REGIONAL ENVIRONMENTAL MANAGEMENT IMPROVEMENT PROJECT (REMIP)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY (EEAA)

GUIDANCE FOR COUNTERMEASURE PLANNING WITH LOGICAL FRAMEWORK APPROACH

JUNE 2008

REMIP WORKING GROUP 2 (WG2)

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Note: This guidance is distributed to only WG2 and associate members for the purpose of the technical training.

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CHAPTER 1
INTRODUCTION

1.1 General

This Guidance presents a common methodology for how to make a plan of the countermeasure to solve environmental problems. The logical framework approach (LFA) is applied as a basic backbone of the methodology for planning. LFA is defined as the methodology for designing a plan by means of Project Design Matrix (PDM).

Major intended output of WG2 in REMIP is to strengthen the capacity of formulating the countermeasure against oil pollution through the OJT for actual countermeasure planning. Since the commencement of REMIP, WG2 has been engaged in the countermeasure planning, aiming at the development of the countermeasure plan against oil pollution in the Suez Gulf region. In the development of the countermeasure plan, LFA has been employed.

In general, countermeasures are formulated by diverse methods. However, common and prevalent ways are comprised of mainly :1) problem identification, 2) problem analysis, 3) examination of solution plan, 4) examination of alternatives, and 5) formulation of action plan. This basic procedure is substantially not changed in the countermeasure planning with LFA. The countermeasure planning employing LFA attempts to set the standard procedure in the overall planning and respective procedural steps, so as to contribute more efficient and effective planning. In addition, the application of LFA makes it possible to implement and evaluate the countermeasure plan in the consistent way with a certain unified and common terms and criteria, based on PDC (Plan, Do and Check) of a project cycle.

LFA is a common tool which many donor countries use in planning, implementing and evaluating technical assistance project, and has a long history in its application into various project. The main purposes of LFA in foreign assistance are to plan objective-oriented undertakings based on the participatory approach, and to manage the undertakings employing a unified and consistent methods. The advantages contained in LFA can be also applied in countermeasure planning.

Basically, the countermeasure planning with LFA is commonly applicable for formulating plans to solve not only oil pollution but also any type of problems. Main users of the guidance are persons engaged in the tasks of EEAA. Considering this, this Guidance is composed so easily to understand essence of LFA, using environmental problems as examples.

This Guidance is aiming:

- For Suez RBO members, to reflect the methodology applied for the countermeasure planning against oil pollution, and extend its application to other environmental problems; and
- For Other EEAA members, to learn the methodology of countermeasure planning with LFA, and apply their encountering environmental problems.

It is quite natural that the contents of developed countermeasure plan are highly different, depending on the environmental subject, the types and degrees of problems, existing capacities of main actors and others. While, prime purpose of this guidance is to instruct

just the methodology employing LFA, some representative documents of actual countermeasure planning undertaken in WG2 activities are attached to help the leaders understand how the methodology is applied in practice.

CHAPTER 2
GENERAL DESCRIPTION OF LOGICAL FRAMEWORK APPROACH

2.1 Basic Logic Model

Guiding Principle

A logic model is a systematic and visual way to present and share our understanding of the relationships among the resources which we have to use/operate, the actions which we plan to do, and the changes or results which we hope to achieve. The logic model is comprised of a set of five (5) component terms[1]: Inputs, Action, Strategy, Target and Goal, and constructs a basic backbone of the Logical Framework Approach (LFA).

Explanation

(1) Basic Logic Model

Basically, a logic model is a systematic and visual way to present and share our understanding of the relationships among the resources we have to use/operate, the actions we plan to do, and the changes or results we hope to achieve.

The purpose of a logic model is to provide stakeholders with a road map describing the sequence of related events connecting the need for the planned project with the project's desired results. Mapping a proposed project helps us visualize and understand how human and financial investments can contribute to achieving our intended project Goal and can lead to project improvements.

As shown in **Figure 2-1**, the basic logic model is a picture of how we believe the project will work. It uses words and/or pictures to describe the sequence of actions thought to bring about change and how these actions are linked to the results which the project is expected to achieve.

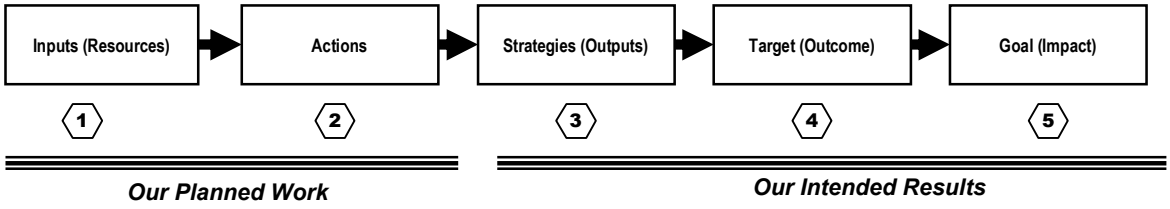


Figure 2-1 Basic Logic Model

The basic logic model component is defined below. The model presents the connection between our planned work and our intended results, comprised from Step 1 through Step 5.

[1] : The component terms of a logic model defined here are often called by different terms depending on countries, institutions and projects, as follows:

Resources instead of inputs, activities instead of actions, outputs or results instead of strategies, project purpose or outcome instead of target, and impact instead of Goal.

Our Planned Work

This describes what resources we think to need in order to implement the project.

1. Inputs (Resources)	Include the human, financial, organizational, and community resources which we can mobilize in a project.
2. Actions (Activities)	Mean what to do with mobilizing the resources. Actions are the processes, events, the usage of technology, etc. that are an intentional part of the project implementation. These interventions contribute to bringing about the intended changes or results.

Our Intended Results

This includes all of the project's desired results (strategies, Target and Goal).

3. Strategies (Outputs)	Mean the direct products of project actions and may include types, levels and services to be delivered by the project.
4. Target (Outcomes)	Means the specific changes in project participants' behavior, knowledge, skills, status and level of functioning. It is a common perception that short-term target should be attainable within 1-3 years, while longer-term target should be achievable within a 6-8 year timeframe.
5. Goal (Impact)	Means the fundamental intended or unintended change occurring in organizations, communities or systems as a result of program activities commonly within around 10 years.

(2) How to Read a Basic Logic Model

When we read from left to right, a basic logic models describes the project basics over time from planning through results. Reading a basic logic model means following the chain of reasoning or "If.....then....." statements which connect the project's parts. **Figure 2-2** shows how the basic logic model is read.

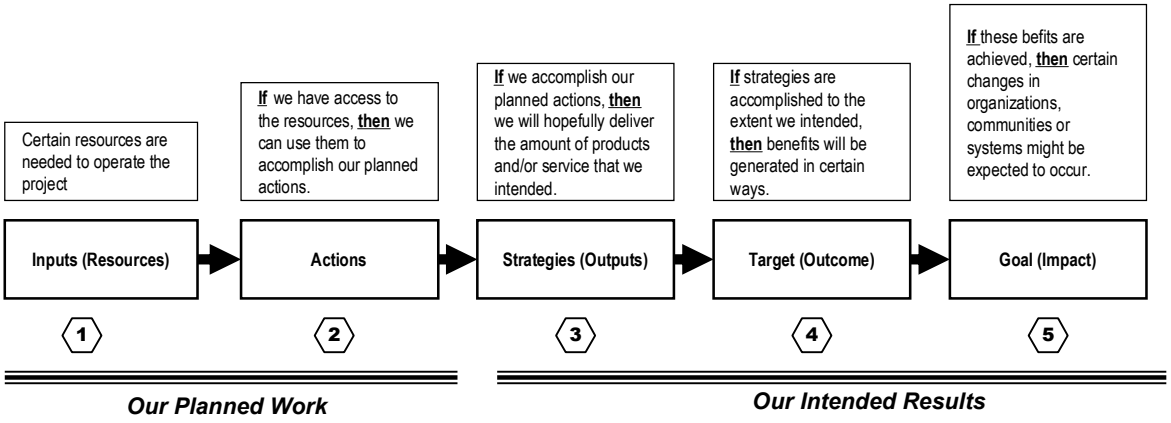


Figure 2-2 How to Read a Basic Logic Model

Example

A logic model presents project concepts. It lets project implementers express how to achieve intended results, based on the principle of how the project would function. The following example shows how the logic model approach works.

Example of a Logic Model: Family Trip

We are going to make an inexpensive family trip from A-City to B-City, to enjoy our vacation in B-City, visiting our relatives. The trip which we will take from A-City to B-City is the "project." Basic assumptions about our trip are:

- We want to visit relatives in the summer, while the children are out of school;
- We will fly from A-City to B-City, because it takes less time than driving and, also, because frequent flier miles are available; and
- Using frequent flier miles may reduce travel costs.

This family trip planning may be expressed by using the basic logic model, as shown in **Figure 2-3**.

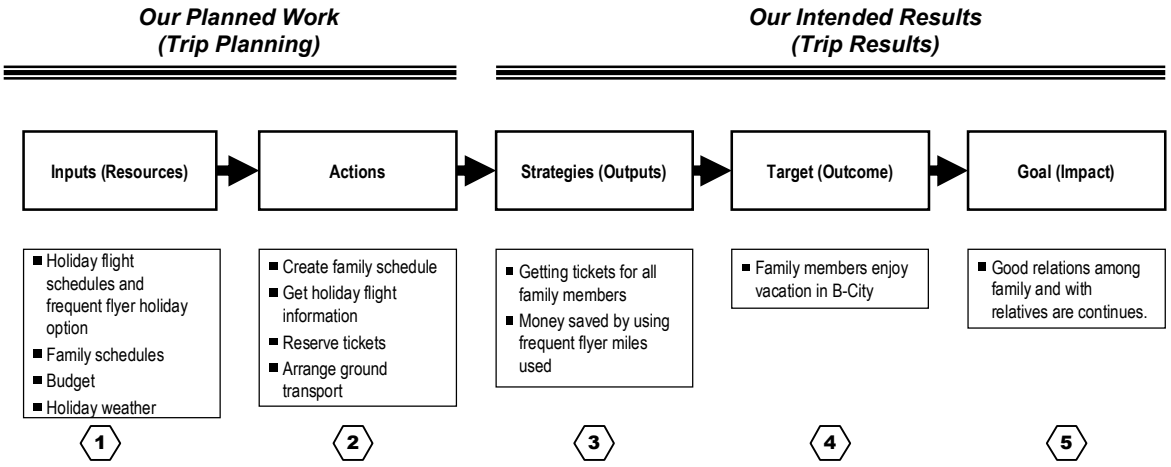


Figure 2-3 Family Trip Planning with Basic Logic Model

In this example, the project may be described along the logic model, as follows:

We have to determine the factors influencing our trip, considering various information (the inputs or resources), such as scheduled vacation time, the number of frequent flier miles, round trip air timetables, and transportation to and from our home to the airport.

The Actions (or activities) necessary to take are the creation of our own family holiday schedule, reservations for air tickets, and transportation to and from the airport. The results of our actions or the strategies (outputs) are to get air tickets with saved money by using the frequent flyer miles.

Thanks to this strategies (outputs), the family members can enjoy their vacation in B-City (the Target), and, then, continue good relations among family and with relatives (Goal).

2.2 What is Project Deign Matrix (PDM)?

Guiding Principle

PDM (Project Design Matrix) is a table which shows the logic model for our planned work and our intended results. Besides Input, Action, Strategy, Target and Goal (called Project Objectives), PDM is accompanied by Verifiable Indicator, Source of Indicator, Important Assumption and Pre-Condition to define the achievement status and encountering risks.

Explanation

(1) Definition of PDM

As mentioned in the section 2.1, our planned work and intended results may be described by a basic logic model as Input, Action, Strategy, Target and Goal. We can take our actions and can expect our intended results along such a basic logic model. In actual projects, however, it is necessary to know our progress status of each step and possible encountering risks to ensure our final success. For that purpose, we uses Verifiable Indicator and Important Assumption along with Source of Indicator and Pre-Condition.

As such, our planned work and intended results may be activated and watched by the component terms: Input, Action, Strategy, Target, Goal, Verifiable Indicator, Source of Indicator, Important Assumption and Pre-Condition. PDM is a table comprised of these terms, as shown in **Table 2-1**:

Table 2-1 Format of Project Design Matrix (PDM)

<table>
<tr><th>Project Objectives</th><th>Verifiable Indicator</th><th>Source of Indicator</th><th>Important Assumption</th></tr>
<tr><td>Goal:
**********</td><td>**********</td><td>**********</td><td>**********</td></tr>
<tr><td>Target:
**********</td><td>**********</td><td>**********</td><td>**********</td></tr>
<tr><td>Strategy:
**********</td><td>**********</td><td>**********</td><td>**********</td></tr>
<tr><td>Action:
****
****
**********</td><td colspan="2">Input:
****
****
**********</td><td>**********
Pre-Condition:
**********</td></tr>
</table>

(2) Elements of PDM

Terms used in PDM are defined as follows:

1. Goal — Benefits expected to be produced from project implementation over the long-term (after the project completion).
2. Target — An objective expected to be achieved as a result of project implementation within the project period.

3. Strategy	Intermediate objectives which are expected to be produced from series of Actions, and must be achieved in order for Target to be produced.
4. Action	Specific activities taken in project implementation employing Inputs in order to achieve Strategies.
5. Input	Personnel, funds, equipment/facilities, information, etc. necessary for project implementation.
4. Verifiable Indicator	Indices which comprise type, quantity, quality, time, location, etc., and are used for measuring the achievement of Strategy, Target and Goal.
5. Source of Indicator[1]	Sources of data which are gathered from the inside and outside of the project and are used for Verifiable Indicator.
6. Important Assumption	Conditions important for the successful achievement, but that cannot be controlled by the project and the fulfillment of these conditions is not certain during the planning and implementing stage.
7. Pre-Condition	Crucial conditions that must be fulfilled before a project gets start. If these conditions are not met, it is impossible to start project.

(3) How to read PDM

PDM is a practical form of a basic logic model. Thus, we can read PDM in the same way as a basic logic model shown in **Figure 2-2**, as explained in **Figure 2-4**:

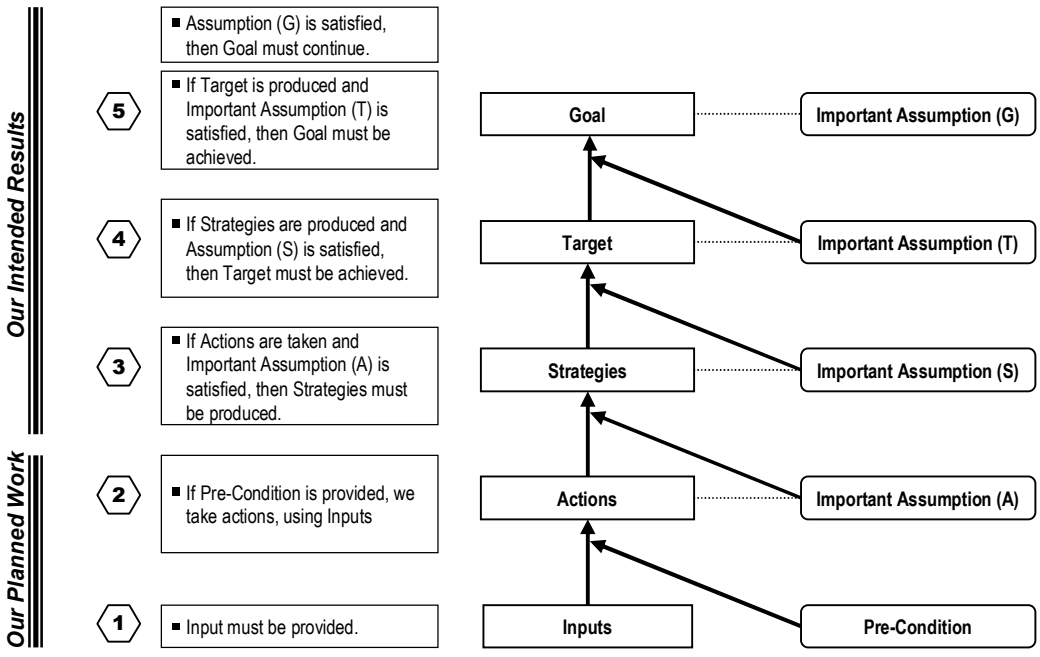


Figure 2-4 How to Read PDM

[1] : Sources of indicator is often called "means of indicator", depending on countries, institutions and projects.

2.3 What are Project Cycle and Logical Framework Approach (LFA)?

Guiding Principle

The project cycle is a term to express the entire stage of a project, which are endlessly repeated by the feedback from "Check" to "Plan", when the project is managed by dividing three (3) stages of "Plan" (planning), "Do" (implementation) and "Check" (evaluation). Logical Framework Approach (LFA) is defined as a tool or methodology which is employed to manage the entire project comprising planning, implementation and evaluation stages by means of Project Design Matrix (PDM).

Explanation

(1) Project Cycle

A project is defined as an undertaking aiming to achieve particular purposes. It is a commonly accepted concept that a project consists of phased processes like project identification, formulation, implementation, monitoring, evaluation, and feedback. The feedback from evaluation results is incorporated in future project planning, thereby resulting into a cycled process in a new phase of the project. This repeated process is called the "P-D-C" cycle of a project. In practice, the "Plan", "Do" and "Check" are corresponding to planning, implementation and evaluation, respectively.

(2) Logical Framework Approach (LFA)

A logic model presented in the section 2.1 helps us organize and systematize a project comprising planning, implementation and evaluation stages. A tool or methodology to manage an entire project by using PDM realizing a logic model is called Logical Framework Approach (LFA)[1]. As illustrated in **Figure 2-5**, the entire project is managed by using PDM, through the stages of planning, implementation and evaluation.

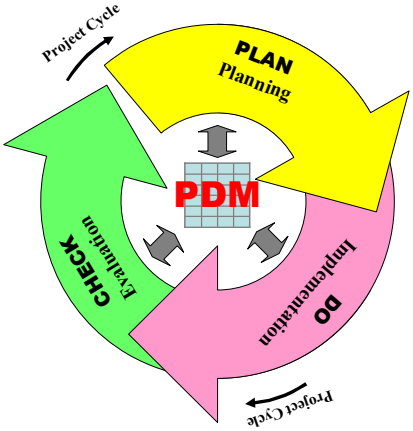


Figure 2-5 Concept of Project Management with LFA

[1] : Logical Framework Approach (LFA) is also called Project Cycle Management (PCM Methods), depending on countries, institutions and projects. Both LFA and PCM Methods are basically the same methodologies, except for the wordings for component terms used.

