natural Resources and Environment (hereinafter referred to as “MNRE”), formulated the National Environmental Quality Management Plan (hereinafter referred to as “National EQMP”). The implementation period of the latest National EQMP is the five years from 2012 to 2016. The Regional Environmental Quality Management Plan (hereinafter referred to as “Regional EQMP”) and Provincial Natural Resources and Environmental Management Plan (hereinafter referred to as “Provincial EQMP”) with its subsequent Provincial Action Plan are also mandated to be formulated. However, issues of delays in the preparation of the EQMPs are a common concern, which is combined with the problem of the quality and effectiveness of the plans themselves. In addition, there are also problems related to the implementation of these respective plans due to the lack or the absence of the technical and financial capacities of related organizations. Such capacities include planning and resolving issues related to financial and technical resource accessing, environmental awareness and participation, among others.

The administrative power over natural resources and environment (hereinafter referred to as “Environment”) management have been transferred to Local Administrations (hereinafter referred to as “LAs”) by the Decentralization Act 1999. The Regional Environmental Office (hereinafter referred to as “REO”) and Provincial Office of Natural Resources and Environment (hereinafter referred to as “PONRE”) are expected to perform coordination and communication roles between the organizations as well as to provide the LAs with the necessary technical and management level advice and instruction. The Eighth Regional Environmental Office (REO8) is considered as an environmentally sensitive area due to the existence of its valuable natural environmental resources and assets. However, there are various environmental issues and problems which have been identified, including water quality management, wetland management, forest conservation and solid waste management caused by various development activities. The unsustainable environmental practices continuously threaten its environmentally valuable resources. Therefore, it has become an urgent concern to establish and to vigorously implement the Regional and Provincial EQMPs in order to foster the balance between environmental conservation and industrial development.

In light of this situation, the Kingdom of Thailand has requested technical cooperation from the Government of Japan. The Japan International Cooperation Agency (JICA) dispatched a Japanese Preparatory Study Team to Thailand in December 2010 and December 2011 and discussed the details of the technical cooperation. As a result, the Record of Discussions (R/D)

was agreed and signed by both parties in September, 2012, and the three year technical cooperation project (hereinafter referred to as the “project” or the “Project”) was launched in January 2013.

1.2 Basic Information of the Project Area

The Office of Natural Resources and Environmental Policy and Planning (ONEP) selected the Eight Regional Environmental Office (REO8) jurisdiction as the model REO to be model in the project’s efforts to strengthen environmental management.

The Eighth Regional Environmental Office (REO8) is based in Ratchaburi Province, which is about 2-hour drive from Bangkok. The jurisdiction of REO8 covers the five (5) Provincial Offices of the Natural Resources and Environment of the provinces of Ratchaburi, Samut Songkhram, Kanchanaburi, Phetchaburi and Prachup Khiri Khan. The location of the project lies in the western part of Thailand which is closely connected with Myanmar. The upper portion of the area extends to the central plain, and the lower eastern part is facing the Gulf of Thailand (see Figure 1-1). The entire area stretches approximately 580 km from north to south with a combined land area of 37,700 km², and a combined population of 2,854.33 as of the 2011 census. The population in this region grew at an average rate of 1.5% annually.

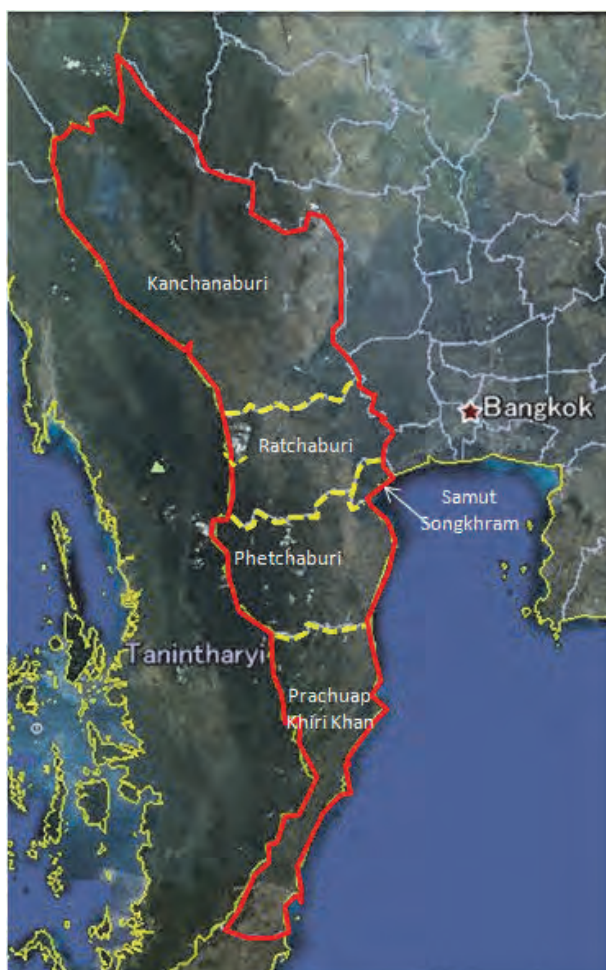


Figure 1-1 Project Area Location

1.3 Profile of Counterpart Agencies

The Project was implemented in partnership with the Office of the Natural Resources and Environmental Policy and Planning (ONEP) together with REO8 and five (5) PONREs in Ratchaburi, Samut Songkhram, Kanchanaburi, Phetchaburi and Prachup Khiri Khan.

The Office of the Natural Environmental Policy and Planning (ONEP) is the responsible agency mandated to formulate and implement the Natural Environmental Quality Management Plan (National EQMP). This Plan is formulated every five years which aims to contribute to sustainable environmental development. Generally, ONEP's main function is to integrate policies and plans, provide guidance and appropriate mechanisms for natural resources and environmental management, as well as implement environmental policies and plans that support the policies embodied in the Enhancement and Conservation of National Environmental Quality Act of 1992. ONEP uses the Environmental Impact Assessment report processes to implement, coordinate and monitor development projects.

The Eighth Regional Environmental Office (REO8), on the other hand is one of the sixteen Regional Environmental Offices in Thailand that manages the affairs of the environment and natural resources at the regional levels. Manned by 25 permanent staff, REO8's main thrust is solid waste management and water quality management, where the number of projects were initiated at the provincial and community levels in coordination with their respective PONREs.

The five (5) PONREs of Ratchaburi, Samut Songkhram, Kanchanaburi, Phetchaburi and Prachup Khiri Khan Provinces, which operate autonomously with close collaboration with REO8, coordinate with each other in matters affecting environmental quality and management of natural resources. REO8 maintains laboratory facilities that PONREs use in monitoring quality standards of water system and water bodies within the jurisdictions. REO8 also provides updated GIS data and information as well as maintain an environmental data base that can be access by all PONREs in the region.

2. Project Outline

2.1 Overall Goal of the Project

The overall goals of the project as indicated under the Project Design Matrix 2 (PDM) are the following:

- For the purpose of improving comprehensive environmental management, the Plan-Do-Check-Action (PDCA) cycle of Regional Environmental Quality Management Plan (EQMP) of REO8, such as participatory planning, implementation, monitoring, evaluation, revising plan, is continuously executed through linkages among central, regional, provincial, and local levels under the REO8's jurisdiction.
- Environmental management in Thailand is improved through the replication of the model to other REOs.

2.2 Project Purpose

The project envisioned that with enhanced and strengthened REO8 capacity, the overall performance will bring about spiral effects and increasing benefits to PONRE and ultimately, the overall environmental management in the REO8 jurisdiction will be improved. Hence, the PDM stipulates the following project purpose as follows:

- Capacity of REO8 and the five (5) PONREs on environmental management particularly in planning, implementation, monitoring/evaluation of Regional EQMP is developed through the process of the REO8 Regional EQMP and pilot project implementation.

2.3 Project Outputs

To achieve the project purpose, the environmental management mechanism and system within ONEP, REO8, PONRE, PAO (Provincial Administration Organization) and Sub-District Municipality (SDM), TAO (Tambon Administration Organization) will be developed and strengthened through a collaborative planning process of Regional EQMP, developing public awareness guidelines and the implementation of pilot projects. Hence, the following project outputs are envisioned as follows:

- Output 1: Model for Environmental Management mechanism for REO8 Regional EQMP is developed through the planning process of REO8 Regional EQMP.
- Output 2: Public awareness on environmental management issues is promoted utilizing a simplified guideline developed by involving stakeholders based on Regional EQMP of REO8.
- Output 3: Recommendation and lessons learned for the promotion of Regional & Provincial EQMP are identified and shared through pilot project implementation.

Figure 2-1 illustrates the structure of the project.

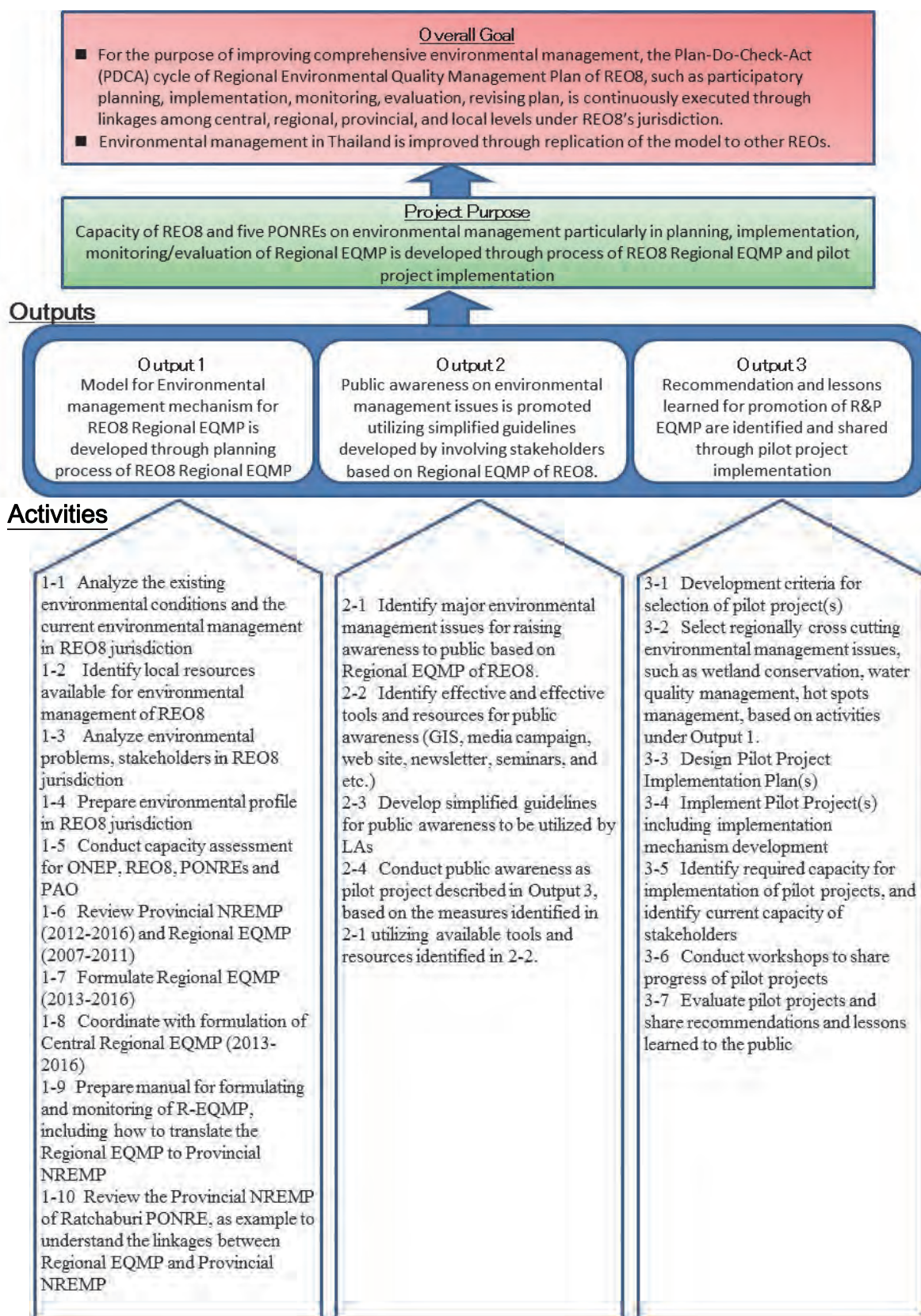


Figure 2-1 Project Structure

2.4 Project Implementation Process

2.4.1 Project Plan

The Project Design Matrix (referred as PDM-0) was developed as a result of the intensive discussion between MNRE and the JICA preliminary survey team dispatched by JICA to Thailand in February 2010 and December 2011. It was revised (see Table 2-1) in August 2012 (referred as PDM-1) during the supplementary survey conducted in Thailand to formulate a detailed plan and to confirm the implementation framework of the project taking into account the following points:

- Simplifying the description of Overall Goal, Project Purpose, and Output-1,
- Expanding the scope of activities planned under Output-2 and
- Decreasing the scope of activities under Output-3.

The PDM-1 was reexamined during the 1st Joint Coordination Committee Meeting (JCC) in April 2013, two months after the official launching of the project, and was revised (see Table 2-2, referred to as PDM-2) based on the following points raised at the 1st JCC Meeting:

- Adding a description in the Project Purpose
- Changing the contents of Output-1 from “Regional EQMP of REO8, which includes its action plan, implementation, monitoring and evaluation (referred herein as M&E) methods, is developed to “A model for an environmental management mechanism for REO8 Regional EQMP is developed through the planning process of REO8 Regional EQMP”.

2.4.2 Progress of the Activities

As per original plan of the project, the activities were divided into two phases: Phase 1 (January 2013-July 2013), and Phase 2 (September 2013 to January 2016). The main activity of Phase-1 was the formulation of the Regional EQMP, while the public awareness activities and the pilot project implementation were to be subsequently conducted during Phase-2 in accordance to the Regional EQMP (2013-2016).

The project was officially launched on February 2013 adopting a 2-phased approach as the plan. During Phase 1, activities and the schedule were based on the original Plan of Operations (PO) and the schedule and actual works were indicated in Table 2-3. During the course of the project however, the formulation of the Regional EQMP took longer than planned and was not completed within the designated period. Hence, the Japan International Cooperation Agency (JICA) and the JICA Expert Team (JET) reviewed the project implementation plan and adjust the implementation of other activities. It took another seven (7) months to develop a detailed implementation plan for Phase 2, which led to the suspension of the project activities in Thailand.

On May 2014, Phase 2 of the project started with the signing of the Minutes of Meeting for the Phase 2 implementation plan. The activities were updated from the PO based on the existing situations and needs of the counterpart organizations as indicated in Table 2-4.

Table 2-1 Project Design Matrix (PDM), Ver.1 August 2012

Target area: Five Provinces under REO8's jurisdiction: Ratchaburi, Kanchanaburi, Samut Songkhram, Phetchaburi, Prachuap Khiri Khan
Target group: Office of Natural Resources and Environmental Policy and Planning (ONEP), the 8th Regional Environmental Office (REO 8), Provincial Offices of Natural Resources and Environment (PONRE) of Ratchaburi, Kanchanaburi, Samut Songkhram, Phetchaburi, and Prachuap Khiri Khan
Cooperation period: Three (3) years starting from October 2012 to September 2015

Narrative Summary	Indicators	Means of Verification	Important Assumption
Overall Goal			
<ul style="list-style-type: none"> For the purpose of improving comprehensive environmental management, the Plan-Do-Check-Action (PDCA) cycle of the Regional Environmental Quality Management Plan (EQMP) of REO8, such as participatory planning, implementation, monitoring, evaluation, revising plan, is continuously executed through linkages among central, regional, provincial, and local levels under REO8's jurisdiction. Environmental management in Thailand is improved by disseminating the experiences of REO8 and five provinces. 	<ul style="list-style-type: none"> Reflecting the evaluation results of the Regional EQMP (2012-2016), the Regional EQMP (2017-2021) is developed and being implemented. Improved and increased environmental activities initiated by REO8 and LAs. The outcome of the Regional EQMP of REO8 is shared among other regions. Plan-Do-Check-Action (PDCA) cycle of Regional EQMP in other REOs is strengthened. 	<ul style="list-style-type: none"> Interviews and/or questionnaires to other REOs. Monitoring and evaluation report of the Regional EQMP (2012-2016) of REO8. The Regional EQMP (2017-2021) of REO8 and others. 	<p>National EQMP remains active. Other REOs are willing to cooperate in implementation of capacity development activities.</p>
Project Purpose			
<p>REO8 and five PONREs' capacity on planning, implementation, monitoring of EQMP are developed.</p>	<ul style="list-style-type: none"> Through implementing pilot projects, problems at project sites are improved. Process of planning of R&P EQMP are clarified and minutes of discussions during the planning process are developed. Progress and results of Regional EQMP of REO8 and Provincial EQMP are published to the public. Quality of technical services which REO8 and PONREs provided to LAs and public are 	<ul style="list-style-type: none"> Monitoring Reports of Regional/Provincial EQMP Web site Interviews Questionnaires 	

		improved, such as water quality improvement or solid waste management.		
Outputs				
1.	Regional EQMP of REO8, which includes its action plan, implementation, monitoring and evaluation method, is developed.	<ul style="list-style-type: none"> Regional EQMP of REO8 is developed reflecting the concerns of PONREs, LAs and the public. Clear demarcation of roles and responsibilities for planning, implementing, monitoring and evaluation among stakeholders is identified. Implementation structure with its mechanism is developed. Improved indicators in Regional EQMP of REO8 are aligned with National EQMP. 	<ul style="list-style-type: none"> Progress Report, Monitoring Report of Regional EQMP (2012-2016) of REO8. 	<p>ONEP, REO8, PONREs, and LAs allocate resources for activities identified in the projects</p> <p>Relevant government agencies assist REO8 and PONREs upon request by providing technical knowledge and data.</p>
2.	Public awareness on environmental management issues is promoted utilizing simplified guidelines developed by involving stakeholders based on Regional EQMP of REO8.	<ul style="list-style-type: none"> Simplified guidelines are developed. Quality and quantity of information provided to LAs and public by REO8 and PONREs are improved. Environmental management activities by community are increased. 	<ul style="list-style-type: none"> Environmental guidelines prepared by stakeholders. Record of public consultation Public awareness impact survey 	
3.	Through the implementation of pilot projects, recommendation and lessons learned for the promotion of R&P EQMP are identified and shared.	<ul style="list-style-type: none"> Recommendations and lessons learned of pilot projects are known to LAs and public. Ways to access budgetary resources are known to LAs. 	<ul style="list-style-type: none"> Monitoring and evaluation reports of pilot project Interviews and questionnaires to LAs involved in pilot project activities 	

Activities		Inputs from Japan	Inputs from Thailand
1-1	By reviewing current regional state of environmental management issues of REO8, identify issues in detail selectively (hot spots, wetland management, water quality management, coastal conservation, community based solid waste management etc.) with appropriate indicators.	<p><Experts></p> <ol style="list-style-type: none"> 1) Team Leader / Environmental Management Planning 2) Organizational Capacity Development / Participatory Planning 3) Area-based planning (GIS) 4) Water Quality 5) Environment Education (GIS) 6) Community Based Solid Waste Management 7) Other experts for implementing the Project activities, if necessary <p><Training></p> <p>Training sessions in Japan (Once a year for both the director levels and officer levels)</p> <p>Study trip in a third country (if necessary)</p> <p><Machinery and equipment ></p> <p>Minimum equipment related to GIS to be decided.</p> <p>Office equipment, training equipment and others as needed.</p>	<p><Counterpart Personnel></p> <ol style="list-style-type: none"> 1) Project Director 2) Co-Project Manager 3) Co-Project Manager 4) Relevant counterparts from both central and local governments <p><Office space and facilities></p> <p>The Project office space and facilities in REO8 and ONEP</p> <p><Operational cost></p> <p>Necessary expenses for local training, meetings and operation cost for activities identified in the Project.</p>
1-2	Based on 1-1, by visualizing environmental management issues in the area under REO8's jurisdiction by utilizing GIS, identify priority issues to be addressed within the Project.		
1-3	Conduct capacity assessment for REO8 and five PONREs.		
1-4	Conduct stakeholder analysis regarding environmental management in the Project site.		
*1-5	Based on 1-3 and 1-4, clarify roles and responsibility among stakeholders identifying resource organizations to provide technical inputs.		
*1-6	Develop an implementation structure of Regional EQMP of REO8 and Provincial EQMP.		
1-7	Develop a method for participatory planning and monitoring of Regional EQMP of REO8 and Provincial EQMP involving various key stakeholders including LAs and the public		
1-8	Develop and review Regional EQMP (2012-2016) of REO8.		
1-9	Review Provincial EQMP (2012-2016) according to Regional EQMP of REO8.		
*1-10	Share the progress of Regional EQMP of REO8 and provincial EQMP to key stakeholders and public.		
2-1	Identify major environmental management issues for raising awareness to public according to Regional EQMP of REO8.		

*2-2	Identify effective and available tools and resources for public awareness (GIS, media campaign, web site, newsletter, seminars, and etc.)			
2-3	Develop simplified guidelines for public awareness to be utilized by LAs.			
*2-4	Conduct public awareness as pilot project described in Output 3, based on the measures identified in 2-1 utilizing available tools and resources identified in 2-2.			
*3-1	Select regionally cross cutting environmental management issues, such as wetland conservation, water quality management, hot spots management, based on activities under Output 1.			
*3-2	Develop work plans, including financial plans, for pilot projects together with LAs, local organizations (e.g., Protected Areas Committee), public and resource organizations identified in 1-5.			
3-3	Implement pilot projects.			
3-4	Identify the required capacity for the implementation of pilot projects, and identify the current capacity of stakeholders.			C/Ps' work will not be disturbed due to a large scale natural disaster or political reason.
3-5	Develop the capacity identified in 3-4 through pilot projects.			
*3-6	Conduct workshops to share the progress of pilot projects			
3-7	Evaluate pilot projects and share recommendations and lessons learned to the public			

*Thai side shall play a major role on activities 1.5, 1.6, 1.10 (activities regarding development of implement structure in Thai side) 2.2, 2.4(activities regarding awareness rising) 3.1, 3.2, 3.6 (activities regarding planning of pilot projects) with support by JICA experts for the purpose of strongly securing the sustainability of the Project.

Table 2-2 Project Design Matrix (PDM), Ver.2 April 2013

Narrative Summary	Indicators	Means of Verification	Important Assumption
Overall Goal			
<ul style="list-style-type: none"> • For the purpose of improving comprehensive environmental management, Plan-Do-Check-Act (PDCA) cycle of Regional Environmental Quality Management Plan (EQMP) of REO8, such as participatory planning, implementation, monitoring, evaluation, revising plan, is continuously executed through linkages among the central, regional, provincial, and local levels under REO8's jurisdiction. • Environmental management in Thailand is improved through the replication of the model to other REOs. 	<ul style="list-style-type: none"> • Reflecting the evaluation results of the Regional EQMP (2012-2016), the Regional EQMP (2017-2021) is developed and being implemented. • Improved and increased environmental activities initiated by REO8 and LAs. • The outcome of the Regional EQMP of REO8 is shared among other regions. • Plan-Do-Check-Action (PDCA) cycle of Regional EQMP in other REOs is strengthened. 	<ul style="list-style-type: none"> • Interviews and/or questionnaires to other REOs. • Monitoring and evaluation report of the Regional EQMP (2012-2016) of REO8. • The Regional EQMP (2017-2021) of REO8 and others. 	<ul style="list-style-type: none"> • National EQMP remains active. • Other REOs are willing to cooperate in the implementation of capacity development activities.
Project Purpose			
<ul style="list-style-type: none"> • Capacity of REO8 and five PONREs on environmental management particularly in planning, implementation, monitoring/evaluation of Regional EQMP is developed through the process of REO8 Regional EQMP and pilot project implementation 	<ul style="list-style-type: none"> • Through implementing pilot projects, problems at project sites are improved. • Process of planning of R&P EQMP are clarified and the minutes of discussions during the planning process are developed. • Progress and results of Regional EQMP of REO8 and Provincial EQMP are published to the public. • Quality of technical services which REO8 and PONREs provided to LAs and the public are improved, such as water quality improvement or solid waste management. 	<ul style="list-style-type: none"> • Monitoring Reports of Regional/Provincial EQMP • Web site • Interviews • Questionnaires 	

Narrative Summary		Indicators	Means of Verification	Important Assumption
Outputs				
1.	Model for Environmental management mechanism for REO8 Regional EQMP is developed through planning process of REO8 Regional EQMP	<ul style="list-style-type: none"> Regional EQMP of REO8 is developed reflecting the concerns of PONREs, LAs and the public. Clear demarcation of roles and responsibilities for planning, implementing, monitoring and evaluation among stakeholders is identified. Implementation structure with its mechanism is developed. Improved indicators in the Regional EQMP of REO8 are aligned with National EQMP. 	<ul style="list-style-type: none"> Progress Report, Monitoring Report of Regional EQMP (2012-2016) of REO8. 	<ul style="list-style-type: none"> ONEP, REO8, PONREs, and LAs allocate resources for activities identified in the projects Relevant government agencies assist REO8 and PONREs upon request by providing technical knowledge and data.
2.	Public awareness on environmental management issues is promoted utilizing simplified guidelines developed by involving stakeholders based on Regional EQMP of REO8.	<ul style="list-style-type: none"> Simplified guidelines are developed. Quality and quantity of information provided to LAs and public by REO8 and PONREs are improved. Environmental management activities by community are increased. 	<ul style="list-style-type: none"> Environmental guidelines prepared by stakeholders. Record of public consultation Public awareness impact survey 	
3.	Recommendation and lessons learned for promotion of R&P EQMP are identified and shared through pilot project implementation	<ul style="list-style-type: none"> Recommendations and lessons learned of pilot projects are known to LAs and public. Ways to access budgetary resources are shared with LAs. 	<ul style="list-style-type: none"> Monitoring and evaluation reports of pilot project Interviews and questionnaires to LAs involved in pilot project activities 	
Activities		Inputs from Japan	Inputs from Thailand	
1-1	Analyze the existing environmental conditions and current environmental management in REO8 jurisdiction	<Experts> 8) Team Leader / Environmental Management Planning 9) Organizational Capacity Development / Participatory Planning 1	<Counterpart Personnel> 1) Project Director 2) Co-Project Manager 3) Co-Project Manager 4) Relevant counterparts from both central and local	
1-2	Identify local resources available for environmental management of REO8			

Narrative Summary		Indicators	Means of Verification	Important Assumption
1-3	Analyze environmental problems, stakeholders in REO8 jurisdiction	10) Organizational Capacity Development / Participatory Planning 2 11) Environmental Analysis/ GIS	governments	
1-4	Prepare environmental profile in REO8 jurisdiction	12) Training/Utilization of GIS 13) Public Awareness		
1-5	Conduct capacity assessment for ONEP, REO8 and PONREs under REO8	14) Pilot Project 1 15) Pilot Project 2		
*1-6	Review Provincial EQMP (2012-2016) and Regional EQMP (2007-2011)	<Training> - Training in Japan (Once a year for both director levels and officer levels)	<Office space and facilities> The Project office space and facilities in REO8 and ONEP	
*1-7	Formulate REO8 Regional EQMP (2013)	- Study trip in a third country (if necessary)		
*1-8	Coordinate with the formulation of Central Regional EQMP (2013-2016)	<Machinery and equipment > - Minimum equipment related to GIS to be decided.	<Operational cost> Necessary expenses for local training, meetings and operation cost for activities identified in the Project.	
2-1	Identify major environmental management issues for raising the awareness of the public based on Regional EQMP of REO8.	- Office equipment, training equipment and others as needed.		
*2-2	Identify effective and effective tools and resources for public awareness (GIS, media campaign, web site, newsletter, seminars, and etc.)			
2-3	Develop simplified guidelines for public awareness to be utilized by LAs.			
*2-4	Conduct public awareness as a pilot project described in Output 3, based on the measures identified in 2-1 utilizing available tools and resources identified in 2-2.			
*3-1	Development criteria for the selection of pilot project(s)			
*3-2	Select regionally cutting environmental management issues, such as wetland conservation, water quality management, hot spots management, based on activities under Output 1.			

Narrative Summary		Indicators	Means of Verification	Important Assumption
3-3	Design Pilot Project Implementation Plan(s)			C/Ps' work will not be disturbed due to a large scale natural disaster or political reason.
3-4	Implement Pilot Project(s) including implementation mechanism development			
3-5	Identify required capacity for implementation of pilot projects, and identify current capacity of stakeholders			
*3-6	Conduct workshops to share progress of pilot projects			
3-7	Evaluate pilot projects and share recommendations and lessons learned to the public			

Table 2-4 Actual works based on Task (Phase 2)

General Task			Phase 2																																															
General Task for 2nd Phase	PDM version 2 (April 2013)		2014												2015												2016																							
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3																								
			Gantt chart grid with bars for Plan and Actual work, and markers for JOC, Final Review, and Final Evaluation.																																															
[0-1] Preparation of Draft Project Implementation Plan for Phase 2	N/A	Plan	[Bar]																																															
[0-2] Preparation of Project Progress Report 2		Actual	[Bar]																																															
[0-3] Preparation of Project Progress Report 3		Plan																																																
		Actual	[Bar]																																															
[0-4] Preparation of Project Progress Report 4		Plan																																																
		Actual	[Bar]																																															
[0-5] Implementation of Public Relations of the Project	Plan																																																	
	Actual	[Bar]																																																
[0-6] Preparation of Project Completion Report	Plan																																																	
	Actual	[Bar]																																																
Japan Training		Plan																																																
		Actual	[Bar]																																															
Explanation and Meetings		Plan																																																
		Actual	[Bar]																																															
Review and Evaluation		Plan																																																
		Actual	[Bar]																																															
Output 1: Model for Environmental management mechanism for REO8 Regional EQMP is developed through planning process of REO8 Regional EQMP																																																		
[1-1] Support for finalization of R-EQMP	1-7: Formulate REO8 R-EQMP (2013) 1-8: Coordinate with formulation of Central Regional EQMP (2013-2016)	Plan	[Bar]																																															
		Actual	[Bar]																																															
[1-2] Capacity Assessment for REO8 and PONREs	1-5: Conduct capacity assessment for ONEP, REO8 and PONREs under REO8 3-5: Identify required capacity for implementation of pilot projects, and identify current capacity of stakeholders	Plan																																																
		Actual	[Bar]																																															
[1-3] Technical assistance for the implementation of the Regional EQMP (2012-2016)	Added in 2nd Phase	Plan																																																
[1-4] Development of a method for participatory planning and monitoring of Regional EQMP		Actual	[Bar]																																															
[1-5] Monitoring in the implementation of Regional EQMP		Plan																																																
		Actual	[Bar]																																															
[1-6] Identification of environmental management issues for the formulation of Regional EQMP		Plan																																																
		Actual	[Bar]																																															
Output 2: Public awareness on environmental management issues is promoted utilizing simplified guidelines developed by involving stakeholders based on Regional EQMP of REO8																																																		
[2-1] Identification of major environmental management issues for public awareness	2-1: Identify major environmental management issues for raising awareness to public based on Regional EQMP of REO8.	Plan	[Bar]																																															
		Actual	[Bar]																																															
[2-2] Identification of effective and available tools and resources for raising public awareness on environmental issues	2-2: Identify effective and effective tools and resources for public awareness (GIS, media campaign, web site, newsletter, seminars, and etc.)	Plan																																																
		Actual	[Bar]																																															
[2-3] Development of simplified guidelines for public awareness campaign to be utilized by LAs	2-3: Develop simplified guidelines for public awareness to be utilized by LAs.	Plan																																																
		Actual	[Bar]																																															
[2-4] Implementation of public awareness campaign in pilot project site(s)	2-4: Conduct public awareness as pilot project described in Output 3, based on the measures identified in 2-1 utilizing available tools and resources identified in 2-2.	Plan																																																
		Actual	[Bar]																																															
[2-5] Monitoring the implementation of public awareness activities in the pilot project site(s)	Added in 2nd Phase	Plan																																																
[2-6] Revision of simplified guidelines for public awareness campaign		Actual	[Bar]																																															
		Plan																																																
		Actual	[Bar]																																															
Output 3: Recommendation and lessons learned for promotion of R&P EQMP are identified and shared through pilot project implementation																																																		
[3-1] Determination of the Pilot Projects	3-1: Development criteria for selection of pilot project(s) 3-2: Select regionally cutting environmental management issues, such as wetland conservation, water quality management, hot spots management, based on activities under Output 1.	Plan	[Bar]																																															
		Actual	[Bar]																																															
[3-2] Preparation of pilot project implementation plan	3-3: Design Pilot Project Implementation Plan(s)	Plan																																																
		Actual	[Bar]																																															
[3-3] Establishment of pilot project implementation mechanism	3-4: Implement Pilot Project(s) including implementation mechanism development	Plan																																																
		Actual	[Bar]																																															
[3-4] Implementation of pilot project(s)	3-6: Conduct workshops to share progress of pilot projects 3-7: Evaluate pilot projects and share recommendations and lessons learned to the public	Plan																																																
		Actual	[Bar]																																															
[3-5] Holding of Workshops to share the progress of the pilot project(s)	3-6: Conduct workshops to share progress of pilot projects 3-7: Evaluate pilot projects and share recommendations and lessons learned to the public	Plan																																																
		Actual	[Bar]																																															

Notes:

- 1- Activities 1-1, 2, 3, 4, 6 in the PDM Version 2 were implemented in 1st Phase and are not shown in the above tasks breakdown
- 2- Task [0-1] ~ [0-6] are general tasks for project management and are not also included in PDM.

3. Project Implementation Mechanism

3.1 Operation and Monitoring of the Project

3.1.1 Coordination and Communication with Counterpart Agencies

1) Bi-weekly Meetings

The Bi-weekly Meeting is organized as a management tool to keep the Thai counterpart team well abreast on the progress of the project. It also provides the venue to share information, resolve issues and concerns about project implementation and to create a venue for the sharing of ideas to better understand the activities of the project. The meeting and the dissemination and exchange of ideas and knowledge that occurred during these meetings contribute to the learning process and capacity building of counterpart staff and of the JICA Expert Team (JET). The regular participants to this meeting consist of the counterpart staff from ONEP, REO8 and in some cases the counterparts from five (5) PONREs.