Benefits in applying logic model concept in LFA for each phase of a project are described as follows:

1. Planning: In the planning phase (including program design), LFA as a planning tool help us develop program strategy and enhance our ability to clearly explain and illustrate program concepts and approach for key stakeholders.
   Logic model concept in LFA can help us formulate structure and organization for program design and conduct self-evaluation based on shared understanding of what is to take place.
2. Implementation: In the implementation phase, logic model concept in LFA helps you identify and collect the data needed to monitor and improve a project.
   Using the logic model concept in LFA help us to consider and prioritize the project aspects most critical for tracking and reporting and make adjustments as necessary.
3. Evaluation: In the evaluation phase, logic model in LFA helps us present program information and progress status toward Goals.

2.4 History and Contribution of LFA

Guiding Principle

Since 1960's, LFA has been long used as a project planning or management tool in many countries and many projects, especially in foreign assistance projects. It has contributed to improve project planning and design, foster project performance and facilitate project management.

Explanation

(1) Background

The LFA was developed in the late 1960's to assist the US Agency of International Development in improving its project planning and evaluation system. It was designed to address three (3) basic concerns, namely that:

- Planning was too vague, without clearly defined objectives that could be used to monitor and evaluate the success (or failure) of a project;
- Management responsibilities were unclear; and
- Evaluation was often an adversarial process, because there was no common agreement as to what the project was really trying to achieve.

LFA has since been adopted as a project planning and management tool for technical assistant projects mainly by many development agencies. For example, EC has required the use of LFA as part of its project cycle management system since 1993, and it provides a core set of tools to undertake quality assessments of project.

Over time, different agencies have modified the formats, terminology and tools of the LFA. The basic analytical principles have remained the same. JICA also use same methodology called PCM commonly for planning, implementing and evaluating its foreign assistance projects.

(2) Contribution to Project Cycle Management

The LFA has contributed to rationally manage over the entire project cycle in various projects and programs. Its major characteristics, advantages and issues are presented hereunder:

Characteristics

1. Participatory approach	Most discussion for LFA take place in workshop in the attendance of stakeholders concerned with the subject. In the workshop called for under the LFA, representatives of all stakeholders have equal opportunities to express their opinions and play primary roles in the project planning.
2. Logicality	Each of the analytical processes leading up to the formation of a PDM is based on logical "Cause and Effect" or "Means and Ends" relationships. Moreover, the PDM which is a main context of a project proposal presents both the components of the project and their interrelationships in a logical manner.
3. Consistency	The use of a same PDM enables consistent management through the project cycle comprised of planning, implementation and evaluation.

Advantages

1. Accurate and effective project management	By clearly defining the objectives and outputs at the project planning stage, LFA provides for effective and accurate project management.
2. Project planning accommodating stakeholders' need	Using the participatory planning method to consider project proposal makes it possible to develop a project plan that accommodates stakeholders' need.
3. Assured transparency	Clearly presenting planning process and bases clarifies the overall image of the project cycle and is effective for ensuring the transparency of development process.
4. More effective communication	Use of common concepts, terminology, and formats among implementing agencies and other stakeholders simplifies and facilitates communication.

Issues

1. Modification of PDM	The PDM drawn up at the planning stage should be modified according to project status and change in external conditions grasped through monitoring. Of course, change should be made only after sufficient consultations with stakeholders.

2. Importance of workshop participants	The PDM is formed through a consensus of workshop participants. Therefore, the selection of people who are suitable as participants is of a importance.
3. Application of supplementary methods	Apart from the discussion in the workshop of the LFA, socio-economic analysis, environmental assessments and other researches and analyses should be employed as needed to clarify the courses and results of the project.
4. Problem-solving	LFA is a project planning technique for analyzing and solving existing problems. Therefore, it is not appropriate for analyzing conditions in which no problem or issues are found.

2.5 Procedural Steps of Countermeasure Planning with LFA

Guiding Principle

The PDM is a key document produced in the countermeasure planning with employing the LFA. The PDM is drawn up through two (2) main phases: the analysis phase comprised of baseline survey, stakeholder analysis, objective analysis and Strategy setting, and the planning phase comprised of design of action plan, PDM forming and PO forming.

Explanation

(1) Procedural Flow of Countermeasure Planning with LFA

The PDM is formulated through a series of steps in the discussion employing the LFA. This discussion is divided into Analysis Phase and Planning Phase which include a set of steps, respectively, as shown in **Figure 2-6**:

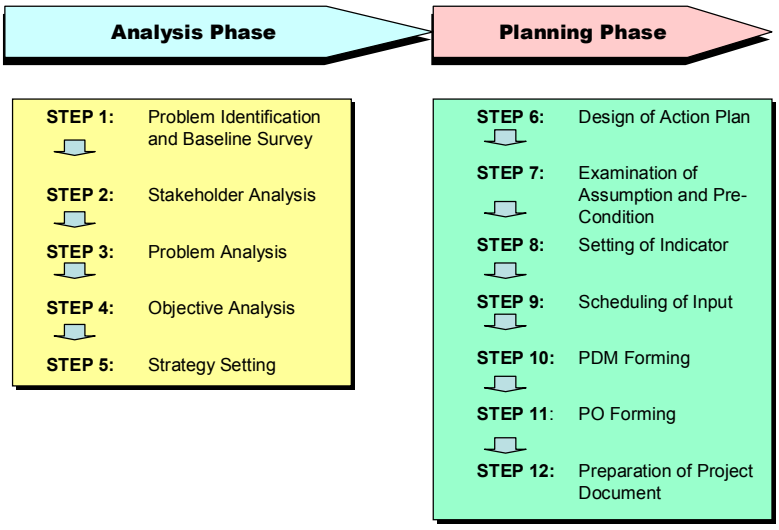


Figure 2-6 Procedural Flow of Countermeasure Planning with LFA

(2) Analysis Phase

The analysis phase clarifies current status and problems to be solved in the project, and finally sets up the basic direction of the project through a series of steps, as follows:

Step 1. Problem Identification and Baseline Survey	Identifying problems to be addressed by the project and, then, collecting data and information associated with the project.
Step 2. Stakeholder Analysis	Identifying stakeholders, their roles, their key problems and opportunities, etc.
Step 3. Problem Analysis	Identifying problems, "Cause and Effect Relationship" between different levels of problems.
Step 4. Objective Analysis	Developing objective lines using of identified problems by means of "Means and end Relationship".
Step 5. Strategy Setting	Establishing actual approaches to be adopted for achieving the project purpose.

(3) Planning Phase

The planning phase designs specific and concrete actions to be taken in the project, and forms the PDM and the time schedule, as follows:

Step 6. Design of action plan	Designing Actions required for generating Strategies.
Step 7. Examination of Assumption and Pre-Condition	Examining Important Assumptions for project objectives and Pre-Condition for the project start.
Step 8. Setting Indicator	Setting Verifiable Indicators to measure the achievement status and their Sources.
Step 9. Scheduling of Input	Examining Inputs requiring the project implementation.
Step 10. PDM forming	Constructing PDM using the results of Step 5 to Step 9.
Step 11. PO forming	Designing the time schedule of Actions in the project implementation to achieve Target over the project period.
Step 12. Preparation of Project Document	Preparing the project document containing various project information, including PDM and PO.

Each procedural step of Step 1 to Step 12 is specifically and precisely described in Chapter 3 and Chapter 4.

2.6 LFA Workshop

Guiding Principle

The countermeasure planning with LFA is conducted by the discussion in the workshop where participants of stakeholders contribute their wisdom, knowledge and intents. As such, the countermeasure planning is done by not someone working at a desk alone but representative stakeholders associated with the problem to be addressed.

Explanation

(1) Why is LFA Workshop Opened?

One of the characteristics of the LFA is to open a workshop where all stakeholders contribute their wisdom and work on countermeasure planning together. In such a way, planning is conducted by not someone working at a desk alone but representatives of stakeholders in the workshop at every stage. The timing, duration and frequency of workshops depend on the characters and scales of the project and the particular stage of planning. It is important for those with expert knowledge or experience relevant to the project to participate.

(2) How to Conduct LFA Workshop

In a LFA workshop, the participants write their own opinions on suggestion cards, and the cards are posted on a board to give a visual presence to each opinion. It should be noted that each decision should be based on a consensus of the participants – not a simple majority. LFA is, in principle, a participatory planning method and, therefore, requires attendants' sincere attitude. **Figure 2-7** shows the image of the LFA workshop being conducted by the navigation of a facilitator.

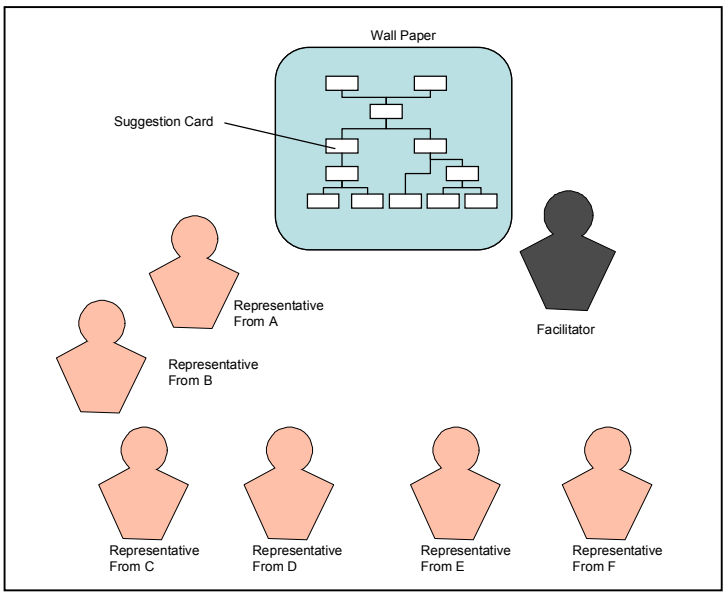


Figure 2-7 Image of LFA Workshop

(3) Basic Rules for Suggestion Card

A suggestion card which participants express their own notions is a crucial tool in the LFA workshop. There are some basic rules which participants should observe to avoid confusions and misunderstandings, as follows:

- Write your own suggestion on a card;
- Write one idea only on a card, making your suggestion specific and concise;
- Stick to the facts and avoid abstractions and generalizations;
- Make it a rule to write cards, before beginning discussions;
- Do not remove a card from the wall paper, before a consensus is obtained; and
- Do not ask who wrote a particular card.

Useful Information

Suggestion cards must be written as clearly as possible, so that every participant understands clearly the contents. Some examples used in the suggestion cards for problem analysis are shown as follows:

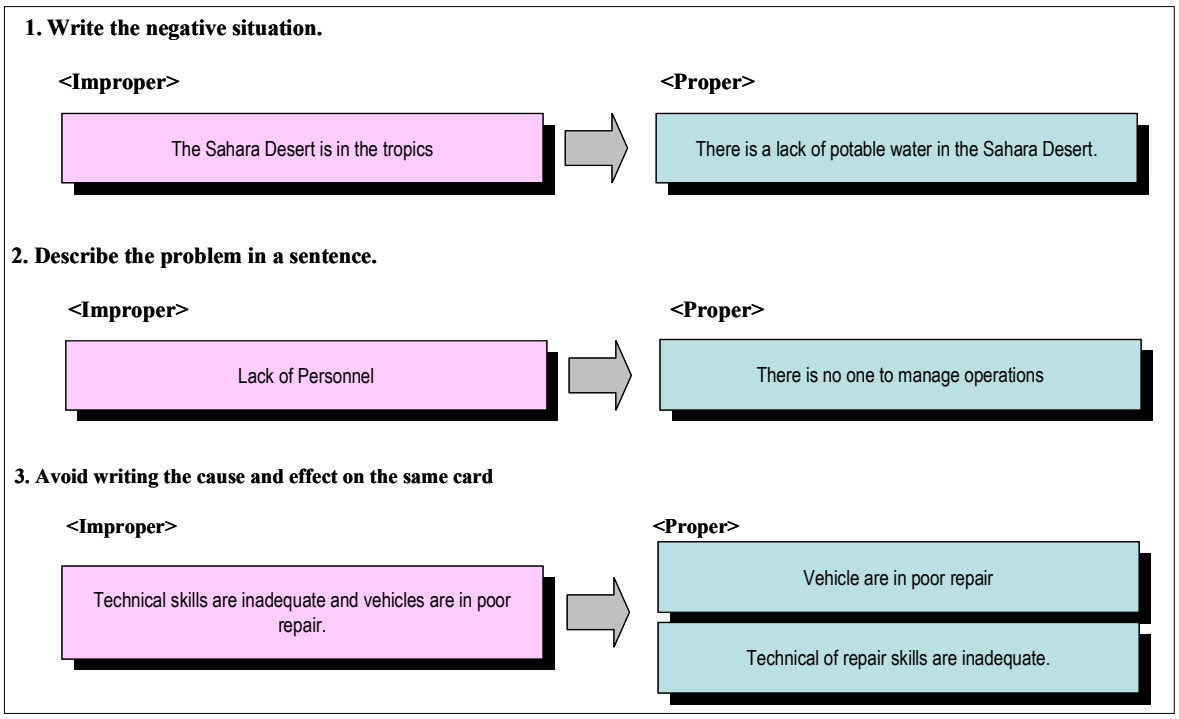


Figure 2-8 Example of Suggestion Cards

CHAPTER 3
ANALYSIS PHASE

3.1 Problem Identification and Baseline Survey (Step 1)

Guiding Principle

First, the problem to be solved by the countermeasure must be identified. Then, the baseline survey is conducted to clarify identified problems from various viewpoints, prior to the problem analysis. The baseline survey takes place to collect data and information relevant to the identified problems, and its results contribute all participants to share the same understanding for the current situations.

Explanation

(1) Problem Identification

The countermeasure is an attempt to solve a certain problem. Therefore, identifying a certain problem is the first step of countermeasure planning.

In the stage of problem identification, usually the detail situation of problem is not clear but, at least, general characters of the problem, the degree of damages, locations being affected by problems, involved stakeholders, etc. should be clarified.

(2) Baseline Survey

Baseline survey is conducted to clarify the actual situation concerned with the identified problem, by gathering data and information, hearing from concerned peoples, visiting the sites and actual measurement/analysis in some cases. In general, the data and information collected may be generally categorized into project area profile, detail situation of the problem and damages, stakeholders concerned with the problems, legal framework, national and regional policies related with the problem, administrative setups, currently taken measures, etc.

Through the baseline survey, many and diverse data and information should be collected. These collected data and information should be appropriately processed and compiled in order to be easily understandable for participants of the problem analysis in the next step.

Example

(1) Example Project Assumed in this Guidance

In this Guidance, specific example titled “Sanchez River Water Improvement Project” is provided in order to learn the methodology of countermeasure planning with LFA. In this example project, Environment Agency which will become an implementing body.

The fictional situations are assumed in the project, as follows.

Project area	Flamenco City with the population of about 300,000 is located along the Sanchez River.
Water utilization	The Sanchez River is used for living water source for washing, bathing, drinking (in some area), and also local fishery in the region.
Water pollution	Recently, the water quality of the Sanchez River is deteriorating, presumably due to the inflow of untreated industrial wastewater and also the non-point source discharge containing fertilizers and pesticides from agricultural lands. Sewerage system in Flamenco City with domestic wastewater treatment plant has already been provided over almost all the urban area, thereby resulting into no effects of water pollution originating from domestic wastewater. Recent deterioration of river water has caused the reduced fishery catch, frequent occurrences of water-born diseases among water users and the damage of biodiversity.
Stakeholders	
- Water users	General citizens, fishery folks and NGOs associated with environmental matters.
- Polluters	• Private Industries: Mainly manufacturing industries ranging from various scales, discharging wastewater into the Sanchez River. • Farmers: Cultivating vegetables and crops in the lands, using fertilizers and pesticides • General citizens: living in Flamenco City and discharging domestic wastewater. Their domestic wastewater is discharged into the Sanchez River after the treatment by sewerage system.
- Administrative agency	• Environment Agency: To manage the entire water environment and regulate industrial wastewater. • Construction Agency: To plan, construct and operate sewerage network and treatment plant of domestic wastewater. • Health Agency: To manage peoples' health conditions. • Agriculture Agency: To manage agricultural activities.

(2) Problem Identification

For example, in case of "Sanchez River Water Quality Improvement Project", the problem may be identified as follows:

Despite of the treatment of domestic wastewater from households by sewerage system, the water quality of the Sanchez River has been deteriorating in Flamenco City, recently. According to the water quality monitoring undertaken by Environment Agency, this water quality deterioration is considered to be caused by untreated industrial wastewater and agricultural drainage. It has been known that this worsening water quality causes the reduction of fishery harvest and the occasional occurrence of water-born diseases in the region.

(3) Baseline Survey

In case of the "Sanchez River Water Quality Improvement Project", necessary data and information collected through the baseline survey should be presented in the following structure:

1. General characteristics of project area	General features of the project area, like geography, socio-economy, natural and environmental conditions, etc.
2. Present status of water pollution and its influences	The present status of water pollution, like water quality, possible pollution sources, environmental problems (the reduction of fishery harvest, the occurrence of water-born diseases, etc.) caused by water pollution, etc.
3. Legislation, policy and administrative setup	Legislation, national and regional policy for water environment, stakeholders related with water pollution, administrative setup and duties concerned with water pollution, etc.
4. Present management and practice for water pollution	Current management and practice for water pollution by associated agencies and respective roles of stakeholders.

3.2 Stakeholder Analysis (Step 2)

Guiding Principle

The purpose of the stakeholder analysis is to understand respective stakeholders' situation concerning the problem, like the degree of involvement in pollution generation, interesting in the problem, influences of the problem, roles and ability in problem alleviation, etc. As a result of stakeholder analysis, the implementing agency, the target group, major objectives of a project, etc. are determined. The steps of the stakeholder analysis are comprised of: 1) Identification of all stakeholders involved, 2) Categorization of stakeholders, 3) Detailed analysis of selected stakeholders, and 4) Setting priorities.

Explanation

(1) Overview

When considering the undertaking of a countermeasure, the first step is to confirm the Target area and to understand its current conditions with regard to the field of the countermeasure to

be addressed. Focusing on people and organizations, an attempt for understanding of current conditions concerning the problem is referred to as the stakeholder analysis.

(2) Preparatory Analysis

Prior to initiating detailed analytical work with stakeholder groups, it is important that those involved in the identification or formulation of projects are sufficiently aware of the policy, sector and institutional context within which they are undertaking their work. The scope and depth of this preliminary analysis will depend primarily on how much information is already available and its quality.

In general, it should not be the work of each individual project planning to undertake "new" analysis of development/sector policies or the broader institutional framework. Rather, it should access existing information and then work to extract necessary elements from existing data and information.

(3) Procedures of Stakeholder Analysis

Step 1: Identification of All Stakeholders Involved

In this first stage, all stakeholders (e.g. individuals, formal/ informal interest groups, e.g. professional groups, family units, institutions, implementing agencies, or other projects, etc.) which may be affected by the problem or which may affect the project are identified.

The groups listed are then reviewed to see, whether they are homogenous units or whether they consist of sub-groups or sections with specific interests or problems that have to be listed separately.

It is important to list all stakeholders whose views have to be known in order to fully understand the problem as well as all stakeholders that are likely to be affected by the project (positively or negatively), in a direct or indirect way. It is equally important to pay attention to gender, as the views and interests of men and women may differ to a considerable extent.

Step 2: Categorization of the Stakeholders

There are a variety of key words used to differentiate between different types of stakeholder. Terminology used commonly may be summarized as below:

1. Stakeholders	Individuals or institutions that may – directly or indirectly, positively or negatively – affect or be affected by a project.
2. Beneficiaries	Beneficiaries are those who benefit in whatever way from the implementation of the project. Further distinction may be made as below:
- *Target group*	The group/entity who will be directly positively affected by the project at the level of the project's purpose.
- *Final beneficiaries*	Those who benefit from the project in the long term at the level of the society or sector at large, e.g. "children" due to increased spending on health and education, "consumers" due to improved agricultural production and marketing

3. Project partners	Those who implement a projects together a project implementing agency.

After having listed all relevant stakeholders, they are categorized according to the relevant criteria as mentioned above. After having categorized the stakeholders, the most relevant stakeholders for the specific project context are selected for detailed analysis.

Step 3: Detailed Analysis of Selected Stakeholders

A number of tools are available for a more detailed analysis of selected stakeholders. Which tool or tools to use always depends on which information is of interest in a specific situation.

One way to analyse stakeholders is to identify their individual characteristics and subsequently the expected implications for a project (such as resistance or support). The findings can be displayed in a matrix.

In addition, SWOT analysis (strengths, weaknesses, opportunities and threats) is used to analyse the internal strengths and weaknesses of an organization and the external opportunities and threats that it faces. It can be used either as a tool for general analysis, or to look at how an organization might address a specific problem or challenge.

Step 4: Setting Priorities

Through the stakeholder analysis, a decision has to be made on which objectives to adopt for the project, i.e. whose interests and views to give priority. In this analysis, the target group (s) of a project is determined. Ideally a consensus should be found between the stakeholders involved. Realistically, an attempt should be made to achieve a compromise between the different stakeholders' views and interests.

When defining objectives, the important is agreed upon and made transparent which views and interests are given priority to. Attention has to be paid to avoid potential conflicts arising from setting priorities. Where conflicts are likely to arise, it should be carefully considered how they could be avoided or mediated, and what impact it would have on the project (if the conflicts cannot be avoided or mediated).

Example

Table 3-1 shows the result of stakeholder analysis for the "Sanchez River Water Quality Improvement Project."

Table 3-1 Example of Stakeholder Analysis

Basic Characteristics / Stakeholders	Interests and how affected by the problems	Capacity and motivation to bring about change	Possible actions to address the problem
<Fishing folks> Low income earners, small scale family businesses, organised into informal cooperatives, women actively involved in fish processing and marketing.	• Maintain and improve their means of livelihood. • Pollution is affecting volume and quality of catch. • Family health is suffering, particularly children and mothers.	• Keen interest in pollution control measures. • Limited political influence given weak organizational structure.	• Support capacity to organize and lobby. • Press industries to take pollution control measures. • Identify/develop alternative income sources.
<Industries> Various scale manufacturing industries, Improper facilities for water pollution, poorly regulated, influential lobby group, poor environmental record.	• Maintain/increase profits • Some concern about public image. • Concern about costs if environmental regulations enforced.	• Have financial and technical resources to employ new cleaner technologies. • Limited current motivation to change.	• Raise their awareness of social and environmental impact. • Mobilise political pressure to influence industry behaviour • Strengthen and enforce environmental laws.
<Citizens> Households discharge wastewater into sewerage, use river water for bathing, washing and, in some area, drinking.	• Aware of industrial pollution and impact on water quality • Trouble in the occurrence of water-born diseases, sometimes. • Want access to clean water.	• Limited understanding of the health impact of their own wastewater disposal. • Press lobby government bodies more effectively.	• Raise awareness of households as to clean water. • Work with communities and local government on addressing water and sanitation issues.
<Environment Agency> Agency is an administrative units responsible for water pollution.	• Receive complains from citizens about water pollution.	• The regulation to promote the introduction of clean technologies is not in place. • No right to regulate the use of fertilizers and pesticides.	• Strengthen the standard of effluent wastewater. • Enforce the incentive measures to promote the introduction of clean technologies.
<Agricultural Agency> Agency is an administrative units responsible for agriculture.	(No relevant information)	• Has the right to regulate toxic pesticides. • Has knowledge and experience on how properly to use fertilizers and pesticides. • Has experience and know-how in instructing farmers.	• Instruct farmers concerning appropriate uses of fertilizers and pesticides.
<Construction Agency> Agency is an administrative units responsible for the construction and operation of infrastructure facilities including sewerage facilities for domestic wastewater.	• Present sewerage system for domestic wastewater has no capacity to receive industrial wastewater.	• The management of industrial wastewater is beyond its responsibility.	(No relevant information)

Useful Information

Table 3-2 shows the SWOT analysis for the fishing folks on the project on the "Sanchez River Water Quality Improvement Project."

Table 3-2 Example of Stakeholder Analysis with SWOT Analysis

For Fishing Folks	
Strengths	**Weaknesses**
• Grassroots-based group comprising small fishery families. • Focused on the specific concerns of the recent reduction of fishery harvest. • Men and women both represented.	• Limited lobbying capacity and environmental management skills. • Lack of formal constitutions and unclear legal status. • Weak linkages with other organizations. • Internal disagreements on limiting fishing effort in response to declining fish stocks.
Opportunities	**Threats**
• Growing public/political concern over water pollution and health impacts. • Recent trends in new government legislation for environmental protection. • The river is potentially rich in resources for local consumption and sale. • New markets for fish and fish products developing as a result of improved transport infrastructure to nearby population centers.	• Political influence of industrial lobby groups who are opposed to tighter environmental protection laws. • New environmental protection legislation may impact on access to traditional fishing grounds and the fishing methods that can be employed.

3.3 Problem Analysis (Step 3)

Guiding Principle

Problem analysis identifies the negative aspects of an existing situation, and establishes the "Cause -Effect" relationship between the identified problems, by using a problem analysis tree.

Explanation

(1) Overview

Problem analysis identifies the negative aspects of an existing situation and establishes the "Cause-Effect" Relationships between the identified problems. It involves three (3) main steps:

1. Definition of the framework and the subject to be analyzed;
2. Identification of the major problems faced by target group(s) and beneficiary (ies) is (What is/are the problem/s? and whose problems?); and
3. Visualisation of the problems in form of a diagram, called a "Problem Tree" or "Hierarchy of Problems" to help participants analyse and clarify "Cause-Effect" relationships.

(2) How to Establish a Problem Analysis Tree

Creating a problem analysis tree should be undertaken with participatory approach attended by major stakeholders. It requires the use of individual pieces of paper or cards (called "Suggestion Cards") on which individual problem statements are written, and then suggestion cards are sorted into the cause and effect relationships on a visual display.

The procedure for creating the problem analysis tree is presented as follows:

Step A: The aim of the first step is to hold brainstorming discussion on problems in which stakeholders consider to be a priority concerns/problems. This first step can either be completely open (no pre-conceived notions as to what stakeholder's priority concerns/problems might be), or more directed, through specifying a "already known" high order problem or objective based on preliminary analysis of existing information and initial stakeholder consultations.

Step B : Select an starter problem from the problems identified through the brainstorming. The starter card is a suggestion card which is considered to represent the problem to be addressed by the project.

Step C : Look for related problems to the starter problem.

Step D : Begin to establish a hierarchy of cause and effects:

- Problems which are directly causing the starter problem are put below.
- Problems which are direct effects of the starter problem are put above.

Step E : All other problems are then sorted in the same way – the guiding question being "What causes that?" If there are two or more causes combining to produce an effect, place them at the same level in the diagram.

Step F : Connect the problems with cause-effect arrows – clearly showing key links.

Step G : Review the diagram and verify its validity and completeness. Ask yourself/the group – "Are there important problems that have not been mentioned yet?" If so, make the suggestion card for that problems and put them at an appropriate place in the diagram.

(3) Important Considerations in Problem Analysis

The analysis result is presented in diagrammatic form, called the "Problem Analysis Tree", showing effects of a problem on the upper and its causes underneath. The analysis is aimed at identifying the real bottlenecks which stakeholders put the high priority to, and which they wish to overcome. A clear problem analysis thus provides a crucial foundation to develop a set of project objectives.

Important points to be noted in using the problem analysis tree as a tool are:

- The quality of output will be determined largely by who are involved in the analysis and the skills of the facilitator. Involving stakeholder representatives with appropriate knowledge and skills is critical;
- A workshop involving groups of up to about 10 people is an appropriate forum for developing a problem analysis tree, to analyze the results and then propose next steps;
- It may be appropriate to undertake a number of separate problem analysis exercises with different stakeholder groups, to help determine different perspectives and how

priorities vary;

- The process is as important as the product. The exercise should be treated as a learning experience for all those involved, and an opportunity for different views and interests to be expressed; and
- The product of the exercise (the problem analysis tree) should provide a robust but simplified version of reality. If it is too complicated, it is likely to be less useful in providing direction to subsequent steps in the analysis. A problem tree cannot (and should not) contain or explain the complexities of every identifiable cause-effect relationship.

Once completed, the problem analysis tree represents a summary picture of the existing negative situation. In many respects, the problem analysis is the most critical stage of project planning, as it then guides all subsequent analysis and decision-making on priorities.

Example

Figure 3-1 presents the problem analysis tree for the "Sanchez River Water Quality Improvement Project".

From this problem analysis tree, it has been clarified that the river water quality degradation is caused by: the discharge of both: 1) fertilizers and pesticides being used for agriculture lands, and 2) untreated industrial wastewater.

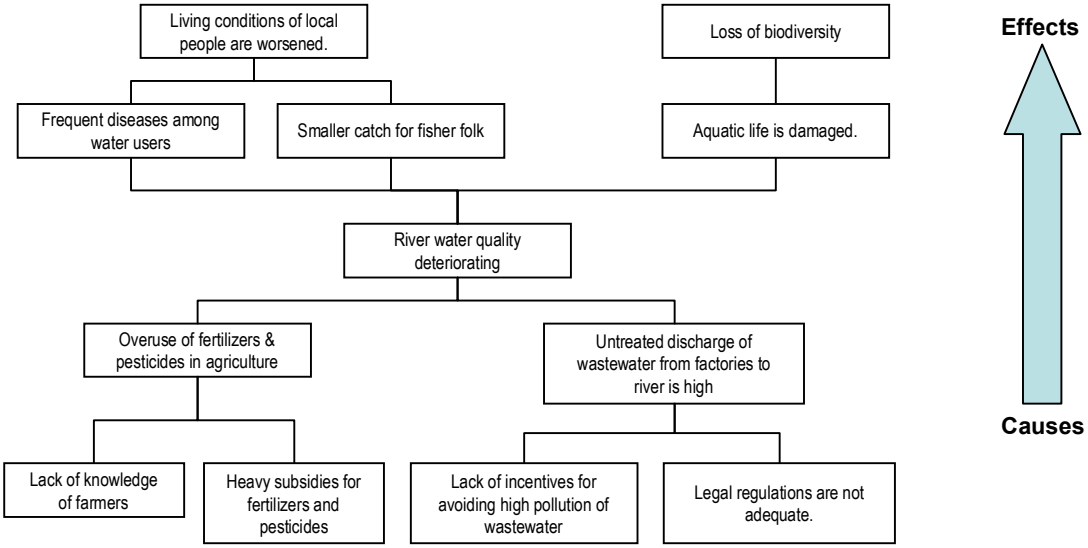


Figure 3-1 Example of Problem Analysis Tree

Useful Information

In some cases of the problem analysis, many suggestion cards are found in the lower raw, taking a long time necessary to finish the analysis. In such case, we should concentrate on identifying influential and major problems, tentatively neglecting some card describing very precise and specific problems. If these cards are placed in the lower raw of around the fourth raw from the starter card, we can tentatively set aside (not remove) out of the problem analysis tree in order to simplify the total picture, as shown in **Figure 3-2**.

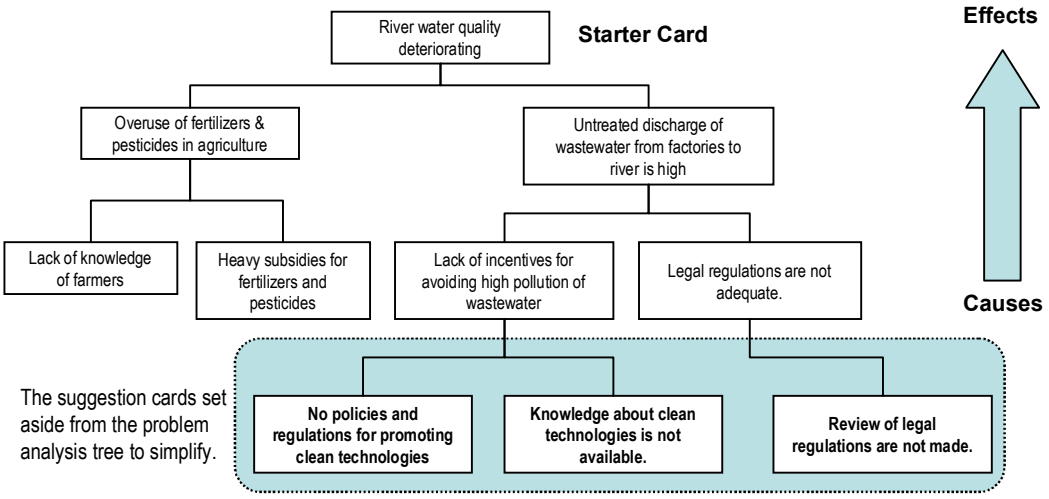


Figure 3-2 Simplification of Problem Analysis Tree

3.4 Objective Analysis (Step 4)

Guiding Principle

Objective analysis identifies the "means and ends" relationship between the desirable situation that would be attained once problems have been solved, by using a objective analysis tree.

Explanation

(1) Overview

Objective analysis is a methodological approach to:

- Describe the situation in the future once identified problems have been remedied;
- Verify the hierarchy of objectives; and
- Illustrate the "means-ends" relationships in a objective analysis tree.

The "negative situations" of the problem analysis tree are converted into solutions, expressed as "positive achievements". For example, "river water quality is deteriorating" is converted into "river water quality is improved".

These positive achievements are in fact objectives, and are presented in a diagram of objectives showing the "means and ends" hierarchy. This diagram aims to provide a clear overview of the desired or intended future situation.

(2) How to Establish a Objective Analysis Tree

Main steps of objective analysis are presented as below:

Step A : Reformulate all negative situations of the suggestion cards for problems analysis into positive situations that are:

- Desirable; and
- Realistically achievable.

Step B : Check the "means-ends" relationships to ensure validity and completeness of the hierarchy (the "cause-effect" relationships are turned into means-ends linkages)

Step C : If necessary:

- Revise statements of suggestion cards;
- Add new objective cards, if these seem to be relevant and necessary to achieve the objective at the next higher level; and
- Delete objective cards which do not seem suitable or necessary.

(3) Important Considerations in Problem Analysis

Once again, the analysis of objectives should be undertaken through appropriate consultation with key stakeholder groups. Information previously gained from the undertaking stakeholder analysis, including the consideration for necessary abilities, should also be taken into account. This should help in terms of:

- Considering priorities;
- Assessing how realistic the achievement of some objectives might be; and
- Identifying additional means that might be required to achieve desired (or intended) ends.

Once complete, the objective analysis tree provides a summary picture of the desired future situation, including the indicative means by which ends can be achieved.

As with the problem analysis tree, the objective analysis tree should provide a simplified but robust summary of reality. It is a simple tool to aid analysis and presentation of ideas. As such, the objective analysis tree keeps the analysis of potential project objectives firmly based on addressing a range of clearly identified priority problems.

Example

Figure 3-2 presents the objective analysis tree for the "Sanchez River Water Quality Improvement Project." This is formed by converting the negative expressions of the situations stated in the suggestion cards into the desirable expressions. Therefore, this shows the "means and ends" relationship on the river water pollution issues.

From this objective analysis tree, it has been clarified that appropriate countermeasure against the discharge of: 1) fertilizers and pesticides from agricultural lands, and 2) untreated domestic and industrial wastewater.

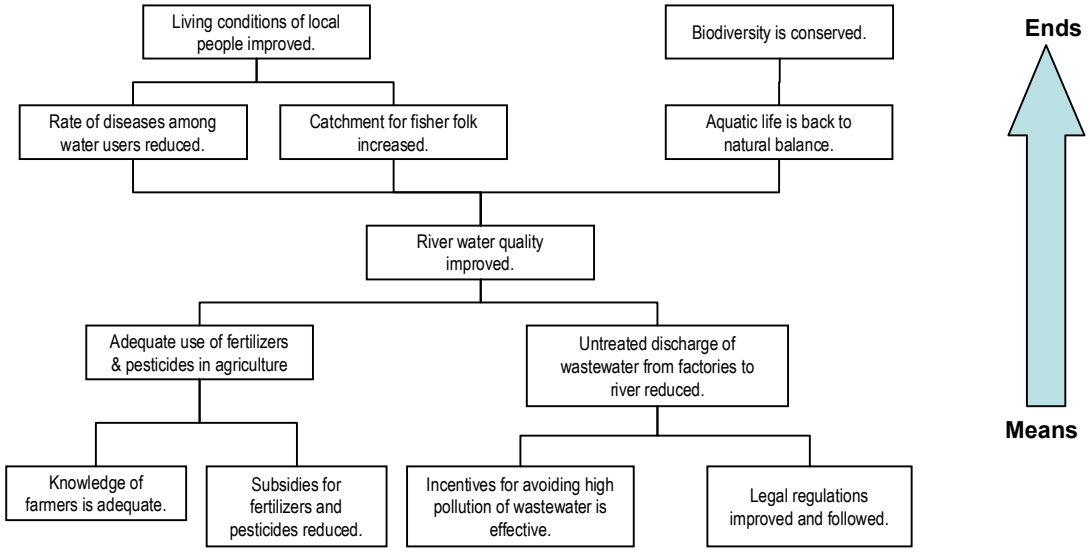


Figure 3-3 Example of Objective Analysis Tree

3.5 Strategy Setting (Step 5)

Guiding Principle

The strategy setting is a process in which specific project approaches (or strategies) are selected from among the groups of the "means and ends" raised in the objective analysis, based on certain selection criteria. As a result of the strategy setting, a scope of the project is determined. Based on this selection, the framework of the project is formed in the subsequent step.