During the project period, approximately 22 bi-weekly meetings were held in Ratchaburi and Bangkok. At each meeting, the progress of the project as well as issues and concerns related to the project implementation were discussed. Aside from the regular and scheduled bi-weekly meetings, periodic communication and consultation with REO8 and ONEP were also facilitated. See Volume 1 of this Report which provides the listing of bi-weekly meetings conducted during the duration of the project.

2) Joint Coordination Committee (JCC) Meetings

The JCC served as the body that reviews the overall progress and achievement of the project. It is composed of 23 members and chaired by the Deputy Secretary General of ONEP. Among its members include the representatives from the Office of Permanent Secretary (OPS), Pollution Control Department (PCD), Department of Environmental Quality Promotion (DEQP), Department of National Park, Wildlife and Plant Conservation (DNP), Thailand International Development Cooperation Agency (TICA), JICA Thailand, REO8 Regional Director and the PONRE Directors from the provinces of Ratchaburi, Samut Songkhram, Kanchanaburi, Phetchaburi and Prachup Khiri Khan.

During the project period, four JCC Meetings were held; on April 2013 for the first meeting; September 2014 for the second meeting; May 2015 for the third meeting and February 2016 for the fourth and final meeting. At each meeting, issues and concerns regarding the implementation of the Project were discussed and the Minutes of Meetings (MM) were signed by both the representatives from the Thai Government, JICA Expert Team (JET) and the Japan International Cooperation Agency (JICA). See Volume 1 of this Report for the compiled signed MM of the Project.



First JCC Meeting held on April 10, 2013 at ONEP Conference Room, Bangkok



Second JCC Meeting held on September 24, 2014 at Novotel Platinum Hotel, Bangkok



Third JCC Meeting held on May 15, 2015 at Novotel Platinum Hotel, Bangkok



Fourth JCC Meeting held on February 05, 2016 at Amari Watergate Bangkok

3.1.2 Coordination with Other Related Agencies

Coordination and collaboration with relevant agencies were initiated in cooperation with ONEP. Such coordination efforts aimed to further promote the project as well as generate support and cooperation in the implementation of the project. During the project period, significant collaborations were facilitated with PCD and Regional Environmental Offices of Regions 5, 6, 7 and 13, particularly in the formulation of the Central, Eastern and Western Regional EQMP.

3.2 Public Relations of the Project

Recognizing the need to create, promote and disseminate the activities of the project, three public relations programs were launched by the project namely: Facebook Page, Website, and Newsletter. These type of communication channels helped the project in disseminating information to the provincial stakeholders about the progress of the project implementation.

3.2.1 Facebook of the Project

The project launched the Facebook ([REO8REQMP](#)) on May 08, 2013 during the Project Kick-off Seminar held in Ratchaburi Province. Since then, it has been periodically updated to reflect various activities and information related to project implementation. During the project period, the use of Facebook as a means to disseminate information has proven to be useful and effective. Figure 3-1 shows the perspective of the Facebook Page of the project.



Figure 3-1 Perspective of the Project’s Official Facebook

3.2.2 Official Website of the Project

The project’s official website (www.reo8reqmp.com) was launched at the beginning of Phase 2. It was linked to the Facebook page and to the official website of REO8 (<http://reo08.mnre.go.th/>). Figure 3-2 shows the perspective of the official website of the project.

In order to enhance the knowledge of REO8 about website updating and maintenance, the project facilitated the Website Training on October 2014. Since then, the management and maintenance of the website is handled by REO8 under the Information Technology Section.



Figure 3-2 Perspective of the Project Official Website

3.2.3 Newsletter Publication

The project facilitated the publication of newsletters covering three volumes during the project period. A combined total of 3,500 copies were distributed to various agencies, organizations and groups within the REO8 jurisdiction and ONEP. Figure 3-3 shows the front page of the newsletters published during the project period.



Newsletter Volume 1
September 2013

Newsletter Volume 2
February 2015

Newsletter Volume 3
January 2016

Figure 3-3 Newsletters Published by the Project

3.3 Project Seminars

The project conducted two major seminars to promote the project to the general public during the project period. The first seminar was the Project Kick-off Seminar held on May 08, 2013 at Ratchaburi Province, aimed to present the overall goal and expected outputs of the project. It was attended by approximately 66 participants from different organizations and institutions in the REO8 jurisdiction and ONEP.

The National Seminar was also held on January 28, 2016 at Grand Mercure Fortune Bangkok, aimed to share the overall results and achievement of the Project. It was attended by 101 representatives from five PONREs, different agencies and institutions in the REO8 jurisdiction, REO2 (Lampang); REO4 (Nakhonsawan); REO5 (Nakornpathom); REO6 (Nonthaburi); REO11 (Nakhon Ratchasima); REO15 (Phuket), Regional Offices of MNRE including the Department of Marine and Coastal Resources; Department of Mineral and Water Resources; Department of Groundwater Resources; Department of National Parks, Wildlife and Plan Conservation; Protected Areas in Region 3; Pollution Control Department; and Division Offices at ONEP including Environmental Fund; Monitoring and Evaluation; Urban Environment and Area Planning Bureau and the Natural Resources and Environmental Management. The Office of the Permanent Secretary and the JICA Thailand also attended the National Seminar.



Project Kick-off Seminar held on May 08, 2013 at Western Grand Hotel, Ratchaburi Province



National Seminar held on January 28, 2016 at Grand Mercure Fortune Hotel, Bangkok

3.4 Project Progress Reporting

During the project period, four (4) progress reports were prepared and submitted to the Joint Coordination Committee (JCC) as indicated in Table 3-1 below.

Table 3-1 Progress Reports Submitted

Project Phase	Report Title	Date Submitted
Phase 1	Progress Report 1	October 2013
Phase 2	Progress Report 2	September 2014
	Progress Report 3	March 2015
	Progress Report 4	September 2015

4. Project General Achievements

4.1 Inputs from Japan

4.1.1 Dispatch of Experts to Thailand




A total of 10 specialized experts were assigned and dispatched to Thailand, covering a total of 66.78 man-months from February 2013 to February 2016. As per PDM, specialized experts were dispatched in accordance to the required field of specialization namely: environmental management, organizational capacity building and participatory planning, GIS/environmental analysis, public awareness, solid waste management and urban environment. Tables 4-1 and 4-2 provide the details of the experts dispatch to Thailand with its corresponding specialized fields, schedule and man-months assignment.

Table 4-1 Dispatch of Experts to Thailand, Phase 1

	Assignment	Name	1st period									Total	
			2013									Thailand	Japan
			January	February	March	April	May	June	July	August	September		
Thailand in Work	Team Leader/ Environmental Management Planning	Dr. Akinori SATO		2/3 30(1.00)	3/4 24(0.8)	4/7 34(1.13)	5/10	6/9-7/16 38(1.27)	7/18- 9/27 71(2.37)			5.77	
	Organization Capacity Development/ Participatory Planning (1)	Mr. Masahiko FUJIMOTO		3/7	3/30 24(0.8)							0.80	
	Organization Capacity Development/ Participatory Planning (2)	Ms. Gloria. E. SATO		2/10 53(1.76)	4/3	4/25 17(0.57)	5/11 38(1.27)	6/1- 7/8				3.60	
	Regional Environmental Management Planning	Ms. Fumio SUGAWARA		2/3 70(2.33)	4/13		5/10 - 8/21 103(3.43)		9/2- 9/27 26(0.87)			6.63	
	Environmental Analysis/ GIS	Mr. Hiroki HARAGA		3/17-3/24 8(0.27)		3/28-4/18 30(0.67)	5/27-7/27 62(2.06)					3.00	
											19.80		
Work in Japan	Team Leader/ Environmental Management Planning	Dr. Akinori SATO		2/1-2/2 2(0.06)				7/17 1(0.04)	9/28-29 2(0.07)			0.17	
											19.80	0.17	
	Overall										19.97		

Table 4-2 Dispatch of Experts to Thailand, Phase 2

	Assignment	Name	2nd Period																								MM										
			JPF 2014												JPF 2015												Thailand	Japan									
			Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar											
Thailand	Team Leader	Mr. Toshiaki Kudo			26	7(13)	23	2(10)	16	24(9)	16	26(11)	18	26(9)	10	20(11)			4	14(11)	26	1(6)	11	22(12)	16	25(10)			19	31(13)	7	16(10)	29	12(3)	13(11)	4.93	
	Deputy Team Leader/Organization Capacity Development/Participatory Planning 1	Ms. Gloria E. Sato			10	9(27)	8						13(98)		25			28(63)	7	15(40)		23	5(44)	26			19(55)	21	4(15)	5	13(9)	11.40					
	Environmental Management	Dr. Akinori Sato		26	9(45)	29	15(18)	8	25(18)								5	10(6)	15	13(30)		6					10(35)	10	2(3)			14	18(5)	30(1)	6.03		
	Pilot Project 1 Solid Waste Management System Improvement	Dr. Akinori Sato								5		15(42)		25		17	19	4(69)			12	25(14)						3	7(5)	8	23(16)	24	28(5)	4.87			
	Pilot Project 1 Landfill Improvement	Mr. Toshihiko Tokita												25		17	19	25	28(59)					17	9(24)							29	13(16)	0.80			
	Pilot Project 1 Urban Environment Survey	Mr. Toshikazu Hiwaki									25					17	19	25	28(59)																1.97		
	Pilot Project 2 Urban Environmental Management	Mr. Kenichi Kuramoto							7	21(15)			18	31(14)	25		28(35)		25	3(9)			2	28(27)	21	26(6)		6	26(21)					4.23			
	Pilot Project 2 Participatory Environmental Management	Ms. Ayumi Koyama								16(6)			1	14(14)	22	30(9)	12	25(18)	8	10(3)	19	22(4)	27	15(20)		14	31(18)		15(1)			16(1)	3.13				
	Public Awareness	Ms. Ayumi Koyama		26		26(62)	13	16(4)	8	10(33)		17	31(15)			30	7(9)		11	18(8)		7	26(20)		11	2(12)		18	8(21)	12	9	11	13(32)	6.13			
Environmental Analysis/GIS/Training	Mr. Akinobu Sembo											25	7(14)													13	12(30)							1.47			
																											44.96										
Work in Japan	Team Leader	Mr. Toshiaki Kudo																														16	17(2)	0.10			
	Japan Training-1	Ms. Ayumi Koyama							23	31(7)										3	26(18)						2	12(8)						1.70			
	Japan Training-2	Mr. Toshikazu Hiwaki																										13(1)							0.05		
																											1.85										
																											Grand-Total	46.81									

Legend :  Work in Thailand
 Work in Japan
 Work borne by the consultant

4.1.2 Provision of Equipment

A number of pieces of equipment were purchased during the project period in order to facilitate the effective implementation of the project activities. Table 4-3 shows the list of equipment purchased by the project. At the end of the project period, these equipment are turned over to the REO8 jurisdiction with REO8 as custodian and to be utilized effectively for its effort to sustaining project activities after termination.

Table 4-3 List of Purchased Equipment

Equipment	Date Purchased	Yen	Baht	Managed by
Multi-function printer	2013/4/30	669,398	203,335	REO 8
Desktop PC	2013/5/16	88,310	26,825	REO 8
LCD Projector	2013/5/28	62,684	19,041	REO 8
LCD Projector Screen	2013/5/22	5,136	1,560	REO 8
Video Camera	2013/5/27	83,657	25,411	REO 8
GPS	2013/6/20	75,744	23,008	REO 8
GIS software	2013/7/30	321,606	97,690	REO 8
Laptop PC for GIS	2013/7/17	217,666	66,118	REO 8
Printer for GIS	2013/7/25	269,658	81,911	REO 8
Total		1,793,856	554,891	

Source: JICA Terminal Evaluation Report, November 2015.

4.1.3 Training in Japan

The project conducted three (3) batches of customized trainings in Japan held, respectively on October 26 - November 1, 2014, June 7 - June 20, 2015 and November 3 - November 17, 2015. The participants in the first batch of the training focused on management level officials, and the other two batches were designed for practical level officers. A total of 44 participants consisting of representatives from various department of MNRE, including the Office of Permanent Secretary (OPS), ONEP, Pollution Control Department (PCD), REO8, five (5) PONREs in REO8 jurisdiction and two (2) pilot LAs have attended the trainings (see Table 4-4 for participants profile).

In each batch of trainings, the participants attended lectures conducted by various organizations; conducted field visits to various environmental related facilities as well as learned Japanese methods in environmental education. Among the significant recipient organizations that have facilitated lectures with the Thai delegations include the Ministry of Environment, Prefectures of Shizuoka and Kanagawa, and the cities of Fuji and Tokyo Metropolitan Government. Table 4-5 shows the outline of the above mentioned trainings.

Table 4-4 Profile of Participants, Training in Japan

Organization	Participants per Batch			Total Number
	First Training (Oct 26-Nov 1, 2014)	Second Training (June 07-20, 2015)	Third Training (Nov 03-17, 2015)	
ONEP	4	4	5	13
PCD	1	-	-	1
OPS	2	-	-	2
REO8	2	2	3	7
PONRE				
Ratchaburi	1	2	1	4
Samut Songkhram	1	1	1	3
Kanchanaburi	1	1	1	3
Phetchaburi	1	2	1	4
Prachup Khiri Khan	1	1	1	3
Pilot LAs				
Pak Tho	-	1	1	2
Tha Yang	-	1	1	2
Total	14	15	15	44

Table 4-5 Outline of the Training in Japan

Details	First Training (Oct 26-Nov 1, 2014)	Second Training (June 07-20, 2015)	Third Training (Nov 03-17, 2015)
Course Objectives	<ul style="list-style-type: none"> To understand the formulation of environmental policies and plans To obtain ideas on environmental management mechanisms 	<ul style="list-style-type: none"> To understand the process in the formulating, implementing, and monitoring/evaluation of environmental management at National, Prefecture and City levels To learn about experiences in the implementation of environmental management To learn about experiences in community participation in environmental management 	
Recipient Organization	<ul style="list-style-type: none"> Ministry of Environment Shizuoka Prefecture Fuji City 	<ul style="list-style-type: none"> Ministry of Environment Kanagawa prefecture Fuji City Tokyo Metropolitan Government Clean Authority of Tokyo 	<ul style="list-style-type: none"> Ministry of Environment Kanagawa Prefecture Fuji city Tokyo Metropolitan Government Clean Authority of Tokyo Itabashi Ward
Lecture Topics	<ul style="list-style-type: none"> Environment Ministry <ul style="list-style-type: none"> Basic Environmental Plan in Central Level Environment Assessment National Park Management Water & Air Environment Management 	<ul style="list-style-type: none"> Environment Ministry <ul style="list-style-type: none"> Basic Environmental Plan in Central Level Environment Assessment National Park Mngt Water & Air Environment Management Environmental Education 	<ul style="list-style-type: none"> Environment Ministry <ul style="list-style-type: none"> Basic Environmental Plan in Central Level Environment Assessment Water& Air Environment Management Solid Waste

Details	First Training (Oct 26-Nov 1, 2014)	Second Training (June 07-20, 2015)	Third Training (Nov 03-17, 2015)
	<ul style="list-style-type: none"> • Shizuoka Prefecture <ul style="list-style-type: none"> ➢ Basic Environmental Plan in Prefecture level ➢ Natural Environment Management ➢ Water& Air Environment Management ➢ Linkage with Central Government ➢ Telemetry System • Fuji City <ul style="list-style-type: none"> ➢ Fujiashitakasanroku Regional Environment Management ➢ Pollution Control Measures 	<ul style="list-style-type: none"> ➢ Solid Waste Management • Kanagawa Prefecture <ul style="list-style-type: none"> ➢ Basic Environmental Plan in Prefecture level ➢ Natural Environment Management ➢ Water& Air Environment Management ➢ Solid Waste Management • Fuji City <ul style="list-style-type: none"> ➢ Fujiashitakasanroku Regional Environment Management ➢ Pollution Control Measures ➢ Solid Waste Management ➢ Community Activities for Solid Waste Management 	<ul style="list-style-type: none"> Management • Kanagawa Prefecture <ul style="list-style-type: none"> ➢ Basic Environmental Plan in Prefecture level ➢ Water& Air Environment Management ➢ Solid Waste Management ➢ Linkage with Community • Fuji City <ul style="list-style-type: none"> ➢ Fujiashitakasanroku Regional Environment Management ➢ Pollution Control Measures ➢ Solid Waste Management
Visited Areas and Facilities	<ul style="list-style-type: none"> • Fuji City Landfill Site 	<ul style="list-style-type: none"> • Environmental Research Center, Kanagawa • Fuji City Landfill Site • Landfill Site, Tokyo • Incineration Plant, Tokyo 	<ul style="list-style-type: none"> • Environmental Research Center, Kanagawa • Fuji City Landfill Site • Landfill Site, Tokyo • Incineration Plant, Tokyo • Eco-polis Center, Itabashi

The participants, in each training learned the Japanese environmental management system from the linkage of Central, Prefectural, and local levels. Their studies were not only in lecture room and site visits, but also daily life in Japan. In particular, they were quite impressed by the high environmental awareness by Japanese citizens, and cleanliness of public areas such as roads, parks, and stations.

At the end of each training program, the participants shared what they learned as summarized in Table 4-6 (see Appendix Volume 1 of this Report for the complete compilation of the Training in Japan Reports)

Table 4-6 Summary of Participants' Lessons Learned

First Training	<ul style="list-style-type: none"> - Being impressed for applying more strict environmental standards than the national level by the prefecture and city level. It is lessons like these and solutions to problems learned by the experiences of environmental pollution. - Laws and regulations for environmental management in Japan are similar to those in Thailand. Therefore, it made them confident that Thailand can also achieve an environmental management program like Japan. On the other hand, Thailand has had problems for its operations. - It is important that close communication and cooperation among related
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	<p>departments for the formulation of the plan. Thailand also needs to establish such a structure.</p> <ul style="list-style-type: none"> - Thailand also conducts periodical monitoring of water and air quality, but the utilization of the results of the monitoring is weak. The results should be incorporated into the plan. - Japanese high awareness for environment, the mind of <i>mottainai</i>, and sincere attitudes toward work needs to be applied into environmental management in Thailand
<p>Second Training</p>	<ul style="list-style-type: none"> - Regarding the formulation of plans, it doesn't have to have big differences between Thailand and Japan; however, the implementation, evaluation, revision, and improvement of the plan are much different. Japanese governmental organizations frequently publish or disseminate plans, leaflets, and any other related information to the public. Thai governmental organizations also need to strengthen on this work in order to increase opportunities to disseminate the roles of each stakeholder. For example, to approach the private sector, it can be good to coordinate with business associations and they can be involved as spokesmen. - Different kinds of techniques to be applied for environmental management. Especially, simple and intermediate techniques such as composting are very useful and easy to apply on a community level. It is better to work on those simple and intermediate techniques first, and disseminate good results to other areas. - Almost all Thai people know the 3R, but the implementation of 3R is not high as that of Japan. Japan applies environmental education from primary age to students, and they have opportunities to visit landfill sites to think about their environment and living life. Thailand also needs to apply environmental education from early childhood. Now it is difficult to construct landfill sites or incineration plants due to strong objections from residents around the sites. But reducing the amount of waste can be possible by raising the awareness of the community and utilizing their cooperation. - Municipalities are the key players to work on the field, and felt big impressions about the activities by non-profit organization (NPO) in Fuji city. LAs need to encourage our community people to promote their voluntary activities. Now waste management is a huge problem for the people of Thailand. The site visit to the landfill reminded us that there is a limitation of the land, and strong cooperation for reducing the amount of waste is urgent and needs to be achieved.
<p>Third Training</p>	<ul style="list-style-type: none"> - Various departments of governments of Japan worked together to prevent pollution. It was impressive that the participation of the volunteers for environmental protection are not only adult but also children. The materials of environmental education from the Eco-polis Center are effectual for children to study. - Local governments in Japan have independent authority, and their roles are clear. Thailand should learn that point. At the beginning, Thailand needs to engage in educational activities on environmental protection. Especially, waste management is important. The materials of environmental education from the Eco-polis Center are effective to study. - Technology of waste treatment from incineration plant. Especially, I was impressed by the burning capacity.

4.1.4 Local Cost

The project has disbursed a total local cost amounting to JPY 55,128,000, which is equivalent to THB 16,490,577.3. This covers the period from Phase 1 to Phase 2 of the project as indicated in Table 4-7 below:

Table 4-7 Summary of Local Cost

Phase	Local Cost (Yen)	Equivalent Amount (Baht)
Phase-1	11,872,000 (2,995,000 for sub-contract)	3,551,301.23
Phase-2	43,256,000	12,939,276.1
Total	55,128,000	16,490,577.3

Note: Exchange rate converting to Thai Baht is used JICA rate of January 2016 (3.343)

4.2 Inputs from Thailand

4.2.1 Appointment of Project's Counterpart Staff

In order to facilitate the technology transfer and strengthen the capacity development strategy of the project, a total of 27 counterpart staff were assigned from ONEP, REO8 and PONRE (see Table 4-8) to work with the JICA Expert Team in the implementation of the project activities. In addition, the pilot LAs have also assigned personnel to assist pilot project implementation.

Table 4-8 Number of Counterpart Staff Assigned

Organization	Number of Assigned Staff
ONEP	6
REO8	8
Ratchaburi PONRE	4
Phetchaburi PONRE	2
Samut Songkhram PONRE	2
Kanchanaburi PONRE	3
Prachuap Khiri Khan PONRE	2
Total	27

4.2.2 Provision of Office Facilities

The project was provided by REO8 with suitable project office space at an REO8 building with office furniture and fixtures as well as free access to the other office facilities, including conference rooms and meeting rooms.

4.2.3 Local Cost

The counterpart organizations, including ONEP, REO 8, and the five PONREs, bore the expenses in organizing project events such as JCC meetings, bi-weekly meetings, the costs of accommodation during in-house training and seminars as well as expenses in the dissemination of the project related materials to the stakeholders, for instance the Regional EQMP and newsletters, among others.

5. Project Achievement by Outputs

5.1 Output 1

The project fulfilled the activities of Output 1 in accordance with the Project Design Matrix 2 (PDM) as indicated in Table 5-1 below. Key indicators were achieved and other significant achievements were also delivered as a result of the modification of activities during the course of Phase 2 implementation.

Table 5-1 Outline of Output 1

Output 1	Model for Environmental Management mechanism for the REO8 Regional EQMP is developed through the planning process of the REO8 Regional EQMP
Indicators	<ul style="list-style-type: none"> 1.1 Regional EQMP of REO8 is developed reflecting concerns of the PONREs, LAs and the public. 1.2 Clear demarcation of roles and responsibilities for planning, implementing, monitoring and evaluation among stakeholders is identified. 1.3 Implementation structure with its mechanism is developed. 1.4 Improved indicators in Regional EQMP of REO8 are aligned with National EQMP.
Activities	<ul style="list-style-type: none"> 1.1 Analyze the existing environmental conditions and current environmental management of the REO8 jurisdiction 1.2 Identify local resources available for environmental management in the REO8 jurisdiction 1.3 Analyze environmental problems and conduct stakeholders' analysis in the REO8 jurisdiction 1.4 Review Regional EQMP (2007-2011) 1.5 Assist in the formulation of Regional EQMP (2013-2016) 1.6 Coordinate in the formulation of Central Regional EQMP 1.7 Prepare an environmental profile in the REO8 jurisdiction 1.8 Prepare a manual for the formulation of the Regional EQMP 1.9 Review Provincial EQMP (Ratchaburi PONRE) 1.10 Conduct capacity assessment with ONEP, REO8, PONRE and PAO

5.1.1 Achievements of Output 1 Indicators and Activities

The model for environmental management mechanism for Regional EQMP of REO8 has been developed in the course of the Regional EQMP planning process applying the PDCA cycle (Plan-Do-Check-Act) as a tool. With the activities initiated and the processes implemented under Output 1, counterpart at ONEP, REO8 and the five PONREs were able to enhance and strengthen their understanding on the concept of the PDCA cycle.

Outlined below are the overall achievements of Output 1.

Indicator 1.1
Regional EQMP of REO8 is developed reflecting concerns of PONREs, LAs and the public.

The Regional EQMP (2013-2016) was formulated and finalized in October 2014. It was presented to the stakeholders of the REO8 jurisdiction during the Regional Seminar held on January 2015 in Ratchaburi. The full version of the Regional EQMP, both printed and electronic copies (compact disk format), were distributed to the members of the JCC. The executive summary, on the other hand, was distributed to relevant stakeholders in the REO8 jurisdiction including, but not limited to, five (5) PONREs, Regional Offices of MNRE and academic institutions. Copies were also provided to different Departments in MNRE as well as to other 15 Regional Environmental Offices (REOs). Table 5-2 shows the total number of copies produced and distributed to the stakeholders.

Table 5-2 Number of Regional EQMP (2013-2016) Printed

Document	Number of Copies		
	English	Thai	CDs
Full version of the Regional EQMP	35	80	75
Executive Summary	200	850	

The Project undertook intensive participatory planning processes (see Figure 5-1) between 2013 and 2014 to formulate the Regional EQMP involving relevant organizations, institutions and non-government organizations (NGOs) in the REO8 jurisdiction. In total, 15 provincial workshops and four regional workshops series were conducted, with appropriately 350 participants¹ in the REO8 jurisdiction during the entire planning period (see Table 5-3 and Volume 1 of this Report). The workshops were organized, aimed at providing a venue for the provincial and local stakeholders in REO8 jurisdiction to express their views and opinions about the current environmental problems and issues confronting them and to share their aspirations, strategies and measures to address the issues.

In addition, during the Regional EQMP planning period, data and information regarding environmental status and socio-economic conditions were generated using methodologies and tools such as Project Cycle Management (PCM), Problem Analysis, Stakeholder Analysis and SWOT Analysis. These activities led to a common understanding on the existing environmental conditions and draw-out shared visions and goals to address the issues and problems in a participatory manner among REO8, PONRE and other relevant stakeholders.

The Project also conducted a supplemental survey to understand the current environmental status of the REO8 jurisdiction, know the current environmental management system in the REO8

¹ Except for Workshop 1, the participants in Workshops 2-5 were selected to represent PONREs to the series of planning workshops conducted in Ratchaburi.

jurisdiction and identify available local resources including an inventory of government agencies, private and academic institutions, state-owned enterprises, non-government organizations and international organizations working for environmental management in Thailand with the REO8 network. The project commissioned a Thai-based organization to collect the environmental data and information and two reports were generated, namely: the “Study on the Identification of Local Resources for Environmental Management in the REO8 Jurisdiction”, and the second one was the “Study on Environmental Condition in the REO8 Jurisdiction”. These reports were submitted to ONEP and REO8 in October 2013.

In addition, the results of the above mentioned studies were used during the formulation of the Regional EQMP and the preparation of the environmental profile for the REO8 jurisdiction.

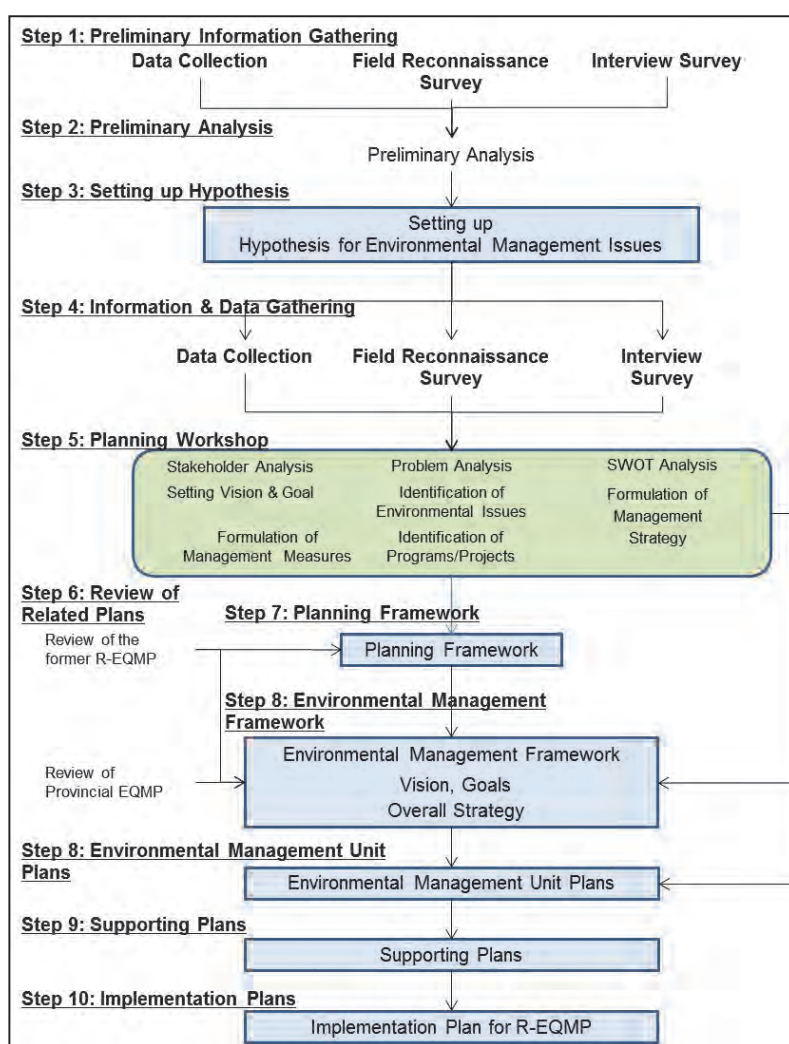


Figure 5-1 Regional EQMP Planning Process

Table 5-3 Regional EQMP Planning Workshop

Workshop 1 Series of Provincial Workshops	
Date	May 29-June 11, 2013 ²
Place	Five provinces in the REO8 jurisdiction
Participants	236 participants (total)
Objectives	<ul style="list-style-type: none"> - To provide a venue to share ideas and opinions about the existing environmental management system in REO8 jurisdiction; - To come up with a common understanding of the existing environmental conditions and problems faced by the provinces in the REO8 jurisdiction
Topics	<ul style="list-style-type: none"> - Stakeholder Analysis - SWOT Analysis - Problem Analysis
Workshop 2 Regional Workshop Series 1	
Date	June 11, 2013 ³
Place	Ratchaburi
Participants	23 participants (representative from five PONREs, NGOs, REO8 and ONEP)
Objectives	<ul style="list-style-type: none"> - To formulate vision of REO8 towards 2026 - To set goals for 2016 - To identify management issues
Workshop 3 Regional Workshop Series 2	
Date	June 17, 2013
Place	Ratchaburi
Participants	23 participants (representative from five PONREs, NGOs, academe, Regional Offices of MNRE, REO8 and ONEP)
Objectives	<ul style="list-style-type: none"> - To formulate environmental strategies, measures by management units namely: environmental spatial management, natural resource management, pollution control, wildlife conservation and protected area management and urban environmental management
Workshop 4 Regional Workshop Series 3	
Date	June 18, 2013
Place	Ratchaburi
Participants	20 participants (representatives from five PONREs, NGOs, academe, Regional Offices of MNRE, REO8 and ONEP)
Objectives	<ul style="list-style-type: none"> - To formulate environmental management measures by management units namely; environmental spatial management, natural resource management, pollution control, wildlife conservation and protected area management and urban environmental management
Workshop 5 Regional Workshop Series 4	
Date	June 25, 2014
Place	Ratchaburi
Participants	40 participants (representatives from five PONREs, NGOs, academe, Regional Offices of MNRE, REO8 and ONEP)
Objectives	<ul style="list-style-type: none"> - To identify programs and projects to be implemented under the Regional EQMP

As a result of the above mentioned activities, the project introduced some modifications to the Regional EQMP. The modifications include the classification of environmental issues into five management units (environmental spatial management unit, natural resource management unit, pollution control unit, wildlife and protected area management unit, and urban environmental

² The Prachup Khiri Khan Province, Workshop 1 was conducted intermittently between June 3, 10 and 11, 2013. Except June 03, 2013, which was conducted in Prachup Khiri Khan, the venue for workshop 1 on June 10 and 11, 2013 was in Ratchaburi.

³ The Prachup Khiri Khan also participated Workshop 2 which was conducted in Ratchaburi and present the results of Workshop 1.

management unit) and the introduction of Environmentally Sensitive Zoning as spatial framework.

With the introduction of spatial framework through GIS and spatial analysis into the Regional EQMP, the Project conducted trainings and seminars on GIS. These aimed to provide common understanding on the basics of GIS and its utilization in environmental planning. During the project period, GIS trainings and seminars were held in April 2013, February 2015 and October 2015, which were attended by two representatives from each of the Information Technology (IT) Section in REO8, five PONREs. Refer to 5.1.2 Subsection 4 and Volume 1 of this Report for the details of each GIS trainings and seminars.



1st GIS Training held on April 05, 2013 at REO8, Ratchaburi



2nd GIS Training held on February 02-05, 2015 at REO8, Ratchaburi



Participants of the 2nd GIS Training in Japan held on February 02-05, 2015



3rd GIS Training held on October 04-07, 2015 at REO8, Ratchaburi

Indicator 1.2

Clear demarcation of roles and responsibilities in planning, implementing, monitoring and evaluation among stakeholders are identified

The consequences of the planning workshops and the series of intensive consultations with the stakeholders in the REO8 jurisdiction as outlined above, have resulted in a deeper understanding of the roles and responsibilities of ONEP, REO8 and PONRE in the planning, implementing, monitoring and evaluation of plans. Table 5-4 outlines roles and responsibilities of counterpart organization as organizational mandates.