Explanation

(1) Overview

During the process of stakeholder analysis, problem analysis and objective analysis, views on the potential merits or difficulties associated with addressing problems have been discussed. These issues and options then need to be more fully scrutinized to help determine the likely scope of the project, before more detailed design work is undertaken.

In some respects, this strategy setting is the most difficult and challenging process in the countermeasure planning, as it involves synthesizing a significant amount of information and then making a complex judgment about the best implementation strategies to pursue. In practice, a number of compromises often have to be made to balance different stakeholder interests, political demands, practical constraints such as the likely resource availability, required abilities and others.

(2) Selection of Adoptable Approach

First, several approaches are primarily identified in the objective analysis tree, taking account of issues to be addressed in the project.

Next, each approach is compared precisely, by using certain criteria. While the criteria to be applied for the strategy setting are widely depending on the characters of the project, it is considered that the following is commonly applicable for the environment countermeasure planning:

- Possibility that the main issue can be solved within a predictable project period;
- Expected contribution to main issues to be addressed;
- Legal mandate and tasks of an implementing agency of the project;
- Possibility of cooperative actions with associated parties,
- Complementarity with other ongoing or planned projects;
- The urgency called in the project;
- Policy priorities of a region and an implementing agency;
- Required amounts and their categories of inputs (like human resources, budgets, facilities, technologies, etc.); and
- Institutional capacities of associated parties, especially a implementing agency;

(3) Strategy Setting

First, select a suggestion card which means the proposition most appropriate for achieving the solution within expected period. The proposition of this selected card becomes the Target aimed in the project.

Then, rearrange all the cards of the selected approach, and review and modify the propositions of cards (if necessary). The cards placed upward become the Goal and the cards placed downward become the strategies.

In the stage of the strategy setting, we must have the image of the project period, in light of the scale of a selected project approach.

Example

(1) Selection of Adaptable Approach

In the example of the "Sanchez River Water Quality Improvement Project", it is assumed that the project is planned by Environment Agency which has the responsibility for water quality management in this region.

It has been already analyzed in the problem analysis that the river water pollution in the region are caused by two (2) causes: 1) the discharge of fertilizers and pesticides used in the agricultural lands and, 2) the discharge of domestic and industrial wastewater. First, two (2) approaches have been primarily selected as possible strategies for addressing this issue as shown in **Figure 3-3**. One is the agriculture strategy for the discharge of fertilizers and pesticides, and another is the environment strategy for the discharge of domestic and industrial wastewater.

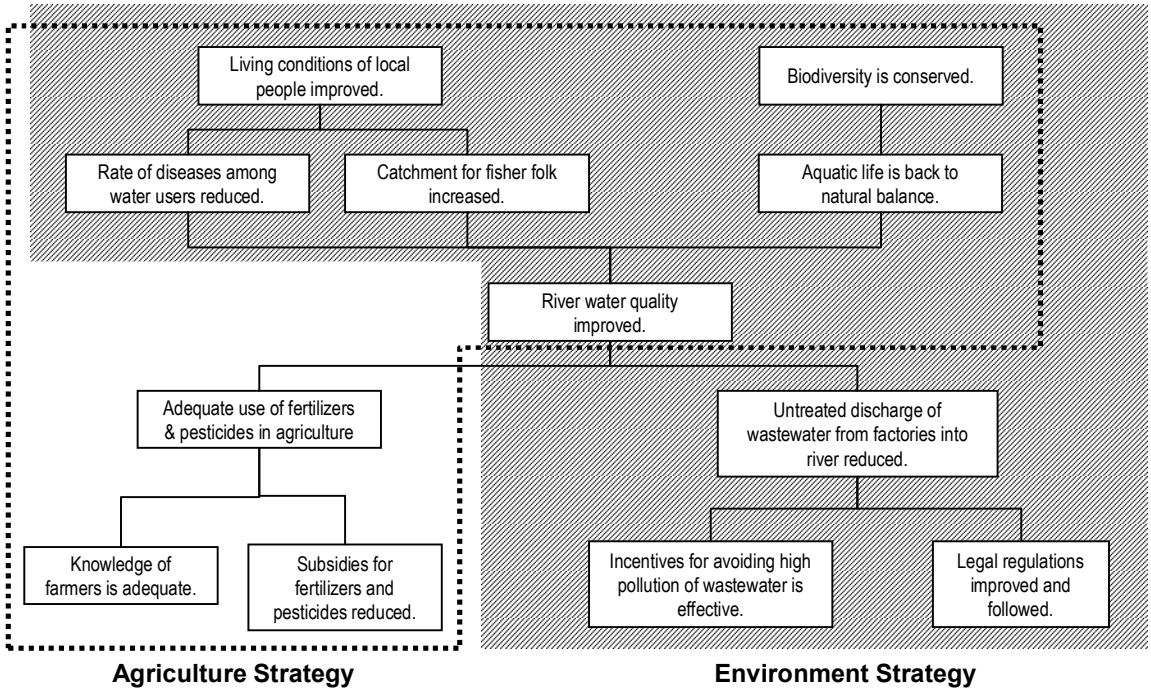


Figure 3-4 Example of Selection of Adopted Strategy

In this case, the environment strategy has been finally selected as the project strategy to be pursued in the project. This is because it is considered that the implementing agency of the project is Environment Agency which has no administrative responsibility for the utilization of fertilizers and pesticides in agricultural lands. While the environment strategy has been selected for the project in this case, it is very important here that, besides the selected approach, the agricultural strategy is required to achieve actual situation of "river water quality improved." For that reason, the selected project needs to put the assumption that some countermeasure against fertilizers and pesticides is taken separately.

(2) Strategy Setting

Based on the selected approach of the environment strategy, the Strategy of the project is set up as the chart shown in **Figure 3-4**.

In this strategy setting, the proposition of the Target has been modified to become a more clear statement, as "pollution load of industrial wastewater discharge to the Sanchez River is reduced." It is possible that, if necessary, we rewrite the proposition of other suggestion cards for the purpose of more clarifications.

This strategy chart is the final outcome of the analysis phase. In the process of the strategy setting, the project objectives like Target, Goal and Strategy, which are intended results of a project are determined.

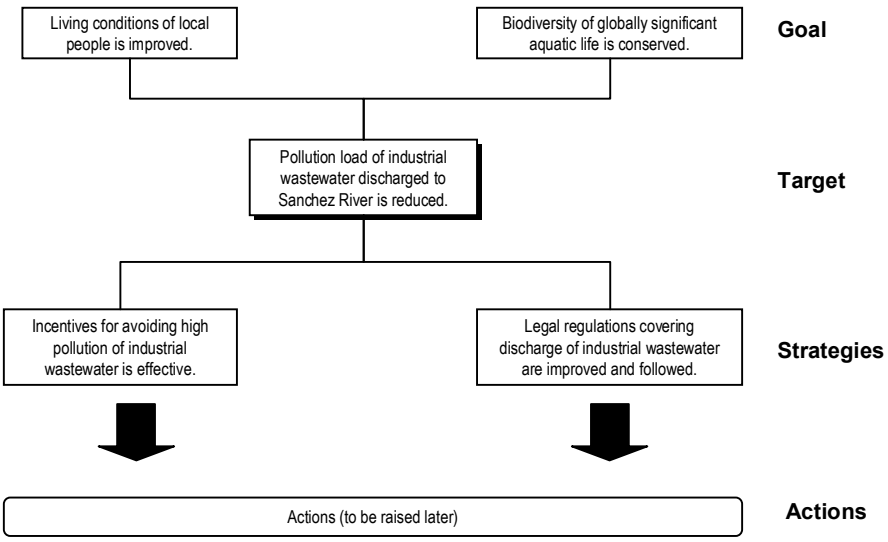


Figure 3-5 Example of Strategy Chart

CHAPTER 4
PLANNING PHASE

4.1 Design of Action Plan (Step 6)

Guiding Principle

The Actions are specific activities to be taken by the implementing agency (together with project partners, if any) to attain the Strategies through the effective use of the Inputs. In the design of the Action Plan, all necessary actions to deliver the Strategies established in the strategy setting must be raised. The Actions are completely clarified in terms of 5W1H (what, when, where, who, why and how).

Explanation

(1) Action Plan

In the design of the action plan, all necessary actions to deliver the Strategies established in the strategy setting of the analysis phase must be raised. Basically, necessary actions should come up in the examination on how, what, when, where, who and why to attain the Strategy.

It is very important in the design of the action plan that all necessary actions are completely raised. This, in the theory of a logic model, means that, if some necessary Actions are missing, the relevant Strategies are not delivered.

To completely raise necessary actions, we must consider how for the situation indicated in the Strategies to be produced based on the "cause and effect" relationship. Thus, not only the actions necessary for directly producing the Strategy but also the ones for indirectly producing must be designed.

To ensure the complete raising of necessary Actions, the following viewpoints are helpful:

1. Are the individual abilities of the implementing agency's staffs enough?	If the individual abilities of taking certain actions are not enough, proper actions for enhancing the capacity development must be incorporated in the design of the action plan.
2. Is the organizational structure of the implementing agency appropriate?	If the organizational structure of the implementing agency is not appropriate for taking certain actions, restructuring or organizing of a new unit must be incorporated in the design of the action plan.
3. Are some cooperative actions necessary?	If some cooperative actions with other units are required to carry out some actions, such cooperation must be incorporated in the design of the action plan.
4. Are certain actions placed within the task of the implementing agency	If certain actions are not placed within the task of the implementing agency under the

under the laws and regulations?	related laws and regulations, the amendment of the laws and regulations must be attempted, otherwise other actions must be reconsidered.

(2) Breakdown of Actions

In some project (especially in a large-scale project), further breakdown of the Actions into sub-actions becomes more convenient. In such case, Actions are comprised of, for example, "Trunk Action" and "Module Action" or "Component Action", as shown in **Figure 4-1**.

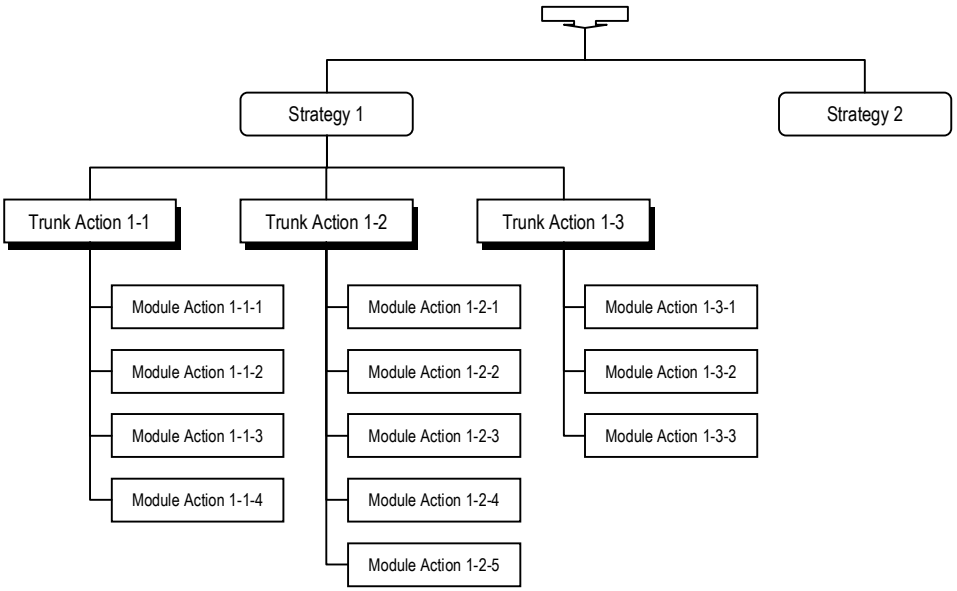


Figure 4-1 Composition of Actions

Example

In the "Sanchez River Water Quality Improvement Project", the Strategies set in the strategy setting are:

- Strategy 1: Incentives for avoiding high pollution of industrial wastewater is effective; and
- Strategy 2: Legal regulations covering discharge of industrial wastewater are improved and followed.

The actions necessary for attaining these Strategies are discussed in the workshop, thereby resulting into the a series of actions as shown in **Figure 4-2**.

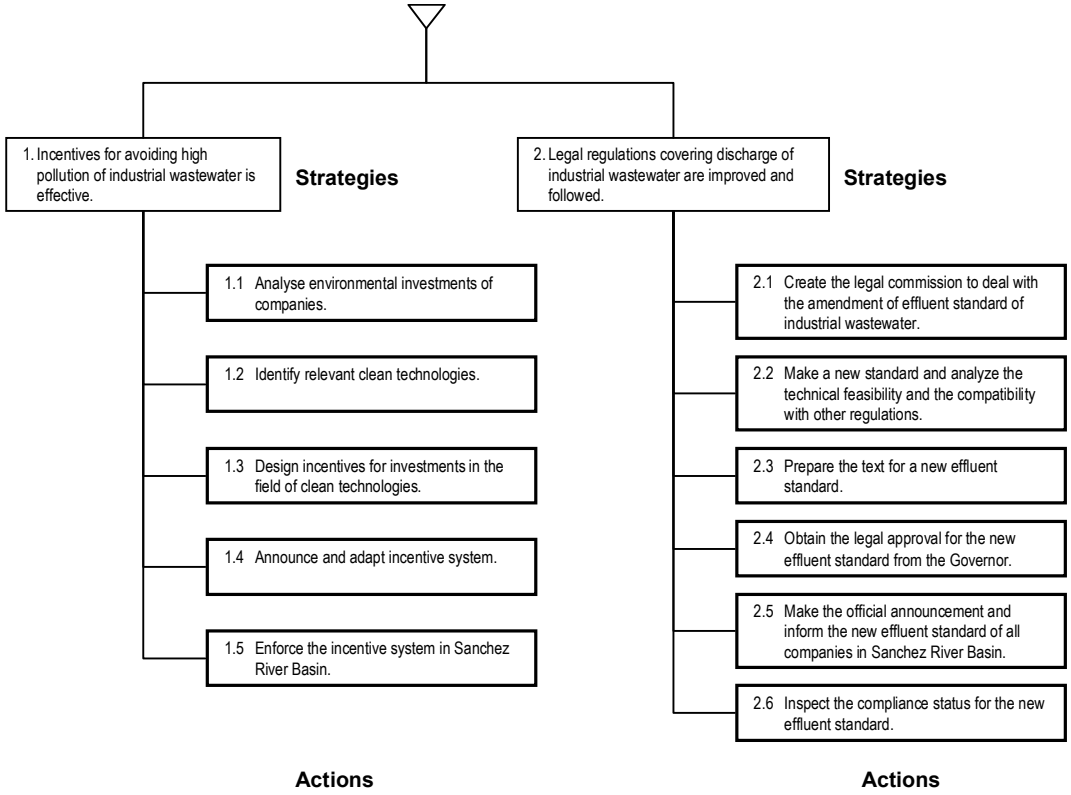


Figure 4-2 Example of Design of Action Plan

Useful Information

(1) Numbering and Arrangement of Actions

All necessary Actions raised in the design of action plan are captioned by serial numbers, so that people concerned can easily find out the strategy to be attained by the actions. Beside, the actions raised should be arranged from the top to down according to the timeline.

(2) Forming of Framework Chart

In the analysis phase and the planning phase up to here, we have discussed the Goal, the Target, the Strategy and the Action which are core elements of PDM. **Figure 4-2** is called a framework chart which visualizes the discussion results. This is often used to review and grasp at a glance the entire results of the discussion up to here.

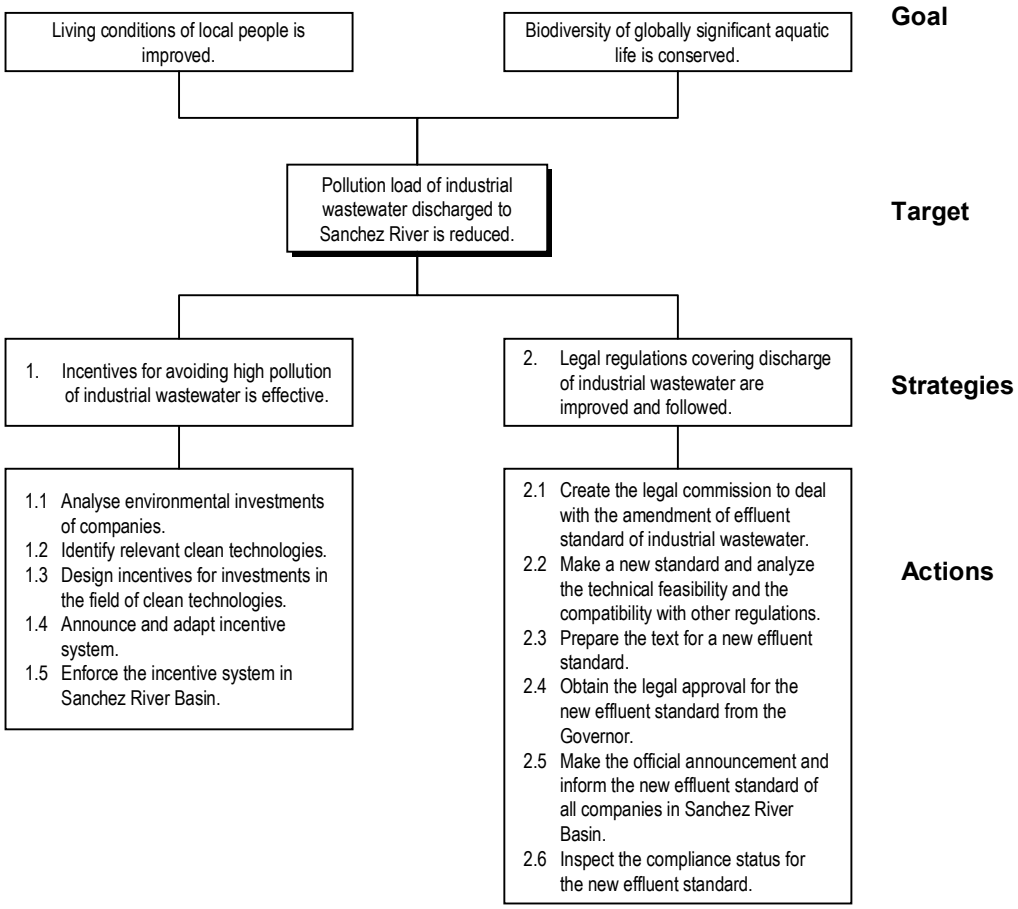


Figure 4-3 Example of Framework Chart

4.2 Examination of Assumption and Pre-Condition (Step 7)

Guiding Principle

The Important Assumption is a critical condition for the success of the project implementation which is not certain at the time of the project planning and not controllable by the project implementers. In this step, the Important Assumption for the Target, the Strategies and the Actions are examined. Together, the Pre-Condition which are necessary for starting the project is examined.