Table 5-4 Roles and Responsibilities of Counterpart Organization

Organization	Role and Responsibilities
ONEP	<ul style="list-style-type: none"> • Provides direction of environmental management at national level • Monitors implementation of Regional EQMP*
REO8	<ul style="list-style-type: none"> • Formulates Regional EQMP • Implements Regional EQMP • Monitors Regional EQMP • Supports and coordinates with PONREs for the implementation of Regional EQMP
PONRE	<ul style="list-style-type: none"> • Incorporates Regional EQMP into PNREMP and Provincial EQM Action Plan • Implements Regional EQMP through the implementation of PNREMP and Provincial EQM Action Plan at provincial level • Coordinates with LAs for the implementation of Regional EQMP • Monitors the implementation of Regional EQMP at a provincial level
LAs	<ul style="list-style-type: none"> • Incorporates Regional EQMP into a Provincial Development Plan • Implements Regional EQMP under the duties and mandates of LAs • Promotes community participation for the implementation of Regional EQMP

* This role was added as one of the responsibilities of ONEP under the Project.

The roles and responsibilities of planning were clearly understood as mandated by law. During the project period, REO8 changed policies and shifted organizational priorities following the directives from the Pollution Control Department of MNRE. The following conditions have affected the shift of policies namely:

- Creation of Central, Eastern, and Western Cluster Region and the formulation of a Central, Eastern, and Western Cluster Region Plan
- Institutional and administrative mandate of REO8 to be under the jurisdiction of the Pollution Control Department of MNRE
- National Policy mandating the development direction of REOs to solid waste management and water quality concerns

Although the Project has little control over the above emerging development, the project necessitates employing a process in order to manage the influential external changes. It is

noteworthy that at the later part of the Project period (October 2015), the mandate and directives of the REO8 was back under the umbrella of the Office of the Permanent (OPS).

As to the implementation, monitoring and evaluation of the Regional EQMP, while it was understood that REO8 has responsibilities over its implementation, monitoring and evaluation, however, the lack of budget and/or the limited budget for REO8 operations played a very critical factor in performing these roles. As practiced in the past, PCD provided special budget for REO8 in implementing activities related to water quality, air quality and solid waste management. However, without such special allocation from PCD, there was no budget allocated to initiate implementation of the Regional EQMP or conduct its monitoring and evaluation. The REO8 needed to conduct intensive promotional activities with various regional offices and to LAs to adopt the projects and programs identified in the Plan.

The demarcation of roles and responsibilities in planning, implementation, monitoring and evaluation were important but without financial or technical support from the National Government, the REO8, and PONRE for that matter, will not be able to perform their expected roles effectively and efficiently. In the end, the REO8 would have limited opportunities to, not only accumulate experiences in implementing, monitoring and evaluation of Regional EQMP but also in clarifying the impact, the overall achievements of key performance indicators they have outlined, and the extent of their contribution to the National EQMP targets.

**Indicator 1.3
Implementation structure with its mechanism is developed.**

In consultation with counterpart agencies, an implementing structure and mechanism were developed (see Figure 5-2). It was envisioned that with the mechanism in place it would fuel the implementation of the Regional EQMP. As indicated in the graph, the structure consists of an Advisory Committee and a Task Force Team. The Advisory Committee, a multi-agency body composed of representatives from ONEP, DEQP, PCD, five PONREs and LAs, established to share the progress of activities as well as update and share environmental concerns within the REO8 jurisdiction. The Task Force Team, on the other hand is a small localized groups organized either at LA or community levels.

The Project also introduced the development of an Advisory Group on Environment (AGE) (see Figure 5-3) and Task Force Teams to be organized at the REO8 level, to serve as a mechanism to improve coordination, linkages, and communication among key environmental players in the Region. Initially, AGE shall consist of permanent representatives from REO8, 5 PONREs, and ONEP and on alternative basis representatives from LAs in five PONREs and selected NGOs. As REO8 gains and increases its capacities, membership and composition of AGE shall be expanded to other agencies and environmental groups within the REO8 jurisdiction. Participation and involvement of other departments within MNRE shall be encouraged namely: Pollution Control Department (PCD); Department of Water Resources (DWR); Department of

Marine and Coastal Resources (DMCR); Royal Forest Department (RFD); National Parks, Wildlife and Plant Conservation Department (NPWPCD), and Department of Environmental Quality Promotion (DEQP), among others. Such involvement and participation will help facilitate in enhancing the coordination of activities and programs at the local level. Moreover, although it is expected that PONRE can bring in the sentiments and concerns of the LAs, TAOs and PAOs, relevant representatives from these groups should also be encouraged to be part of AGE whenever possible. The REO8 can be considered as the secretariat of AGE.

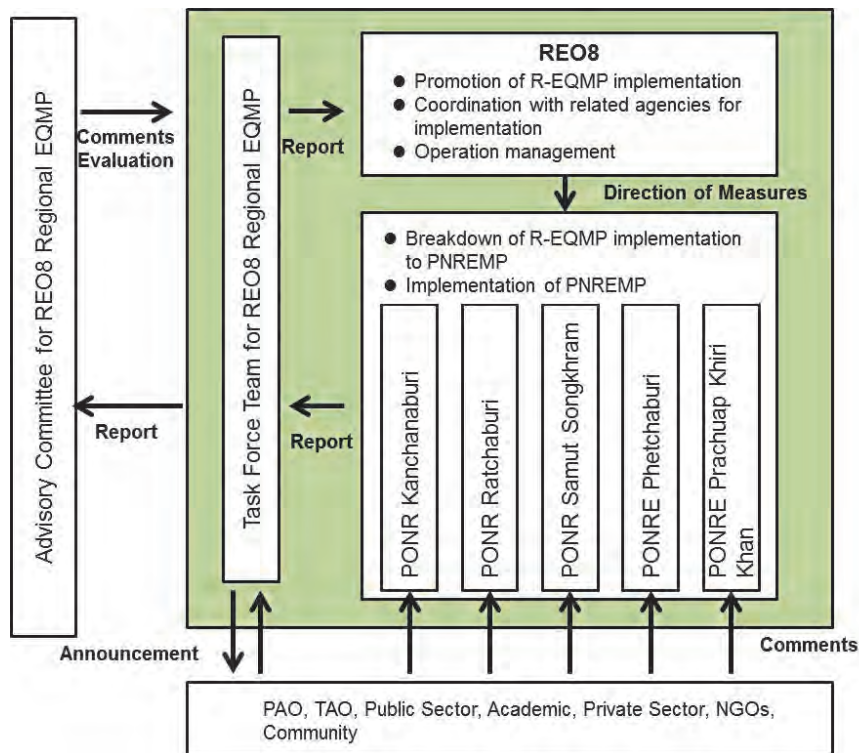


Figure 5-2 Regional EQMP Implementing Structure

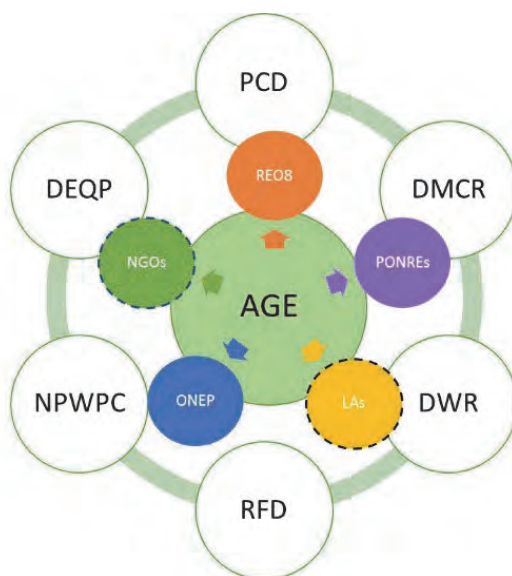


Figure 5-3 Regional EQMP Institutional Implementing Structure

Moreover, in order to test the viability of the mechanism, the Project applied them in the implementation of activities at pilot projects in two LAs. The implementation of the pilot project activities were managed by the Advisory Team and the Task Force Teams. The progress and results of the monitoring activities were reported during project meetings, including bi-weekly meetings and at the JCC (see Section 5.3 for details on the pilot project implementation).

Indicator 1.4
Improved indicators in Regional EQMP of REO8 are aligned with National EQMP

The Project facilitated the review of the National EQMP (2012-2016) in order to ensure that the Regional EQMP of REO8 aligned with the National EQMP. Hence, on the basis of the results of such review, the Regional EQMP of REO8 developed key performance indicators as indicated in Table 5-5 below (see Regional EQMP (2013-2016 in Appendix Compact Disk for details). It is envisioned that with the improved KPIs, the Regional EQMP of REO8 can ensure its concrete contribution to the achievements of goals and targets of the National EQMP.

Table 5-5 Key Performance Indicators in the Regional EQMP

Management Unit	Identified KPIs	Performance Target
Environmental Spatial Management	<ul style="list-style-type: none"> • Integration of environmentally sensitive zoning into land use plan in selected provinces of REO8 	<ul style="list-style-type: none"> • Environmentally sensitive zone maps are prepared • Environmentally sensitive zone maps are integrated into land use plan
Natural Resource Management	<ul style="list-style-type: none"> • Restoration of Pranburi reservoir in Prachup Khiri Khan • Development of database for natural resource management 	<ul style="list-style-type: none"> • 2 km² of watershed is restored in Pranburi reservoir • Mutual Agreements with communities on forest resource management are signed and implemented
Pollution Control	<ul style="list-style-type: none"> • Improvement of water quality standards in Mae Klong River and Phetchaburi River 	<ul style="list-style-type: none"> • Solidarity mechanism for water pollution control is developed at provincial level • Study on special pollution control area is conducted
Wildlife and Protected Area Management	<ul style="list-style-type: none"> • Strengthen management of protected area 	<ul style="list-style-type: none"> • Illegal occupants rate in protected areas are reduced at 17 km² or 5% of total encroached areas
Urban Environmental Management	<ul style="list-style-type: none"> • Increase urban environmental value 	<ul style="list-style-type: none"> • Increase green areas of 18.8 km² in the city limits of Kanchanaburi and Ratchaburi • 5 Village level environmental management are established • 50-100m reduction of visual pollution (signboards) in Hua Hin and Cha am

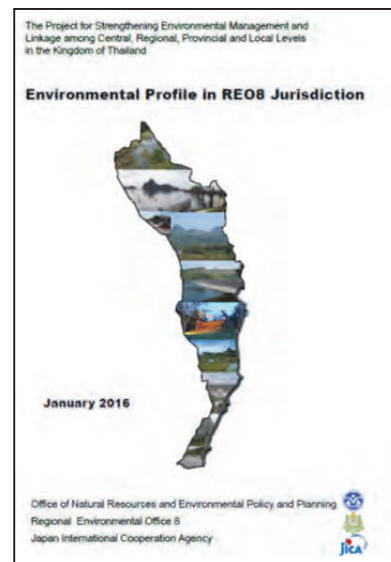
5.1.2 Other Significant Achievement of Output 1

Outlined below are other significant achievements of Output 1 per the implementation plan. These include the following:

1) Environmental Profile in REO8 Jurisdiction

The project facilitated the review of data and information collected during the course of the Regional EQMP planning and reformatted the data and information into an environmental profile of the REO8 jurisdiction. The preparation took a few months before its final completion in December 2015 in order to check the accuracy of data as well updating of some data and information, where information was available.

The project published the draft Environmental Profile document in January 2016 and was finalized in February 2016 with the production of 85 printed copies and 45 compact disks. These were distributed to REO8, ONEP and other 15 REOs.

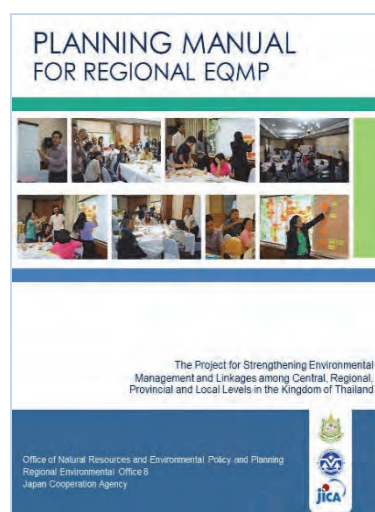


2) Planning Manual for Regional EQMP

As per PDM-2 and the implementation plan for Phase 2, the project developed the planning manual for Regional EQMP. As per the plan, the methods, tools and the overall experience during the planning, implementation and monitoring of the Regional EQMP (2013-2016) were incorporated in the manual.

In the preparation of the manual, the project conducted series of meetings and discussions with C/P in order to incorporate their ideas and opinions as well as enhance the learning process and ensure ownership.

The draft manual was published in January 2016 and was finalized in February 2016 with the production of 90 printed copies and 45 compact disks which were distributed to ONEP, REO8 and other 15 REOs.



3) Review of Provincial EQMP in PONRE Ratchaburi

The review of Provincial EQMP in PONRE Ratchaburi was pointed out during the kick-off meeting for phase 2 in May 2014 as a modification of the original task of reviewing all Provincial EQMPs. The concept of the review as pointed out by ONEP was to “showcase” and generate ideas in understanding the linkages between Regional EQMP and Provincial EQMP.

In the light of this, the project conducted workshops and a series of consultative sessions with PONRE Ratchaburi, aimed to understand the extent of the linkage, identify problems, and come up with measures to address them. In consultation with REO8 and ONEP, the parameters of the

review were set to include structure, contents (hierarchy, domain, target year, data, issues to be addressed, goals, vision, etc.), planning tools used and the process and timing of plan formulation.

The following points were noted during the review:

- Regional EQMP is formulated as a framework which serves as a guideline to be adopted by PONRE, regional agencies and similar organizations in the protection and conservation of the environment within the period of the Plan. The projects and programs that are identified in the Regional EQMP will be implemented by various regional agencies of MNRE and other similar agencies at the regional level.
- Provincial NREMP (PEQMP) is formulated as a framework at the same time, with the end view of formulating the Provincial Action Plan. The Provincial Action Plans are submitted to the Provincial Committee annually for approval and for fund allocation. The funding for the Provincial Action Plan came from the Ministry of Interior (MOI) and disbursed by ONEP, upon approval of the Provincial Action Plans. The LAs, on the other hand, are responsible in the implementation of the Provincial Action Plan.

Moreover, the “Provincial Action Plans” as required by Law were only applicable to certain provinces and thus, not all provinces are mandated to prepare the Provincial Action Plan. The provinces required by law to submit are those provinces considered as pollution control zones, protected areas and/or areas where the environment and its natural resources are valuable and environmentally sensitive. The PONREs which do not have a pollution control and protected areas are not obligated to prepare and submit Provincial Action Plans.

In the case of PONRE Ratchaburi, although not a pollution control area and there were no designated protected areas, PONRE Ratchaburi can prepare the Provincial Action Plan of which activities are solid waste management and waste water treatment.

Based on the information collected, the project presented the results and its conclusion to PONRE Ratchaburi, REO8 and ONEP on September 2015. The summarized results were the following:

- Both plans considered the existing national government’s plans and policies i.e. National EQMP, National Economic and Social Development Plan (NESDP), National Environmental Act (NEA) as well as other existing central and provincial plans, as the basis in the formulation (see Figure 5-4)
- Both plans are following the hierarchy of plans although in some cases, Provincial EQMP are formulated first before Regional EQMP, due to factors including budget, national policy and/or directive from OPS.
- There were similarity on the plans’ overall contents although the degree and the extent of the description in each section of the plans vary substantially. This is primary due to the availability of data, time constraints, skills of personnel, processes involved, etc.

- Depending on budget, both plans used participatory processes and considered the opinions from stakeholders through the holding of participatory workshops to identify environmental problems and analyze the problems, formulation of strategies and measures and identification of projects and programs.
- Where budgets are limited for holding participatory workshops, different ways of participation were conducted through the dissemination of questionnaire surveys sent to various agencies and similar organizations to solicit opinions about problems, strategies and measures as well as projects and programs to be implemented.
- The timing of plan formulations were not synchronized and the difference in timing may be caused by various internal and external factors i.e. budget, etc. However, it was noted that the target year of both Plans followed the National Government time frame.

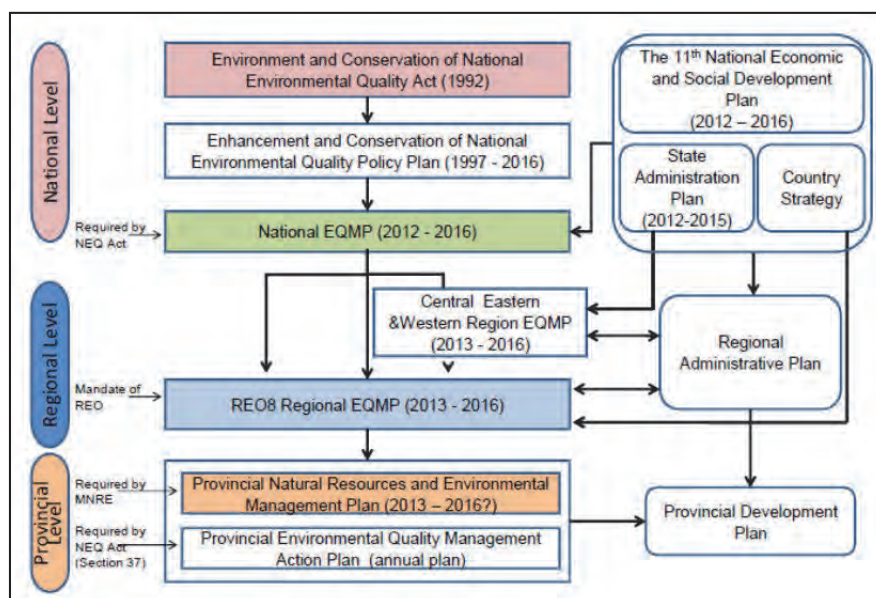


Figure 5-4 Linkages of Plans

4) Capacity Assessment

As per Plan, the Project conducted the capacity assessment with ONEP, REO8 and PONRE. At the end of the project, three capacity assessment surveys were conducted between 2013 and 2015. One in April 2013, the second one in October 2014 and the third one, which is the end survey of the project, was conducted in November 2015.

The Project, at the beginning of the project implementation, conducted capacity assessment workshops in order to clarify and determine the current level of capacity as well as to increase awareness of the characteristics of different organizations (ONEP, REO8 and PONRE) involved in the overall environmental management in the REO8 jurisdiction. Importantly, the CA was also conducted to help understand the relationship of various agencies in planning, implementation, monitoring and evaluation of Regional EQMP.

The results of the assessment were compiled and submitted in June 2013. Majority of the findings were used as one of the basis of the project in its strategic implementation approach, which at the time was used as the basis in designing the contents of the counterpart's training in Japan.

The Project conducted a follow-up of the first capacity assessment survey on October 2014 targeting the same respondents and participants as the first capacity assessment, as well as expanding its target to include the Provincial Administration Office (PAO). Additional respondents at ONEP was added to include other sections of the Office of National Environment Board (ONEB). The inclusion of PAO as one of the target organizations for capacity assessment was based on the recommendation forwarded by the Joint Coordination Committee at the Meeting held in 10 April 2013 in Bangkok. At the follow-up assessment, a capacity development intervention plan was developed (see Volume 2 of this Report) and presented to REO8 for inclusion in their annual planning and budget allocation. However, some items in the said intervention plan were conducted by the project being expressed to be urgent as outlined in Table 5-6. See Volume 1 for the compilation of the results of the mentioned seminars and training.

Table 5-6 In-house Seminars and Training Conducted

	Seminar Title/Topics	Date	No. of Participants
1	Training on Project Development and Proposal Designing and Preparation for Environmental Projects in REO8 Jurisdiction Topics: <ul style="list-style-type: none"> - Overview of Project Cycle Management - Tools in Project Proposal Development including problem identification, setting of objectives, developing indicators, monitoring and evaluation system and management and coordination - Tips in Project Sourcing and Fund Accessing - Donor Perspective and Core Principles in Project Proposal Evaluation 	May 2015	14
2	Seminar/Training Water Quality Management System Topics: <ul style="list-style-type: none"> - Pollution Control in Non-Pollutant Sources - Area-based Management for Water Resource Protection and Management - Application of Technology in Single Septic and Combined-Septic Tanks - Water Quality Monitoring by Biological Indicators 	August 2015	28
3	Public Awareness Skills Enhancement Seminar Topics: <ul style="list-style-type: none"> - Approaches , Tools and Techniques in Designing Public Awareness and Public Education and the Role of Communities - Tools and Materials for Designing Public Awareness Education - Infographics and Its Role in PA and Public Education 	Sept 2015	80

Seminar Title/Topics	Date	No. of Participants
4. GIS and Spatial Analysis Seminars		
a. Follow-up Training Topics: – Overview of Geographic Information System – GIS and Quantum GIS – Overview of GPS (GERMIN eTrex 20) – Utilization of Satellite Images (Remote Sensing) – Introduction to Environmentally Sensitive Zoning – Map Layout and Printing	Feb 2015	27
b. Advance Training Topics: – Methodology of Environmentally Sensitive Zoning – Data Management – Practices of Environmentally Sensitive Zoning – Map Layout and Printing	Oct 2015	20

Towards the end of the project period, the Project conducted a capacity assessment survey with the counterpart agencies. The end survey aimed to measure the level and areas of improved capacity among the counterpart agencies as a result of the Project interventions. The results of the survey was compiled and marked as the Volume 2 of this Report.

5.1.3 Overall Achievement of Output 1

Given the above activities, the Output 1 indicators established under PDM-2 were achieved. The overall achievement is shown in Table 5-7 below.

Table 5-7 Overall Achievement of Output 1 Indicators

Indicators	Achievement Levels
Indicator 1.1 Regional EQMP of REO8 is developed reflecting concerns of PONREs, LAs and the public.	<ul style="list-style-type: none"> – The Regional EQMP was developed through intensive participatory planning workshops involving 350 combined participants from the different agencies, institutions and non-government agencies in the REO8 jurisdiction. – A total of 15 provincial workshops and four (4) regional workshops were facilitated to effect participatory processes in ,thereby reflecting concerns from PONREs, LAs and the public – Key concerns of REO8 and PONRE were reflected in the Regional EQMP such as the use of geographic information system (GIS), spatial framework and classification of environmental issues into management units. The project provided three GIS training sessions, provision of QGIS software and GIS equipment. – Copies of the Regional EQMP were widely distributed consisting of 100 copies for its full version and 1,050 copies of an executive summary were distributed to the different stakeholders in the REO8 jurisdiction and ONEP. – A Regional Seminar was organized in March 2015 to present to a wider audience in the Regional EQMP, of which over 100 delegates from different agencies and institutions in the REO8 jurisdiction as well as other Regional Environmental Offices in the country. – The project conducted a status review of the Regional EQMP and recommendations were provided for consideration in the next Regional EQMP formulation. – Planning Manual for Regional EQMP was developed to provide guideline for REO8 and other REOs for use in the formulation of the next Regional EQMPs.

Indicators	Achievement Levels
<p>Indicator 1.2 Clear demarcation of roles and responsibilities for planning, implementing, monitoring and evaluation among stakeholders is identified</p>	<ul style="list-style-type: none"> - Roles and responsibilities of REO8, PONRE and including ONEP were clarified and understood.
<p>Indicator 1.3 Implementation structure with its mechanism is developed.</p>	<ul style="list-style-type: none"> - The structure of the Regional EQMP implementation as well as implementing mechanism were developed but were not applied to PONRE due to factors related to timing in the release of the Regional EQMP vis-à-vis formulation of the Provincial NREMP. - Implementing mechanism was applied in the implementation of activities at the pilot projects in two LAs (ThaYang and Pak Tho SDMs).
<p>Indicator 1.4 Improved indicators in Regional EQMP of REO8 are aligned with National EQMP.</p>	<ul style="list-style-type: none"> - Key performance indicators were reflected in the Regional EQMP. The KPI was set to help REO8 define and measure the progress towards the goals, objectives, strategies and measures established under the Regional EQMP. - The KPI under the Regional EQMP was fixed taking into account the targets of the National EQMP as well as the peculiarity of the environmental problems and issues facing REO8 jurisdiction.

5.2 Output 2

The expected results of Output 2 as per PDM 2 and implementation plan is showed in Table 5-8.

Table 5-8 Outline of Output 2

Output 2	Public Awareness on Environmental Management Issues is Promoted Utilizing Simplified Guidelines Based on Regional Environment Quality Management Plan (R-EQMP)
Indicators	2.1 Simplified PA guidelines are developed. 2.2 Quality and quantity of information provided to LAs and public by REO8 and PONREs are improved. 2.3 Environmental management activities to community are increased
Activities	2.1 Identification of major environmental management issues for public awareness 2.2 Identification of effective and available tools and resources for raising public awareness on environmental issues 2.3 Development of simplified guidelines for public awareness campaigns to be utilized by LAs 2.4 Implementation of public awareness campaigns in pilot project site(s) 2.5 Monitoring the implementation of public awareness activities in the pilot project site(s) 2.6 Revision of simplified guidelines for public awareness campaigns

5.2.1 Achievements of Output 2 Indicators

The project accomplished the activities of Output 2 in accordance as per the plan stated in PDM 2 and in the implementation plan for Phase 2. Outlined in Table 5-9 are the overall achievement of Output 2 indicators.

Table 5-9 Overall Achievement of Output 2 Indicators

Indicator	Achievement Level
Indicator 2.1 Simplified PA guideline is development	<ul style="list-style-type: none"> - The draft of the guideline was presented at the 3rd JCC Meeting on May 2015. - Pre-test of the guideline to the pilot project sites was conducted from August to November 2015 - The guideline was finalized in January 2016 and presented at the National Seminar.
Indicator 2.2 Quality and quantity of information provided to LAs and public by REO8 and PONREs are improved.	<ul style="list-style-type: none"> - Through the trial of the guideline, REO8 and PONRE supported LAs to conduct an environmental education program to students at PP-1 site. REO8 and PONREs also provide information to local people, and they explained steps of waste recycle bank. - At PP-2 site, REO8 and PONRE provide the knowledge on composting to LA and local people to help them understand.
Indicator 2.3 Environmental management activities to communities are increased.	<p>Through the trial of the guideline, REO8, PONREs, and LAs collaborated and implemented environmental management activities to community people.</p> <ul style="list-style-type: none"> - At PP-1 site, they made good relationships with school teachers, and further activities can be expected. - At PP-2 site, recycling and composting activities to community people were conducted initiated by LAs and collaborated with REO 8 and PONRE, and activities related to zero waste communities can be expected to increase in the future.

5.2.2 Achievement of Output 2 Activities

Activity 2-1

Identification of major environmental management issues for public awareness

1) Preliminary Surveys

A preliminary survey and data collection on public awareness activities implemented by concerned organizations has been implemented from May 2014. Table 5-10 shows key points shared by concerned organizations regarding their public awareness work.

Table 5-10 Results of Preliminary Survey

Organization	Key Points shared by concerned organizations
REO8	<ul style="list-style-type: none"> • Five members are in charge of PR belonging to Environmental Quality Promotion Section, REO8. • PR work is mainly 3R promotions working with PONREs. • REO8 role is mainly technical support to PONREs and LAs.
PONREs	<ul style="list-style-type: none"> • There is no staff member in particular in charge of public awareness, but all staff is working on it. • PONREs cooperate with LAs to implement public awareness activities.
DEQP	<ul style="list-style-type: none"> • DEQP is working on Public Awareness, research, training, and database under MNRE. • Eco-school and waste bank are country-wide projects owned by DEQP. • A newsletter is issued once per two months. • DEQP formulates many kinds of reports, manuals, guidelines DVDs, notebooks, etc., to promote each environmental issue. • DEQP is the technical supporter of lower governmental organizations such as PONREs and LAs, but also the implementer of the projects.
PCD	<ul style="list-style-type: none"> • PCD is working on regulation promotion related to pollution control. • PCD is mainly a technical supporter to LAs. PCD have experiences to dispatch staff to support community participatory activities to LAs. • The public service center under PCD collects and shares the data related to pollution control to other governmental organizations.
PAOs	<ul style="list-style-type: none"> • Ratchaburi PAO implemented project-based public awareness activities such as supporting youth for river conservation. • Phetchaburi PAO works mainly for disaster management, and environmental management is transferred to lower governmental organizations. • Environmental section of Samut Songkhram PAO is working on environmental conservation and implementing environmental events such as mangrove planting to involve communities. • Kanchanaburi PAO's main role is to supervise environmental works of TAOs and municipalities and also implement big projects. Before, they tried to construct landfill sites in Kanchanaburi, and the PAO held several public hearings.

In Thailand, public awareness for environmental management includes not only dissemination or education to people, but also community participation activities and public hearing/acceptance work. In the process of formulating the manual, all needs of public awareness for environmental management shall be considered. REO8 and PONREs will take the main role to formulate the manual, and PAOs and several actively working TAOs and

Municipalities will be involved. DEQP has developed many kinds of material for public awareness and education and many experiences to implement activities involving communities. PCD promotes regulations to people and private sectors, and has experience to support community activities from a technical aspect. Thus, DEQP and PCD will also be involved as technical supporters or advisers to formulate the manual and implement public awareness activities. ONEP also provided ideas which were considered in the process of the activities for Output 2 as follows:

- To incorporate Japanese experiences especially for environmental education
- To involve the private sectors effectively and promote their social responsibilities
- To promote each stakeholder's responsibility in each environmental issue
- Effectiveness of the public awareness should be made a part of general life
- Develop appropriate measurements for evaluation

2) Questionnaire Survey on Previous PA Experience

A questionnaire survey was conducted in September 2014 in order to understand the experiences of PONREs in public awareness activities/campaigns. The results suggest that a total of 18 awareness campaigns were conducted in the REO8 jurisdiction in the past five years. Environmental issues covered in the PA activities include water pollution, solid waste, and groundwater contamination, among others. The common PA activities undertaken include the following: tree planting, coastal and beach clean-up, canal clean up, mangrove planting and 3R campaigns. Table 5-11 shows the summary of the significant results.

3) Public Awareness Workshop-1

Based on the results of the questionnaire survey, Public Awareness Workshop-1 was organized on October 10, 2014 at the REO8 Conference Room, Ratchaburi. The workshop aimed at providing a venue to share the outcomes of the questionnaire survey and to provide a deeper understanding of the experiences of the previous PA activities. Attended by 14 representatives from five (5) PONRE in Ratchaburi, Samut Songkhram, Kanchanaburi, Phetchaburi and Prachup

Khiri Khan, and REO8, the participants shared various analyses of the public awareness activities being conducted in their respective provinces. Among the important lessons learned that were shared by the participants are the following:

- The support of the higher officials is necessary in the continuity of public awareness activities
- Results, especially tangible ones, of the activities need to be shared with the people to encourage targets of the activities

- Collaboration and involvement with NGOs can promote more effective participation from local people

Considering the above and the results of the discussion with REO8, the major environmental issues to be included in the PA activities were clarified, namely: 1) pollution control issues particularly related to water pollution; 2) natural resources i.e. water resources, soil resources, forest resources, mineral resources, fishery resources, among others; 3) urban environment such as solid waste management, parks and green areas.

Table 5-11 Summarized Results of PA Questionnaire Survey-1

PA Activities/Campaign		Budget	Approach	Method of M&E
Samut Songkhram	Mangrove Plantation Activity	130,000 THB	<ul style="list-style-type: none"> • Distribute leaflets/newsletters 	<ul style="list-style-type: none"> • Evaluation based on the number of participants • Evaluate the growth of mangrove forests 6 months /1 year after plantation
	The Strengthening of Knowledge for Mangrove Conservation	415,200 THB	<ul style="list-style-type: none"> • Distribute leaflets/newsletters • Hold clean-up event • Lectures at schools/universities 	<ul style="list-style-type: none"> • Satisfaction survey
	Canal Clean Up Campaign	130,800 THB	<ul style="list-style-type: none"> • Using mass media • Newsletter, Local TV Media • Hold clean-up event 	<ul style="list-style-type: none"> • Satisfaction survey of community people who participated the campaign
	Water Source Quality Monitoring Youth Network	209,300 THB	<ul style="list-style-type: none"> • Using mass media (Newsletters, Local TV, Media) • Lectures at schools/universities • Simplified water quality monitoring • Hand out 	<ul style="list-style-type: none"> • Pre-test and post-test of the training • Monitoring and Evaluation after the training for the water quality monitoring
	Coastal Clean Up Campaign	463,900 THB	<ul style="list-style-type: none"> • Distribute leaflets/newsletters • Hold clean-up event 	<ul style="list-style-type: none"> • Satisfaction survey • Evaluation from participants
Phetchaburi	Workshop for Natural Resources and Environmental Community Management Plan Formulation	82,000 THB	<ul style="list-style-type: none"> • Hold workshops/meetings • Distribute leaflets/newsletters 	<ul style="list-style-type: none"> • Satisfaction survey
	The Project of Natural Resources and Environmental Exposure and Study Visit	100,000 THB	<ul style="list-style-type: none"> • Study visit and knowledge sharing in the network 	<ul style="list-style-type: none"> • Satisfaction Survey
	Municipal Solid Waste Management based on 3R Principles	55,000 THB	<ul style="list-style-type: none"> • Using mass media • Distribute leaflets/newsletters • Lectures at schools/universities • Training on 3R principles • Businessman related to solid waste 	<ul style="list-style-type: none"> • Satisfaction survey

PA Activities/Campaign		Budget	Approach	Method of M&E
	Project of Green and Low Carbon Community Phetchaburi	78,000 THB	<ul style="list-style-type: none"> Using mass media (Global Warming Video) Distribute leaflets/ newsletters Hold training for the community 	<ul style="list-style-type: none"> Satisfaction survey
	Global Warming Reduction	157,200 THB	<ul style="list-style-type: none"> Using mass media (Global Warming Video) Lectures at schools/universities Hold a training 	<ul style="list-style-type: none"> Satisfaction survey
	The Solid Waste Management by the Community	34,000 THB	<ul style="list-style-type: none"> Using mass media (Recycling) Hold workshops/meetings Distribute leaflets/newsletters 	<ul style="list-style-type: none"> Satisfaction Survey
Kanchanaaburi	The Project for Water Quality Improvement in Tha Chin, Mae Klong River and Sub Canals for Safe Agricultural Products. Fiscal year 2012	5,000,000 THB	<ul style="list-style-type: none"> Using mass media Hold workshops/meetings Local cable TV 	<ul style="list-style-type: none"> Satisfaction survey
	Project for Capacity Development for LAs in Community Solid Waste and Hazardous Waste Management. Fiscal year 2013	17,000 THB	<ul style="list-style-type: none"> Using mass media Hold workshops/meetings Distribute leaflets/newsletters Lectures at schools/universities 	<ul style="list-style-type: none"> Evaluation from LAs
Prachup Khiri Khan	The Development of an Environmental Volunteer Network and King's Project for Tree Plantation	80,000 THB	<ul style="list-style-type: none"> Using mass media Hold workshops/meetings Distribute leaflets/newsletters 	<ul style="list-style-type: none"> Satisfaction survey
	Empowerment Regarding Monitoring the Groundwater Work under the Groundwater Act	500,000 THB	<ul style="list-style-type: none"> Using mass media Hold workshops/meetings Distribute leaflets/newsletters 	<ul style="list-style-type: none"> Monitoring by PONRE
	Good Life with Self-Sufficient Lifestyle under Family Love Bonding Project (Sai Yai Rak Hang Krob Krua)	300,000 THB	<ul style="list-style-type: none"> Using mass media Hold workshops/meetings Distribute leaflets/newsletters Hold environmental event Lessons learned visualizing up-stream, mid-stream, down-stream management 	<ul style="list-style-type: none"> Satisfaction survey
	Project for Cooperation on Natural Resources and the Environment at the Local Level for Climate Change Capacity	900,000 THB	<ul style="list-style-type: none"> Using mass media (Radio/Local TV) Hold workshops/meetings Hold contests/Organize a competition for "Low Emission Carbon Award" 	<ul style="list-style-type: none"> Satisfaction survey

Source: JICA Expert Team

Activity 2.2

Identification of effective and available tools and resources for raising public awareness on environmental issues

4) Existing Tools and Resources for PA Activities

Based on the results of the questionnaire survey and Workshop-1 the following were identified as the common PA activity tools used by REO8 and five (5) PONREs:

- Use of mass media i.e. Local TV, distribution of newsletters, leaflets, etc.
- Lectures in schools and universities
- Environmental events i.e. Environmental Day, and Green Day, among others
- Hold contests and competitions on significant environmental topics
- Community activities, i.e. workshops, interviews
- Study Tours

The majority of the public awareness activities in REO8 jurisdiction were facilitated by DEQP. Some PONREs have also included a public awareness budget in their special projects as mentioned in Table 5-11. Other PA resources identified are the following: ONEP, PCD and other non-government organizations such as the Thai Environmental Corporation, Thailand Environment Institute, Green World Foundation, the Sirindhorn International Environmental Park, and the Foundation of Western Forest Complex Conservation, among others.

5) Possible Tools to be used for PA Activities

Based on the existing experiences of PONREs in PA activities, JET, in consultation with REO8, recommended the utilization of existing tools used by PONREs and listed the following tools to be considered and maximized in the project's PA activities:

- Video production
- Workshops/meetings
- Training and lectures
- Excursions and study trips
- Local communication tower
- Facebook//Twitter
- Events in schools and offices
- Production of leaflets
- Website
- Local TV/radio
- Knowledge center

6) PA Workshop-2

The Public Awareness Workshop-2 was held on January 27, 2015 to discuss the draft PA Activity Guideline. It was attended by representatives from ONEP, REO8, PCD, five (5) PONREs in the provinces of Ratchaburi, Samut Songkhram, Kanchanaburi, Phetchaburi and Prachup Khiri Khan, and representatives from SDM Tha Yang and Pak Tho. Major comments raised by the participants on the draft PA Activity Guideline are listed below:

- Too much text and needs to be shortened
- Re-arrange the design to be easily understood and use some illustrations/pictures
- Need to add more information in each section for readers to understand more easily
- Monitoring and evaluation of each tool should be added
- Tools suggested and how to use the tools should be more simple and should be clearly presented
- Overall contents of PA Activity Guideline needs to be further clarified

7) Follow up Questionnaire Survey

The results of Workshop-2 provided direction to JET, based on which the draft PA Activity Guideline should be revised. In order to follow up on some of the ideas raised in the workshop, a questionnaire survey was designed in February 2015.

Based on the results of the opinion survey, individual meetings with each PONRE, SDM in Pilot sites, and DEQP were held and clarified more details of each input. At the workshop, each comment stayed abstract, but they were clarified in individual meetings. In the meeting, target groups and tools which need more detailed descriptions were pointed out. Also, some charts and tables need to be modified to be simpler in order to be understood easily.

Activity 2.3

Development of simplified guidelines for public awareness campaign to be utilized by LAs

1) PA Workshop-3

A series of meetings were facilitated and Workshop-3 was conducted on April 7th 2015 to discuss the draft PA Guideline (see Figure 5-5 for the cover and TOC of the draft PA Guideline). At Workshop-3, revised draft guideline was shared to all participants in advance of the workshop. The style and visuals of the guideline were modified in a more attractive manner, and some descriptions, tables, and charts were updated following the comments from C/P.

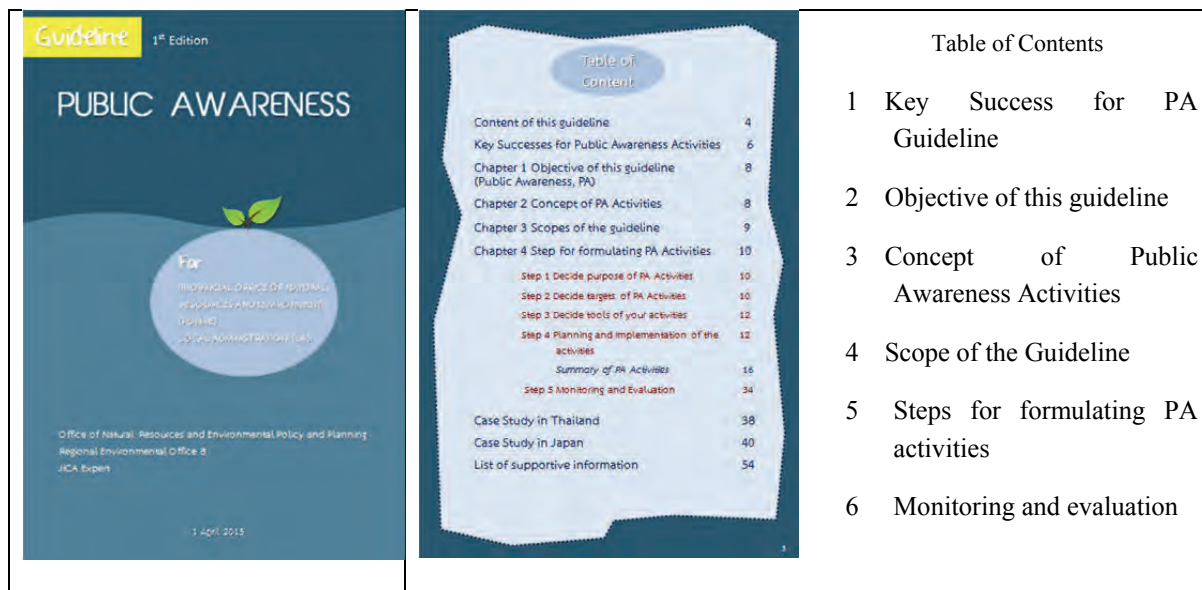


Figure 5-5 Cover and Table of Contents of Draft PA Guideline

On May 15th, the 3rd JCC Meeting was held, and the draft Guideline was presented in order to generate feedback and to further enhance the draft Guideline. The JCC raised the following comments on the draft PA guideline:

- The draft public awareness guideline should be improved and clearly clarify its direction and adjust the contents to be more simple and practical.
- A formal meeting involving DEQP, REO8, PONRE and other related organizations need to be set up to support the formulation of the PA Guideline.
- As the contents of the 2nd training in Japan include public awareness, the participants of this training are encouraged to learn the experiences and techniques in public awareness during their two-week stay in Japan and provide input to the draft public awareness guideline.

2) PA Workshop-4

Given the comments received from the JCC members, Workshop 4 was conducted in July 17, 2015 to further discuss the draft PA Guideline and to share the process of the trial use of the guideline at the pilot project sites. In addition, following the comments of the 3rd JCC, participants of 2nd Japan Training shared their opinions on environmental public awareness by lessons learned from the training. In particular, they were impressed by the manner of disclosure of information by the Japanese and public education for primary school students starting at an early age.

At the end of the workshop, topics and the outline of the trial activities of the PA guideline were explained to the participants.

3) Trial Use of the Draft Public Awareness Guideline

In order to verify the contents of the PA Guideline, PA activities will be implemented in each pilot project site using the PA Activity Planning Sheet. In consultation with the C/P assigned in each pilot project site, activities for the trial use of the guideline were outlined as shown in Table 5-12.

Table 5-12 Outline of PA Activities in Pilot Project Sites

	Pilot Project Sites	
	PP-1: Tha Yang, Phetchaburi	PP-2: Pak Tho, Ratchaburi
Activity name	Ex-curriculum Development for Solid Waste Management	Enhancement of Community Solid Waste Management
Objectives	<ul style="list-style-type: none"> To promote good behavior and characteristics through education on solid waste management To raise the public awareness of students on solid waste management 	<ul style="list-style-type: none"> To initiate the first step towards a zero-waste community To raise the awareness of the community on reduction of waste generation
Target groups	<ul style="list-style-type: none"> Primary school students (Baan Tha Yang school and Baan Tha Koi school) Secondary school students (Tha Yang Wittaya school) 	<ul style="list-style-type: none"> Selected Community (Rim Klong community)
Tools	<ul style="list-style-type: none"> Games Video Training/ Lecture Excursion 	<ul style="list-style-type: none"> Workshop/Meeting Training/Lecture

(1) Ex-curriculum Development for Solid Waste Management in Tha Yang SDM

In order to implement effective education to students, an education program was designed for primary and secondary level students as follows:

- Education Program for Primary Level

Frequency	1 class ×2 times
Target group	Primary School students G5 and G6
Objectives	<ul style="list-style-type: none"> To promote good behavior and characteristics through education on solid waste management. To raise the public awareness
Schedule	1 st and 2 nd classes will be implemented before term break in September, and the follow up will be after the term break
Topic of each class	1 st : Introduction of SWM in Tha Yang and Waste segregation and waste segregation 2 nd : A. Waste management knowledge game and formulation of action planning paper B. Introduction of Waste recycle bank After the program: Following up to school for further education

- Education Program for Secondary Level

Frequency	Two times
Target group	Secondary school students G9 and G11
Objectives	<ul style="list-style-type: none"> - To promote good behavior and characteristics through education on Solid Waste Management (SWM). - To promote understanding on SWM system
Schedule	1 st and 2 nd classes will be implemented before term break.
Topic in each class	1 st : Whole system of SWM and introduction of Tha Yang and Japanese situation 2 nd : Visiting Tha Yang landfill site, and Tar Mai Rua school as advanced school

1st class in Primary school (Same program for Baan Tha Yang and Baan Tar Koi School)

Tools	Details
Video	Waste segregation
Lecture	Explanation of current SWM situation of Tha Yang How to segregate and dispose the wastes
Game	Waste segregation game

The 1st class was held on August 13th 2015 at Baan Tha Yang School, and September 8th 2015 at Baan Tha Koi School. The contents of the lecture was: the current SWM situation in Tha Yang was summarized and discussions focused on how to segregate the wastes. A short video was also presented to introduce general information in waste management and waste segregation. The students were observed to be interested in the cartoon video, which helped in bringing in students' attention to the class. The students were then challenged to a waste segregation game where they segregated the waste into three types: general waste, recyclable waste and hazardous waste. With the lessons learned from the game, the students prepared the waste segregation table and were encouraged to use it in their respective homes.



Participants in action during the Environmental Education at Baan Tha Yang School, August 13, 2015



Participants in action during the Environmental Education at Baan Tha Koi School, September 08, 2015

At the 2nd class in Primary school

Tool	Details
Video	Waste recycling bank (Only for Baan Tar koi school)
Lecture	Explanation of waste recycling bank (Only for Baan Tar koi school)
Game	Three multiple selection quiz about solid waste management (Only for Baan Tha Yang school)

The program of the 2nd class was designed accordance with the schools' situations. Baan Tar Koi school had started by preparing waste recycling bank introduction, and the 2nd class was supporting their initial work for a waste recycling bank.

Baan Tha Yang school, on the other hand, implemented three multiple selection quizzes about solid waste management in order to promote students' understanding on the 4Rs introduced in Tha Yang. This game could help students understanding well the "Good actions for SWM in daily life". Homework during the term break was also prepared; the students did their best tried for SWM and put the sticker every day.



Participants in action during the Environmental Education at Baan Tha Yang School, September 11, 2015



Participants in action during the Environmental Education at Baan Tha Koi School, October 2, 2015

1st and 2nd class in Secondary school

Tool	Details
Video	SWM in Japan
Lecture	Explanation of current SWM situation of Tha Yang History of Solid Waste Management in Tokyo Explanation of Tha Yang SWM Action Plan Waste collection and segregation
Excursion	Visiting Tha Yang landfill site, and Tar Mai Rua School as outstanding school

The secondary school program consists of consecutive two days including excursion on Day 2. Before the excursion, lectures of explanation on the SWM system and current SWM situation of Tha Yang and Japan gave students ideas of SWM.

For the excursion, students visited a landfill site operated by Tha Yang SDM, and Tar Mai Rua School. Tha Yang SDM officials explained the basic information of the landfill site, and the operation of waste management. Tar Mai Rua School is an outstanding school for zero waste, and has been awarded by the DEQP. The students from Tar Mai Rua School presented a well-organized explanation of their school based on SWM activities. After the excursion, students drew what they learned onto posters.



Environmental Education and Excursion Tha Yang Wittaya School, September 3 and 4, 2015

(2) Enhancement of Community Solid Waste Management in Pak Tho SDM

This activity was inspired by the results of the 2nd Training in Japan attended by Pak Tho SDM on June 2015. Based on the lessons learned in Fuji City, combined by the situation in Thailand and Pak Tho on a community based SWM, the activity hopes to result in the realization of a “Zero waste community”. The framework is shown in Figure 5-6.

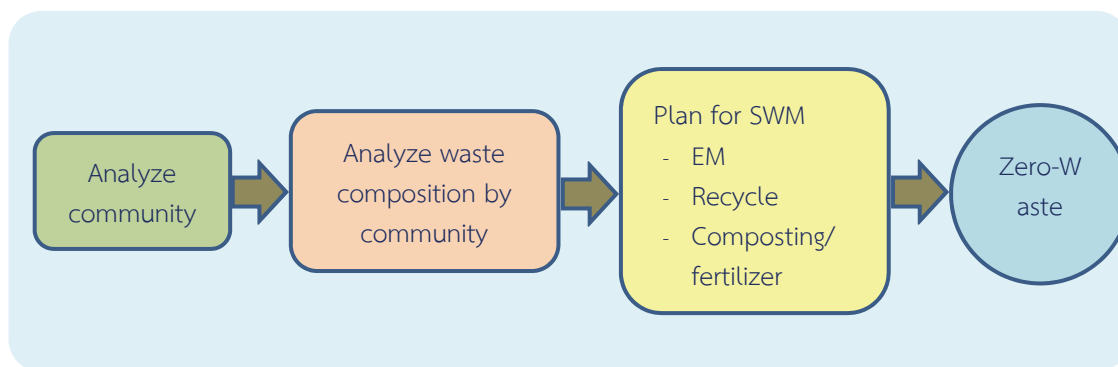


Figure 5-6 Process of Community Solid Waste Management Enhancement

In order to proceed with the activity, a waste composition survey was conducted to understand the amount of waste and the characteristics of waste generated every day at Rim Klong. Based on the survey results (see Table 5-13), it is revealed that kitchen waste generated- the highest contribution of waste collected represented by approximately 68% to the total waste collected. However, community people weren't aware that they generated such a large proportion of kitchen waste. Therefore, a meeting to share the survey results to community people was conducted with the following details:

Tool	Details
Meeting	Community meeting to share the results of waste composition survey, and discuss the next step towards becoming a 0 waste community.
Training	<ul style="list-style-type: none"> Waste recycling bank was introduced in the Wat Pak Tho School to reduce the amount of wastes. REO 8 also conducted pre-training to selected students and teachers. Two types of composting method were introduced by REO 8 and PONRE Ratchaburi.
Action	Composting, recycling and other actions are promoted

Table 5-13 Results of Waste Composition Survey

Items	Waste Classification										Total
	1	2	3	4	5	6	7	8	9	10	
Weight (kg/day)	6.39	4.77	0.62	22.92	0.32	99.73	0.48	2.42	0.95	6.70	145.31
Weight (%)	4.40	3.28	0.43	15.77	0.22	68.63	0.33	1.67	0.66	4.61	100.00
Weight/HH (kg/HH/day)	0.06	0.04	0.01	0.21	0.00	0.91	0.00	0.02	0.01	0.06	1.33
Volume (m ³ /day)											0.92

Legend:

- 1 Paper/Cloth
- 2 Cartoon box, newspaper, magazines
- 3 Pet bottle
- 4 Other plastic/rubber/leather
- 5 Wood/Bamboo/Straw

- 6 Kitchen waste
- 7 Steel can/aluminum can
- 8 Glass/glass bottle
- 9 Hazardous waste (battery, light, spray)
- 10 Others

(3) Meeting to promote community understanding and acceptance

Regarding the results of the waste composition survey, each household generates around 900g of kitchen waste every day. However, the community people weren't aware of the amount of kitchen wastes they produced, and hesitated to apply composting. Therefore, the Pak Tho Sub-district Municipality held the community meeting together with their ordinary public hearings to inform the results of the waste composition survey, and promote community understanding and acceptance of further actions for a zero waste community.



Community Meeting held on December 21 -25, 2015

(4) Training on waste recycling bank at school

Cooperation with the pilot project activity lead by community people, a waste recycle bank was opened at the school, and the students have been trained on how to operate the bank. It also contributes to a zero waste community through the children to promote recycling.



Waste Recycling Bank at Wat Pak Tho School, November 27, 2015

(5) Training on composting

With technical support from REO 8 and PONRE Ratchaburi, two types of composting were introduced to each household, one is using EM, and the other is earthworms. The municipality and working group leaders coordinated to gather volunteered households, and they made the initial arrangement of composting together.

(6) Actions (composting/recycling)

By the training on waste recycling bank and composting by each household, each action is being continued. For the waste recycling bank, the school held a grand opening ceremony on 19th January, and they are receiving recyclable waste once in a month.

**Activity 2-5
Monitoring the implementation of public awareness activities in the pilot project site(s)**

1) Monitoring and Evaluation were conducted in each pilot site as shown below:

Ex-curriculum Development for Solid Waste Management in PDM Tha Yang

Method	Results
Homework (as simple test)	Homework and post class work at primary (only Baan Tha Yang) and secondary school were conducted to make lessons learned into roots. Primary school students take good actions every day in their home.
Questionnaire survey to students	A questionnaire survey was conducted for secondary school students. They were interested in the Japanese SWM situations, and learned many new things during the two days.
Interview to teachers	The education program was really effective at each school, but some teachers shared their concerns over the difficulties for continuous classes for environmental education due to material/budget limitation.

Enhancement of Community Solid Waste Management in Pak Tho SDM

Method	Results
Interview to community and teachers	Facilitated by SDM
Result monitoring	After several months of implementation, results of the waste recycle bank and composting will be monitored by the community, school, and the municipality.

**Activity 2-6
Revision of simplified guidelines for public awareness campaign**

1) Public Awareness Workshop-5

Following the comments by the workshop-4 and results of trial activities for the guideline, the workshop-5 was held on November 23, 2015 to finalize the contents.

Through the trail activities, the flow and steps of the PA activities mentioned in the guideline were recognized as valid, and the participants carefully looked through charts, tables and wording of the guideline. The results of the trial at each pilot site are compiled as a case study.

By the discussion of the workshop, major points were pointed out for modification and the contents of the guideline were finalized.

5.3 Output 3

As per PDM 2 and Implementation Plan, Table 5-14 below shows the outline of Output 3.

Table 5-14 Outline of Output 3

Output 3	Recommendations and lessons learned for the promotion of R&P EQMP are identified and shared through pilot project implementation.
Indicators	3.1 Recommendations and lessons learned of pilot projects are known to LAs and the Public. 3.2 Ways to access budgetary resources are known to LAs.
Activities	3.1 Determination of pilot project <ul style="list-style-type: none"> - Criteria for the selection of pilot projects, - Selection of regionally cross cutting environmental management issues, such as wetland conservation, water quality management, hot spots management, based on activities under Output 1 3-2 Preparation of Pilot Project Implementation Plan <ul style="list-style-type: none"> - Design pilot project implementation plan 3-3 Establishment of pilot project implementation mechanism <ul style="list-style-type: none"> - Implement pilot projects including the implementation mechanism 3-4 Implementation of pilot projects 3-5 Holding of workshops to share progress and results of pilot projects <ul style="list-style-type: none"> - Conduct workshops to share the progress of pilot projects - Evaluate pilot projects and share recommendations and lessons learned to the public

5.3.1 Achievements of Output 3 Indicators

The activities of Output 3 were implemented as per plan as described in the succeeding sub-section below:

Indicator 3.1

Recommendations and lessons learned of pilot projects are known to LAs

In order to come up with shared lessons from the implementation of the pilot projects, the Project together with the Pilot Project Advisory Team conducted a monitoring and evaluation workshop in December 2015. The criteria used is outlined in Table 5-15 and the key performance indicators are shown in Table 5-16. Refer to Volume 3 of this Report for details.

Table 5-15 Criteria in Pilot Project Evaluation

Criteria	Explanation
Efficiency	Verify whether the inputs provided are appropriate in terms of achieving the desired outputs. This could be in terms of time, staff, and equipment, and so on.
Effectiveness	Measures the extent to which the pilot project achieves the objectives it sets to accomplish.
Impact	Measures whether or not the outputs of the pilot project activities made a difference to the problem situation that is trying to resolve and address by the pilot project (either indirectly or directly; immediate and in the near future)

Table 5-16 Pilot Project Key Performance Indicators

Pilot Project 1

PP Outputs	Indicators
1- Strengthening solid waste management system in Tha Yang SDM	<ul style="list-style-type: none"> • D/S improvement and life expansion plan is prepared and adopted by Tha Yang SDM • Appropriate data collection on waste generation, etc are introduced
2- Capacity enhancement of Tha Yang SDM in solid waste management system	<ul style="list-style-type: none"> • Number of training and seminars conducted • Number of people participated in the training and seminars conducted • At least half of those who are involved in solid waste management were trained • At least 30-50 % of the key personnel in Tha Yang SDM have understood the solid waste management hierarchy
3- Enhancement and promotion of people's awareness on solid waste management	<ul style="list-style-type: none"> • Visible increase of community involvement in solid waste management • Number of public awareness activities and campaigns conducted and people's participation in these campaigns

Pilot Project 2

PP Outputs	Indicators
1- Improvement of water quality in canals and "beautification" of the environment and surroundings.	<ul style="list-style-type: none"> • Community waste pre-treatment systems are in place in selected communities near the canals • User groups were involved in establishing a waste pre-treatment system • Community involvement in canal clean-up activities is enhanced • At least 3 out of 5 communities in Pak Tho are involved in water quality monitoring (% of people in 3 out 5 communities are involved in water quality monitoring) • Visible visual improvement of living and surrounding environment
2- Strengthening community awareness in environmental issues and problems (water pollution and solid waste)	<ul style="list-style-type: none"> • Number of public awareness raising activities conducted • Number of people participated in the public awareness raising activities • Visible improvement in people's "attitudes and behavior" towards water pollution and solid waste problems
3- Improvement of skills and knowledge of communities in responding environmental issues and problems (water pollution and solid waste)	<ul style="list-style-type: none"> • Number of training and seminars conducted • Number of people participated in the training and seminars • At least half of those "trained" become active in community activities related to environment

The Project, through the achievement of the pilot projects implementation, have documented the lessons learned and recommendations were developed and disseminated to the major stakeholders in REO8 jurisdictions, ONEP and other regional environmental offices in the country. The project also conducted the National Seminar held on last January 2016 to promote the lessons learned with the vision so that other REOs in the country can gain insights in implementing environmental projects such as solid waste management and community based environmental management. The following lessons learned and recommendation were presented as outlined below. Refer to Chapter 7 of this Report for discussion of the lessons learned and recommendation.

Pilot Project 1

1- On the process

- Pilot Project 1 has a good process; however, its impact has not obviously been seen yet. Continuous implementation will ultimately obtain the explicit results.
- The solid waste management system plan of Tha Yang included waste generation, collection-transportation and waste disposal and was featured with a scientific survey as well as public awareness rising which is similar to PCD road map ideas.
- Community, SDM staff and PONREs staff have learnt solid waste management plan formulation process through the Pilot Project 1. However, transferring the plan to actual implementation need to be enhanced.
- There are the gainful training sessions and seminars thoroughly implements PP-1 such as safety waste collection and transportation training which is valuable training in terms of health and safety for the SDM waste collection staff. Moreover, the suggestion on cleaning waste collection cars after use is also necessary for the deduction of unpleasant smells.
- Utilization of the mascot increased the motivation and involvement of the youth in Tha Yang for solid waste management.

2- On Technology

- The prototype of a recyclable waste collection cart is interesting. Its size is appropriate for small roads around the communities. This recycle waste collection cart will encourage the community people to pay attention in waste separation.
- Scientific data is necessary for a proper solid waste management plan formulation. Therefore, solid waste survey is important as well as the installation of a truck scale.

3- Replicability

- During PP- 1 implementation, many LAs were invited to seminars. Knowledge and ideas obtained can be adopted and applied to other areas. However, time and a budget are needed.
- Some activities need supporting skills and advice from expert such as the utilization of GPS to determine appropriate waste collection routes. LAs may carry out only to the extent that can be done.
- The waste management plan of Tha Yang was formulated as a completed SWM system which is similar to the concept of the PCD road map. Therefore, the Tha Yang model

can be applied to other LAs since it is not contrary with government direction. However, the action plan in each area may vary depending on the context such as composition of waste and characteristics of the area.

4- Sustainability

- The Tha Yang model can be applied to other areas. Phetchaburi PONREs will apply Tha Yang model to 2 LAs; Nong Chok TAO and Cha Am municipality, by using the budget obtained from MNRE and central cluster region.
- The Tha Yang model can be applied to the Phetchaburi solid waste management provincial plan.

Pilot Project 2

1- Feasibility

- The success of the PP- 2 in public involvement has obviously shown that community people will consent to the installation of sewage systems in households. Building acceptance from the public needs time to coordinate and communication with the community people. In addition, public understanding and public awareness are also important for receiving acceptance and need the implementation continuously.
- The target group has been emphasized and school activities were continuously implemented. School activities have been planned as a series from educate to implement as establishing the waste bank in a school. Having the activities as step by step encourages students to be interested and willing to attend the activities.
- Creating the appropriate activities by considering the context of the school will increase more collaboration from students and parents as well. For example, establish the waste bank in a school which located the heart of community will provide the convenience for students and parents in bringing their waste to school.
- Community environmental management plans were formulated by community participation. Since then, projects and activities are initiated by community people therefore the community people have the ambition to complete the activities as planned.
- Strengthening of the community could be created from community participation.
- Public awareness should be inculcated in the youth.
- Water quality improvement by involving community people brings about better water quality. As a result, SDM does not have to invest in an expensive waste water treatment system.

2- Replicability

- The process introduced by JET is different from the conventional process which PONREs usually do. Hence, PONREs applied the JET's process in their job.
- The equipment used in a pre-water treatment system is quite fragile. It may not be suitable to replicate in other areas.

3- Sustainability

- Pak Tho SDM plans to promote ancient houses in the community for tourism purposes. This project will impact on the sustainability of the cleanliness of the canals.
- SDM is going to formulate the SDM development plan (three-year plan). Community environmental management plans will be taken into consideration by the SDM council and incorporated to a three-year plan. However, the possibility of implementation depends on budget approval from SDM council.
- SDM plans to continue the operation of the waste bank. PONREs and REO8 will also continuously support and technical advice.
- Nowadays, the environment is the priority issue (guided by policy). However, responsible organizations need to be strengthened in practice. As well, each organization differs in implementation skills.

Volunteer spirit is one of the factors that make the project a success. However, encouraging volunteers as well as educating, allocating the budget for activities will allow the sustainable implementation of environmental volunteers.

Furthermore, the project also recognized, especially community participation, the following lessons:

1) Community selection process

It was good to hold a meeting in every community in the selection process in order to understand the local situation and select appropriate communities as pilot sites. The selection results were clearly announced to all communities to promote their understanding, especially for those communities which were not selected. Those steps generated good relationships between each community, and could be a key for the smooth application to communities not selected.

2) Involvement of community people broadly

Involving ordinary community people is essential but is the most difficult matter. The community leaders and environmental volunteers can be facilitators for ordinary people to raise their awareness. But due to some limitations such as busy for work, or it's too bothersome to participate,

the involvement of ordinary people is limited. In order to raise their awareness and understanding, continuous approaches in many channels are really necessary.

3) Cooperation among communities on the formulation of a community-based environmental management plan

The CEM Plan was formulated individually based on environmental aspects in each community even though the training and planning workshops were held together. The CEM Plan itself was issued individually, while most of the pilot activities were jointly conducted by three Working groups. Actual background, environmental issues faced, etc. are common in Pak Tho and the three communities in the pilot project have had close relation and communication, so that the pilot project 2 could succeed in terms of coordination among different communities. It, however, may be a fact that there can be different issues or approaches to be individually managed.

Therefore, it is important to identify what issues can be jointly managed or shall be separately handled when community environmental groups are formulated.

4) Demarcation and role sharing between communities and government

It might be not easy to handle this issue and it is important to respect, consider each situation and roles, and then highly suggestible SDM to have regular meetings especially with communities in order to understand each other well.

5) Limitation of experiences/knowledge in community

There are limitations to conducting seminars/training to enhance skills and knowledge on environment within a community. It is suggestible to continue and strengthen a network among concerned groups in order to introduce sufficient experiences, technical knowledge, etc.

In addition to said network, SDM shall be a key player for coordination with communities. Therefore it is suggestible for SDM to conduct regular meetings with communities to share the same direction.

6) Effective use of local resources

Tools and materials are necessary to implement activities. Also, in accordance with local situations, equipment should be adjustable. In order to remove any inconvenience to implement activities, necessary tools and materials are provided and managed by the community. Also, equipment is usually made by community people to adjust to local situations.

7) Budgetary matters

Budget allocation by SDM is important. If community activities are shouldered by this allocated budget, communities will rely too on it and the activities can be constrained. It is important for

community themselves to search for the chance of possible budget allocation such as donation, charity, selling community products, etc.

Based on the above lessons, the project recommended the following areas to be considered when implementing solid waste management and community-based environmental management:

Pilot Project 1

- 1- In order to make the recyclable cart, the worthiness of investment and characteristics of the area as well as effectiveness may need to be considered.
- 2- The SWM plan should add quantitative indicators such as waste amount. Volume of generated waste should inform to public in order to reflect on the effectiveness of an SWM plan and action. When people observe the reduction of the amount of waste, they will pay more attention and cooperation in SWM.
- 3- Tha Yang SDM may consider creating a waste separation system (such as a recycle center) before disposing at a disposal site to reduce incoming waste at the disposal site. The waste separation system used in Muang Klang municipality, Rayong province can be a good example for Tha Yang.
- 4- One training course should be added to train waste collection staff about how to advise the public on waste separation.
- 5- SDM should coordinate between recycle shops/junk shops and community people. A good relationship between recycle shops and the people will create good cooperation in waste separation from the community people and also generate additional income for people.
- 6- Volunteer spirit is one of the factors that makes the project a success. However, volunteers as well as educating, allocating the budget will allow the sustainable implementation of environmental volunteers.
- 7- In order to create the sustainability of solid waste management, the public awareness of people should be emphasized as well as create a new generation of volunteers who can maintain public awareness activities with community people.

Pilot Project 2

- 1- Pak Tho should consider promoting urban visual quality (lifestyle of community people, identity of community for tourism attraction)
- 2- In the process of coordination, the implementer needs to understand the context of stakeholders as well as the relationships of related sectors in a pilot area such as the relationship between communities or the relationship between a community and organizations.
- 3- Beside the installation of waste water treatment system, the knowledge in water quality monitoring should be transferred and volunteer groups for water quality monitoring should be established.

Moreover, the results of water quality monitoring should be disseminated to the public in order to raise public awareness.

- 4- Social measurements should be added to solid waste management measures, or more attractive activities should be initiated, such as the introduction of a point card system to award people who use the eco-bag.

Indicator 3.2
Ways to access budgetary resources are known to LAs.

The project held a two-day a training session on Project Development and Proposal Designing and Preparation for Environmental Projects in REO8 Jurisdiction. Attended by 14 key staff from REO8, 5 PONREs, and two LAs, the training modules include:

- Overview of Project Cycle Management
- Tools in Project Proposal Development including problem identification, setting of objectives, developing indicators, a monitoring and evaluation system and management and coordination
- Tips in Project Sourcing and Fund Accessing
- Donor Perspective and Core Principles in Project Proposal Evaluation

At the seminar, the participants were practiced what they learned by preparing three project proposals namely: Clean Hua Hin City, Promote Tourism Revenue Project; Tha Yang Floating Market Development Project, and Waste Millionaires Community Project in Samut Songkhram. The activity gave the participants the opportunity to practice what they have learned as well as receive feedback from other participants and lecturers about how to further improve their proposals.



Participants during the Project Proposal Seminar held on May 28-29, 2015

In addition, the project also identified possible ways to increase fund mobilization. Of utmost importance, however, is for REO8, PONRE and LAs to increase their financial capacity and improve financial management by utilizing the funds transferred from the Central Government more effectively, ensuring coordinated implementation of environmental related local projects. Described below are the funding mechanisms that were explored:

(1) Environmental Fund

The Enhancement and Conservation of National Environmental Quality Act of 1992 clearly designated the establishment of the Environmental Fund that would provide the financial capital required to promote environmental related projects and conservation projects.