Explanation

(1) Vertical Logic Relationship of PDM

The Important Assumptions are connected to parts of the project objectives by logic relationships. In a project, Inputs are provided and, then Actions begin, after Pre-Conditions are fulfilled. Strategies are achieved when Actions have been conducted and Important Assumptions appearing on the same level of the PDM as the Actions, are satisfied. This relationship continues to apply at every level moving up along the PDM, and is illustrated with arrows in **Figure 4-4**. This relationship is referred to as the "Vertical Logic Relationship of PDM."

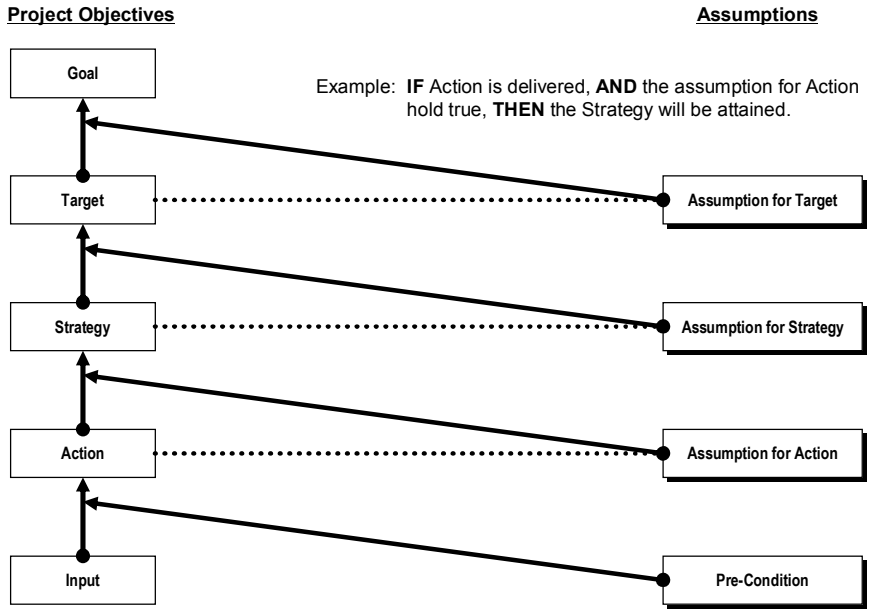


Figure 4-4 Concept of Assumption and Pre-Condition

(2) Examination of Important Assumption

The important assumptions are crucial conditions for the project success. More precisely they may be described as the following conditions that they:

- Are required for the success of the project;
- Exist outside the control of the project; and
- Cannot be positively determined whether it will be fulfilled or not.

The Important Assumptions can be commonly identified form the following perspectives which are considered to be not controllable in the project:

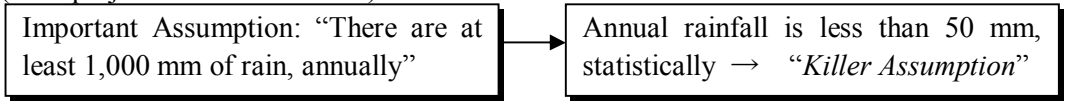
Perspectives	Examples
1. Economy (price and distribution)	"The price of rice does not fall." *(Regarding the goal of "increasing income from the sale of rice")*
2. Policies and regulations	"The Ministry of Health does not change its pediatric medicine policies." *(Regarding the goal of "sustaining the pediatric medicine project")*
3. Environment	"There are at least 1,000 mm of rain annually (or there are not severe drought)." *(Regarding the target of "increasing agricultural harvest")*
4. Socio-culture	"Substantial numbers of men (husbands and sons) do not leave the village to work elsewhere." *(Regarding the strategy of "lightning the workloads of women")*
5. Stability of staffing	"Trained employees continues working." *(Regarding the output of "improving the skills of employees")*

(3) Killer Assumption

In case the probability of an Important Assumption to be fulfilled is expected to be very low, a change of project components must be considered. Such an Assumption is called "Killer Assumption". If the project component are not changed, this assumption may kill the project and the project will eventually fail.

For example, if the higher harvest of rice is the target of the project to be implemented in the desert area, the following Important Assumption can be a "Killer Assumption". The failure of the project is no doubt.

(for a project in the desert area)



(4) Pre-Condition

Pre-Conditions are basic requirements that should be fulfilled before a project starts. They are conditions that should be fulfilled, with an understanding that it is not possible to begin a project simply by applying Inputs.

Example

Important Assumptions and Pre-Conditions are raised in the workshop discussions. In case of the "Sanchez River Water Quality Improvement Project", the following assumptions and pre-conditions are considered:

Project Objectives	Important Assumptions or Pre-Conditions
1. <Target>: Pollution load of wastewater discharged into the Sanchez River is reduced.	Pollution through application of fertilizers and pesticides is not increased.
2. <Strategy>	Upstream water quality remains stable.
-1. Incentive for avoiding high pollution of wastewater are effective.	
-2. Legal regulations covering the discharge of wastewater are improved and followed.	
3. <Pre-Condition>	Budget necessary for environmental measures is available in time.

In the Important Assumption for the Target, it is foreseen that the pollution caused by fertilizers and pesticides will become not serious in the future. On the other side, this Important Assumption implies that Environment Agency cannot handle the pollution caused by fertilizers and pesticides, because the regulations against them are within the task of the Agriculture Agency. However, we must confirm that the amounts of fertilizers and pesticides to be used in the future are not likely to increase.

Likewise, in the Important Assumption for the Strategy, it is predicted that the water quality in the upstream will remains stable.

4.3 Setting of Indicator (Step 8)

Guiding Principle

The Verifiable Indicators shows levels or degrees to be achieved for project objectives (like Strategies, Target and Goals). The setting of the Verifiable Indicators allows clear determination of project objectives to be achieved and makes verification of project status more objective. Meanwhile, Source of Verification refers to the source of data to used for Verifiable Indicators. They indicates the place from which data is to be obtained.

Explanation

(1) Verifiable Indicators

Verifiable Indicators are used to verify project status in monitoring an ongoing project, and project achievement, when a project has finished. Generally, Verifiable Indicators comprise such element as type, quantity, and quality of data, the time and locations. To the extent possible, the Verifiable Indicators should be quantitative as shown in **Table 4-1**, so that they help to clarify the status to be achieved.

Table 4-1 Verifiable Indicators

Elements and Indicator	Example A	Example B
Target (as Project Objective)	Capabilities of engineers on flood and erosion control in Country A are improved.	Wheat production increases in Village B
Type of Data	Numbers of engineers	Wheat production
Group	Engineers of Civil Engineering Division	Families living in C District
Quantity	20 people trained	Increase by 30 %
Quality	Ability to appropriately use developed technologies	Same level as in 2007
Time	May 2013	October 2010
Location	Civil Engineering Division	Village B
Verifiable Indicator	In Civil Engineering Division, 20 engineers who can use technologies developed by the project for flood and erosion control in Country A are trained by May 2013.	Wheat production by C District farming families in Village B increases by 30 % by October 2010, while preserving 2007 level crop quality.

(2) Source of Verification

Source of Verifications indicates the place from which data is to be obtained, organization providing the data, documentation in which they are found, and methods for obtaining them. Statistics and recorded data gathered internally and externally serve as the Source of Verification.

When there are no external data sources for the Verifiable Indicators, necessary data are gathered and analyzed internally. In this case, it should be noted that the work for gathering data and information itself becomes a component of project actions which must be placed in PDM.

Example

The Verifiable Indicators and Source of Verification are raised in the workshop discussions. In case of the "Sanchez River Water Quality Improvement Project", the following in **Table 4-2** the Verifiable Indicators and the Source of Verification are considered:

Table 4-2 Example of Verifiable Indicators and Source of Verification

Narrative Summary	Verifiable Indicator	Source of Verification
<Goal> • Biodiversity of globally significant aquatic life is conserved. • Living conditions of local people is improved.	• The species x-fish, and y-fish returns into the Sanchez River, 3 years after the project started. • The rate of water-born diseases amongst water users is reduced by 60 %, 3 years after the project started.	• Biological survey report • Yearly Health Condition report
<Target> Pollution load of wastewater discharged into the Sanchez River is reduced.	• Organic pollution load is reduced by 85 %, 3 years after the project started. • The concentration of heavy metal compounds (Pb, Cd, Hg) in the monitoring station of the Sanchez River is reduced 90 %, 3 years after the project started.	• Environmental monitoring report
<Strategy> 1. Incentive for avoiding high pollution of wastewater are effective. 2. Legal regulations covering the discharge of wastewater are improved and followed.	• 60 % of the companies in the province, use the incentives to invest in environmental technologies, 2 years after the project started. • 80 % of the companies observes the new standard of heavy metals, 10 months after the project started. • Self-monitoring reports are submitted quarterly by al companies in the Flamenco Province, 15 months after the project started.	• Project report • Official gazette issued by the Government • Environmental monitoring report

Useful Information

In the early stage of project planning, determining the Verifiable Indicators is often difficult, because of a lack of precise data and information. In such case, raise a simple description of the Verifiable Indicators for the moment, and then replace by more specific ones at a later stage.

4.4 Scheduling of Input (Step 9)

Guiding Principle

The Inputs are personnel, equipment and facilities, budget and others necessary for taking Actions. All Inputs necessary for taking Actions raised in the PDM must be considered including their types and quantities.

Explanation

In any project, kinds of resources are required to realize the Actions raised in the PDM. These resources are called Inputs.

Inputs may be categorized by personnel, equipment and facilities, budget and others as presented below:

1. Personnel	Man-powers (from a implementing agency, project partners and cooperative parties) necessary for realizing the Actions.
2. Equipment and facilities	Equipment and facilities necessary for realizing the Actions, like equipment and materials for measurement and analyses, vehicles for transportation, computers and related devices (including soft-wares), etc.
3. Budget	Budgets necessary for realizing the Actions, like expenses for travels, meeting, documents preparations, etc.
4. Others	Anything else necessary for realizing the Actions, like special data and information, etc.

Example

Inputs necessary for the project implementation are raised in the workshop discussions. In case of the "Sanchez River Water Quality Improvement Project", the following Inputs are considered:

1. Manpower of Environment Agency's staffs
2. Expenses for document preparations
3. Expenses for meetings and travels

It should be remarked that, in this case, required budget is raised as not the Inputs but the Pre-Condition.

4.5 Project Design Matrix (PDM) Forming (Step 10)

Guiding Principle

PDM (Project Design Matrix) is formed, using the project objectives and other key elements examined through the analysis and planning phase.

Explanation

PDM is a final output of the planning process on the countermeasure planning, and a basic tool which is very often used in the implementation, monitoring and evaluation of the project.

In the analysis and planning phase, the following projects objectives and other key elements have been set:

1. Generality of project (like project title, project period, implementing agency, target group)
2. Project objectives (like Goal, Target, Strategy, Action and Input)
3. Other key elements (like Verifiable Indicator, Source of Verification, Important Assumption and Pre-Condition)

Using these project objectives and other key elements, the PDM is formed by means of a certain format mentioned in the section 2.2.

Example

In case of the "Sanchez River Water Quality Improvement Project", the PDM shown in **Table 4-3** is formed:

Table 4-3 Example of PDM

Title:	Sanchez River Water Quality Improvement Project	***Project Period:***	Five (5) years
Implementing Unit:	Environment Agency	***Target Group:***	General citizens and fishery folks in Domingo Province

Project Objectives	Verifiable Indicator	Means of Verification	Important Assumption
<Goal> • Biodiversity of globally significant aquatic life is conserved. • Living conditions of local people is improved.	• The species x-fish, and y-fish returns into the Sanchez River, 3 years after the project started. • The rate of water-born diseases amongst water users is reduced by 60 %, 3 years after the project started.	• Biological survey report • Yearly Health Condition report	
<Target> Pollution load of wastewater discharged into the Sanchez River is reduced.	• Organic pollution load is reduced by 85 %, 3 years after the project started. • The concentration of heavy metal compounds (Pb, Cd, Hg) in the monitoring station of the Sanchez River is reduced 90 %, 3 years after the project started.	• Environmental monitoring report	• Pollution through application of fertilizers and pesticides is not increased.
<Strategy> 1. Incentive for avoiding high pollution of wastewater are effective.	• 60 % of the companies in the province, use the incentives to invest in environmental technologies, 2 years after the project started.	• Project report	• Upstream water quality remains stable.
2. Legal regulations covering the discharge of wastewater are improved and followed.	• 80 % of the companies observes the new standard of heavy metals, 10 months after the project started. • Self-monitoring reports are submitted quarterly by al companies in the Domingo Province, 15 months after the project started.	• Official gazette issued by the Government • Environmental monitoring report	
<Action> (For Strategy 1) 1.1 Analyse environmental investments of companies. 1.2 Identify relevant clean technologies. 1.3 Design incentives for investments in the field of clean technologies. 1.4 Announce and adapt incentive system. 1.5 Enforce the incentive system in Sanchez River Basin. (For Strategy 2) 2.1 Create the legal commission to deal with the amendment of effluent standard of industrial wastewater. 2.2 Make the new standard and analyze the technical feasibility and the compatibility with other regulations. 2.3 Prepare the text for the new effluent standard. 2.4 Obtain the legal approval for the new effluent standard from the Governor. 2.5 Make the official announcement and inform the new effluent standard of all companies in Sanchez River Basin. 2.6 Inspect the compliance status for the new effluent standard.	***<Input>*** • Man-hours of Environment Agency's staffs • Expenses for document preparations • Expenses for meetings and travels		***<Pre-Condition>*** Budget necessary for environmental measures is available in time.

4.6 Plan of Operations (PO) Forming (Step 11)

Guiding Principle

The PO (Plan of Operations) must be prepared to specify the timing, duration and responsible unit (at least) for all Actions listed in the PDM.

Explanation

The project must be implemented in accordance to the planned schedule. To do so, the PO which specifies the timing, duration and responsible unit of each the Action is prepared. The PO will be used to check the progress status in not only the project implementation but also monitoring and evaluation purpose.

In the preparation of the PO, the timing and duration of certain Actions need to be come out. Besides these, the following considerations should be incorporated to ensure actual enforcement of Actions:

1. Whether are Actions listed enough to generate Strategy aimed in the PDM?	Sometimes, it is found that some Actions are missing to generate scheduled Strategy. In such cases, additional Action must be placed in both the PDM and PO.
2. Whether are necessary Inputs available, when they are necessary?	The timing of certain Actions must be arranged carefully, considering the availability of Inputs as well as the necessity.
3. Whether are the man-powers for certain Actions available, when they are necessary?	Generally, the project implementation goes along with other routine works which engaged members must do as their duties. Therefore, the timing and duration of certain Actions must be considered carefully, taking account of the availability of the man-powers of units responsible for certain Actions.

Example

In case of the "Sanchez River Water Quality Improvement Project", the PO shown in **Figure 4-5** is prepared:

Actions	Units in Charge	Year 1				Year 2				Year 3				Year 4				Year 5			
		1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.
<Strategy 1>																					
1.1 Analyse environmental investments of companies.	Environment Management Dept.	■	■																		
1.2 Identify relevant clean technologies.	Environment Management Dept.			■	■	■	■	■	■												
1.3 Design incentives for investments in the field of clean technologies.	Environment Management Dept.									■	■	■	■								
1.4 Announce and adapt incentive system.	Public Relation Dept.													■	■						
1.5 Enforce the incentive system in Sanchez River Basin.	Legal Affairs Dept.															■	■	■	■	■	■
<Strategy 2>																					
2.1 Create the legal commission to deal with the amendment of effluent standard of industrial	Legal Affairs Dept.	■	■																		
2.2 Make the new standard and analyze the technical feasibility and the compatibility with other regulations.	Legal Affairs Dept. and Environment Management Dept.			■	■	■	■														
2.3 Prepare the text for the new effluent standard.	Legal Affairs Dept.							■	■												
2.4 Obtain the legal approval for the new effluent standard from the Governor.	General Director									■	■										
2.5 Make the official announcement and inform the new effluent standard of all companies in the	Public Relation Dept.											■	■								
2.6 Inspect the compliance status for the new effluent standard.	Environment Management Dept.													■	■	■	■	■	■	■	■

Figure 4-5 Example of PO

4.7 Preparation of Project Document (Step 12)

Guiding Principle

As the final step of the planning phase, the Project Document containing the baseline situation, the proposed countermeasure plan, the methods of project implementation and evaluation must be prepared. Besides these, the design sheet of action plan should be prepared to describe the background, justification, precise actions, etc. The PDM and PO must be attached to the Project Document.

Explanation

(1) Design Sheet of Action Plan

In the section 4.1, the Actions necessary for the project are enumerated. The design sheet of action plan should be prepared to describe the background, justification, precise actions, etc. This will be used to ascertain the respective actions in the plan, implementation and evaluation stage by the implementing parties and other stakeholders.

(2) Project Document

Throughout the steps of the analysis phase and the PO forming of the planning phase, the PDM and PO have been prepared. The PDM and PO contain main points of the countermeasure plan and will be conveniently used in the course of the project implementation. However, the PDM and PO cannot present all things related with the project which we often need to know more specifically through the plan, implementation and

evaluation stage. Therefore, it is crucial to prepare the Project Document accompanied by the PDM, PO and, also, the design sheet of action plan.

The Project Document will contribute more deeply and specifically to know the background, related matters, etc. concerned with the project and problems to be addressed, when we will analyze and solve some problems to be encountered during the project implementation, monitoring and evaluation. The Project Document may be used when we explain the project contents to get the decision-making of the up layers and the consensus of related stakeholders, also.

Basically, the Project Document is comprised of the reports including the baseline situation and the proposed countermeasure plan, and is accompanied by the PDM, PO and the design sheet of action plan.

Example

In case of the "Sanchez River Water Quality Improvement Project", the Project Document as shown below should be prepared for example. The results of the baseline survey in the step 1 may be used to prepare the section 1 to the section 4.

1. General characteristics of project area	To describe the survey results on general features of the project area, like geography, socio-economy, natural and environmental conditions, etc.
2. Present status of water pollution	To describe the survey results on the present status of water pollution, like water quality, possible pollution sources, environmental problems caused by water pollution, etc.
3. Legislation, policy and administrative setup	To describe the survey result on legislation, national and regional policy for water environment, stakeholders related with water pollution, administrative setup concerned with water pollution, etc.
4. Present management and practice for water pollution	To describe the survey results on current management and practice for water pollution.
5. Development of countermeasure plan	To describe the result of countermeasure planning, like problem analysis, framework of countermeasure plan, action plan, plan of operation, required inputs, etc.
6. Implementation of countermeasure plan	To describe the institution and methodologies for the project implementation, like the configuration of project team, the project enforcement scheme, the project evaluation, etc.

Annex:

1) Design Sheet of Action Plan
2) PDM (Project Design Matrix)
3) PO (Plan of Operations)

CHAPTER 5
MONITORING AND EVALUATION OF PROJECT

5.1 Project Monitoring

Guiding Principle

The project monitoring is periodically undertaken in the course of the implementation in order to check the progress status of the project. As a result of the project monitoring, small modifications mainly in the Plan of Operations (PO) are made, if necessary.

Explanation

4. Objective and Methodology of Monitoring

The objective of monitoring is to check the progress status of the implemented project against the planned schedule, and to adequately take responses modifying the plan (if necessary, but they are limited to just a small modification). The project monitoring is undertaken as the procedure shown in **Figure 5-1**:

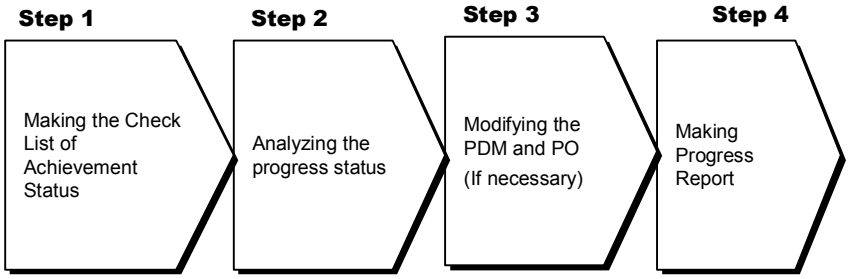


Figure 5-1 Procedure of Project Monitoring

Check List of Achievement Status as shown in **Table 5-1** is used to clarify the progress status. In the project monitoring, the progress status of mainly the Target, Strategies and Actions are checked by means of respective Verifiable Indicators. Appropriate modifications will be made mainly in the PO to alleviate problems found in the monitoring, if necessary.

4. Carrying out of Project Monitoring

The project monitoring is periodically carried out by the implementing agency as one of the project activities, every one to three months, generally.

As a result of the monitoring, the monitoring report should be made, containing the contents like progress status and problems, modification of PO and conclusion.

Table 5-1 Check List of Achievement Status (Form)

(As of:)

Project Strategy	Verifiable Indicator	Progress Status	Responses
<Goal> • Biodiversity of globally significant aquatic life is conserved. • Living conditions of local people is improved.	• The species x-fish, and y-fish returns into the Sanchez River, 3 years after the project started. • The rate of water-born diseases amongst water users is reduced by 60 %, 3 years after the project started.		
<Target> Pollution load of wastewater discharged into the Sanchez River is reduced.	• Organic pollution load is reduced by 85 %, 3 years after the project started. • The concentration of heavy metal compounds (Pb, Cd, Hg) in the monitoring station of the Sanchez River is reduced 90 %, 3 years after the project started.		
<Strategy> 1. Incentive for avoiding high pollution of wastewater are effective. 2. Legal regulations covering the discharge of wastewater are improved and followed.	• 60 % of the companies in the province, use the incentives to invest in environmental technologies, 2 years after the project started. • 80 % of the companies observes the new standard of heavy metals, 10 months after the project started. • Self-monitoring reports are submitted quarterly by al companies in the Domingo Province, 15 months after the project started.		
<Action> (For Strategy 1) 1.1 Analyse environmental investments of companies. 1.2 Identify relevant clean technologies. 1.3 Design incentives for investments in the field of clean technologies. 1.4 Announce and adapt incentive system. 1.5 Enforce the incentive system in the Province. (For Strategy 2) 2.1 Create the legal commission to deal with the amendment of effluent standard of industrial wastewater. 2.2 Make a new standard and analyze the technical feasibility and the compatibility with other regulations. 2.3 Prepare the text for a new effluent standard. 2.4 Obtain the legal approval for the new effluent standard from the Governor. 2.5 Make the official announcement and inform the new effluent standard of all companies in the Province. 2.6 Inspect the compliance status for the new effluent standard.	***<Input and Plan f Operation>***		

5.2 Project Evaluation

Guiding Principle

The project evaluations are undertaken to ascertain the outcomes of a completed or ongoing project, or to examine the appropriateness of the project prior to the commencement. The project performance are evaluated primarily by using five (5) evaluation criteria (Relevance, Efficiency, Effectiveness, Impact and Sustainability). As a result of the evaluation, lessons for other projects as well as recommendations for the future course of the project are induced (in case of the terminal evaluation).

Explanation

(1) Types of Evaluations

Depending on the timing of evaluation, project evaluations are divided into three (3) types (Ex-Ante, Mid-Term and Terminal Evaluation) with respective objectives, as below:

1. Ex-Ante Evaluation	Timing:	Prior to the commencement of the project.
	Definition:	To examine the appropriateness of the project.
	Objective:	To get the consensus and approval of the project implementation.
	Participant:	All stakeholders
2. Mid-Term Evaluation	Timing:	At the mid-term of the project period
	Definition:	To check the achievement status at the mid-term stage.
	Objective:	To make appropriate modifications for the PDM and the PO.
	Participant:	All stakeholders
3. Terminal Evaluation	Timing:	At the time of the project completion.
	Definition:	To check the final achievement.
	Objective:	To suggest recommendations and lessons.
	Participant:	All stakeholders

4. Methodologies of Project Evaluation

The project performance is evaluated through the analysis of achievement status against planned PDM and the assessment by means of five (5) evaluation criteria, as shown in **Figure 5-2**. In the analysis of the progress status, the check list of achievement status shown in **Table 5-1** (the same check list as used in the project monitoring) is employed.

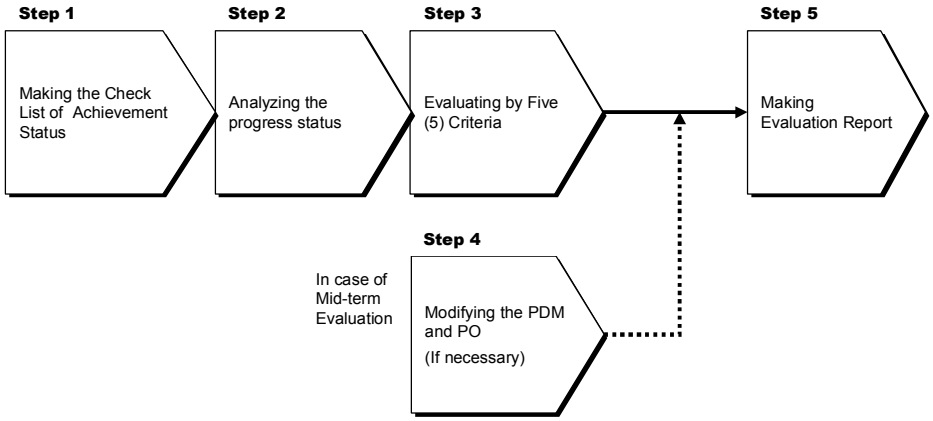


Figure 5-2 Procedure of Project Evaluation

4. Evaluation Criteria

The performance of a project is assessed by five (5) criteria like Relevance, Efficiency, Effectiveness, Impact and Sustainability, based on actual achievement status of the project objectives at the time of the evaluation.

In the ex-ante evaluation, the appropriateness of the project is assessed by using planned PDM, assuming that all project objectives are completely achieved. This is because the project is not started at the time of the ex-ante evaluation.

The significances of five (5) evaluation criteria are presented below:

1. Relevance	Whether are the Target and the Goal conforming to the direction which the region and the country desire?
2. Efficiency	Whether are the Inputs and Actions converted in the Strategies efficiently, in terms of cost, speed and management?
3. Effectiveness	In what degree is the Target achieved by the Strategies?
4. Impact	Are there positive and/or negative changes produced directly or indirectly as a result of the project (including those not anticipated in the project planning)?
5. Sustainability	Are the benefits produced by the project sustainable after its completion?

Table 5-2 enumerates the check items for five (5) evaluation criteria and project objectives to be used for each evaluation.

Table 5-2 Check List of Evaluation Criteria

Evaluation Criteria	Project Objectives to be Used	Check Items
1. Relevance	Target and Goal	• Are the Target and Goal conforming to the direction of the people's need in the region and regional policies? • Are the Target and Goal conforming to the direction of the government policies?
2. Efficiency	Inputs, Actions and Strategies	• Are the Inputs used efficiently? • Is there any Input not used? • Are the Actions efficient in generating the Strategies? • Does the Important Assumption influence the generation of the Strategies?
3. Effectiveness	Strategies and Target	• Is the Target generated enough? • Is the Target achieved by the Strategies? • Does the Important Assumption influence the achievement of the Target?
4. Impact	Target and Goal	• Is the Goal generated (or expected to be generated) enough now (after the project completion)? • What changes are brought (expected to be brought) to the target group now (after the project completion)? • What changes are brought (or expected to be brought) to other areas now (or after the project completion)?
5. Sustainability	Input, Action, Strategies, Target and Goal	• Will necessary Inputs and Actions continue, after the project completion? • Is the supporting system for ensuring continuous Inputs and Actions established?

(3) Evaluation Report

As a result of the project evaluation, the evaluation report must be prepared to present the recommendations and lessons as well as the conclusion of the evaluation, containing the following contents:

1. Evaluation Results by Five (5) Criteria — Individual evaluation results of:
   - Relevance
   - Efficiency
   - Effectiveness
   - Impact
   - Sustainability
2. Conclusion — Overall conclusion of the project evaluation, including:
   - Has the project been successful or not?
   - What causes are behind success or failure?
3. Recommendations — To suggest opinions on follow-up actions of the project.
4. Lessons leant — To suggest opinions which contribute to the success of other projects for the future.

Glossary

Terminology

Project:	An undertaking for the purpose of achieving established objectives, within a given budget and time period.
Project Cycle:	The entire process of an undertaking, including project identification and formulation, appraisal, implementation, monitoring, evaluation, and feedback. Feedback from evaluation results is incorporated in the future project planning. In actual practice, a cycle of "Planning→ Implementation→Check→Revision of Plan" is repeated.
Goal:	The development effect that is expected to be attained as a result of the Target being achieved. The Goal shows the direction of a project.
Target:	An objective that is expected to be achieved as a result of the implementation of a project. The Target is revealed in the form of specific benefits for and positive impacts on the target group.
Strategy:	Several objectives that must be achieved for the Target to be attained. The Strategies are achieved by implementing the Actions.
Action:	Specific behaviors taken by a project to produce the Strategies through the effective use of the Inputs such as personnel, funds, equipment, etc.
Inputs:	Personnel, funds, facilities and equipment, land, information and others necessary for the implementation of a project.
Pre-Conditions:	Necessary conditions that must be fulfilled before a project gets underway. If these conditions are not met, it is impossible to start the Actions by merely applying Inputs.
Important Assumptions:	Conditions important for project success, but that cannot be controlled by a project. Fulfillment of these conditions is not certain at the time of project planning.
Killer Assumption	An important assumption with a very low probability to be fulfilled, resulting to lead the failure of a project.
Verifiable Indicators:	Target figures that function as specific standards for measuring the achievement of Strategies, Target and Goal. These data comprises the type, quantity, quality, time and location.
Source of Verification:	Data sources for verifying Verifiable Indicators. Data are gathered from sources internal and external to a project.

Project Design Matrix (PDM):	A table summarizing a project objectives (Actions, Strategies, Target and Goal), Input, Verifiable Indicators, Source of Verification, Important Assumptions and Pre-Conditions, according to the logical relationship among them.
Plan of Operations (PO):	A planning chart showing, for each of the Actions appearing on the PDM, implementation timing and duration, budget and Inputs, and units and persons in charge.
Target Group:	The principal group for which positive changes are intended as a result of the project implementation. In many cases, the target group is selected from beneficiaries identified in the stakeholder analysis.
LFA Workshop:	A meeting at which representatives of stakeholders discuss various things associated with project planning, implementation and evaluation, based on the Logical Framework Approach (LFA). A facilitator navigates workshops, which are held at the planning, implementation and evaluation stages of a project.
Facilitator:	A person with facilitating ability in the LFA, who coordinates and promotes workshop discussions, while maintaining his or her neutrality.
Monitoring:	Checking to see that the project implementation is proceeding according to the project plan, using Verifiable Indicators to check the progress status and revising the project design, when necessary.
Evaluation:	Examining a project before, during or after the implementation, from the perspective of five (5) evaluation criteria, to assess the appropriateness of a project or propose revisions to the plan of a project or draw lessons for planning, implementation and evaluation of similar project.
Relevance:	The validity of the Goal and Target of a project at the evaluation stage.
Efficiency:	The productivity in the project implementation. The degree to which Inputs have been converted into Outputs.
Effectiveness:	The degree to which the Target has been achieved by the Strategies of a project.
Impact:	Positive and negative changes produced, directly or indirectly, as a result of the project implementation, including those not anticipated at the time of project planning.

Sustainability:	The durability of the benefits and development effects produced by the project after its completion.

Abbreviations

JICA:	Japan International Cooperation Agency
LFA:	Logical Framework Approach
NGOs:	Non- Governmental Organizations
PCM:	Project Cycle Management
PDM:	Project Design Matrix
PO:	Plan of Operations

References

(1)	PCM, Project Cycle Management (Participatory Planning)	FASID (Foundation for Advanced Studies on International Development)
(2)	PCM, Project Cycle Management (Monitoring and Evaluation Based on the PCM Method)	FASID (Foundation for Advanced Studies on International Development)
(3)	Practical Project Evaluation Methods (Guideline of JICA Project Evaluation)	JICA
(4)	Aid Delivery Methods (Volume 1, Project Cycle Management Guidelines)	European Commission, EuropeAid Cooperation Office
(5)	Project Cycle Management Training Handbook	ITAD Ltd. (Information Training and Agricultural Development)
(6)	Logic Model Development Guide	W.K. Kellogg Foundation
(7)	Introduction to the Logical Framework Approach (LFA) for GEF-Financed Project	PARTICIP GmbH

ANNEX

Major resultant documents of Countermeasure Plan against Oil Pollution which WG2 developed in a series of LFA workshops are attached herewith for readers' understanding actual work of the countermeasure planning, as follows:

ANNEX 1: Framework Chart of Countermeasure Plan against Oil Pollution in Suez Gulf Region

ANNEX 2: Design Sheet of Action Plan of Countermeasure Plan against Oil Pollution in Suez Gulf Region

ANNEX 3: PDM of Countermeasure Plan against Oil Pollution in Suez Gulf Region

ANNEX 4: PO of Countermeasure Plan against Oil Pollution in Suez Gulf Region

ANNEX 1

FRAMEWORK CHART
OF
COUNTERMEASURE PLAN
AGAINST OIL POLLUTION IN SUEZ GULF REGION

Title	**Oil Pollution Prevention Project in Northern Gulf Region (OP3)**
Period	**5 years**

<Goal>

Oil pollution in the water environment of coastal and marine areas of Northern Gulf Region is improved.

<Target>

The risk of oil pollution in Northern Gulf Region is declining by the initiation of regional cooperative actions against oil pollution.

<Strategy 1: Source identification and monitoring>

1. Identification of oil pollution sources and monitoring of oil pollution situation in Northern Gulf Region is enforced.

<Actions for Strategy 1>

1.1 <Pollution source identification>

Apply fingerprint analysis for pollution source identification for actual events, and acquire more advanced technologies.

1.1.1 Establish and maintain the database of fingerprint data for crude oils and oil derivatives.

1.1.2 Develop the standard method for fingerprint analysis.

1.1.3 Develop the operation standard for identification system of spilled oil sources (ISOS).

1.1.4 Obtain sampling equipment for spilled oils and practice sampling.

1.1.5 Carry out pollution source investigations in actual events by using fingerprint analysis in cooperation with concerned parties.

1.1.6 Obtain the accreditation of ISO 17025 for oil analysis.

1.1.7 Take action to expand analytical capacities of pollution source investigation, introducing advanced technologies.

1.2 <Oil pollution monitoring>

Document oil spill incidents and conduct periodical oil pollution monitoring in the coastal areas in a sustainable way.

1.2.1 Make the report and database of oil spill incidents.

1.2.2 Develop the monitoring plan for oil pollution.

1.2.3 Construct and maintain the database for oil pollution monitoring.

1.2.4 Carry out coastal water monitoring in cooperation with EQS of Head Quarters, and beach survey in cooperation with EMUs.

1.2.5 Evaluate monitoring data and compile the monitoring report for oil pollution, annually.

1.2.6 Publicize the progress status of oil pollution prevention project (OP3).

<Strategy 2: Oil discharge prevention>

2. Management of oil discharge prevention from various pollution sources in Northern Gulf Region are reinforced.

<Actions for Strategy 2>

2.1 <Information system of pollution sources>

Develop a information system for all pollution sources covering stationary and moving sources.

2.1.1 Develop the inventory of stationary oil pollution sources covering land-based and sea-based sources in cooperation with concerned parties.

2.1.2 Collect the statistic data of moving oil pollution sources in cooperation with concerned authorities.

2.1.3 Construct and maintain the database for all oil pollution sources employing GIS.

2.2 <Oily wastewater control>

Strengthen the control for oily wastewater discharged from oil-related industries.

2.2.1 Enforce more strict supervision through the self-monitoring system for oil-related industries to comply with the effluent standards of Law No. 4.

2.2.2 Open the seminars for enhancing the skill of oil-related industries in managing oily wastewater treatment in cooperation with oil sector and local universities.

2.2.3 Take actions to support H/Q for promoting cleaner production (CP) technologies for industrial process improvement.

2.3 <Awareness raising and cooperative actions>

Take actions for awareness raising of all stakeholders and take cooperative actions with RPA for oil pollution.

2.3.1 Open annual risk communication meeting in the attendance of all stakeholders (like citizens, children, public sectors and private sectors).

2.3.2 Launch the awareness raising campaign for fishery industries on oil pollution.

2.3.3 Launch the awareness raising campaign for small workshops on oil pollution.

2.3.4 Provide technical advice on the reception facilities to RPA.

2.4 <Launching of marine inspection>

Launch marine inspection for sea-based and coastal pollution sources.

2.4.1 Take action to provide staffs with opportunities for technical trainings for enhancing their skills for marine inspections.