The Environmental Fund was created by the Enhancement and Conservation of National Environmental Quality Act of 1992 as a financial measure to create incentives and support efforts to resolve urgent environmental problems under the participation of all concerned sectors and in accordance to the Polluter Pays Principle. It was established under the Enhancement and Conservation of National Environmental Quality Act of 1992. The objective is to promote solutions for environmental problems with participation from all sectors, through the provision of air pollution and waste water treatment systems, and waste disposal systems. The scope of activities to be funded consists of the following:

- Provision of a central waste water treatment system and waste disposal system which belongs to the government agency or to the local administration.
- Provision of a waste water/air pollution treatment system, waste disposal system or other equipment that are used by the local administration, state enterprises and public organizations.
- Provision of a waste water/air pollution treatment system, waste disposal system or other equipment, whose sources are of those small and medium-sized private entities that have a legal responsibility to solve environmental problems, and of those private entities that have no legal responsibility but wish to participate in solving such problems.
- The dismantling/relocation of the enterprise to a suitable industrial estate or industrial zone equipped with a waste water treatment system or waste disposal system.
- The task of a service contractor who is permitted by the Act to provide waste water treatment and waste disposal services.
- Activities of the government agency/ies, local administrations and NGOs on environment, for the promotion of natural resource and environmental conservation which are participated by the organization of the community and people.
- Other activities related to the enhancement and conservation of environmental quality of the government agencies and local administrations as deemed appropriate by the Environmental Fund Committee.

Accessing funding from the Environmental Fund can be challenging. For local governments, the cost associated with procuring funding from EF was relatively high compared to other sources of funding. When procuring funding from EF, local governments will have to procure part of the project costs on their own, but when procuring funds are based on loans, they have to pay the loans including interest. Also, on average it takes a while to complete the funding

application procedure so that it means that the funds could not necessarily be used where environmental conservation activities were an urgent matter.

Another area to consider is the deficiency in technological standards and fund-raising capacities on the part of the local government. In obtaining funding from EF, it requires the proponent to prepare feasibility studies and to develop facilities under their own responsibility rather than the central government taking the initiative for environmental projects. The technical capability and expertise in project planning and design are critical where most of the local governments do not have the required expertise to do so.

These are some considerations that REO8 may need to think about regarding the capability and capacity factors in accessing the environment fund to support the projects contained in the R-EQMP.

(2) Decentralization Fund

The intergovernmental transfer in the Thai context includes grants and shared revenue. Grants are distributed in an ad hoc and highly politicized manner. The general grants are distributed to local administrations based on indicators that are proxies for local government expenditure needs and revenue capacities which are administered by the Department of Local Administrations. There are also special grants for specific purposes e.g. infrastructure also administered by the Department of Local Administration. Subsidies with the transfer of responsibility are only allocated to TAOs. An amount is set aside for each local government for special purposes and can be accessed by submitting a plan before the funds are disbursed.

Municipalities and Tambons are also allowed to borrow under Article 28 of the Act. The Act however, contradicts existing Local Administrations' regulations, which only permits municipalities to borrow with Governors' concurrence.

Disbursement of grants with a transfer of responsibility has been slow due to the stringy requirements of the Bureau of Budget and the local governments' capacity to plan and procure projects. Many local administrations complained that the central government delayed the release of these funds, making the timing and the amount of grants unpredictable to the local governments. The majority of the planned projects could not be disbursed by the end of the fiscal year.

ONEP also implemented its own decentralization fund which allocated a budget to the PONRE with the submission of its Provincial Action Plan to ONEP.

5.3.2 Achievements of Output 3 Activities

Activities of Output were achieved and described are the achievement levels in each activities.

1) Determination of Pilot Projects

As per the plan, the two pilot projects were determined from the list of projects and programs contained in the Regional EQMP (2013-2016). Since the Regional EQMP has 43 programs and

projects, thirteen priority projects and the REO8 jurisdiction has five provinces, choosing only two projects were not easy. Hence, the project conducted a series of meetings in July 2014 and August 2014 participated by representatives from ONEP, REO8 and five PONRE. At each activity, consensus were built and the following issues were clarified:

- Definition of pilot projects
- Purpose and expected outcomes
- Type of projects to be selected as pilot projects
- Criteria for selection
- Process of selection
- Time frame of pilot project implementation

Tables 5-17 to 5-20 and Figure 5-7 showed the confirmed details of the pilot projects implementation. Also see Volume 1 of this Report for the compilation of records of meetings and proceedings of the workshops).

Table 5-17 Definition, Purpose and Expected Outcome of Pilot Project

Definition	1- An experimental research, a pre-test of technologies, or a leading activity on a major program/project that requires experimentation to determine its viability. 2- Results of pilot projects can be used to feedback to the design and concepts as stipulated in the environmental management measures, programs or projects.
Purpose	1- To develop a model that can be disseminated to other areas 2- To verify the feasibility and effectiveness of the project by implementing it on a small scale or implementing a part of the whole project
Expected outcomes	1- Increased success rate of the project during full blown project implementation 2- Developed the best practices and a good case study for replication/duplication to other areas

Table 5-18 Definition of Pilot Project

Type of Project	Definition
Model Development	<ul style="list-style-type: none"> • New type of environmental management interventions not yet done by REO8 and PONREs • Easily replicable new technological model to other PONRE or other regions
Development of Implementation Mechanism	<ul style="list-style-type: none"> • Linkage between REO8 and PONRE • Linkage between PONREs • Linkage between PONREs and LA • Linkage between REO8, PONREs, and LAs
Verification of feasibility and effectiveness of concepts and technology	<ul style="list-style-type: none"> • Test of soundness and effectiveness • Applicable and practicable methodology for easy duplication to other areas

Table 5-19 Criteria in Pilot Project Selection

Criteria	Description
Policies in Regional-EQM (2013-2016)	Water quality management, wetland management, coastal zone management, solid waste management, climate change, among others
Responsibility of REO8 and PONRE on the issue	Whether the scope or responsibility and role to resolve are in context with PONRE and REO8
National special agenda on environmental management	According to the national environmental management agenda, waste management is designated for 2014, and water quality management for 2015.
Common or Cross border issues among REO8 and neighboring Provinces	Whether the pilot project(s) benefits not only in one but several provinces in REO8
Contribution to strengthen environmental management system and relationships among regional and local levels	Whether different organizations are involved in the pilot project to address issues
Allocation of necessary staff	Whether PONRE/REO8 can provide necessary staff
Easy dissemination and application to other areas or regions	The pilot project(s) which can disseminate and apply not only to specific areas or regions but other areas or regions as well. This will be given a higher priority.
Acceptance of activities	The project activities and pilot project are accepted by related government agencies, people, and NGOs in the target areas.
Security	Safety in the implementation of pilot project activities is ensured.

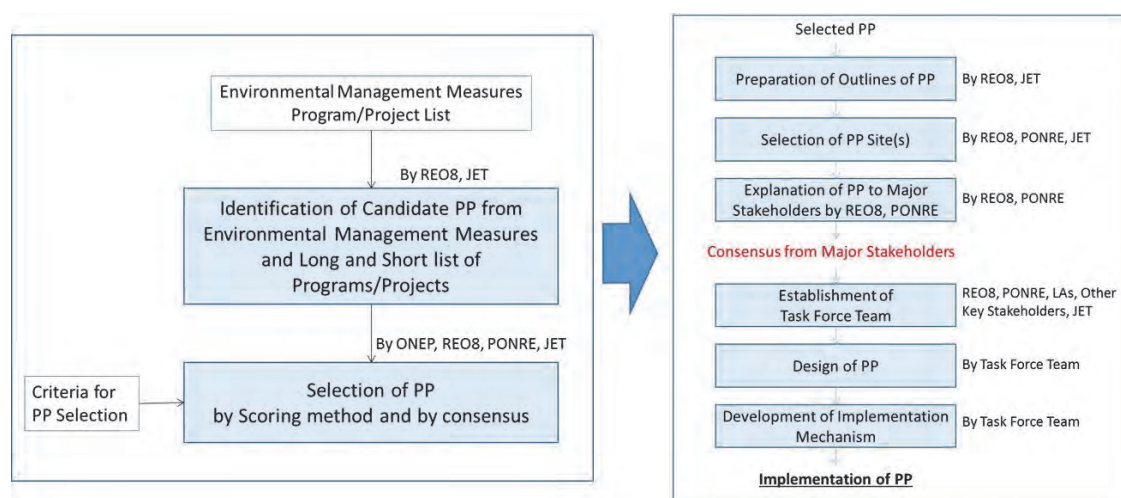


Figure 5-7 Process of Pilot Project Selection

Table 5-20 Time Frame of the Pilot Project Implementation

Activity	2014					2015												2016			
	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
PP Planning	←→																				
PP Implementation			←→																		
Monitoring and Evaluation							▲			▲				▲				▲			
Reporting, coordination and communication	←→																				
Pilot Project Completion/Reporting																					←→

In the light of the above mentioned activities, two pilot projects were determined, namely: 1) Improvement of Solid Waste Management in Tha Yang Sub-district Municipality, Phetchaburi Province (referred in this report as PP-1), and 2) Establishment of Community-based Environmental Management in Pak Tho Sub-district Municipality, Ratchaburi Province (referred in this report as PP-2).

The project conducted field surveys and consultations in the selected project sites in order to understand the environmental condition and environmental management system in both sub-district municipalities.

At the Joint Committee Meeting (JCC) held on September 2014, the two pilot projects were approved and the Notification Letter was issued By ONEP in November 2014. The Acceptance Letters were received by the project from the respective Local Executives of Tha Yang and Pak Tho Sub-districts Municipalities (see Figure 5-8) in November 2014.

2) Establishment of a pilot project implementation mechanism in the selected sites

As per plan, the project developed the mechanism for the implementation of the selected pilot projects in the respective pilot project sites. The following activities as outlined in the PDM 2 were conducted in the following manner:

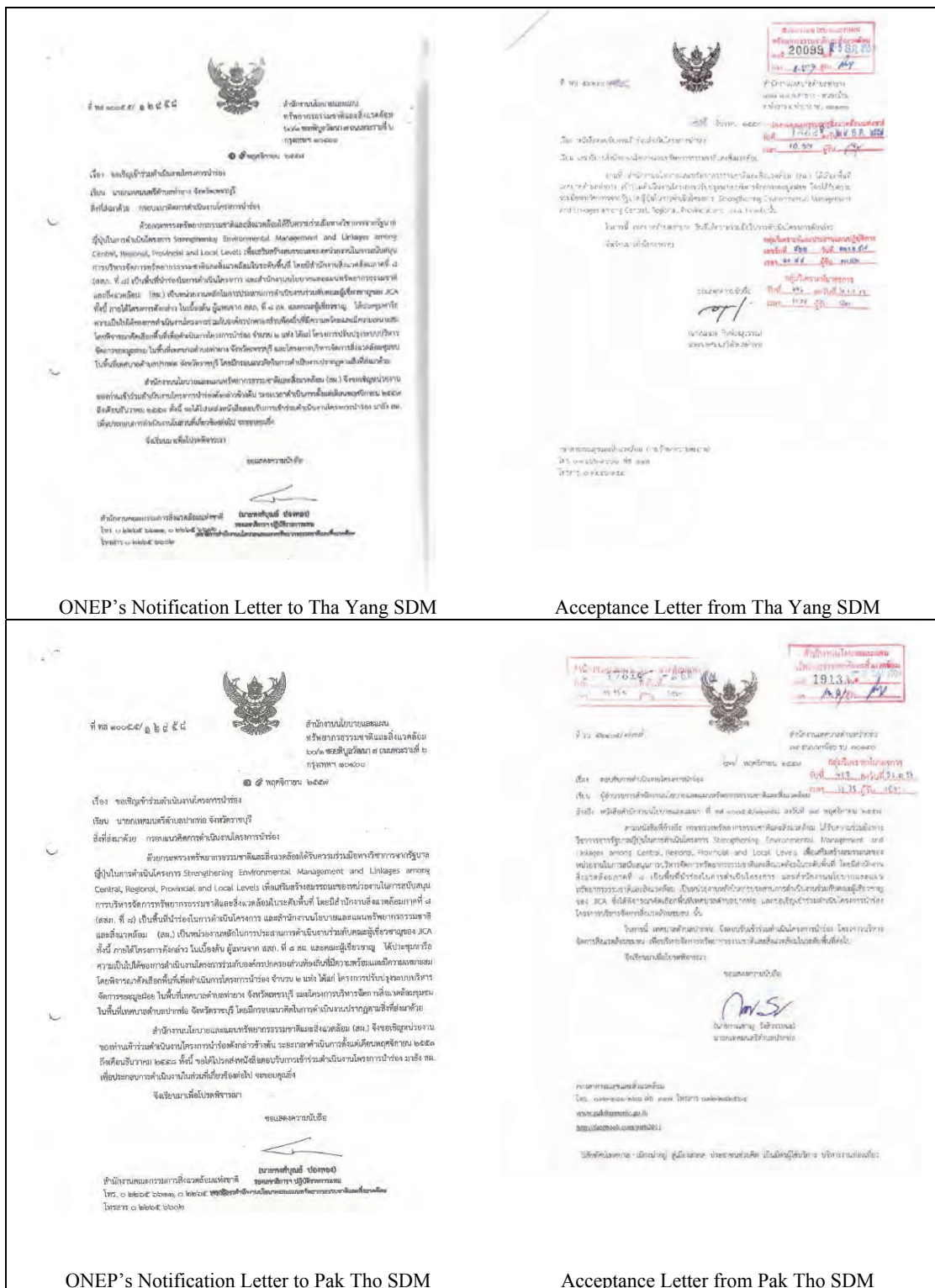
(1) Formulation of Pilot Project Implementation Plan

The project, in consultation with respective sub-district municipalities, formulated the Pilot Project Implementation Plans. Each implementation plan contained the following information: 1) analysis of existing conditions; 2) framework of pilot project; 3) implementing mechanisms, and 4) methods of monitoring and evaluation. A series of meetings and discussions were conducted in October 2014 to facilitate common understanding of the pilot project implementation plans among relevant stakeholders.

The summary and overview of pilot projects are shown in Box 5-1 for Pilot Project 1 and Box 5-2 for Pilot Project 2. The full contents of the implementation plans are covered in the Volume 3 of this report.

(2) Organization of Pilot Project Task Force Teams (TFTs)

Under Output 1, the project developed an implementing structure and mechanism in the implementation of the Regional EQMP. In order to confirm the viability of the mechanism, the project applied them in the implementation of the pilot projects.



ONEP's Notification Letter to Tha Yang SDM

Acceptance Letter from Tha Yang SDM

ONEP's Notification Letter to Pak Tho SDM

Acceptance Letter from Pak Tho SDM

Figure 5-8 Confirmation and Acceptance Letters, Pilot Project Sites

At the beginning of the pilot project implementation, the project organized the Task Force at each pilot project site. This also aimed to enhance participation and create ownership of the pilot project. The function of the TFT is to coordinate the implementation of the pilot project; assist the implementation and provide progress reports to the Pilot Project Advisory Team. Chaired by PONRE Directors, the TFT for Pilot Project 1 is composed of 12 members, while at Pilot Project 2, the TFT is composed of 15 members. Table 5-21, and 5-22 show the detailed composition of the pilot project’s task force team in each pilot project site. See Section 5.3.3 of this report for the detailed activities of the TFTs in each pilot project sites.

Table 5-21 Composition of Task Force Team in Pilot Project 1

Chair Person	Director Pipop Phatcharaphansakul, PONRE Phetchaburi
Members	
REO8	Ms. Kullada Eakboonchu
PONRE Phetchaburi	Mr. Nippon Chaisalee Ms. Chantana Bualom
SDM	Mr. Thawatchai Kunthithong, Chief Administrative Mrs. Suni Kunthiamsin, Director, Public Health and Environment Section Mr. Rueangsin Hasakun, Director, Public Works Section Ms. Chanthra Mahabenchawong, Head, Public Health Section Mr. Supphawit Sochaemchit, Head of Sanitary Works Ms. Waraphon Thawisi, Registered Nurse
Tambon Tha Leng	TBD
Community Group	Mrs. Janthimar Pinhiran, Environmental Volunteer

Table 5-22 Composition of Task Force Team in Pilot Project 2

Chairperson	Director Sawong Soodprasert, PONRE Ratchaburi
Members	
REO8	Ms. Chaba Kaeophuang
PONRE	Mrs. Achima Klaihong Ms. Tabtim Limsoontorn
SDM	Mr. Phonthep Wanitthitikan (Vice Mayor) Lt. Rung Ni Ran Sa-atoat Mr. Kritimet Chaidi
Representatives from community	Mr. Chai Riaproi (Community Leader of Talad Pak Tho) Mr. Phonchai Wanitthitikan (Community Leader of Rim Klong) Mrs. Parichat Phongthong (WG Leader of Klong Nok Noi)
Leaders of Community Groups	Sgt. Phichet Khao Khong (Environmental volunteer) Ms. Sinarun Samangthip (Labor representative)
Community Group Leaders	Sgt. Phichet Khao Khong from Talad Pak Tho Mr. Phonchai Wanitthitikan from Rim Klong Mrs. Parichat Phongthong from Klong Nok Noi

(3) Organization of Pilot Project Advisory Team

As an application to the developed implementing structure and mechanism under Output 1, the project in cooperation with REO8, established the Pilot Project Advisory Team in January 2015, of which the agreed roles and functions and responsibility are detailed in Table 5-23 below.

Figure 5-9 outlines the organizational structure that governed the implementation of pilot projects. As shown in the figure, the composition of the Advisory Team include: REO8 Director

was designated as Chairperson and the members were composed of representatives from ONEP, PCD, DEQP, five PONREs in Ratchaburi, Samut Songkhram, Kanchanaburi, Phetchaburi and Prachup Khiri Khan, Chairpersons of the Task Force from Tha Yang and Pak Tho, representatives from SDM Tha Yang and Pak Tho, Environmental Quality Promotion Division of REO8 and JET. The project’s counterpart staff of REO8 was acting as the coordinator for the Advisory Team.

During the project period, four Advisory Team Meetings were conducted (see Volume 1 for the compiled minutes of meetings) between the periods of January 2015 to December 2015. At each meeting, the progress of the implementation was reported, problems and issues were discussed and resolved.

Table 5-23 Roles, Functions and Duties of Advisory Team

Roles and functions	<ul style="list-style-type: none"> - Provide technical support to the Task Force Teams in implementing the activities and plans of pilot projects - Facilitate in the coordination with the relevant agencies, groups and institutions at the national or regional levels on matters that are important to the implementation of the pilot projects and are deemed beneficial to the successful outcome of pilot project activities - Conduct monitoring and evaluation of activities and ensure that the Implementation Plans are carried out
Duties and responsibilities	<ul style="list-style-type: none"> - Attendance at meetings and participate in activities - Share data and information significant for the implementation of the pilot projects - Assist in disseminating good practices, experiences and knowledge gained from the implementation of the pilot project to other areas - Act as resource persons during special events organized by the Task Force Teams

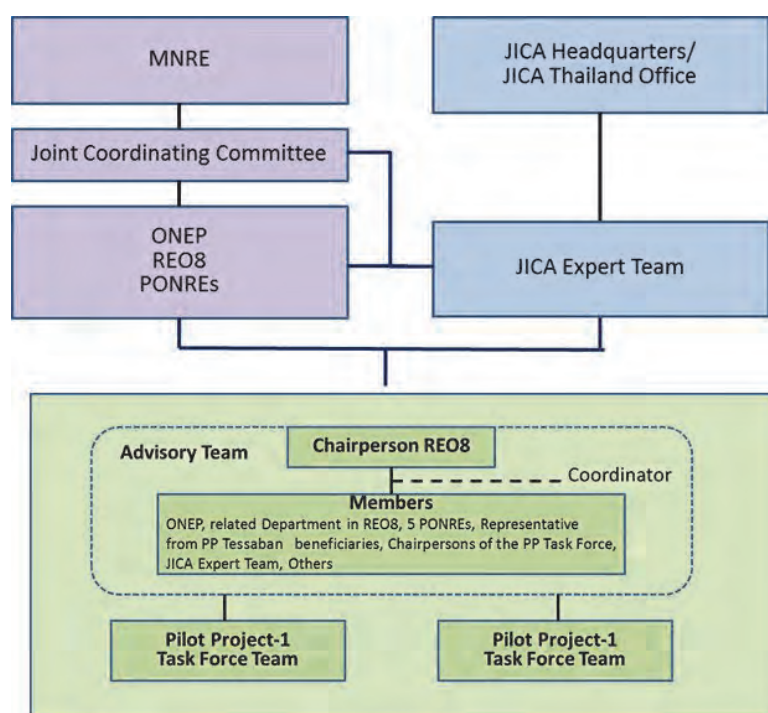


Figure 5-9 Pilot Project Implementing Structure



Participants during the organization and 1st Meeting of Pilot Project Advisory Team, January 2015

Box 5-1

Overview of Pilot Project 1

Improvement of the Solid Waste Management System in Tha Yang Sub-district Municipality

1. Background

Solid waste is one of the major and urgent environmental problems not only in the REO8 jurisdiction but also in other areas of Thailand. Data on waste generation showed an increasing trend parallel to the development of economic condition, urbanization and rapid growth of population. Under the Regional EQMP two environmental management issues related to solid waste management were identified namely:

- Pollution load should be minimized effectively
- Clean cities should be achieved through practical solid waste management

Given this context and the commonality of the solid waste management problems across the REO8 jurisdiction, this pilot project was selected. The selection was also a timely response to the urgent need on the problems of disposal sites brought about by the PCD Guidelines on Assessment for Capacity of Landfill Site (PCD, 2013) wherein open dumping will no longer be allowed starting in 2015. With the implementation of this pilot project, Tha Yang will be technically assisted by ONEP, REO8, JET and PONRE in the evaluation of the existing solid waste management system in order to ensure that requirements from PCD are met.

2. Profile of Tha Yang SDM

The Tha Yang Municipality is located in the eastern part of Phetchaburi Province. It has a total land area of 79 sq. km and a population of 38,337 being distributed in 37 villages. The solid waste management system, which includes waste collection, transportation and disposal, though not properly established by the Municipality, can be considered to be relatively good compared to other areas in Thailand, hence streets, markets and other public spaces are relatively clean with no garbage scattered around. Also visible were the presence of garbage and collection bins around public and residential areas.

Tha Yang has a total of 25,600 m² waste disposal site in Tha Laeng, established in 1995 and located about 12km from the town center. The Pollution Control Department categorized the Tha Laeng waste disposal site as an open dump employing strict compliance of a soil covering method. The disposal site received 58 tons/day, 1.8 tons/day from Yang Yong TAO and 6 tons/day from Wang Krai TAO.

One of the major problems were related to the management of disposal sites, specifically on the capacity of Tha Laeng to absorb garbage. This situation has become an urgent concern aggravated by the Guidelines on Assessment for Capacity of Landfill Site (PCD, 2013) wherein PCD is no longer allowing open dumping starting in 2015.

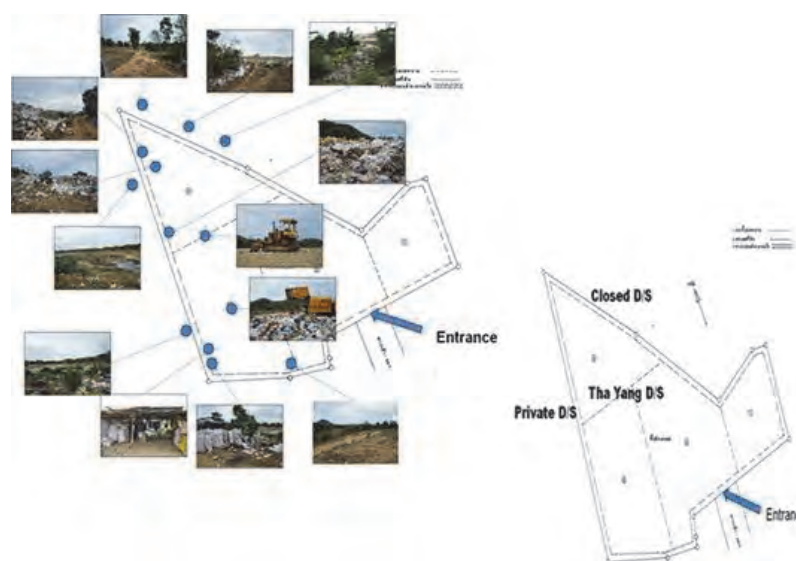


Figure B5-1 Condition of Disposal Site, Pilot Project 1

Overview of Pilot Project 1
Improvement of Solid Waste Management System in Tha Yang Sub-district Municipality

2. Objective of the Pilot Project

The objective of the pilot project is to develop the capacity of Tha Yang in solid waste management and develop a balanced solid waste management system based on a waste hierarchy.

3. Framework of the Pilot Project

The framework for PP-1 considers the waste management components namely: generation, collection/transportation, intermediate treatment, and disposal (see Figure B5-2 below). Each section will be looked into and recommendations will be provided, when deemed necessary.

4. Work Structure and Implementing Structure

The activities to be implemented are conducted in a participatory manner in order to effect the transfer of knowledge to the SDM (see Figure B5-3 & 4).

5. Monitoring and Evaluation Mechanism

The monitoring and evaluation of each activity are carried through with meetings, period consultation and site visits.

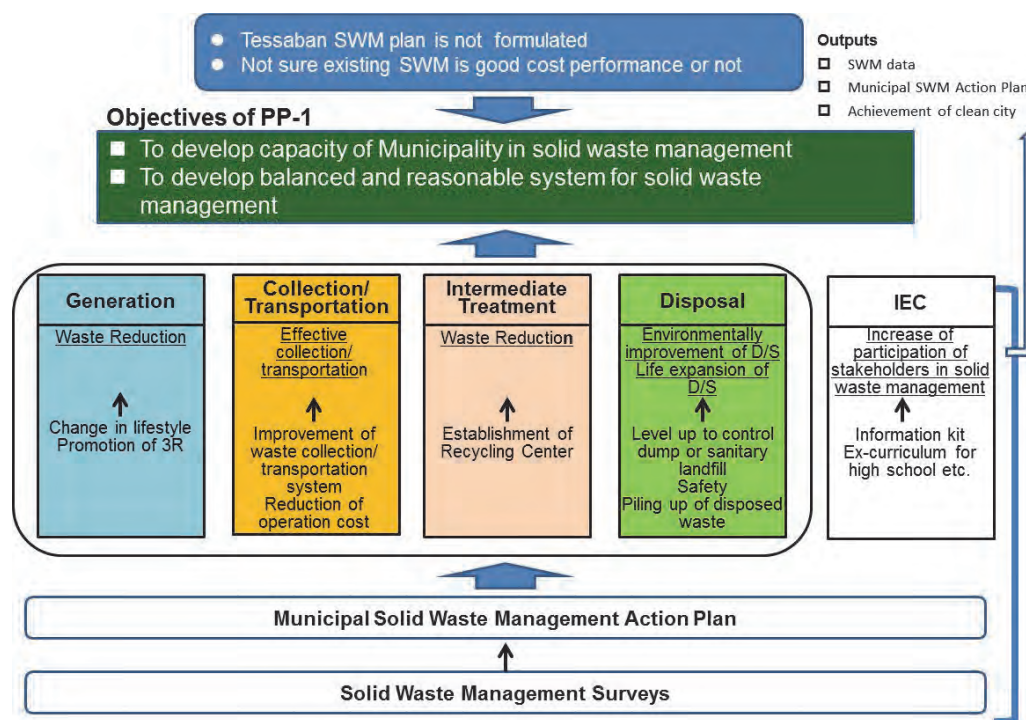


Figure B5-2 Framework of Pilot Project

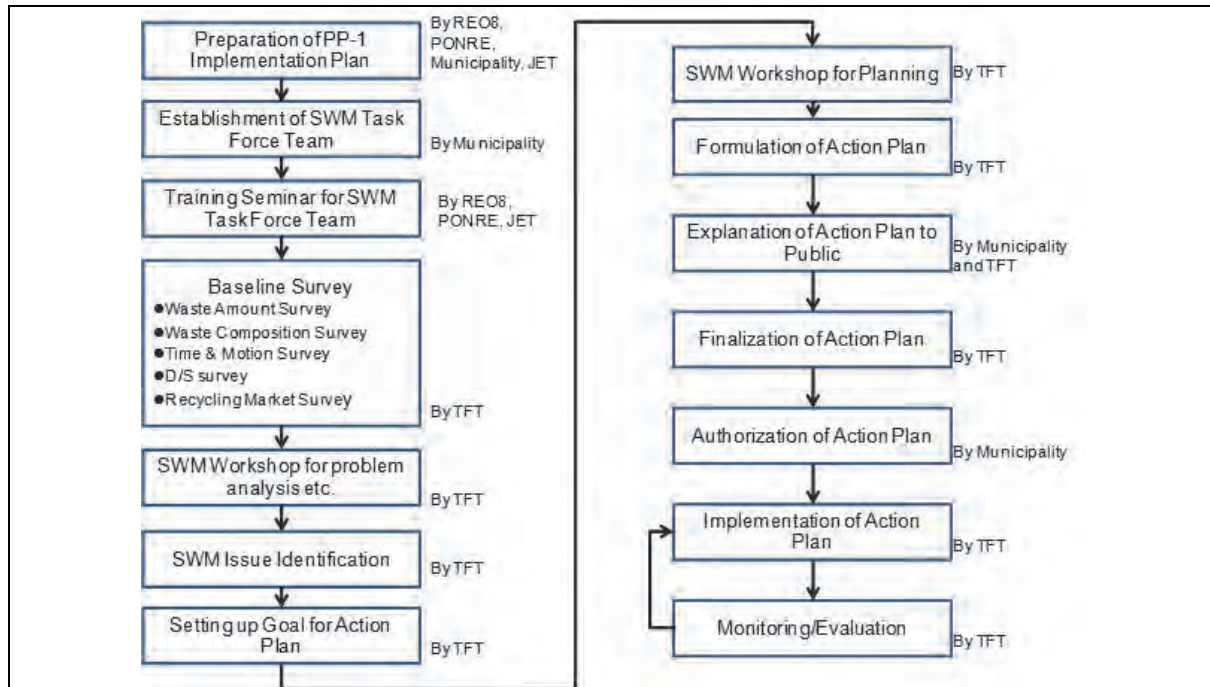


Figure B5-3 Work Structure

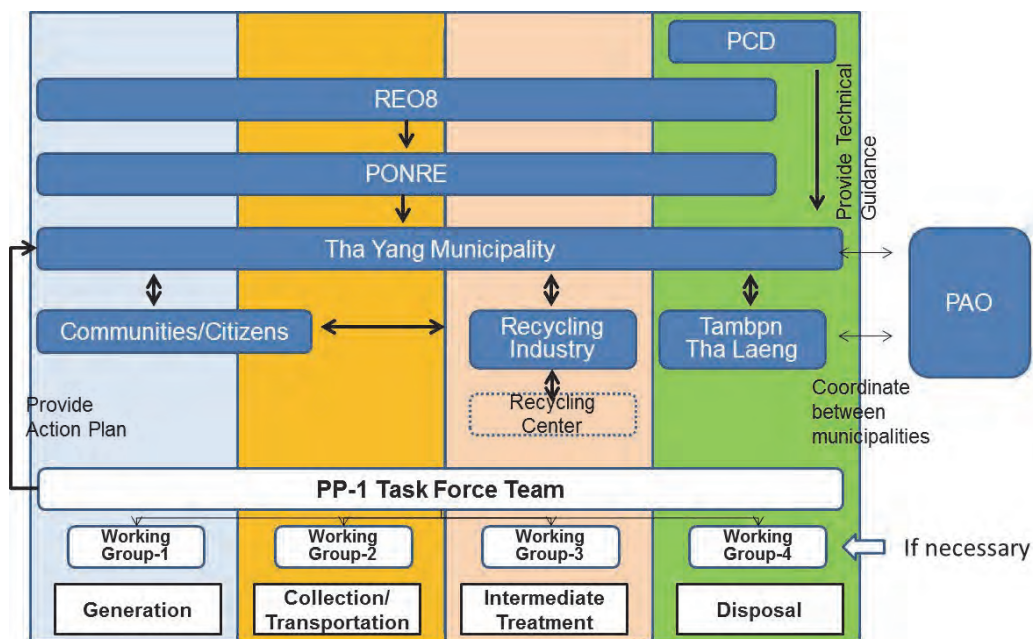


Figure B5-4 Framework of Pilot Project

Box 5-2

Overview of Pilot Project 2

Establishment of Community-based Environmental Management in Pak Tho Sub-district Municipality

1. Background

In Thailand, the participation of local communities in environmental management has been recognized and promoted by various government agencies. Evidence of this is provided by the current National Constitution, which contains some articles giving rights to the local people and communities to participate in any state-owned development projects. These local communities currently have a say in any decision making processes on environmental resource management.

Within this context, the Regional EQMP promotes community participation as an important principle in planning and implementation of various environmental initiatives. Under the Urban Management Unit Strategy, community participation is strongly promoted and identified to be enhanced in order to achieve sustainable participation and involvement of the community. Community involvement is indispensable and yet it is difficult to involve community people because of different social situations. Therefore, the PP-2 envisions to develop a workable community based environmental management system.

2. Profile of Pak Tho SDM

The Pak Tho Sub-District Municipality consists of five communities which are relatively small with a population of around 300-500 people, except for the Pak Tho Market community which has over 1,000 people. The Pak Tho Sub-District Municipality has three canals, namely Wan Dao Canal, Nok Noi Canal and Pak Tho Canal. Pak Tho Canal is the major canal that connects to other canal networks in Ratchaburi, particularly the Pradu Canal that is connected to Damnoensaduak Canal. The water quality in these canals is the major concern in these communities.

3. Objective of the Pilot Project

The pilot project 2 generally aimed to establish a community-based environmental management system in Pak Tho Sub-District Municipality. Specifically, it aims to:

- To develop a model for a community environmental management system
- To develop and enhance linkages between and among the community, the SDM/PONRE, REO8 and other related organizations in supporting the community environmental management efforts

4. Framework of the Pilot Project

Community participation is important for effective environmental improvement as envisioned by the Regional EQMP of REO8. Because of pilot projects like these the communities, while some environmental problems are caused by themselves, have a chance and responsibility to tackle environmental issues in cooperation with the government. Participatory planning for establishing community environmental management envisions to empower and raise environmental awareness through pilot project activities, improve the communities' living environment by community people and develop a workable community participatory environmental management system. Figure B5-6 shows the structure of community based environmental management, and Figure B5-7 shows the concept of cooperation in community based environmental management.