2.4.2 Establish the operation protocol of marine inspection in cooperation with concerned authorities.

2.4.3 Establish and operate the mobilization system for marine inspection by using a patrol ship in cooperation with RPA.

<Strategy 3: Oil spill response>

3. Contingency responses against oil spill incidents in Northern Gulf Region are implemented after the establishment of ROSCP.

<Actions for Strategy 3>

3.1 <Development of draft ROSCP>

Work as a leading player to organize the regional committee and develop the draft ROSCP.

3.1.1 Set up Emergency Unit and work as a leading player to organize the regional committee for ROSCP, preparing the framework of ROSCP.

3.1.2 Work as a leading player to conduct information gathering and compile data & information necessary for developing the strategy and operation plan.

3.1.3 Work as a leading player to develop the draft ROSCP conforming to NOSCP.

3.2 <Public consultation and implementation of ROSCP >

Work as a leading player to open public consultation of ROSCP and implement it.

3.2.1 Work as a leading player to open the public consultation meeting for the draft ROSCP in the participation of all the concerned parties and general citizens.

3.2.2 Work as a leading player to activate and maintain ROSCP with managing and reviewing it as needed, and conducting periodical drills.

3.3 <Clean-up of oil pollution hotspots>

Work as a leading player to establish a funding system and carry out clean-up operation of oil pollution hotspots beaches.

3.3.1 Work as a leading player to establish the funding mechanism through PPP (public-private partnership) to cover the expenses of clean-up operation.

3.3.2 Carry out the survey of oil pollution hotspots and pollution sources.

3.3.3 Work as a leading player to carry out the clean-up operation of oil pollution hotspots.

Note:
Two digit and three digit of title number represent "Trunk Action" and "Module Action", respectively.

ANNEX 2

PROJECT DESIGN MATRIX (PDM)
OF
COUNTERMEASURE PLAN AGAINST OIL POLLUTION IN SUEZ GULF REGION

Project Design Matrix (PDM) for Countermeasure Plan against Oil Pollution

Title: Oil Pollution Prevention Project in Northern Gulf Region (OP3)
Period: Five (5) years
Implementing Unit: Suez RBO of EEAA
Target Group: General citizens, fishery industries, tourism industries.

Narrative Summary	Verifiable Indicator	Means of Verification	Important Assumption
<Goal> Oil pollution in the water environment of coastal and marine areas of Northern Gulf Region is improved.	Result of monitoring indicates the declining of oil pollution in the coastal water areas.	Coastal Water Monitoring Report	EEAA strong policy for oil pollution prevention under Law No. 4 is not changed.
<Target> The risk of oil pollution in Northern Gulf Region is declining by the initiation of regional cooperative actions against oil pollution.	• The numbers of pollution sources identified in oil spills are increased. • Total amount of discharged oil from oily wastewater is decreased.	Project report Report of environment monitoring and inspection report	Extremely large-scale oil spill doesn't happen.
<Strategy 1: Source identification and monitoring> Identification of oil pollution sources and monitoring of oil pollution situation in Northern Gulf Region is enforced.	• The identification system of oil pollution sources (ISOS) is implemented. • Project report including monitoring result is publicized periodically.	Project report Activity report of Suez RBO	Concerned parties are not reluctant to continue cooperative actions.
<Strategy 2: Oil discharge prevention> Management of oil discharge prevention from various pollution sources in Northern Gulf Region are reinforced.	• Information system of pollution sources is used. • Oily wastewater quality is improved. • Management of oily waste in fishery industries and small-workshops is improved. • Marine inspection is started.	Project report Report of environment monitoring and inspection report Report of environment monitoring and inspection report Marine inspection report	Concerned parties are not reluctant to continue cooperative actions.
<Strategy 3: Oil spill response> Contingency responses against oil spill incidents in Northern Gulf Region are implemented after the establishment of ROSCP.	• Regional oil spill response is running. • Beach-cleaning of oil hotspots is started.	Project report Project report	Concerned parties are not reluctant to continue cooperative actions.

Narrative Summary	Verifiable Indicator	Means of Verification	Important Assumption
For Trunk Actions & Module Actions			
<Strategy 1> **1.1 Pollution source identification** **Apply fingerprint analysis for pollution source identification for actual events, and acquire more advanced technologies.** 1.1.1 Establish and maintain the database of fingerprint data for crude oils and oil derivatives. 1.1.2 Develop the standard method for fingerprint analysis. 1.1.3 Develop the operation standard for identification system of spilled oil sources (ISOS). 1.1.4 Obtain sampling equipment for spilled oils and practice sampling. 1.1.5 Carry out pollution sources investigation in actual events by using fingerprint analysis in cooperation with concerned authorities. 1.1.6 Obtain the accreditation of ISO 17025 for oil analysis. 1.1.7 Take action to expand analytical capacities of pollution source investigation, introducing advanced technologies. **1.2 Oil pollution monitoring** **Document oil spill incidents and conduct periodical oil pollution monitoring in the coastal areas in a sustainable way.** 1.2.1 Make the report and database of oil spill incidents. 1.2.2 Develop the monitoring plan for oil pollution. 1.2.3 Construct and maintain the database for oil pollution monitoring. 1.2.4 Carry out coastal water monitoring in cooperation with EQS of Head Quarters, and beach survey in cooperation with EMUs. 1.2.5 Evaluate monitoring data and compile the monitoring report for oil pollution, annually. 1.2.6 Publicize the progress status of oil pollution prevention project (OP3). **<Strategy 2>** **2.1 Information system of pollution sources** **Develop a information system for all pollution sources covering stationary and moving sources.** 2.1.1 Develop the inventory of stationary oil pollution sources covering land-based and sea-based sources in cooperation with concerned parties. 2.1.2 Collect the statistic data of moving oil pollution sources in cooperation with concerned authorities. 2.1.3 Construct and maintain the database for all oil pollution sources employing GIS.	***<Input>*** Later, the necessary costs will be raised for: Module 1.1.4: Sampling equipment Module 1.1.5: Chemicals and consumables for laboratory works Module 1.1.7: Equipment such as GC/MS, GC/FPD, HPLC, digestion for the Ni & V measurement and materials (Manhour costs and costs for documents and meeting, etc. are neglected, here)		• Concerned parties are not reluctant to start cooperative actions. • Concerned parties are not reluctant to start cooperative actions.

Narrative Summary	Verifiable Indicator	Means of Verification	Important Assumption
2.2 Oily wastewater control **Strengthen the control for oily wastewater discharged from oil-related industries.** 2.2.1 Enforce more strict supervision through the self-monitoring system for oil-related industries to comply with the effluent standards of Law No. 4. 2.2.2 Open the seminars for enhancing the skill of oil-related industries in managing oily wastewater treatment in cooperation with oil sector and local universities. 2.2.3 Take actions to support H/Q for promoting cleaner production (CP) technologies for industrial process improvement. **2.3 Awareness raising and cooperative actions** **Take actions for awareness raising of all stakeholders and take cooperative actions with RPA for oil pollution..** 2.3.1 Open annual risk communication meeting in the attendance of all stakeholders (like citizens, children, public sectors and private sectors). 2.3.2 Launch the awareness raising campaign for fishery industries on oil pollution. 2.3.3 Launch the awareness raising campaign for small workshops on oil pollution. 2.3.4 Provide technical advice on the reception facilities to RPA. **2.4 Launching of marine inspection** **Launch marine inspection for sea-based and coastal pollution sources.** 2.4.1 Take action to provide staffs with opportunities for technical trainings for enhancing their skills for marine inspections. 2.4.2 Establish the operation protocol of marine inspection in cooperation with concerned authorities. 2.4.3 Establish and operate the mobilization system for marine inspection by using a patrol ship in cooperation with RPA. ***<Strategy 3>*** **3.1 Development of draft ROSCP** 3.1.1 Set up Emergency Unit and work as a leading player to organize the regional committee for ROSCP, preparing the framework of ROSCP. 3.1.2 Work as a leading player to conduct information gathering and compile data & information necessary for developing the strategy and operation plan. 3.1.3 Work as a leading player to develop the draft ROSCP conforming to NOSCP.			• Concerned parties are not reluctant to start cooperative actions.

Narrative Summary	Verifiable Indicator	Means of Verification	Important Assumption
3.2 Public consultation of ROSCP **Work as a leading player to open public consultation of ROSCP and implement it.** 3.2.1 Work as a leading player to open the public consultation meeting for the draft ROSCP in the participation of all the concerned parties and general citizens. 3.2.2 Work as a leading player to activate and maintain ROSCP with managing and reviewing it as needed, and conducting periodical drills. **3.3 Clean-up of oil pollution hotspots** **Work as a leading player to establish a funding system and carry out clean-up operation of oil pollution hotspots beaches.** 3.3.1 Work as a leading player to establish the funding mechanism through PPP (public-private partnership) to cover the expenses of clean-up operation. 3.3.2 Carry out the survey of oil pollution hotspots and pollution sources. 3.3.3 Work as a leading player to carry out the clean-up operation of oil pollution hotspots.			***<Precondition>*** SRBA approves the proposed countermeasure plan, endorsing the budget necessary for the project implementation.

ANNEX 3

PO (PLAN OF OPERATIONS)

OF

COUNTERMEASURE PLAN AGAINST OIL POLLUTION IN SUEZ GULF REGION

Trunk Actions / Module Actions	Units in Charge	Year 1				Year 2				Year 3				Year 4				Year 5				Remarks
		1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.	
<Strategy 1>																						
1.1 Pollution sources identification																						
1.1.1 Establish and maintain the database of fingerprint data for crude oils and oil derivatives.	EQD, IU																					Already started in REMIP
1.1.2 Develop the standard method for fingerprint analysis.	EQD																					Already started in REMIP
1.1.3 Develop the operation standard for identification system of spilled oil sources (ISOS).	EQD, EMD																					Already started in REMIP
1.1.4 Obtain sampling equipment for spilled oils and practice sampling. *(Requiring the input for sampling equipment)*	EQD																					
1.1.5 Carry out pollution sources investigation in actual events in cooperation with concerned authorities by using fingerprint analysis. *(Requiring the input for chemicals and consumables for laboratory works)*	EQD, EMD, Legal Affairs Unit																					
1.1.6 Obtain the accreditation of ISO 17025 for oil analysis.	EQD																					
1.1.7 Take action to expand analytical capacities of pollution source investigation, introducing advanced technologies. *(Requiring the input for equipment such as GC/MS, GC/FPD, HPLC, digestion for the Ni & V measurement and materials)*	EQD																					Preliminarily started in REMIP
1.2 Oil pollution monitoring																						
1.2.1 Make the report and database of oil spill incidents.	EMD, IU																					
1.2.2 Develop the monitoring plan for oil pollution.	EQD, EMD																					
1.2.3 Construct and maintain the database for oil pollution monitoring.	EQD, EMD, IU																					
1.2.4 Carry out coastal water monitoring in cooperation with EQS of Head Quarters, and beach survey in cooperation with EMUs.	EQD, EMD																					
1.2.5 Evaluate monitoring data and compile the monitoring report for oil pollution, annually.	EQD, PAD																					
1.2.6 Publicize the progress status of oil pollution prevention project (OP3).	EQD, EMD, PAD																					
<Strategy 2>																						
2.1 Information system of pollution sources																						
2.1.1 Develop the inventory of stationary oil pollution sources covering land-based and sea-based sources in cooperation with concerned parties.	EMD																					Part of data already cpllected in REMIP
2.1.2 Collect the statistic data of moving oil pollution sources in cooperation with concerned authorities.	EMD																					
2.1.3 Construct and maintain the database for all oil pollution sources employing GIS.	EMD, IU																					
2.2 Oily wastewater control																						
2.2.1 Enforce more strict supervision by means of self-monitoring for oil-related industries to comply with the effluent standards of Law No. 4.	EMD																					
2.2.2 Open the seminars for enhancing the skill of oil-related industries in managing oily wastewater treatment in cooperation with oil sector and local universities.	EMD, PAD																					
2.2.3 Take actions to support H/Q for promoting cleaner production (CP) technologies for industrial process improvement.	EMD																					
2.3 Awareness raising and cooperative actions																						
2.3.1 Open annual risk communication in the attendance of all stakeholders (like citizens, children, public sectors and private sectors).	PAD																					Started in REMIP as a trial
2.3.2 Launch the awareness raising campaign for fishery industries on oil pollution.	EMD, PAD																					
2.3.3 Launch the awareness raising campaign for small workshops on oil pollution.	EMD, PAD																					
2.3.4 Provide technical advice on the reception facilities to RPA.	EMD, PAD																					
2.4 Launching of marine inspection																						
2.4.1 Take action to provide staffs with opportunities for technical trainings for enhancing their skills for marine inspections.	EMD																					
2.4.2 Establish the operation protocol of marine inspection in cooperation with concerned authorities.	EMD																					
2.4.3 Establish and operate the mobilization system for marine inspection by using a patrol ship in cooperation with RPA.	EMD																					
<Strategy 3>																						EMD members received numbers of trainings for oil spill response during
3.1 Development of draft ROSCP																						
3.1.1 Work out the draft proposal for establishing the regional committee for ROSCP.	EMD																					
3.1.2 Work as a leading player to conduct information gathering and compile data & information necessary for developing the strategy and operation plan.	EMD																					
3.1.3 Work as a leading player to develop the draft ROSCP conforming to NOSCP.	EMD																					
3.2 Public consultation of ROSCP																						
3.2.1 Work as a leading player to open the public consultation meeting for the draft ROSCP in the participation of all the concerned parties and general citizens.	EMD																					
3.2.2 Work as a leading player to activate and maintain ROSCP with managing and reviewing it as needed, and conducting periodical drills.	EMD																					
3.3 Clean-up of oil pollution hotspots																						
3.3.1 Work as a leading player to establish the funding mechanism through PPP (public-private partnership) to cover the expenses of clean-up operation.	PAD																					
3.3.2 Carry out the survey of oil pollution hotspots and pollution sources.	EQD, EMD																					
3.3.3 Work as a leading player to carry out the clean-up operation of oil pollution hotspots.	EMD, PAD																					

Legend

: Actions to be taken almost continuously

: Actions to be taken in a spotted way

ANNEX 4

DESIGN SHEET OF ACTION PLAN
OF
COUNTERMEASURE PLAN
AGAINST OIL POLLUTION IN SUEZ GULF REGION

Contents

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Trunk Action 1.1

Title of Trunk Action	**1.1 Pollution source identification**
Narration of Trunk Action	Apply fingerprint analysis for pollution source identification for actual events, and acquire more advanced technologies.

Expected Output of Trunk Action	Oil pollution sources are investigated by using fingerprint analysis technology which will be stepwise reinforced by advanced technologies.
Justification of Trunk Action	• At present, pollution sources of oil discharge events in Northern Gulf Region are not identified in large portions, due to lack of fingerprint analysis technology. Therefore, the polluter of oil spill incidents is not found in many cases in Northern Gulf Region. • During the period of REMIP, basic technologies of fingerprint analysis for identifying pollution sources were transferred to Suez RBO, employing GC/FID, FT-IR, FL, etc. These technologies are applied to find out the pollution source. The result of identification contributes to make an polluter of actual oil pollution bear the expenses necessary for remedying the damages. • To apply fingerprint analysis into actual events, a series of actions to establish the database of fingerprint data, operation manuals (for analysis and identification) and ISO accreditation are required. • Also, it is required in the future for Suez RBO to acquire more advanced analytical technologies (beside GC/FID, FT-IR, FL), to ensure the identification of pollution sources more completely. • In addition, it is required that the good cooperation with concerned units (especially RSPA, SCA and oil sectors) be established to ensure the identification of pollution sources, especially in collecting pollution source information and carrying out spilled oil sample at the site.
Module Actions	The trunk action is comprised of the following module actions: 1.1.1 Establish and maintain the database of fingerprint data for crude oils and oil derivatives. 1.1.2 Develop the manual for fingerprint analysis. 1.1.3 Develop the manual for identification system of spilled oil sources (ISOS). 1.1.4 Obtain sampling equipment for spilled oils and practice sampling. 1.1.5 Carry out pollution source investigations in actual events by using fingerprint analysis in cooperation with concerned parties. 1.1.6 Obtain the accreditation of ISO 17025 for oil analysis. 1.1.7 Take action to expand analytical capacity of pollution source investigation, introducing advanced technologies.
Strategy to be attained	Strategy 1: Source identification and monitoring Investigation of oil pollution sources by using fingerprint analysis and oil pollution monitoring in Northern Gulf Region are enforced.

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Action 1.1.1

Narration of Module Action	1.1.1 Establish and maintain the database of fingerprint data for crude oils and oil derivatives.

Work Items	This module action is comprised of the following work items: 1. Study and decide kinds of oils and oil derivatives to be collected and their source firms including moving and stationary pollution sources (following up the results during in the period of REMIP). 2. Construct (or renovated) the database of fingerprint data. 3. Collect samples of oils and oil derivatives from concerned firms (following up the results during in the period of REMIP). 4. Measure fingerprint data (including physical properties) of collected oils and derivatives and update fingerprint data stored in the database and input the result (following up the result of REMIP).
Work Description	• Suez RBO has acquired skills of basic techniques for fingerprint analysis employing GC/FID, FT-IR, FL, and also for physical property measurement (like density, kinetic viscosity and refractive index) in the period of REMIP. By using these techniques, Suez RBO makes measurement & analysis for fresh crude oils and oil derivatives and establishes the database of fingerprint data (including physical properties), following up the result during in the period of REMIP. • Oils and oil derivatives (fuels, lubricants and other oil products) which are produced, handled and transported in Northern Gulf Region should be collected and analyzed. In the period of REMIP, a total of 11 crude oils were collected, resulting into the construction of preliminary database. More thorough surveys on stationary and moving pollution sources should be made to select oils and oil derivatives to be collected. • The type of data derived from fingerprint analysis and physical property measurement are numerical or graphical (like gaschromatogram and IR spectra, etc). Therefore, the database has to be designed so as to easily store and handle both types. The database for fingerprint data will be constructed or renovated based on the proto type constructed in REMIP, so as to be used and maintained more easily. • Fingerprint data stored in the database should be updated by times, taking account of changes of oils at sources and the increased analytical data depending on the introduction of advanced techniques. • The database to be constructed in this module action will be used for profiling and screening suspected pollution sources in the initial stage of actual investigation of pollution sources by using of fingerprint analysis. It is considered generally that the similarity check between a spilled oil and suspected oils be carried out by using measurement data derived from the same analytical run. Thus, Suez RBO needs to check whether database can be used for actual similarity check or not, through its experiences.
Time Frame	Work Item 1, 2: Year 1 Work Item 3. 4: Continuous actions
Required Inputs	Staff costs
Units in Charge	EQD, Information Unit

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Action 1.1.2

Narration of Module Action	1.1.2 Develop the standard method for fingerprint analysis.