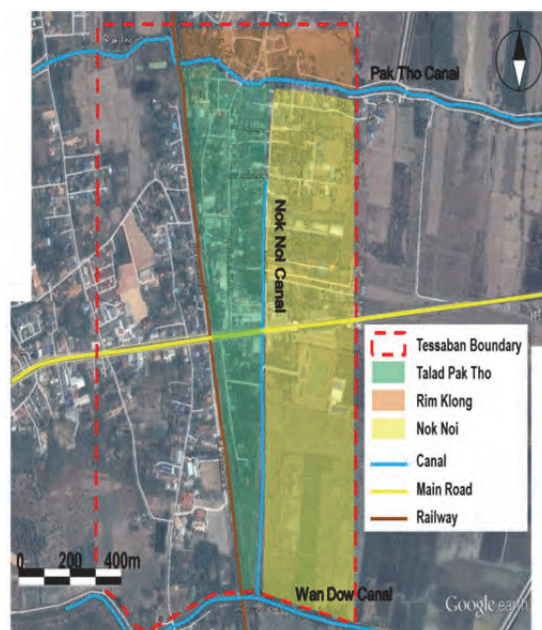


Figure B5--5 Location of Pilot Project Site

Overview of Pilot Project 2
Establishment of Community-based Environmental Management in Pak Tho Sub-district Municipality

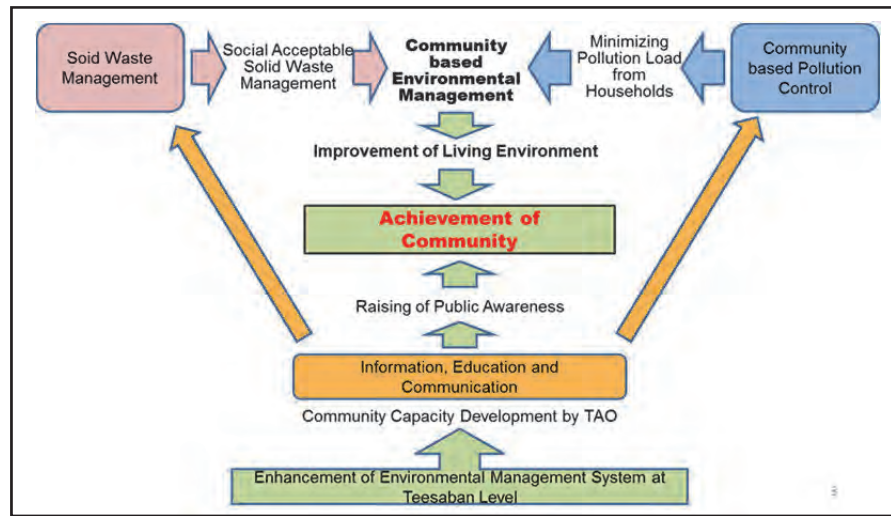


Figure B5-6 Structure of Community-based Environmental Management

5. Work Structure and Implementing Structure

The activities under pilot project 2 are outlined in Figure B5-8 and its implementing structure is shown in Figure B5-9. In Figure B5-10 Key roles of organization.

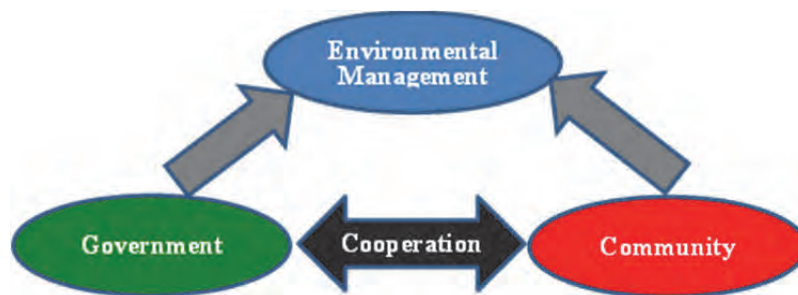


Figure B5-7 Concept of Cooperation in Community-based Environmental Management

Overview of Pilot Project 2
Establishment of Community-based Environmental Management in Pak Tho Sub-district Municipality

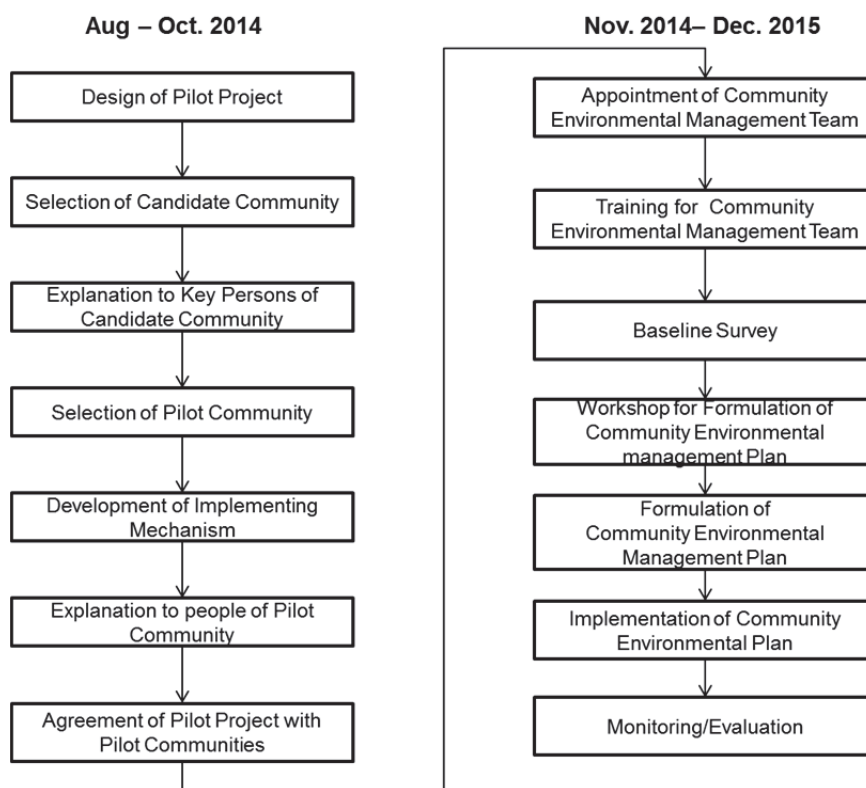


Figure B5-8 Work Structure

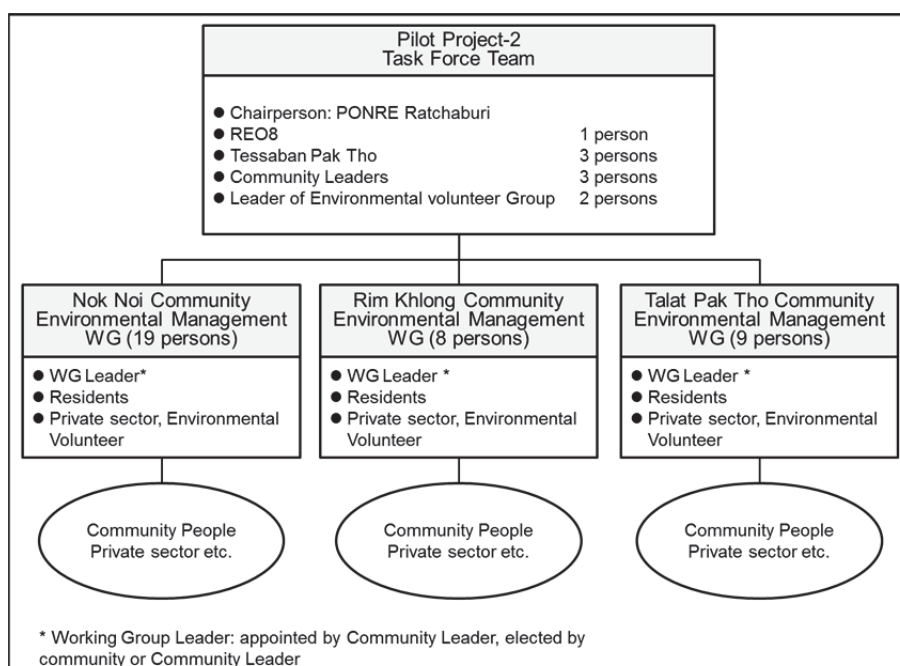


Figure B5-9 Implementing Structure

Overview of Pilot Project 2
Establishment of Community-based Environmental Management in Pak Tho Sub-district Municipality

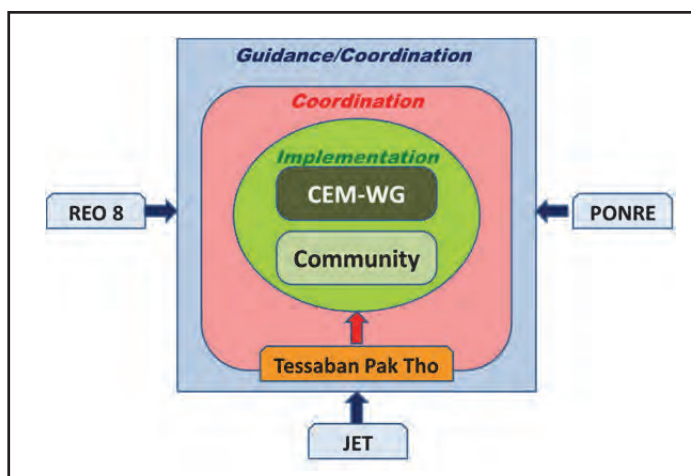


Figure B5-10 Implementing Structure

6) Monitoring and evaluation was conducted in the following three levels:

- Self-Monitoring: Self-Monitoring was taken by the Community WGs in cooperation with Tessaban Pak Tho. Mainly this activity was undertaken through interviews/hearings with community members, school students, teachers, etc., who were involved in the pilot activities.
- Monitoring/Evaluation by (TFT): TFT meetings were periodically held in order to monitor and evaluate the pilot activities.
- External Monitoring/Evaluation: It was conducted by the advisory Team through the field survey and meeting held on December 8 – 9, 2015. This field survey and meeting focused on both pilot project 1 and 2.

5.3.3 Achievements of Output 3 Activities by Pilot Project

1) Pilot Project 1: Improvement of the Solid Waste Management System in Tha Yang Sub-district Municipality

The implementation of the pilot project activities covered the period from November 2014 to December 2015. During this period, the project conducted training/seminars on solid waste management, planning workshops, solid waste management surveys, and regular TFT meetings. Volume 3 Part B of this Report contains the compiled report covering the implementation of PP-1, and below is the summary of accomplishments:

(1) Training and Seminars for Task Force Teams on Solid Waste Management

During the project period, four training seminars were conducted from February to December 2015. These were intended for the members of the Task Force Team and Tha Yang SDM key personnel to further understand solid waste management systems and enhance their knowledge on the overall system of solid waste management. Attended by a combined total of 100 participants, the major topics consisted of the solid waste management system from waste collection and transportation, intermediate treatment and final disposal. ONEP, REO8 and PONRE Phetchaburi were among the participants in these training sessions.



Participants during the first training on Solid waste management, February 2015



Participants during the Seminar on Solid Waste Disposal Management, May 2015

(2) Solid Waste Management Survey

One of the major issues identified during the meetings with Tha Yang was the lack of solid waste related baseline data for planning. In order to obtain the baseline data on solid waste, the project conducted the solid waste management survey. The survey covered the period from February to March 2015 and was conducted by a group of surveyors composed of representatives from PONRE (3), Environmental Volunteers (1), JET (2); and student volunteers (4). Table 5-24 describes the outline of the survey and Table 5-25 provides the schedule of the surveys.

The significant outcome of the survey was the development of the SWM data book and a 20-minute SWM video production. The SWM data book was the compilation of results of the solid waste management survey, while the SWM video production showed the conduct of the survey. With the establishment of the data book and the video production, the project envisioned that Tha Yang will continue to conduct surveys with other communities and use these resources as a guideline.

Table 5-24 Outline of Solid Waste Management Surveys

Survey	Objectives	Methods	Utilization of Data
Household Questionnaire Survey	<ul style="list-style-type: none"> To understand the situations of solid waste management To understand people's satisfaction with the existing solid waste management 	1) Interview	<input type="checkbox"/> To assess the existing solid waste management from the viewpoint of the people.
Waste Amount Survey	<ul style="list-style-type: none"> To estimate amount of generated waste from households 	1) Take samples from households or waste collection vehicles by classified generation sources 2) Measures weight of waste	<input type="checkbox"/> To estimate amount of generated waste and waste generation rate <input type="checkbox"/> To prepare waste flow
Waste Composition Survey	<ul style="list-style-type: none"> To measure waste composition 	1) To take samples from households or waste collection vehicles by classified generation sources 2) Classify waste into several categories such as paper, cloth, plastic, wood, kitchen waste, metal etc. 3) Measure the weight of each category	<input type="checkbox"/> To assess methods for waste treatment and disposal <input type="checkbox"/> To assess the possibility of recycling
Time & Motion Survey	<ul style="list-style-type: none"> To assess the effectiveness of waste collection and transportation To observe waste discharging actions of the citizens and actions of collection crews 	1) To follow collection vehicles from garbage collection stations to D/S 2) To measure and record time spent for each activity for the collection and transportation of waste	<input type="checkbox"/> To utilize for the improvement of collection and transportation methods
Incoming Waste Survey at D/S	<ul style="list-style-type: none"> To assess the existing D/S To estimate amount of waste coming into D/S 	1) To observe conditions of disposed waste including location, contents of waste, scattering of waste 2) To observe the operation of unloading waste and the disposal of waste by collection vehicles and heavy equipment	<input type="checkbox"/> To estimate the amount of disposed waste at D/S <input type="checkbox"/> To provide insights regarding how to increase the capacity for disposal of the waste

Source: JICA Expert Team

Table 5-25 Schedule of Solid Waste Management Survey

Task Name	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	
Preparation of surveys		1																													
Questionnaire Survey				2																											
Time and Motion Survey A													2																		
Time and Motion Survey B														1					1												
Waste Amount Survey												3																			
Waste Composition Survey													4									4									
Incoming Waste Survey																						1									

Source: JICA Expert Team

- Household Questionnaire Survey

The household questionnaire survey was conducted from Feb 16-17, 2015 to understand the situation of solid waste management at the household level as well as to learn the perceptions of the households about solid waste and the system of solid waste management in Tha Yang SDM from the view point of the household level.

Based on a random sample, a total of 149 samples were generated from two high density populated areas in Tambon Tha Yang and Tambon Takoi.



Surveyors during interview in Tha Yang on Feb 16, 2015

- Waste Amount Survey

The waste amount survey was conducted to estimate the amount of generated waste from six selected waste generators namely households, restaurants, shops, schools, temples and hospitals/clinics. A total of 61 samples were generated by the waste generators with the following sample distribution:

Table 5-26 Distribution of Samples in Waste Amount Survey

Waste Generators	No. of Samples
1) Households	
Densely populated area	31
Low/moderate/non-populated area	14
2) Restaurants	5
3) Shops	5
4) Schools	2
5) Temples	2
6) Hospitals/Clinics	2



- Waste Composition Survey

The waste composition survey was conducted on February 23-26, 2015 in order to measure the amount of waste generated from homes, commercial establishments, public facilities and streets/roads. A total of 11 samples were collected from the pre-selected zones which are densely populated and less populated areas. Figure 5-10 shows some of the pictures taken during the conduct of the waste composition survey.

- Time and Motion Survey-A

The time and motion survey was conducted on February 26-27, 2015 in order to understand and assess the effectiveness of the waste collection systems of Tha Yang SDM. An observation of waste discharging actions and system were also conducted. The surveyors observed three collection vehicles (from 03:30 am to 11:00am). Using a Global Positioning System (GPS), the surveyors followed the movement of the waste collection vehicles. Figure 5-10 and 5-11 shows some of the pictures taken during the survey.





Figure 5-10 Waste Composition Survey





Figure 5-11 Time and Motion Survey, February 2015, Tha Yang

- Other surveys

The time and motion survey B and incoming surveys were undertaken on March 2, 2015 and the incoming waste survey at disposal sites on March 2-7, 2015

The results and analysis of the above mentioned surveys will be compiled by PONRE Phetchaburi, in cooperation with the Task Force Team and JET in March 2015. In view of this, the project compiled all data and information into the SWM Data Book and facilitated the production of SWM video (see Volume 3 of this Report for details).

(3) Planning Workshops

During the pilot project implementation, the project conducted four planning workshops from February 2015 to June 2015. These planning workshops were attended by representatives from the Task Force Teams, waste collection vehicle crews, community leaders and environmental volunteers. These workshops were facilitated to come up with a solid waste management action plan for Tha Yang. At each workshop the participants discussed and analyzed the solid waste management problems in Tha Yang. The problem analysis centered on the system of solid waste management including waste collection, waste transportation, intermediate treatment and disposal sites. The community awareness regarding solid waste management systems, i.e. segregation and recycling were also discussed.



(4) Solid Waste Management Action Plan

The project formulated and published the solid waste management action plan for Tha Yang in June 2015 and was authorized by the Mayor of Tha Yang in a public hearing conducted in June 2015. This was attended by 140 delegations from the members of the Tessaban Council, Section and Departments Heads of Tha Yang SDM, and representatives from the different communities in the SDM. During this ceremonial celebration, the Mayor of Tha Yang SDM expressed commitment and support for the implementation of the Action Plan and asked the representatives of the communities to support its future implementation. The Mayor expressed support to provide and allocate a budget for the implementation of the SWM Action Plan.



Participants during the SWM Action Plan Public Hearing held on June 05, 2015 in Tha Yang

(5) Support in the Implementation of the SWM Action Plan

The project provided support to Tha Yang in the implementation of the SWM Action Plan. During the project, the following activities were conducted:

- Preparation of Upgrading and Lifespan Extension Plan for Tha Yang Disposal Site

During the period covered, technical collaboration was facilitated with Tha Yang Public Works in preparing the plan to upgrade and extend the lifespan of the Tha Yang disposal site. The plan was presented to Tha Yang SDM Public Works in the presence of ONEP, REO8, five PONREs and LAs in Prachup Khiri Khan on June 04, 2015 held at Tha Yang SDM. This activity was facilitated to clarify the contents of the plan and to generate feedback and comments (see Appendix L for the power point version of the upgrading and lifespan extension plan).

The proposed upgrading was estimated to cost around 8.5 Million Baht to be constructed within a period of 1-2 years. With the implementation of this plan, the lifespan of the disposal site in Tha Yang can be extended up to five years. This plan is now under study by the Heads of Public Works and discussions are underway as to the feasibility and securing of budget for its implementation.

- Track Scale Installation and Development of Recyclable Waste Collection Cart

In support of the overall SWM Action Plan, JET provided technical support to Tha Yang SDM in the preparation of a project proposal for the installation of track scale as well as the development of five units of recyclable waste collection carts amounting to approximately 2 Million Baht. This project proposal was submitted to the Embassy of Japan by Tha Yang SDM on July 24, 2015.

- Segregation Project with the Community

The Kra Jab community was selected to be the pilot community to undertake the waste segregation project with the SDM. A community workshop has been conducted in September 2015 to further clarify the objective and activities of the sub-project. The PCD has given JET specialized containers for hazardous waste and these will be turned over to the Kra Jab community. Waste collection carts as well as the establishment of waste stations were implemented in September 2015.

- Mascot and Logo Contest in School

Three schools, namely: Ban Tha Koi School (Primary School Grade 1-6), Ban Tha Yang School (Primary School Grade 5-6), and Tha Yang Wittaya School (High School Grade 5), participated in the mascot and logo contest. There were a total of 63 entries received, of which 59 entries were from primary schools and four entries were from secondary school.

The entries were judged according to the criteria set by the TFT namely: originality, appropriateness of the design to solid waste management, color coordination, and message. The winner/s of the contest will receive a plaque of appreciation from JET and non-winners will also receive complimentary gifts. The Mayor of Tha Yang and the Public Works Department have also confirmed that the winning entry/ies or best logo and mascot designs will be used as materials for succeeding public campaigns, logo for reports, publications, and to be printed in various waste collection trucks and waste collection carts, among others.



2) Pilot Project 2: Establishment of Community-based Environmental Management in Pak Tho Sub-district Municipality

The implementation of pilot project activities covered the period from November 2014 to December 2015. As per the plan, PP-2 was implemented on a phased approach; preparation phase, planning phase, implementation phase and monitoring and evaluation phase. The preparation phase focused on the selection of pilot communities and formulation of pilot project organization mechanisms. The planning phase consisted of training, workshops for the formulation of community-based environmental management action plans, and the implementation phase for the conduct of pilot activities based on the action plan. The monitoring and evaluation phase has been conducted. Figure 5-12 and Table 5-27 outlined the tasks and schedule under PP-2.

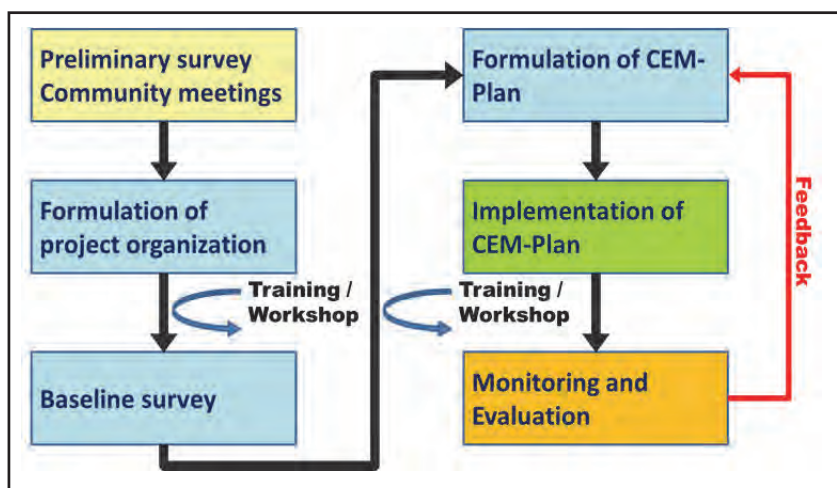


Figure 5-12 Tasks under PP-2

Table 5-27 Project Phasing and Actual Schedule

Tasks	2014	2015											
	12	1	2	3	4	5	6	7	8	9	10	11	12
Preliminary survey and community meetings	■												
Formulation of project organization		■											
Baseline Survey			■										
Formulation of CEM			■	■									
Implementation of CEM					■	■	■	■	■	■	■	■	■
Monitoring, Evaluation					■	■	■	■	■	■	■	■	■

(1) Preliminary Survey and Meetings

Selection of Pilot Communities

Pak Tho SDM consists of five communities, namely: Talad Pak Tho, Rim Khlong, Dao Loy, Nok Noi and Don Muang. As the pilot project cannot cover all these communities, PONRE Ratchaburi in consultation with Tha Yang SDM, REO8 and the JICA Expert Team decided to select three communities as pilot communities. A series of community meetings were held in October 2014 in order to identify suitable pilot communities, for which the selection is based on five criteria, namely: 1) characteristics of the community and its location; 2) community issues and suitability as a community based management model; 3) spill-over effect of problems to other areas; 4) community willingness/volunteer spirit, and 5) presence of existing environmental community groups.

The three selection processes conducted with the community showed that Talad Pak Tho (Village 1), Rim Khlong (Village 3) and Nok Noi (Village 7) were the top three communities that received favorable evaluations (see Table 5-28 for the results of the evaluation on community selection).

Organization of Working Groups

The organization of a working group in each selected community was facilitated by PONRE Ratchaburi together with Pak Tho SDM. The organization of working groups aimed to enable the key members in each community to work together with PONRE Ratchaburi and JET to:

- Conduct surveys, attend planning activity meetings and implement plans
- Enhance involvement in the project
- Report activities to the Task Force Team

In the Nok Noi community, the working group is composed of 19 members, eight members in Rim Klong community and nine members in Talad Pak Tho community. In each working group, a group leader was selected to represent the group during meetings with the Task Force Team, PONRE Ratchaburi and JET.

(2) Baseline Survey

The results of the questionnaire survey suggest the following:

Waste Management

- Most of the community people discard waste to provided bins near or in front of their houses. Some of them burn waste in the yard.
- 80% of community people separate recycle waste for selling.

Plastic bottles are the most separated items, followed by paper and glass bottles.

Table 5-28 Results of the Selection of Target Community, Pak Tho

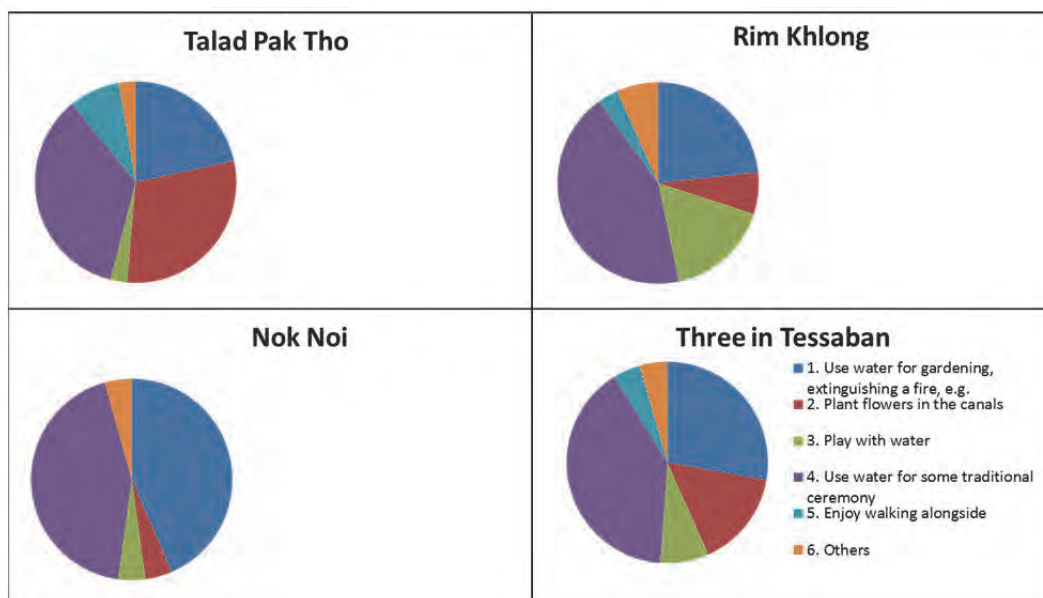
Evaluation Criteria	Dao Loy (Village 5)	Don Muang (Village 8)	Talad Pak Tho (Village 1)	Nok Noi (Village7)	Rim Khlong (Village3)
Characteristics of the community and location	<ul style="list-style-type: none"> • Facing Wan Dao Canal • Facing the railway • Lower population density, smaller commercial zone 	<ul style="list-style-type: none"> • Facing Pak Tho Canal • Facing the railway • Lower population density, smaller commercial zone 	<ul style="list-style-type: none"> • Facing Pak Tho, Noc Noi and Wan Dao Canal • Facing the railway • Highest population density in northern part, less population in southern part • Two big markets are operated 	<ul style="list-style-type: none"> • Facing Pak Tho, Noc Noi and Wan Dao Canal • Highest population density in northern part • No residents, but rice fields and wetlands in southern part • Near Tessaban Office and community center 	<ul style="list-style-type: none"> • Facing with Pak Tho Canal • Smallest community but high population density
Community Environmental issues and suitability as community based management model A: suitable B: moderate C: not suitable	<ul style="list-style-type: none"> • Drainage problems (blocked and disconnected from canals) -> C • Scattered livestock waste outside of farm during rainy season -> B • Improper collection of waste from school and temple, e.g. -> A 	<ul style="list-style-type: none"> • Flooding by heavy rain -> C • Odor/noise from livestock farm -> B • Damage and blocked drainage pipe -C • Scattered livestock waste outside of farm -> B • Improper collection of waste, e.g. -> A 	<ul style="list-style-type: none"> • Odors due to improper waste water treatment in Nok Noi Canal -> B • Bird scat -> B • Odors from garbage bins -> A • Waste in Noc Noi Canal and Hattaya Market -> B • Improper waste collection -> A • Market clean up -> A • Odors from Pak Tho Canal -B • Leakage of odorous water from garbage collection vehicles -> C 	<ul style="list-style-type: none"> • Odors due to blockage of drainage pipe -> B • Improper waste collection -> A • Waste water and solid waste in Nok Noi Canal -> B • Waste water and solid waste in Pak Thoi Canal -> B 	<ul style="list-style-type: none"> • Waste water in Sawang Chan Canal from rice field (out of Tessaban) -> B • Mosquito breeding in vacant private land -> C • Disturb beautification by non-used TEL line ->C • Dropping bird scat -> B
Spill-over effect of problems onto other areas	<ul style="list-style-type: none"> • Those issues may be common in Pak Tho as well as other areas except for the issues related to livestock 	<ul style="list-style-type: none"> • Those issues may be common in Pak Tho as well as other areas except for the issues related to livestock 	<ul style="list-style-type: none"> • Those issues may be common in Pak Tho. 	<ul style="list-style-type: none"> • Those issues may be common in Pak Tho. 	<ul style="list-style-type: none"> • Those issues may be common in Pak Tho.

Evaluation Criteria	Dao Loy (Village 5)	Don Muang (Village 8)	Talad Pak Tho (Village 1)	Nok Noi (Village7)	Rim Khlong (Village3)
Community Willingness (Volunteer Sprit)	<ul style="list-style-type: none"> Participants in the meeting expressed willingness. 	<ul style="list-style-type: none"> Participants in the meeting expressed willingness. 	<ul style="list-style-type: none"> Participants in the meeting expressed willingness. Also they pay close attention to actual work/processes. They willingly participated in the meeting. 	<ul style="list-style-type: none"> Participants in the meeting expressed willingness. Also they pay close attention to actual work/processes. They willingly participated in the meeting. 	<ul style="list-style-type: none"> Participants in the meeting expressed willingness.
Presence of existing community group	<ul style="list-style-type: none"> Environmental volunteer and housewife group 	<ul style="list-style-type: none"> Community welfare fund, environmental volunteer, elderly group, public health volunteer group 	<ul style="list-style-type: none"> Environmental volunteer, housewife group, cultural group, labor volunteer, Muban funding group, joint environmental group with Talad Pak Tho and Rim Khlong community 	<ul style="list-style-type: none"> Environmental volunteer, housewife group, public health volunteer, joint environmental group with Talad Pak Tho and Rim Khlong community 	<ul style="list-style-type: none"> Environmental volunteer, housewife group, public health volunteer, joint environmental group with Talad Pak Tho and Rim Khlong community
Overall Evaluation	+	+	+++	+++	++

Legend:
 +++: high advantage
 ++ : medium advantage
 + : low advantage

Waste Water

- Most community people discharge toilet waste water (black water) through cesspools or septic tanks, while 26.5% of Talad Pak Tho directly discharges.
- 90% of kitchen waste water (gray water) is directly discharged to public drainage without treatment.
- 60% of community people reuse kitchen waste water for gardening.
- More than 90% of community people think Nok Noi and Pak Tho canals are polluted. The greatest cause is from the dumping of solid waste followed by the inflow of untreated waste water and stagnated water flow.
- If the canal water is cleaned up, respondents would like to use the water for some traditional ceremonies and for gardening or firefighting.

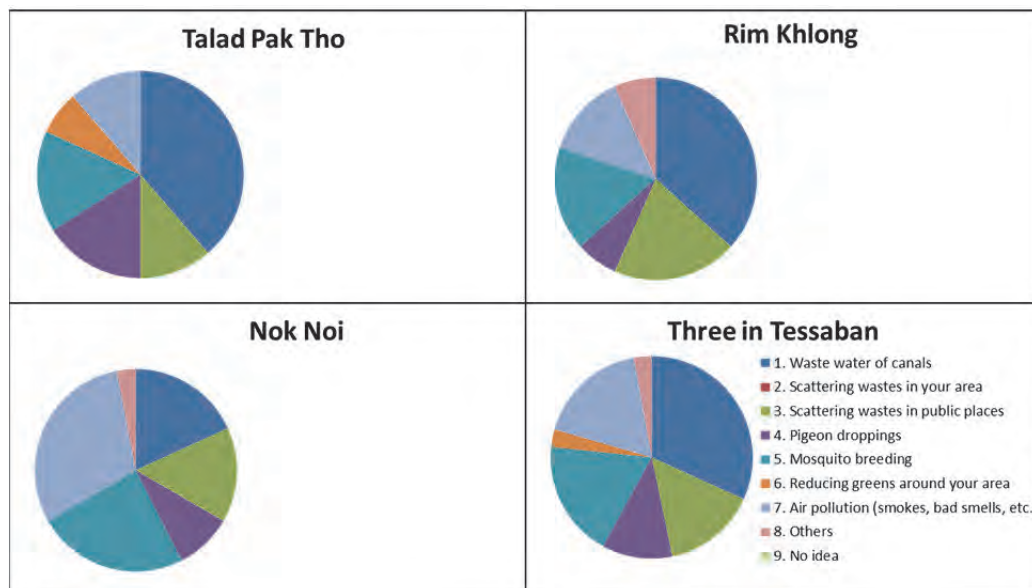


Source: JET

Figure 5-13 Uses of canal water, Pilot Project 2

Community Awareness

- Solid waste was the first image that people had come to mind when thinking of an “Environmental problem” followed by “waste water”.
- Environmental problems in their daily life are mostly caused by waste water in the canals, mosquito breeding and air pollution, respectively.
- Most eco-friendly activities which are undertaken in people’s daily lives are to segregate and recycle wastes and to save electricity.
- Half of the community people think “training of certain eco-activities” is the most necessary form of raising public awareness, followed by creating a “knowledge center”.



Source: JET

Figure 5-14 Common environmental problems in the communities

Waste Amount Survey

The following conclusions were highlighted through the waste amount survey:

- Plastic bottles (23%) is the most recycled waste, it accounted for 23% of total household waste, following by paper (15%) and glass bottles (8%).
- Average household wastes generated were roughly estimated⁴:
 - Talad Pak Tho is 11 L/day/HH.
 - Rim Khlong is 11 L/day/HH.
 - Nok Noi is 18 L/day/HH

Water Quality Survey

The results of the water quality survey are outlined in Figure 5-8 Based on this, the following can be concluded:

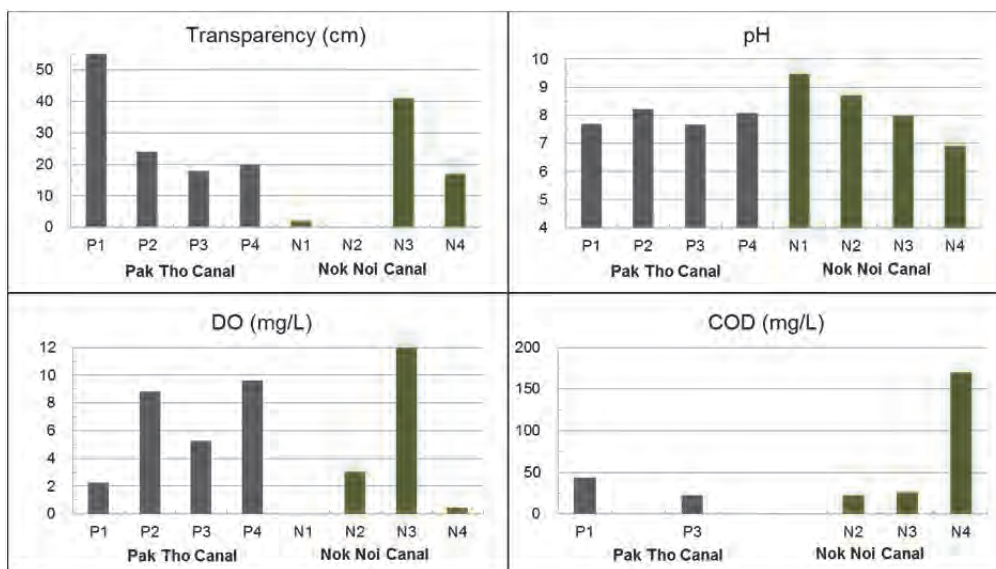
Pak Tho Canal

- Location Point 1 (near temple) showed high transparency, while DO was relatively low.
- Pak Tho canal has very high ammonia, nitrate, and phosphate, especially at location point 3 (near market) and location point 1.

⁴ Volume of one plastic bag is equivalent to approximately 8L

Nok Noi Canal

- N4 (outlet) showed high concentration of COD and ammonia, and low concentration of DO. Water smelled of hydrogen sulfide.
- N1 (water colored green by algae) showed extremely low concentration of DO



Source: JET

Figure 5-15 Results of Water Quality Survey



Working Group during water quality sampling, Pak Tho canal, February 05, 2015

(3) Major Project Activities and Outputs

The preparation and implementation of the community-based environmental management plan (CEM-Plan) was developed through the procedure described in Figure 5-16.

(CEM-Plan) was developed through the procedure described in Figure 5-16.

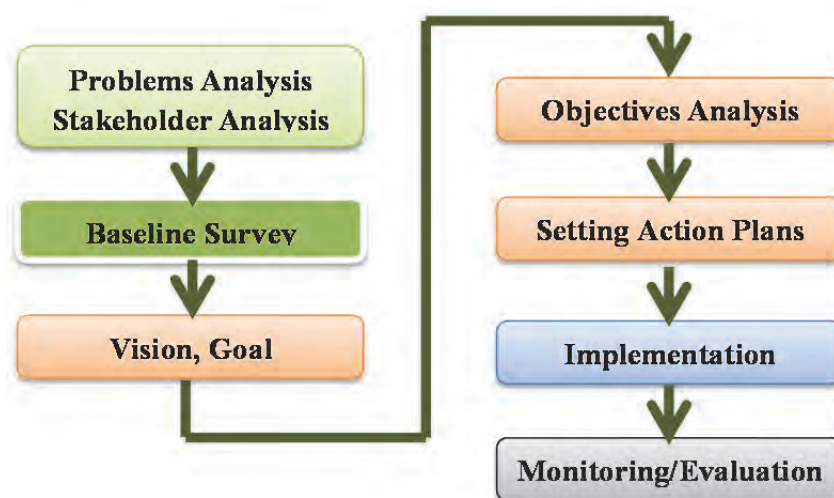


Figure 5-16 Procedure of developing CEM-Plan

Planning Community-based Environmental Management Plan

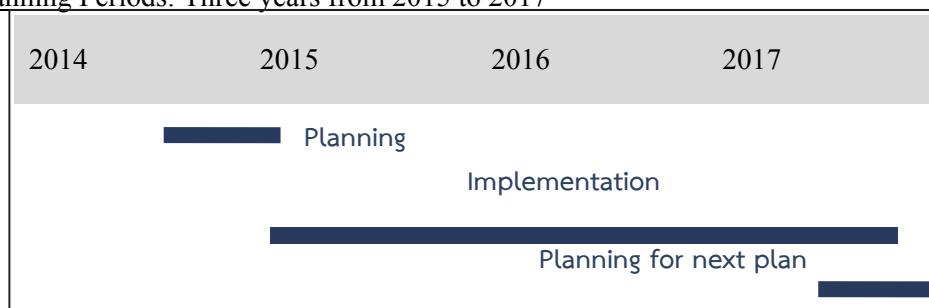
The formulation of the CEM Plan was conducted through participatory process and activities under the planning phase are listed in Table 5-29.

Table 5-29 Activities under Planning Phases

	Activities	Date	Purposes
1	First Task Force Team kick-off meeting	December 25, 2014.	- Kick-off meeting
2	First training/workshop	December 26 – 27, 2014	- Explanation of pilot project 2 - Technical training
3	Second Task Force Team meeting	January 30, 2015	- Further scheduling - Guidance on baseline survey and planning
4	Second training/workshop	January 30 - 31, 2015	- Training and formulation of baseline survey
5	Baseline survey	February 2 – 10, 2015	- Baseline survey
6	Planning Workshop		- Confirmation of results of baseline survey - Planning CEM

The Community-based Environmental Management Plan (CEM Plan) was developed through participatory planning in the planning workshop (held on February 21 and 27, 2015). The brief overview of the CEM Action Plan is summarized as below:

Planning Periods: Three years from 2015 to 2017



Vision:

Talad Pak Tho	Clean Water for Talad Pak Tho Community Pak Tho – Zero Waste Area -
Rim Klong	Clean and Useable Water for Us
Nok Noi	Beautiful and Clean Canal by Ourselves

Goal:

Talad Pak Tho	- Canal water conditions are improved. - Waste from community is reduced.
Rim Klong	- Canal water conditions are improved. - Community-based water treatment are introduced
Nok Noi	- Community actions for improvement of canal are started. - Canal water conditions are improved.

Action Plans:

Talad Pak Tho	Priority Activities ⁵ (1) Clean-up Canals – Removal of Waste and soil from canals - (2) Installation of community waste water pre-treatment systems Others - Waste recycle bank (Plant bank, EM bank) - Training Seminar/Workshop on “Waste recycling” and “Waste water treatment” - Slogan Contest - Public Board Installation
Rim Klong	Priority Activities (1) Public Education (training) on production and use of EM (2) Clean water campaign by bio-treatment Others - Digging the canal - Installation of waste water pre-treatment system
Nok Noi	Priority Activities (1) Public education (training) on recycling (2) Environmental conservation campaign (Exhibition) - Drawing contest - Establish water monitoring - Warning/announcement

⁵ Priority activities were taken as trial activity under the Output 2

Implementation of Pilot Activities

Based on the CEM Action Plan developed by the Community Working Groups, the following pilot activities were formulated:

Table 5-30 List of Pilot Activities

Action Plan	Date	Contents
1. Canal Clean up	29 March, 2 April 24 June	Cleaning Pak Tho canal
2. Water Quality Monitoring	29 April 7 June	Check the water quality of Pak Tho canal and Nok Noi canal
3. Public board installation	May-July	Public boards were made by community people Installed in nine places in the Tessaban area
4. Slogan and Drawing contest	27 July	It was held at Wat Pak Tho school, and students from Wat Pak Tho, Anuban Pak Tho, as well as the community people joined.
5. Public Seminar	10 August	Seminar on EM and waste recycle at Wat Pak Tho School.
6. Waste Composition survey	4,5,6 September	This is part of Output 2, Public Awareness Activity leading by Tessaban. Selecting Rim Klong Community, and survey waste composition for three days.
7. Community Waste water Pre-Treatment Tank	August – December	Community people made and installed a waste water treatment system in HHs.
8. Public Education on Recycle	6 November	Teachers of Wat Pak Tho school were facilitators and students and community people made gifts from waste such as plastic bottles, milk boxes, etc.,
9. Public Education on EM	20 November	Wat Pak Tho and Anuban Pak Tho school students make EM ball and throw it to the pond.
10. Waste Recycle Bank	27 November	Training for opening a waste recycle bank at Wat Pak Tho School involving Anuban Pak Tho school students.

Although the pilot activities were formulated by each Working Group, most of the activities were conducted through the cooperation among the three communities because they have had close communication and all environmental issues were raised in all communities.

a) Canal Clean-up

The canal clean-up activity was organized by the Palad Pak Tho working group (WG) and Rim Klong in cooperation with Nok Noi communities. The main players were the community member, while SDM as well as JET supported them in terms of equipment preparation, announcement, coordination with relevant local authorities, etc.

It was over two days, March 29, 2015 and April 2, 2015, and the number of participants was 25 people and 36 people respectively.

The second day of the canal cleaning activity was scheduled on the Thai Princess's Birthday. After the first day WG members found it necessary to make an announcement before the second event. Tessaban cooperated by making an announcement to the public by local radio and speakers, and the WG leaders also announced it by hand speaker. The number of participants on the second day slightly increased.



Before cleaning-up (March 29)



After cleaning-up (March 29)

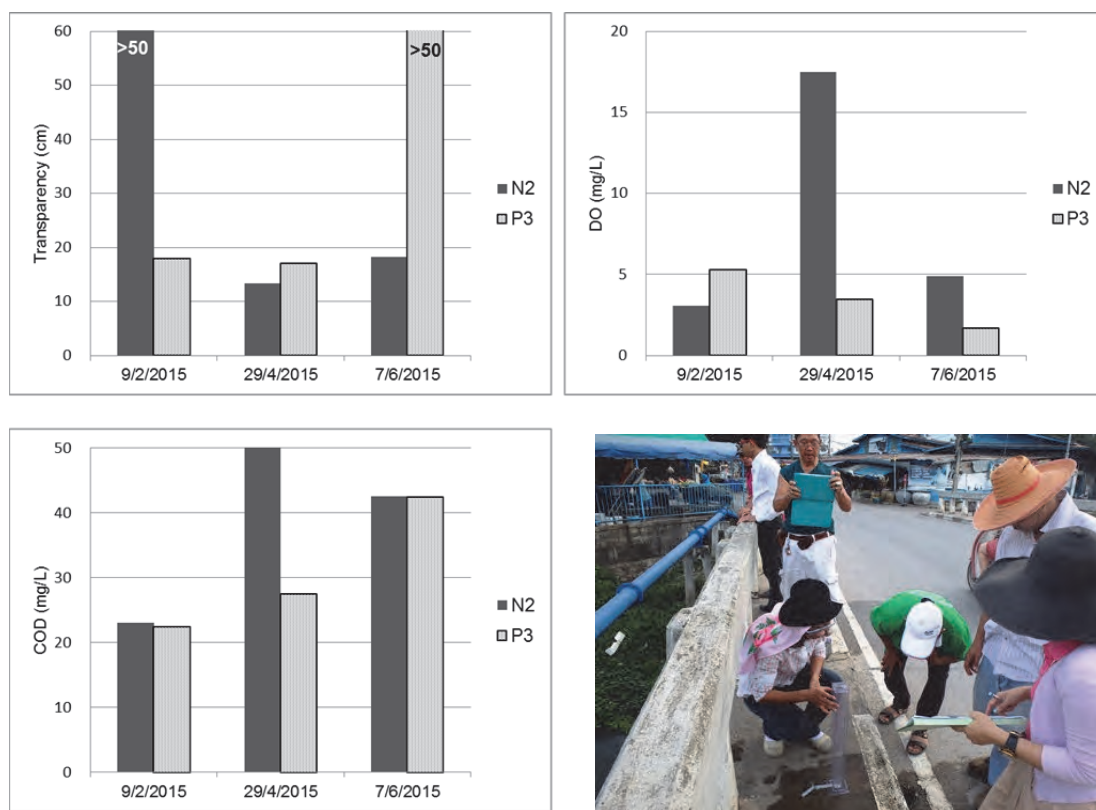


Kids enjoy swimming

b) Water Quality Monitoring

Water quality monitoring was undertaken based on the results of the baseline survey conducted in February, 2015. Two representative locations (Pak Tho and Nok Noi Canals) were selected for regular monitoring. The monitoring activity has been organized by the Nok Noi WG, while members of other WGs also dispatched participants to observe.

The results of the water quality monitoring are shown in Figure 5-17. As shown in the results, the transparency in Pak Tho Canal seems to be getting better, probably due to the increase of the amount of inflow starting in the rainy season. However, the results of COD did not indicate any quality improvement of water.



Source: JET

Figure 5-17 Results of Water Quality Monitoring

c) Public Board Installation

The installation of public boards was conducted as a result of the lessons learned from the canal clean-up activity. It aimed to be utilized for the announcement and dissemination of activities and other related information such as slogan/drawing contests, public seminars, among others.

The WG members, in cooperation with SDM Pak Tho, organized a survey team to select appropriate locations of the public boards in terms of accessibility, appropriateness and effectiveness and then eight locations were selected as indicated in Figure 5-18



Figure 5-18 Location of Public Boards

d) Slogan and Drawing Contests

Slogan and Drawing contests were conducted in July 27, 2015 in order to raise awareness on environmental conservation in Pak Tho.

The application of entry for slogan contest was announced to the public on July 25, 2015. A total of 180 slogans were received by the Evaluation Team, which is composed of five members representing SDM, PONRE Ratchaburi and REO8. The criteria for evaluation consists of the following points: the meaning and message it conveys, harmonization and presentation. Table 5-31 shows the results.

Table 5-31 Winners of the Slogans Contest

Adult	Canal will be beautiful, water will be clean, if everybody concern, not discard waste, not destroy water resource safe beauty for our Pak Tho Canal
Primary Grade 1-2	Pak Tho Canal looks attractive, house looks livable because of no waste
(Primary Grade 3-4	Canal is beautiful, town is lively because of Pak Tho community concern
Primary Grade 5-6	Pak Tho is livable, canal is clean, everybody should care and not discarding into canal
Junior high 1-3	Pak Tho is clean because our unity Canal is beautiful because of our helps

As to the drawing contests, there were 115 entries received and the winners were evaluated based on certain criteria namely: beauty, meaning of the drawing, composition and color combination. Figure 5-19 shows the winners of the drawing contest.

รางวัลชนะเลิศ

อันดับที่ 1



ต.ญ. วรวิญญู คนจำ, ระดับอนุบาล 1-2



ต.ญ. เกวลิณ คำข้า, ระดับประถมศึกษา 3-4



ต.ญ. วนิตา จิตาเรืองรอง, ระดับประถมศึกษา 1-2



ต.ญ. กุลธิดา คงกะพันธ์, ระดับมัธยมศึกษา 1-3



ต.ญ. นิภาพร เดชเกิด, ระดับประถมศึกษา 5-6

Figure 5-19 Results of the Drawing Contest, Pilot Project 2



Drawing contest activity held at Wad Pak Tho School

e) Public Seminar

A public seminar was held on August 10, 2015 at Wad Pak Tho School aimed to raise the public awareness of the community and school children; promote the 3R to the community and school children and give experience on EM and waste recycling to the children. A total of 83 people consisting of the Pak Tho community (15); Wad Pak Tho School (29) and Anuban Pak Tho School (39 of which 24 were from Junior High).



Demonstration on making EM by WG leaders



Demonstration on product of waste recycle

f) Waste Composition survey

A waste composition survey was conducted in the area of Rim Klong Community; the number of households to be surveyed counted for approximately 100 HHs. The survey was handled by Tessaban and Rim Klong Community WG in coordination with PONRE Ratchaburi and JET.

As indicated in the results (Figure 5-20), kitchen waste had high contribution of 68%. Based on this result, it was decided to research the possibility of making compost by using kitchen waste.

this result, it was decided to research the possibility of making compost by using kitchen waste.

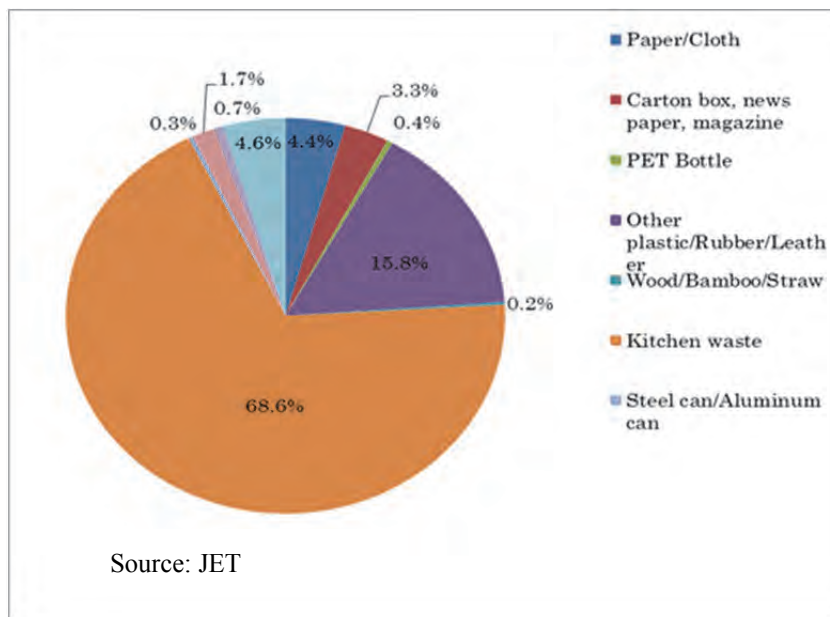


Figure 5-20 Types of Garbage Generated, Pilot Project 2

g) Community Waste Water Pre-Treatment Tank

The system installation is conducted to improve household waste water quality before discharging it into the Pak Tho Canal. For this activity, a total of 24 pilot houses are targeted to be the beneficiaries of the community waste water pre-treatment system.

There were two types of pre-treatment tanks designed, because many houses wash dishes without using a sink, so that type B is attached to the washing area on a tank.

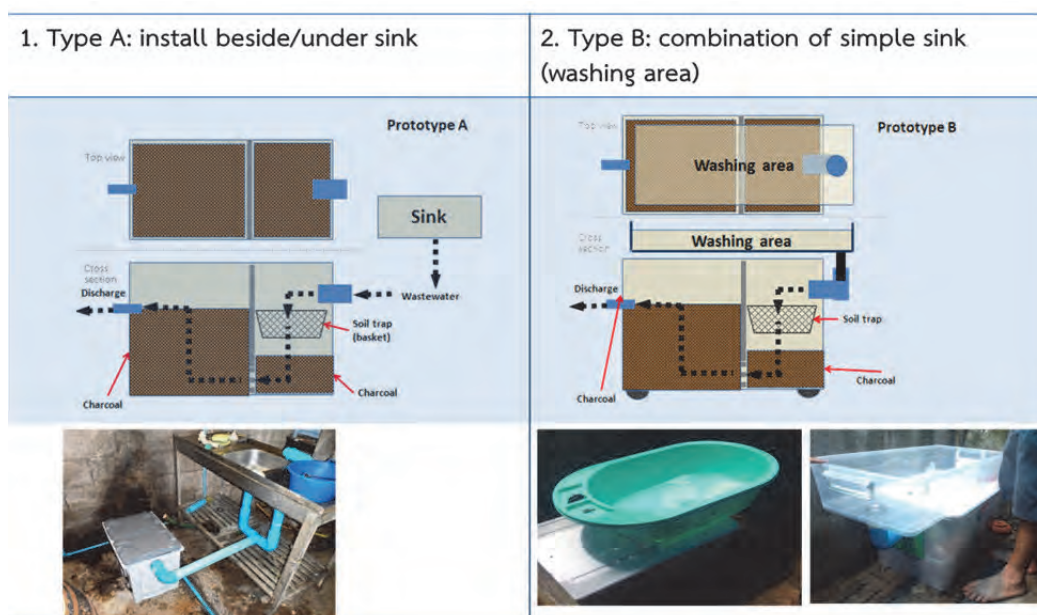


Figure 5-21 Types of Pre-treatment Tank

The waste water pre-treatment systems have been installed in cooperation with the WG and SDM Pak Tho. Monitoring on the usability of the waste water pre-treatment system installed in the houses was conducted to check and improve the systems.



Process of Assembling



Installation (L: Type A, R: Type B)

In addition, the following two documents were built as a part of the activity:

- Brochure on the Installation of Community-based Waste Water Pre-treatment System (Household type)”
- Installation and Operation Manual for Community-based Waste Water Pre-treatment Tank

h) Public Education on Recycling Waste

As a second event related to recycling waste, public education was conducted on November 6, 2015 for the following purposes:

- Expand and share knowledge of making goods from recycle waste.
- Raise public awareness in school children and the community on valuable goods from recycle waste.

The total number of participants counted for 81 people, including school children; 29 from Wat Pak Tho School, and 34 from Anuban Pak Tho School.

Based on the experiences of previous events, children enjoyed making products by recycled waste such as piggy banks, pencil sharpeners, and baskets.



Pencil sharpener activity with students



Basket making out of milk boxes

i) Public Education on EM

As a second event related to bio-treatment by EM balls, public education was conducted on November 6, 2015 for the following purposes:

- Raise public awareness in school children and the community on biological treatment
- Improve water quality in canals and water bodies

The total number of participants counted for 82 people including school children, 30 from Wat Pak Tho School, 38 from Anuban Pak Tho School. After making EM balls, children threw the ball in the municipal lake in Dao Loy.



School children working



Applying EM Ball to municipal lake

j) Waste Recycle Bank

The seminar on the establishment of a recycle bank was taken on November 27 2015 at Wad Pak Tho School for the following purposes:

- Raise Public Awareness on the value of waste recycling
- Reduce the amount of the waste from schools and community areas
- Strengthening discipline on saving behavior for school children and the community

The total number of participants counted for 94 people including school children, 39 from Wat Pak Tho School, 36 from Anuban Pak Tho School.

The bank has been established in Wad Pak Tho School. Two students have been appointed as bank presidents and a teacher handles money in charge of selling recycled materials. A brief explanation of the process of recycle banks is explained as below:

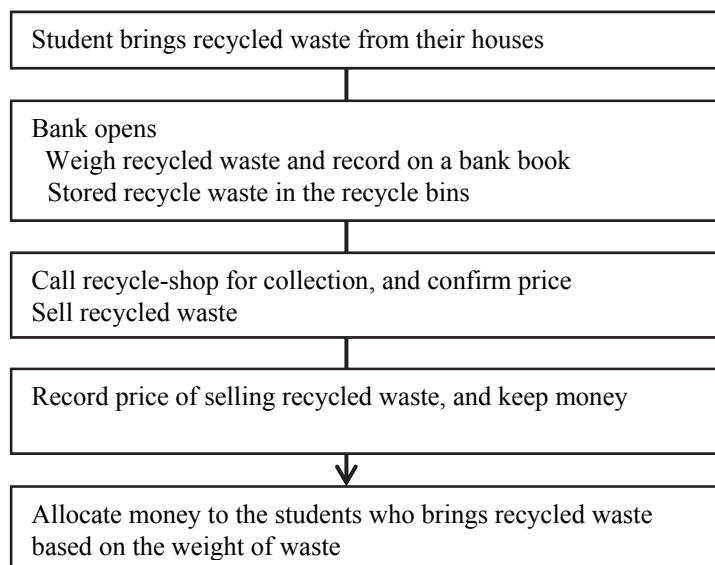


Figure 5-22 Procedure of Operation of Recycle Bank



Opening Recycle Bank held at Wad Pak School, November 27, 2015

5.3.4 Monitoring and Evaluation by Pilot Project

As part of the framework in implementing the pilot projects, each pilot project conducted an evaluation of each activity. Highlights of the evaluation results are described below:

1) Pilot Project 1

The PP 1 designed M&E using the PDCA cycle as indicated Figure 5-23 below. Table 5-32 shows evaluation by tasks.

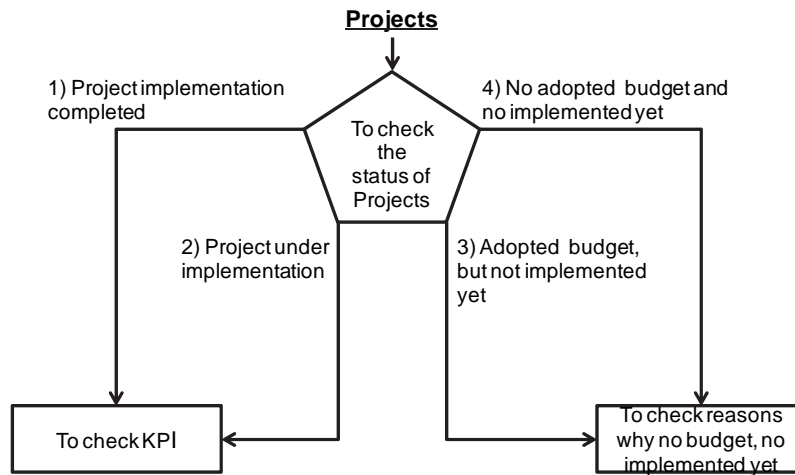


Figure 5-23 Monitoring and Evaluation Design, Pilot Project 1

Table 5-32 Evaluation of Pilot Project by Task

	Phase	Task	Activities	Score - 2 - + 2	Comments
April 21	Phase 1		Preparation of Pilot Project-1		
		Task 1-1	Preparation of Implementation Plan	+2	
		Task 1-2	Establishment of Implementation Mechanism	+2	
		Task 1-3	Establishment of Task Force Team	+2	<ul style="list-style-type: none"> No officer from Tha Lange SDM join TFT meeting
		Task 1-4	Training for Task Force Team	+1	<ul style="list-style-type: none"> Some TFT member could not attend all section/class.
April 21	Phase 2		Formulation of Municipal SWM Action Plan		
		Task 2-0	Preparation of Survey	-1	<ul style="list-style-type: none"> Daily target and daily operation of survey did not plan well.
		Task 2-1	SWM Surveys	+1	<ul style="list-style-type: none"> Vehicle used during survey is not appropriate for SWM survey. There is no announcement to Tha Yang people in advance about SWM survey. So, sometime people did not understand and did not cooperate well. Timing and equipment management during survey is not appropriate There is a small problem regarding communication between surveyor and expert
		Task 2-2	Design of Planning Workshop	+2	
		Task 2-3	Series of Planning Workshop	0	<ul style="list-style-type: none"> It is better to invite more participants from the community, i.e. community leader. Some participants did not attend all series of workshops. Therefore, the continuity is not so well.
		Task 2-4	Formulation of Draft Action Plan	+2	<ul style="list-style-type: none"> Time management during meeting should be more appropriate Draft action plan should deliver to TFT in advance.
July 21	Phase 2		Formulation of Municipal SWM Action Plan		
		Task 2-5	Explanation of Action Plan	+2	<ul style="list-style-type: none"> Other channels should be used for promoting the action plan such as the Tessaban website The presentation of the action plan on June 5th did not cover all the details of the action plan content because of time limitation. On a public hearing on June 5th, the private sector which is one of target groups in the action plan was not invited.
		Task 2-6	Finalization of Action Plan		

	Phase	Task	Activities	Score - 2 - + 2	Comments
		Task 2-7	Authorization of Action Plan	-	<ul style="list-style-type: none"> The action plan will be incorporated in the Tessaban development plan. Therefore, it is not necessary to authorize the action plan.
July 21	Phase 3		Implementation of Action Plan		
		Task 3-1	Implementation of Action Plan	0	<ul style="list-style-type: none"> At this moment, the implementation of the action plan is under the preparation stage. As of now, the preparation of the action plan implementation are 1) D/S improvement and life span expansion plan 2) selection of pilot community and pilot school. TFT should discuss and analyze the potential and needs of a pilot school and community in order to create appropriate activities.
		Task 3-2	Monitoring and Evaluation	0	<ul style="list-style-type: none"> In order to evaluate the achievement of the pilot project, the schedule of each activity should be set up and then a pattern and date of evaluation will be specified. Action plan activities should be evaluated every three months.
Oct 9	Phase 3		Implementation of Action Plan		
		Task 3-1	Implementation of Action Plan	+2	<ul style="list-style-type: none"> Many projects completed during 2015 fiscal year
		Task 3-1	Monitoring and Evaluation	+2	<ul style="list-style-type: none"> Timing, process, documents and place is appropriate.

2) Pilot Project 2

The monitoring and evaluation on each pilot activity which were conducted through the above mechanism is as follows:

1. Canal clean-up

- Prior announcement to communities is important. It is effective to bring the activity to their attention even during implementation. Invitation letters to schools shall be facilitated to encourage joining.
- Coordination among communities, leaders, and SDM is important.
- Concrete procedures shall be made before implementation otherwise it is at risk to stagnate the schedule.

- A survey and check shall be previously taken to identify cause of the pollution, the location,
- The results of the activities shall properly disseminated through public boards, e.g.
- Coordination among related government organizations is important to the effectiveness of the project implementation.

2. Public board

- Planning of the implementation process should concretely be facilitated before implementation, e.g. survey team formulation, board making team formulation and budget estimation.
- A site survey for installation is important for project implementation to decide location, measure areas for appropriate boards, prior asking for permission and checking whether the suitability of a location to the target group or not.
- Announcement after board installation for attraction is a necessary activity to promote the feedback of the project implementation, such as an announcement via local communication tower about the location and content of the boards.
- Other activities to promote the feedback of the project implementation is, for example, EM distribution at the boards, using cartoon as media, putting good people pictures on the boards, guessing those people's name in the picture and providing awards.
- Monitoring and evaluation after the board installation activity should include assessment on location of the installation on whether it could get more attention or is need of changing location.

3. Slogan/Drawing Contest

- It is much better to use the products for further dissemination (poster, calendar, e.g.).⁶
- It was suggested that the contest criteria for slogans should be more specific and clear, that can easily understood and can also easily catch peoples' attention. Also it was suggested to consider gender.
- Students who participated have been already encouraged about environmental matters, but their actual activity has been less compared to their motivation. Hence, activities should be continuously undertaken.

⁶ Finally, calendars were produced from the slogans and drawings.

4. Public seminar (1st event on recycling waste and EM)

- Keeping children’s interest in lectures should be considered. Therefore, not only explanation and/or showing products, but also involving a demonstration is important.⁷
- It was suggested to hold a seminar with separate (single) topics to avoid confusing participants and giving sufficient time. In addition, it was suggested that dividing into small groups in order to effectively keep the participants interested.
- Also it was suggested to arrange using a learning station for each topic for students to participate more and attract the interest of the students.
- Arranging lecture sessions for suggested topics using learning stations for demonstration. The number of students in one group should not be more than 10-15 people to cover all students.
- The capacity of EM and EM balls as used in cleaning the canal from water hyacinth may be less effective so it was recommended to continuously use of EM so that its effectiveness can be maximized.

5.3.5 Overall Achievement of Output 3

Given the activities of Output 3, the indicators set for this Output have been achieved as indicated in the achievement level contained in Table 5-33 below:

Table 5-33 Overall Achievement of Output 3 Indicators

Indicators	Achievement Levels
Indicator 3.1 Recommendations and lessons learned of pilot projects are known to LAs and the Public	<ul style="list-style-type: none"> – Advisory Team has sorted out lessons learned and recommendations through their monitoring and evaluation activities of the pilot projects – Lessons learned and recommendations were also made public and shared to LAs and some of the other REOs at the National Seminar held in January 2016. – The Project prepared Pilot Project Report containing the process of pilot project including its implementation, monitoring and evaluation and expected to be shared through REO8 and ONEP.
Indicator 3.2 Ways to access budgetary resources are known to LAs.	<ul style="list-style-type: none"> – The Project reviewed available sources of funding from Thai government including the Environmental Fund at ONEP, Decentralization Fund from the Ministry of Interior and Special fund from the Office of the Permanent Secretary. The review also examined the requirement and the process of application. Based on the review the Project make recommendation to counterpart organizations. – LA seminar on project proposal to access financial sources from Thai governmental organizations were held, inviting counterpart organization including PP1 (Tha Yang SDM) & PP2 (Pak Tho SDM)

⁷ As a second education event, seminars on recycling waste and EM was separately conducted with more concentration on active involvement.

	<ul style="list-style-type: none">- Both PP1 (Tha Yang) and PP2(Pak Tho) have decided to allocate budget for the projects through regular budget- PP1 (Tha Yang SDM) submitted application for support in the grass-root grant fund from the Embassy of Japan.
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6. Achievement by Project Purpose

6.1 Achievement of Project Purpose

The Project Purpose, as indicated in the PDM 2 is outline in Table 6-1. The achievement of the Project Purpose was determined by the performance of the REO8 and PONRE in improving environmental management in their respective areas.

Table 6-1 Outline of the Project Purpose

Project Purpose	Capacity of REO8 and five PONREs on environmental management particularly in planning, implementation, monitoring/evaluation of Regional EQMP is developed through the process of REO8 Regional EQMP and pilot project implementation.
Indicators	<p>1.1 Through implementing pilot projects, problems at the project site are improved.</p> <p>1.2 Process of planning of R&P EQMP are clarified and minutes of discussion during the planning process are developed.</p> <p>1.3 Progress and results of Regional EQMP of REO8 and Provincial EQMP are published to the Public.</p> <p>1.4 Quality of technical services which REO8 and PONREs provided to LAs and the public are improved, such as water quality improvement or solid waste management.</p>

Based on the results of the capacity assessment conducted in November 2015, the impact of the project showed a very positive improvement in the overall capacity and competency levels of the REO8, 5 PONREs and LAs (see Volume 2 for the CA Report). Results revealed that the Project positively contributed to the overall capacity development of the counterpart agencies and such contributions are demonstrated by the following:

1) Improved Organizational Performance

- Increase activities initiated with LAs and communities

Feedback from the respondents showed that the experiences gained from their involvement in the Project motivated them to initiate more activities with LAs and communities in areas related to solid waste management, community-based environmental management. In addition, budget allocated for special activities and projects in most PONRE and in REO8 increased since 2013.

- Improved quality of services provided to stakeholders

Based on comments received, quality of services provided to PONRE and LAs by REO8 were improved in areas related to solid waste management and water quality. Coordination has also improved in terms of planning and responding to environmental problems in the community as well as ease in accessing data and information about environmental condition in the region. At the 5 PONREs and LAs levels improved quality of services in areas related to organizing public awareness and public education, encouraging public participation in environmental activities also revealed.

2) Increased Individual Competencies

- Enhanced skills in conducting workshops, meetings, raising public participation in environmental management, critical thinking, among others.

The on-the-job training introduced by the Project provided the opportunity to practice the skills in planning, organizing workshops and meetings, among others. During the project period, the counterpart staff necessitate to act as facilitators and resource speakers during project activities. Such kind of exposure led them to develop skills in facilitation and organizing meetings and consultations and thereby gaining their self-confidence.

- Enhanced skills in planning, monitoring and evaluation

The planning workshops conducted at the beginning of the project period led to enhance skills in project cycle management and have resulting in the development of critical thinking in analyzing problems and establishing measures to solve them. The tools developed during the planning workshops (SWOT analysis, PCM, Stakeholder analysis and problem analysis) have enriched understanding of methods and ways to analyze problems and identify measures and strategies.

- Attitude adjustment and progressive way of thinking

According to the respondents' feedback, the trainings in Japan have resulted in the positive change of attitudes and way of thinking about the role of community and its participation, care for environment and in responding environmental problems and issues. Also, the exposure gained in Japan provided the opportunity to see the situation in Thailand and examine areas where improvement can be done from the point of view of Japan experience.

- Enhanced the motivation to work

Most of the respondents expressed that their participation and involvement to the Project and attendance to the trainings and seminars as well as working with International Experts have enhanced their motivation to work and inspired to improve their performance and organizational contribution in environmental management.

Given the overall impact, it can be said that the Project Purpose of strengthening the capacities of REO8 jurisdiction have been achieved.

6.2 Achievement of Project Purpose Indicators

The achievement level based on the indicators are discussed in succeeding sections:

Indicator 1.1

Through implementing pilot projects, problems at the project site are improved.

The Project selected two environmental issues namely solid waste management and community-based environmental management implemented as a pilot case in Tha Yang and Pak Tho SDMs. As indicated in the previous sections, the project achieved most of the indicators in each pilot projects, hence it can be said that this indicator under the Project Purpose is achieved. The progress of positive improvements as indicated, despite the fact that the pilot projects were only implemented for less than a year. Some indication that condition in the pilot project sites have improved are established based on the achievement levels of Output 3. Notable improvement of conditions at the pilot project sites include the following:

(1) General improvement

- Roles of the community in responding to environmental problems were recognized and strengthened by the active participation in the activities not only of the project but also in the environment related activities of LA and PONREs
- Enhanced awareness and involvement of local people in responding to community issues have been promoted and empowered to solve respective environmental issues in the areas;
- Linkages between and among REO8, PONRE, LA and community have been enhanced and a renewed commitment to work together have been fostered.

(2) PP-1 in Tha Yang SDM

- Participation of community members in waste management increased;
- PA activities at schools and the community inspired the community members and thus, promoted their active participation in environmental management;
- Tha Yang SDM implemented some of the proposal of the project in the improvement of the disposal site.
- Budget allocation of solid waste management in the SDM have increased by 10% from 2014, of which increased are allocated to waste segregation efforts.

(3) PP-2 in Pak Tho SDM

- Proactive participation of community members to advance further improvement of environmental issues.
- Water quality in at least 3 canals have improved tremendously since the project activities started in 2014.
- Community members have become motivated and started cleaning the canal on their own initiatives;

Indicator 1.2
Process of planning of R&P EQMP are clarified and minutes of discussion during the planning process are developed.

As per Implementation Plan of Phase 2, the concerns of the Provincial EQMP has been reconsidered because the Provincial EQMP was already developed at each five PONREs before the finalization of the R-EQMP. Hence, under this indicator, only the Regional EQMP planning process was clarified and established by the Project.

The planning process and well as the minutes of discussions were developed and compiled into a technical planning manual for Regional EQMP (see Table 6-2). To make the manual comprehensive and self-contained, information pertaining to data generation and data analysis, preparing environmental profile, conducting spatial zoning, process in conducting participatory workshop, writing the R-EQMP, set of tools in monitoring and evaluation, among others, have been included to the main text. The Manual also provide recommended approaches and formats that are to be adapted to fit the circumstances of REOs in given time.

In line with this, the Planning Manual for Regional EQMP was published and distributed not only to REO8 and PONREs but also to other 15 REOs. It was expected that ONEP will develop a mechanisms so that the planning manual can be adopted and widely utilized by REOs led by REO8.

Table 6-2 Contents of Regional EQMP Manual

<ul style="list-style-type: none"> 1. Introduction 1.1 Background 1.2 Objectives of this Manual 1.3 Expected Users of this Manual 1.4 Structure of this Manual 	<ul style="list-style-type: none"> 2. Scope and Planning Process of Regional EQMMP 2.1 Hierarchy of Regional EQMP (or Status of R-EQMP) 2.2 Scope of R-EQMP 2.3 Planning Methods 2.4 Planning Process
<ul style="list-style-type: none"> 3. Environmental Information and Their Processing 3.1 Necessary Data Collection and Data Processing 3.1.1 Necessary Data and Information 3.1.2 Data Security and Management 3.2 Preparation of Environmental Profile 3.2.1 Structure of Environmental Profile 3.2.2 Points in the Existing Environmental Conditions 3.3.3 Methodology 3.3 Environmental Sensitive Zoning as Spatial Environmental Management Framework 3.3.1 Designated Environmentally Sensitive Zones 3.3.2 Concept of Environmentally Sensitive Zoning 3.3.3 Methodology of Environmentally Sensitive Zoning 	<ul style="list-style-type: none"> 4. Participatory Planning Workshop 4.1 Introduction 4.2 Preparation Work 4.3 Management of Workshop 4.3.1 How to conduct Participatory Workshop 4.3.2 Process for Planning Workshop 4.4 Stakeholder Analysis 4.4.1 Points of Stakeholder Analysis 4.4.2 Methods for Stakeholder Analysis 4.4.3 Outcomes from Stakeholder Analysis 4.5 Problems Analysis 4.5.1 Points of Problem Analysis 4.5.2 Methods for Problem Analysis 4.5.3 Outcomes from Problem Analysis 4.6 SWOT Analysis 4.6.1 Points of SWOT Analysis

<p>3.3.4 Example of Environmentally Sensitive Zoning Maps Preparation (Case Study for Environmentally Sensitive Zoning of Regional EQMP 2013-2016)</p>	<p>4.6.2 Methods for SWOT Analysis 4.6.3 Outcomes from SWOT Analysis 4.7 Setting Vision and Planning Goals 4.7.1 Points of Setting Vision and Goals 4.7.2 Methods for Setting Vision and Goals 4.7.3 Outcomes from Setting Vision and Goals 4.8 Identification of Environmental Management Issues 4.8.1 Points of Identification of Environmental Management Issues 4.8.2 Methods for Identification of Environmental Management Issues 4.8.3 Outcomes from Identification of Environmental Management Issues 4.9 Formulation of Environmental Management Strategy 4.9.1 Points of Formulation of Environmental Management Strategy 4.9.2 Methods for Formulation of Environmental Management Strategy 4.9.3 Outcomes from Formulation of Environmental Management Strategy 4.10 Formulation of Environmental Management Measures 4.10.1 Points of Formulation of Environmental Management Measures 4.10.2 Methods for Formulation of Environmental Management Measures 4.10.3 Outcomes from Formulation of Environmental Management Measures 4.11 Identifications of Programs and Projects 4.11.1 Points of Identification of Programs and Projects 4.11.2 Methods for Identification of Programs and Projects 4.11.3 Outcomes from Identification of Programs and Projects 4.12 Follow-up After Workshop</p>
<p>5. Writing Regional EQMP 5.1 TOC of Regional EQMP 5.2 Contents of Regional EQMP 5.3 Points of Consideration in Writing Regional EQMP</p>	<p>6. Monitoring and Evaluation 6.1 What is Monitoring and Evaluation? 6.2 Monitoring and Evaluation System 6.3 Mechanism for Monitoring and Evaluation 6.3.1 Overall 6.3.2 Monitoring and Evaluation of Projects/Programs 6.3.3 Monitoring and Evaluation of Environmental Management Units</p>

Indicator 1.3
Progress and results of Regional EQMP of REO8 and Provincial EQMP are published to the public.

As mentioned in the previous sections, the Regional EQMP was completed in October 2014 and was published in January 2015. Considering this, and other factors influencing the implementation, monitoring and evaluation of the Regional EQMP, the achievement level of this indicator is not so high. In order to supplement the level of achievement of this indicator, the Project conducted a review of the status of Regional EQMP utilization at PONRE level. Shown in Table 6-3 are the results of such review.

Table 6-3 Status of R-EQM and Utilization

	Adoption of the Regional EQMP	Status of Utilization
Ratchaburi	○	<ul style="list-style-type: none"> • Reference document in the formulation of P-EQMP 2016-21
Samut Songkhram	○	<ul style="list-style-type: none"> • Reference document in the formulation of P-EQMP 2016-21 • Implemented some programs and projects
Kanchanaburi	○	<ul style="list-style-type: none"> • Reference document in the formulation of P-EQMP 2016-21
Phetchaburi	○	<ul style="list-style-type: none"> • Reference document in the formulation of P-EQMP 2016-21 • Implemented some programs and projects
Prachup Khiri Khan	○	<ul style="list-style-type: none"> • Reference document in the formulation of P-EQMP 2016-21 • Implemented some programs and projects

In addition, the Project also developed a monitoring and evaluation methods of the Regional EQMP that REO8 and other REOs can adopt in making sure that the Regional EQMP has achieved what it is hoping to achieved and publish the results to the public. Such monitoring and evaluation methodologies were included in the Planning Manual for Regional EQMP that the Project produced and published.

Indicator 1.4
Quality of technical services which REO8 and PONREs provided to LAs and the public are improved, such as water quality improvement or solid waste management.

The level of achievement of this indicator lies on the performance of REO8 and PONRE using the experience they had with the Project. As mentioned, the Project provided various trainings and seminars on water quality improvement and solid waste management held both in Japan and in Ratchaburi to enhance skills and knowledge in these issues. Aside from this, the Project also held various trainings at the pilot project level.

Moreover, the application of the skills and knowledge learned can be observed by the improved technical services and support provided by REO8 to PONRE and PONRE to LAs not only in

responding to water quality improvement and solid waste management issues but also in the overall activities related to the environmental management in REO8 jurisdiction. Hence, it is considered, that this indicator was achieved by the Project.

The results of CA conducted in November 2015 also revealed positive comments and opinions as to the application of the skills and knowledge acquired through the Project. Table 6-4 outline the application of the skills and knowledge learned. It is considered that with the enhanced skills and knowledge of REO8 and 5 PONREs, it has a spiral effect to LAs and the community in general being the end beneficiaries of the services extended by REO8 and PONREs.

Table 6-4 Application of Skills and Knowledge learned

Organization	Activities/Services done
PONRE Ratchaburi	<ul style="list-style-type: none"> - Educating staffs in the organization and working committees related to the operation of PONRE Ratchaburi on the issues i.e. solid waste management by participation from community , the formulation of Regional EQMP 2016-2021 - Conducting more activities with the community on the campaign activity for example the project of community model on waste management to zero by 3R concept - Using comics to produce poster or cutout used in the event and meets the concept of “Fun to Share” participation - Conducting the waste segregation within the organization - There are plans to apply the knowledge to carry out the activity, dissemination of the knowledge to raise awareness to the community
PONRE Samut Songkhram	<ul style="list-style-type: none"> - Adopting the concept of public participation and “Fun to share” to manage the environmental problem of province - The training activities to educate the public in terms of solid waste management and waste water management as a base to build participation of various sectors in taking care of the environment
PONRE Kanchanaburi	<ul style="list-style-type: none"> - Focusing on the existing projects and applies the learning from training to implement the projects i.e. educating the public by presenting the successful case of environmental management of Japan as a guideline for people to manage environment in their own community - The knowledge from training can be applied as a guideline for the solid waste management roadmap - Raising awareness on solid waste management to the public through the role of Speaker for LAs and convey the experiences of training in Japan to participants to know about the environmental operation of Japan - There is plan to improve environmental database to manage the environmental planning of Kanchanaburi
PONRE Phetchaburi	<ul style="list-style-type: none"> -Adopting the concept of public participation and “Fun to share” to manage the environmental problem of province - A plan to carry out the project of environmental management to promote tourism in the community level which will focus on waste management issues - Raising awareness of the environment and create the process of voluntary and fun participation to the public (Fun to Share) , enabling the public can easily monitor environmental quality by providing academic support, educating people and the youth on solid waste management and building and supporting the network of NGOs in environmental work
PONRE Prachuapkirikhan	<ul style="list-style-type: none"> - The mediation on environmental dispute - Encouraging the private sector participate in the management of natural resources and the environment, particularly, maintenance and cleaning the

Organization	Activities/Services done
	<p>beach, warning on air pollution, haze</p> <ul style="list-style-type: none"> - Integrated waste management in term of policy and conversion the plan into practice as follows : <ul style="list-style-type: none"> • Budget request from the province /provincial cluster to conduct the project of solid waste disposal in tourist attractions 2016 • Budget request from Environmental Funds to restore old disposal site to meet the academic criteria, amount 21 projects • Implementing the project of climate change preparedness by emphasizing participation from all sector on waste management i.e. recycling waste in household 2016
.Pak Tho SDM	<ul style="list-style-type: none"> - Campaign project to create awareness on environmental conservation and restoration. - Campaign to reduce the use of plastic bags - Cycling activities to reduce global warming - Strengthening the awareness of environmental communities along the canal for zero waste management - Adopt the principles of environmental planning process learned from Japan to apply in the projects generated from the community's opinions - Explaining to the people in each community to be aware of environmental issues and to get an idea that led to the environmental project
Tha Yang SDM	<ul style="list-style-type: none"> - Conveying the knowledge gained from the training and experience to related parties - Conducting 3 R activities - Educating and raising awareness to students and the public - Coordination, preparation of a project to improve and extend the lifetime of landfill - Co-operation in environmental protection activities
<u>REO8</u>	<ul style="list-style-type: none"> - Disseminating information to the public in community waste management of LAs - Applying the knowledge in the planning process, as appropriate - Creating awareness and public participation in the management of natural resources and the environment - Applying the knowledge from site visit and training on the solid waste management, landfill knowledge, landfill management when working as Lecturer to educate community/LAs on the solid waste management in an area from the source (household management), middle (collecting and transporting) and destination (disposal) - Applying the knowledge of involvement of community / volunteer by adopting the process and techniques of group members as examples, and alternative approaches to match the context of the community in Thailand - -What can be carried out after the training is a waste management in daily life, waste segregation, using resources that worth earnestly. The other knowledge will be applied in the right occasion and time - What will be applied to encourage Thai people to have awareness of environmental conservation and appreciation of the value of natural resources and environment of Thailand even more, is to promote the activities of Eco-Police Center

7. Good Practices and Lessons Learned through Project Implementation

7.1 Good Practices

1) Use of Spatial Framework

In the formulation of the Regional EQMP, the mapping of Environmentally Sensitive Zoning (ESZ) was introduced which provides information on areas to be preserved, conserved, restored and protected from the viewpoint of environmental conservation and ecosystem protection. The spatial framework is an outstanding planning tool in identifying the environmental management units. The Environmentally Sensitive Zoning maps are not applicable in the formulation of the Regional EQMP but also in the evaluation of EIA reports, identification of program/project, waste disposal site selection, among other applications.

In Thailand, spatial planning is not commonly used especially at the regional and provincial levels. Hence, there is a very limited understanding on the concept of spatial framework in environmental management. When this tool was introduced by the Project, REO8 and the 5 PONREs as well as ONEP were cynical but with continuous coaching and mentoring as well as intensive trainings, REO8 and 5 PONREs recognized the importance of spatial framework.

2) Tripartite Partnership between LA, REO8/PONRE and Community

The project developed an implementing mechanisms during the Regional EQMP planning process. This implementing mechanism was applied in the implementation of activities in the pilot project sites. The project facilitated the organization of an Advisory Team at the regional level composed of representatives from REO8, five PONREs and LA. At the LA level, Task Force Team was also created composed of representatives from PONRE, LA and community.

Before the Project, it is not so much to conduct the meeting gathering related organizations as well as LAs and community representatives to have active discussions. Therefore, this process resulted in a stronger linkage, renewed partnership and commitment among themselves.

3) Development of Champions within the Community

The activities in the pilot projects were implemented in close coordination with the communities, being the target beneficiaries for implementing solid waste management activities. At each community meetings, the project identified potential community leaders for both PP-1 and PP-2 that were grown as “champion” within the community. For the entire duration of the pilot projects implementation, these community leaders were great a influence to other communities leading to successful implementation of activities at the community level.

The experience of the project showed that developing “champions” who are passionate about the project and are willing to pursue, and expand their influence and their contribution when

condition exists to greatly contribute to the success of the project. The concept of developing “champions” can be done at the community, local, provincial, regional and national levels alike.

4) Need-based Capacity Development

The project conducted Capacity Assessments (CA) for its counterpart organizations prior to the implementation of activities in April 2013. A follow up survey of that survey was done in October 2014 and an end survey was conducted in November 2015. The results of the first two CA surveys provided a valuable information used by the Project in understanding the level of capacities of the counterpart organizations thereby assisted the project in planning and designing appropriate trainings and seminars as well maximizing that capacity in positioning project activities. The series of surveys also gave opportunities for C/Ps to realize their actual capacity. The common understanding with C/Ps for their actual capacity can help to avoid arising gaps between what C/Ps want/interest and what C/Ps need. Therefore, such needs-based assessment plays a vital role in focusing the capacity interventions on the most important topics and providing training on appropriate level.

5) Good Consultation and Involvement of School Teachers

At the trial of the Public Awareness Guideline conducted at the PP-1 site, environmental education was implemented with the secondary and primary schools. The result of these activities education program is the beginning of raising students’ awareness in Thailand. To sustain their learnings, teachers are the one who initiate the education regularly. Therefore, contents of the education program needs to be decided through well discussions and coordination with teachers, and it should be easier for the teachers to continue the education program.

6) Fostering community relationship

A series of community meetings were conducted with communities during the selection process of pilot communities in order to understand local situation and select appropriate communities to be involved in a community-based environmental management. The project clearly announced to all communities the results. Those steps make the activities more clear and transparent, and lead to establish good relationships between each community, especially for unselected communities. Therefore, the ways to establish good relationships with community need to be highly considered. It could be a key for smooth application to those communities which were not selected.

Also, during the community-based environmental management planning period, each community developed its individual plans based on each vision and goal, but during the implementation period, close coordination among all community groups was conducted. This approach led to the successful process in terms of developing close relationship by collaborating and coordinating activities among different communities. It also led to narrowing the gap among communities.

7.2 Lessons Learned

1) Lessons learned related to Regional EQMP

(1) Participatory Approach in Planning

As a general rule in planning, participatory approach should not only be encouraged but it should be the guiding principle embodied in the planning process. With participation, data collection, identification of problems and issues, establishing visions, goals, strategies, measures and project formulation are commonly “shared” by all. With participation, ownership of the Plan as well as promoting empowerment of the local people in drawing out their own visions are enhanced.

However, participatory approach to planning and getting views and opinions from various stakeholders are very difficult and challenging tasks. Such difficulty reflects not only in terms of financial and manpower resources but also in terms of timing and schedule allocated to effect participatory process. So, when using participatory planning and bottom-top-approach, especially if budget is a constraints, certain parameters in designing participation need to be established and understood (i.e. limits and delimits of involvement of stakeholders, budget, time frame, etc.) in order to make the process sustainable.

(2) Accurate, scientific data and information

The use of accurate, scientific data and information are essential when doing planning in order to draw out effective solutions to environmental problems. At the beginning, the Project, conducted a comprehensive survey of environmental condition in REO8 jurisdiction in additional to what have been collected during workshops. As experienced in the Project, generating accurate data and information are very difficult and expensive, hence, it desirable that REO8 exert efforts to link and establish networks with academe, agencies at MNRE and generate updated information about the region and constantly facilitate updating its database. Such continuous efforts in updating data and information are important contributor to making sound decisions for effective environmental management.

2) Lessons learned in the operation of pilot projects

(1) As the entry point at the pilot project sites, mutual and common understanding of the environmental issue to be tackled in the project sites are important step to be undertaken because not all LAs in Thailand have the same level of capacity and understanding of the environmental issues. So, preparatory period needs to be allocated before starting any project activities, which involves meetings, consultations, trainings and seminars.

(2) In order to enhance linkages among organization (ONEP, REO8, PONRE and LAs as well as communities, constant communication, regular meetings and consultation are important. In the operation of the pilot project, the establishment of the Advisory Team and the Task

Force Teams have contributed to the successful monitoring of activities at the pilot project sites. Such kind of organization can foster relationship and create a sense of partnership.

3) Lessons learned in reflecting policies to action

- (1) For effective utilization of the Regional EQMP, technical and financial support from the Central government are important in order to operationalize the Plan, disseminate the Plan and eventually implement the Plan. Monitoring the implementation of the Regional EQMP is also very important, which was partially done during the Project.
- (2) The authorization of the Regional EQMP is also important to consider for the Regional EQMP to be effectively put into operation. Such process of authorization, ensure continuous budget for planning and monitoring at the same time could also provide REO8 or the REOs for that matter the legal basis to seek support from other regional offices of MNRE to implement some projects under the Regional EQMP.

4) Lessons learn in project management

(1) Organizing Training in Japan at the early stage of the Project

The project planned to undertake three trainings in Japan involving substantive number of counterpart staff. The training experience of the counterpart organizations could have been given a different perspectives and could have created momentum in the project activities implementation at an early stage if these were conducted as originally planned.

In view of the experience of the Project, when a project involves a wide range of counterparts as seen in this project, the training in Japan should be held at an early stage of the project in order to implement project activities based on mutual understanding and good communication network.

8. Project Terminal Evaluation Results

The JICA Terminal Evaluation Team visited the Project from October 18 to 31, 2015 in order to review the progress of project activities and examine the achievements of the project. Based on the information collected, the Evaluation Team assessed the Project in accordance to the criteria set by JICA as indicated in Table 8-1 below.

Table 8-1 Evaluation Criteria

Criteria	Viewpoints
Relevance	Verify whether Outputs, Project Purpose, and Overall Goal of the Project are in line with the policy propriety, needs and concerns of the recipient country, and the aid policy of the government of Japan at the time of evaluation.
Effectiveness	Measure the level of achievement of Project Purpose.
Efficiency	Measure how efficiently various inputs are converted into outputs of the Project. This criterion also examines the appropriateness of input in view of its amount, contents, and timing.
Impact	Estimate the extent to which Overall Goal of the project will be achieved in 3-5 years after the completion of the project, and to verify the existence of intended and unintended, direct and indirect, positive and negative changes attributed to the project activities.
Sustainability	Verify whether the effect of the project will be sustained after the completion of the Project in view of the policy, organizational, financial, and technical aspects.

During the Stakeholders' Meeting organized on Oct 30, 2015, the Evaluation Team presented the results of their evaluation as shown in Table 8-2 below.

Table 8-2 Evaluation Results

Criteria		Evaluation Results	
Relevance	High	The direction of the Project is consistent with the policy of the Government of Thailand, needs of the environment sector, and the Japan's aid policy.	
Effectiveness	Moderate	The Project Purpose has been partially achieved.	
Efficiency	Moderate	The timing of some inputs i.e. dispatching experts, and training in Japan were not as appropriate as it was originally planned.	
Impact	Moderate	Foundation of the PDCA Cycle will be developed by the end of the Project, and several spin-off impacts have been already recognized.	
Sustainability	Policy	High	Environmental management is and will be one of the priority areas in the national policy.
	Organizational	Moderate	Although, the implementation structure of environmental activities are complicated, mandates of each organization are precisely indicated and are well understood.
	Technical	Moderate	Most officers assigned at the environmental section of the five PONREs have participated in the Project activities, and no frequent staff turn-over is observed.
	Financial	Limited	Recurrent budget is allocated by the supervisory organization and remains stable, and budget for the next R-EQMP is possibly prepared by MNRE based on the preposition by ONEP (still planning stage).
Recommendations:			
Measures to be taken by end of the Project			
1- In order to complete the PDCA cycle that the Project proposes, JET in cooperation with ONEP, REO8, and the five PONREs shall: <ul style="list-style-type: none"> Conduct the M&E of the PP activities in cooperation with the counterparts, analyze the results, and share them through seminars and workshops including the National Seminar by the end of the 			

<p>Project,</p> <ul style="list-style-type: none"> Identify appropriate methods of the M&E activities for the R-EQMP in the R-EQMP manual, Finalize the PA guideline as well as R-EQMP manual based on the mutual understanding on its style and the main users. Review the status of utilization of the R-EQMP by PONREs, and make recommendations for the next R-EQMP formulation.
<p>2- In order to clarify the contribution of the Project to the capacity development of the counterparts,</p> <ul style="list-style-type: none"> JET shall conduct CA (Capacity Assessment) of the counterpart organizations as the part of the end survey of the Project, and measure the level and areas of improved capacity among the counterparts,
<p>3- In order to enhance the sustainability of the project effect,</p> <ol style="list-style-type: none"> 1- REO8 in cooperation with other REOs shall request a budget for the next R-EQMP formulation including the M&E activities, 2- ONEP shall propose the importance of formulation, and M&E of the R-EQMP to MNRE in order to allocate the necessary budget to REOs. 3- ONEP shall propose the establishment of a coordination mechanism led by REO8 in order to formulate the next R-EQMP in an appropriate manner.
<p>Measures to be taken in the post project period</p>
<p>4- In order to formulate the next R-EQMP and implement future environmental activities, REO8 shall establish a mechanism for sharing information and facilitating activities with ONEP and the five PONREs in their jurisdiction.</p> <p>5- ONEP shall share the project outputs to other REOs to promote the model of the planning, the implementing, and the M&E activities for the R-EQMP of REO8 as well as the lessons learned from the Project,</p>
<p>Lessons Learned</p>
<ol style="list-style-type: none"> 1- When modification of the project design is done, it is necessary to: (a) re-establish indicators with specific target figures at an early stage; (b) revise the indicators based on the modification of the project design; (c) verify the applicability of the designated indicators during project implementation, if required. 2- In implementing projects targeting regional activities, the preparation period is one of the most important factors to consider at the time of project formulation. 3- For Projects involving a wide range of counterparts, training in Japan should be held at an early stage of the project in order to implement project activities based on mutual understanding and a good communication network.

Source: JICA Terminal Evaluation Report, November 04, 2015



JICA Terminal Evaluation Stakeholders' Meeting held on October 30, 2015 at ONEP, Bangkok

9. Recommendations

9.1 General Recommendations

The following recommendations were given by the JICA Expert Team, as follows:

- 1) The Project provided REO8 the technical know-how and equipment for Geographic Information System. REO8 needs to take measures maintain the equipment and use them in order to further develop their database.
- 2) REO8 shall institutionalized trainings and seminars as part of the regular annual human resource development with regular budget allocation. Simplified capacity and needs assessment shall be conducted as the basis of organizing in-house trainings and seminars.
- 3) Mechanisms need to be developed by REO8 and ONEP to sustain and enhance the linkages created as a result of this Project.
- 4) To ensure sustainability of activities initiated by the Project, REO8 in coordination with PONRE in the pilot project sites shall establish mechanism for follow up works. The Advisory Team organized by the Project could be one of the methods by which activities initiated can be continued.
- 5) ONEP need to develop measures on how to respond to significant environmental management policy gaps as seen in this Project related to authorization and funding for planning, implementation and monitoring and evaluation of Regional EQMPs.
- 6) ONEP shall develop mechanism in coordination with OPS in aligning policies and implementing guidelines related to Regional EQMPs.
- 7) ONEP is also recommended to develop measures to share significant outputs of the Project to other REOs.

9.2 Output 1 Recommendations

- 1) REO8 has been provided with various tools and resources that are useful references in the formulation of the next Regional EQMP as outlined below, hence, it is highly recommended to utilize these resources as a guideline.

Planning	<ul style="list-style-type: none"> • Planning Manual for Regional EQMP • Regional EQMP 2013-2016 (as example) • Environmental Profile in REO8 Jurisdiction • QGIS Seminar Materials • Upgrading and Lifespan Extension Plan for Tha Yang Disposal Site
Implementation of Plans	<ul style="list-style-type: none"> • Manual Video for Solid Waste Management Surveys • Safety Manual for Waste Collection Crews • PA Guidelines • Model for Community based Environmental Management

- 2) In order to utilize the experience of the Project, REO8 shall develop measures to incorporate spatial framework and the use of environmentally sensitive zoning into the next Regional EQMP for effective environmental management. It is also highly recommended that regular updating of the environmentally sensitive maps (ESZ) that the Project produced shall be done periodically.
- 3) REO8 in coordination with OPS and ONEP shall undertake measures to introduce and share environmental spatial framework based environmental management to other REOs by disseminating the Planning Manual for Regional EQMP produced by the Project.
- 4) REO8 to exert all efforts to effect participatory methods in the formulation and monitoring of Regional EQMP in order to, not only reflect the views of the major stakeholders, but also to create ownership of the plan, thereby the implementation and monitoring could be widely supported.

9.3 Output 2 Recommendations

- 1) Collaboration with Local Administrations (LAs)

In order to reach the target people of the environmental public awareness activities, collaboration with LAs is very important especially for solid waste and waste water management. In the guideline, seven out of nine target groups are local people, and one of the LAs' duties is approaching community people for better public services. Also, each LA appoints a community development officer to promote community participation. Assembling available resources to approach target people, it is effective for organizations in MNRE, such as PONREs which collaborate with LAs to conduct the activities. An environmental network with LAs in each province can be set up for further collaborations.

- 2) Formulation of comprehensive policy on raising environmental awareness involving related Ministries

Public awareness activities usually don't need very much budget, but continuous implementation is necessary to change target groups' behavior. As mentioned above, collaboration with LAs is important to approach local people. To implement the environmental education program, school teachers take key roles to grab the attention of students, and sustain the program. When environmental standards are introduced and disseminated to industrial sectors, the Ministry of Industry is also an important organizations to cooperate with.

Therefore, environmental issues should be responded not only within MNRE, but in cooperation with other related Ministries. In Japan, "Act on the Promotion of Environmental Conservation Activities through Environmental Education" was formulated in 2003 and support any levels of environmental promotion activities. In order for related Ministries to cooperate smoothly, a comprehensive policy is really supportive for sustainable environmental awareness raising activities.

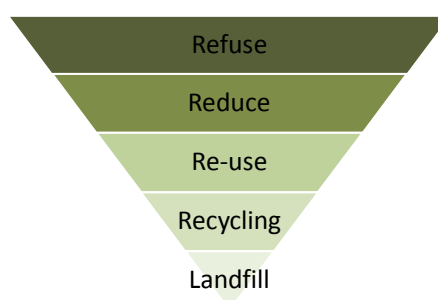
9.4 Output 3 Recommendations

9.4.1 On Pilot Project 1

- 1) Measures to ensure that the outputs of the project in Tha Yang are being utilized and follow up work shall be coordinated by PONRE Phetchaburi.
- 2) The data book as well as the disposal plan developed by the project shall be reviewed by Tha Yang as to its utilization and subsequent funding of conducting solid waste management baseline survey and implementing items contained in the disposal plan.
- 3) The project initiated one community for waste segregation. Tha Yang may need to consider expanding the activities to other communities in order to generate the expected impact of the initiatives.
- 4) Solid Waste Management should be systemized based on waste hierarchy

The solid waste management is a kind of system management covering solid waste management flow including generation, collection and transportation, intermediate treatment and disposal. The following four steps should be considered as one system. For example, even though LA has good waste collection and transportation service, LA cannot manage solid waste if LA does not have enough disposal site capacity. On the other hand, LA has good disposal site, LA cannot manage solid waste, if LA does not have enough waste collection vehicles.

Solid Waste Management hierarchy in Thailand should put more emphasis on the upper stream activities such as refuse, reduction, re-use and recycling in order to expand the lifespan of disposal sites. It is important to promote systemized solid waste management based on solid waste management hierarchy.



The following outputs from Pilot Project 1 can be used for the promotion of systemized solid waste management:

- “Training Seminar for Task Force Team and Tha Yang SDM on Solid Waste Management” (for understanding solid waste management system and each component of solid waste management)
- Manual video for Solid Waste Management

9.4.2 On Pilot Project 2

- 1) Involving community people is essential but it the most difficult matter in participatory planning. It is the reality that the involvement of ordinary people are limited due to some limitations such as busy for work, or bothersome to participate. To raise their awareness and understanding, continuous efforts in various channels through facilitation by community leaders, volunteers, etc. are necessary.
- 2) It is necessary to understand the context of stakeholder as well as relationships of related sectors in the area such as the relationship between communities, the relationship between community and organizations.
- 3) In addition to the above recommendation, it is also important to identify what issues can be jointly managed among community groups or shall be separately handled when community environmental groups are formulated.
- 4) Communities, in general, may have limited experiences and knowledge on environmental matters. So Government sections (SDM, PONRE, REO8,) shall support to strengthen the network among concerned groups in order to introduce sufficient experiences, technical knowledge, etc. For this suggestion, especially SDM shall perform as a key coordinator.
- 5) On the other hand, effective use of local resources, materials, equipment, etc. shall be considered in order to assure sustainable implementation by communities.