Work Items	This module action is comprised of the following work items: 1. Make frameworks of the standard method of fingerprint analysis. 2. Formulate of the standard method of fingerprint analysis and modify for more advanced techniques.
Work Description	• The standard method of fingerprint analysis covers laboratory works (like storing of samples, sample preparation, clean-up & separation, measurement, data processing, similarity check and final judgment of pollution sources). Methodologies of measurement, analysis, preparation, etc. with GC/FID, FT-IR, FL, density meter, kinetic viscosity apparatus, refractive index meter should be prescribed as a standard practice. • The standard method of fingerprint analysis is formulated so as to be understood easily for every users, basically by using the textbook employed during the technical training during the period of REMIP (as attached in the final product document Vol. 4).
Time Frame	Work item 1: Year 1 Work item 2: Year 1 and continuous actions
Required Inputs	Staff cost of Suez RBO
Units in Charge	EQD

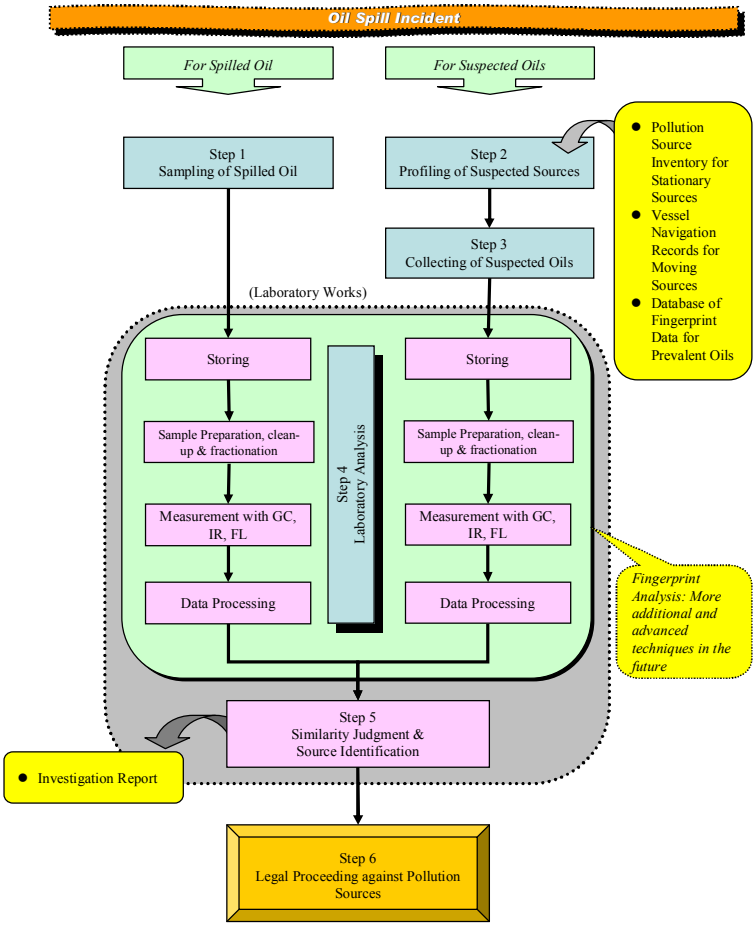
Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Action 1.1.3

Narration of Module Action	1.1.3 Develop the operation standard for identification system of oil pollution sources (ISOS).

Work Items	This module action is comprised of the following work items: 1. Make frameworks of the manual of ISOS. 2. Formulate of the operation standard of ISOS.
Work Description	• The operation standard of ISOS covers a series of work steps necessary for identifying pollution sources in oil spill incidents such as: sampling of spilled oils at the site, profiling of suspected sources, collecting of suspected oils, measurement & analysis, final judgment, etc. • Suez RBO should develop the standard necessary for ensuring works for ISOS (Identification system of Spilled Oil Sources), based on the discussion result during the period of REMIP as attached below:.
Time Frame	Work item 1: Year 1 Work item 2: Year 1
Required Inputs	Staff cost of Suez RBO
Units in Charge	EQD, EMD



PROCEDURAL FLOW OF ISOS
(IDENTIFICATION SYSTEM OF OIL POLLUTION SOURCES)

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Action 1.1.4

Narration of Module Action	1.1.4 Obtain sampling equipment for spilled oils and conduct the training for sampling by using it.

Work Items	This module action is comprised of the following work items: 1. Study sampling methodologies of spilled oils and select appropriate sampling equipment. 2. Apply for purchasing sampling equipment and obtain it. 3. Conduct the training for sampling at the site by using sampling equipment.
Work Description	• Generally, various methodologies and equipment are used for sampling spilled oils from sea surfaces. Suez RBO studies about sampling methodologies of spilled oils and selects appropriate sampling equipment. • As the result of the study mentioned above, Suez RBO applies for purchasing sampling equipment to SRBA (Sector of Regional Branch Office), and obtains it. • Suez RBO sets and conducts the training in which staffs obtain skills necessary for sampling of spilled oils.
Time Frame	Year 1
Required Inputs	Initial cost for sampling equipment Staff costs
Units in Charge	EQD

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Action 1.1.5

Narration of Module Action	1.1.5 Carry out pollution source investigations in actual events by using fingerprint analysis in cooperation with concerned parties.

Work Items	This module action is comprised of the following work items: 1. Make an agreement with RSPA, SCA and the oil sector on sampling of spilled oils in the events. 2. Carry out pollution source investigations at the event of actual oil spill incidents, based on the manual of ISOS. 3. Take necessary legal actions as the result of pollution source investigation.
Work Description	• Sampling of spilled oils requires a ship to access the site, because many oil spill incidents happens offshore. The ship for such purpose is not available for Suez RBO in the beginning of the project, and, therefore, sampling of spilled oils should be done by Suez RBO staff by using the ship of RSPA or SCA (and also the oil sector in certain cases). So, the agreement between Suez RBO and RSPA or SCA (and the oil sector) should be made to realize this cooperation. • Pollution source investigation is carried out by Suez RBO, through a series of works like sampling, profiling of pollution sources, collecting of suspected oils, measurement & analysis, judgment of pollution sources, as prescribed in the manual of ISOS. • Suez RBO takes a legal action to charge a polluter, based on the final judgment of pollution source investigation.
Time Frame	Work item 1: Year 2 Work item 2 and 3: Continuous action, started from Year 2
Required Inputs	Chemicals and consumables for analysis Staff costs
Units in Charge	EMD, EQD, Legal Affairs Unit

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Action 1.1.6

Narration of Module Action	1.1.6 Obtain the accreditation of ISO 17025 for oil analysis.

Work Items	This module action is comprised of the following work items: 1. List up actions necessary for meeting the quality management system of ISO 17025. 2. Prepare and establish the laboratory system which meets the requirements of ISO 17025. 3. Apply for the accreditation of ISO 17025 and acquire it.
Work Description	• Main requirements for the quality management system of ISO 17025 are as follows: - A set of procedures that cover all key processes in the business, - Monitoring processes to ensure they are effective, - Keeping adequate records, - Checking output for defects, with appropriate corrective action where necessary, - Regularly reviewing individual processes and the quality system itself for effectiveness, and - Facilitating continual improvement. • First, Suez RBO studies and lists up necessary items required for establishing the quality management system. • Suez RBO has experienced in acquiring the accreditation for water quality laboratory. So, such experience should be used conveniently to acquire the accreditation for oil analyses.
Time Frame	Year 2
Required Inputs	Staff costs
Units in Charge	EQD

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Action 1.1.7

Narration of Module Action	1.1.7 Take action to expand analytical capacities of pollution source investigation, introducing advanced technologies.

Work Items	This module action is comprised of the following work items: 1. Study and make a plan of developing analytical capacity by using advanced technologies. 2. Implement the development plan, obtaining equipment and materials for advanced technologies, rendering the opportunities of technical training to staffs. 3. Verify staff numbers engaged in analytical works and take action for increasing them (if necessary).
Work Description	• Staffs of Suez RBO acquired skills and knowledge for pollution source investigation by using GC/FID, FT-IR and FL during the period of REMIP. More advanced technologies (GC/MS, measurement of Ni & V, measurement of sulfur by GC/FPD, HPLC) are being used for identifying pollution sources in the worlds, and they helps Suez RBO identify pollution sources more accurately. • First, Suez RBO should make a development plan, after studying features, cost performance in installing and running, schedule of technical training and etc. for respective technologies, and takes action, step by step, to expand analytical capacity. • Human resources for analytical works is also studied in the development plan mentioned above, and take action for increasing them (if necessary).
Time Frame	Work item 1: Year 1 Work Item 2 and 3: Year 2
Required Inputs	Initial cost for equipment and materials (GC/MS, measurement of Ni & V by AAS, measurement of sulfur by GC/FPD, HPLC). Staff cost
Units in Charge	EQD

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Trunk Action 1.2

Title of Trunk Action	**1.2 Oil pollution monitoring**
Narration of Trunk Action	Document oil spill incidents and conduct periodical oil pollution monitoring in the coastal areas in a sustainable way.

Expected Output of Trunk Action	The status of oil spill incidents and oil pollution is clarified by conducting periodical monitoring and publicized its result.
Justification of Trunk Action	• Oil spill incidents happening in Northern Gulf Region is not completely recorded in Suez RBO, at present. Thus, it is required that all the incidents including quantitative and qualitative characters be documented to be able to ensure the analysis of causes and effects of oil pollution. • At present, water qualities of coastal areas in Northern Gulf Area are monitored at several places in CWMP (Coastal Water Quality Monitoring Program) which EQS of H/QS is in charge of. However, the monitoring items of CWMP are only limited to very simple observation in terms of oil pollution. As such, the periodical monitoring of oil pollution is not conducted in Northern Gulf Region. Therefore, precise status of oil pollution in Northern Gulf Region is not clarified at present. • The clarification of oil pollution by periodical monitoring is required to take appropriate actions against oil discharges and to know effects of countermeasure actions. • Furthermore, publication of monitoring results to general citizens and stakeholders is essential for raising the awareness to oil pollution.
Module Actions	The trunk action is comprised of the following module actions: 1.2.1 Make the report and database of oil spill incidents. 1.2.2 Develop the monitoring plan for oil pollution. 1.2.3 Carry out coastal water monitoring in cooperation with EQS of H/QS, and beach survey in cooperation with EMUs. 1.2.4 Construct and maintain the database for oil pollution monitoring. 1.2.5 Evaluate monitoring data and compile the monitoring report for oil pollution, annually. 1.2.6 Publicize the progress status of oil pollution prevention project (OP3).
Strategy to be Attained	Strategy 1: Source identification and monitoring Investigation of oil pollution sources by using fingerprint analysis and oil pollution monitoring in Northern Gulf Region are enforced.

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Action 1.2.1

Narration of Module Action	1.2.1 Make the report and database of oil spill incidents.

Work Items	This module action is comprised of the following work items: 1. Set out a format for reporting and construct a database for oil spill incidents. 2. Establish and maintain the database of oil spill incidents. 3. Make the report of oil spill incidents, when they happen actually.
Work Description	• Oil spill incidents happening in Northern Gulf Region are documented in Suez RBO, at present. However, the present recording practice is not enough quantitatively and qualitatively. Therefore, it is required that Suez RBO make the report containing enough data & information, for all the oil spill incidents happening in the region. The collected data & information are used for analyzing the pollution status in a short and long term. • First, the format for reporting oil spill incidents should be set out. Because COR of EEAA H/QS has already used a certain format meeting its purpose, Suez RBO should develop the format, consulting with COR of EEAA. At least, the minimum data to be documented are data of incident, location, spill origin, spill size, action taken at damage. • The report of oil spill incidents should be made whenever incidents happens and the data & information of incidents should be stored in the database. This database should be constructed as a component of integrated database for the inventory of pollution sources described in the module action 2.1.3.
Time Frame	Work item 1 and 2 : Year 1 Work item 3: In the event of oil spill incidents
Required Inputs	Staff costs
Units in Charge	EMD, Information Unit

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Action 1.2.2

Narration of Module Action	1.2.2 Develop the monitoring plan for oil pollution.

Work Items	This module action is comprised of the following work items: 1. Study and make a conceptual idea of monitoring of coastal water monitoring and beach survey, surveying and selecting candidate monitoring sites. 2. Consult EQS and COR of EEAA H/QS about the implementation of coastal water monitoring and beach survey respectively, based on the conceptual idea. 3. Make actual monitoring plan to implement for coastal water monitoring and beach survey, specifying locations of stations, observed items, frequency and timing of samplings, etc., including the demarcation of tasks undertaken by parties concerned.
Work Description	• Suez RBO needs to establish a comprehensive monitoring plan for oil pollution (including coastal water monitoring and beach survey) to evaluate the effect of countermeasures to be taken from now. The monitoring should be conducted periodically in a sustainable way, because the change of water pollution generally takes a long time over the years. First, Suez RBO should make a conceptual idea for coastal water monitoring and beach survey to realize a comprehensive monitoring. • In CWMP (Coastal Water Monitoring Program), EQS of EEAA H/QS is now carrying out periodical monitoring over the whole beaches of Egypt including the Gulf of Suez and the Mediterranean Sea. It is considered to be a good way that Suez RBO conducts coastal water monitoring in Northern Gulf Region consulting and cooperating with EQS of EEAA H/QS. • CWMP by EQS of EEAA H/QS covers several monitoring points in Northern Gulf Region. These existing monitoring points should be reviewed. The items now being monitored with CWMP also should be reviewed so as to become appropriate for oil pollution monitored. For the monitoring of oil pollution, it is expected that oil & greases, Total Hydrocarbon (THC) and individual petroleum hydrocarbons for water, sediment, biota and/or aquatic plants should be measured., • Though beach survey for monitoring oil pollution was once planned by COR of EEAA H/QS in 1990[S], this has not been continued. In addition to coastal water monitoring, periodical beach survey is considered to be useful for monitoring oil pollution. Suez RBO should implement the appropriate beach survey plan, requesting the support of COR. • Parameters to be monitored should be enough to clarify oil pollution status and its improving status of coastal and marine water. For example, they may contain oil & greases of water and total hydrocarbon & PAHs of sediment, biota, aquatic plant, etc. • The implementation of coastal water monitoring and beach survey require a lot of labor works for samplings and site observations. Thus, the monitoring plan should carefully planned and address a good cooperation mechanism for mobilizing EMUs. • Oil pollution has the nature that the seriousness of pollution is highly depending on locations and depths of water, because oils are insoluble and lighter than water. Thus, generally, it is not easy to clarify oil pollution situation in the numerical way, unlike other water pollution. The way of the monitoring proposed is to observe by human eyes at certain places (beaches), periodically. The beach survey carried out in NOSCP (in 1990S) gives a good indication on the methodology of observation by eyes, like: - Type of oiling (patchy, thin films, tar balls, continuous layer) - Degree of oiling (light, medium and heavy layer)

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

	- Age of oiling (fresh or aged, to be assed by a rod placed in the oil) • The pollution situation is highly depending on locations. For that reason, beaches to be surveyed should be so carefully and appropriately selected that the oil pollution over Northern Gulf Region is clarified. For example, the beach survey in NOSCP selected a total of 78 beaches (24 in the Governorate of Suez and 54 in the Governorate of South Sinai). • Suez RBO has not been experienced in conducting beach survey until now. Thus, it is necessary that Suez RBO asks COR of EEAA H/QS for its assisting in formulating the monitoring plan and associated site surveys.
Time Frame	Year 1
Required Inputs	Staff cost
Units in Charge	EQD, EMD

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Actions 1.2.3

Narration of Module Action	1.2.3 Construct and maintain the database for oil pollution monitoring

Work Items	This module action is comprised of the following work items: 1. Construct the database storing the resultant data of coastal water monitoring and beach survey. 2. Store and maintain the database periodically.
Work Description	• Suez RBO constructs the database for storing and processing the data derived from coastal water monitoring and beach survey, and maintains it. • This database should be constructed employing GIS (Geographical Information System) so as to evaluate the monitoring data in relation with geographical locations, distribution of pollution sources, locations of oil pollution events. The database should be constructed as one component of a integrated database for the inventory of oil pollution sources described in the module action 2.1.3.
Time Frame	Work item 1: Started in Year 1 Work item 2: Continuous action
Required Inputs	Staff costs
Units in Charge	EQD, EMD, Information Unit

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Actions 1.2.4

Narration of Module Action	1.2.4 Carry out coastal water monitoring in cooperation with EQS of Head Quarters, and beach survey in cooperation with EMUs.

Work Items	This module action is comprised of the following work items: 1. Make agreements with EQS of H/QS and EMUs on monitoring (where necessary). 2. Confirm each task in coastal water monitoring and beach survey. 3. Conduct technical training associated with beach survey for EMU. 4. Carry out periodical coastal water monitoring and beach survey, and collect monitoring data.
Work Description	• Suez RBO confirm each task of participants, according to the monitoring plan set up for coastal water monitoring and beach survey, • Though the beach survey is conducted in cooperation with EMUs, EMUs members are considered to be not used to conducting their tasks. Therefore, Suez RBO should give technical instructions necessary for ensuring their works. • According to the monitoring plan, Suez RBO carries out periodical coastal monitoring and beach survey, and collects monitoring data to stores them in the database.
Time Frame	Work item 1 and 2: Year 2 Work item 2: Periodical action after the work item 1
Required Inputs	Staff cost
Units in Charge	EQD and EMD

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Actions 1.2.5

Narration of Module Action	1.2.5 Evaluate monitoring data and compile the monitoring report for oil pollution, annually.

Work Items	This module action is comprised of the following work items: 1. Suez RBO annually evaluates monitoring data collected and stored in the database, 2. Suez RBO compiles the annual monitoring report containing the analysis of the situation of oil pollution.
Work Description	• Generally, clarifying the oil pollution status is not easy and requires many data over a long time. Thus, periodical evaluation of collected monitoring data (from coastal water monitoring and beach survey) should be continued to know of the oil pollution status at that time and the effects resulting from various countermeasures undertaken in the project. • The monitoring data should be analyzed so as to know the influences of locations of oil pollution sources and oil pollution events in the relation with countermeasures undertaken.
Time Frame	Annual actions, starting from Year 3
Required Inputs	Staff costs
Units in Charge	EQD and EMD

Design Sheet of:

Action Plan for Strategy 1: Source Identification and Monitoring

Module Actions 1.2.6

Narration of Module Action	1.2.6 Publicize the progress status of oil pollution prevention project (OP3).

Work Items	This module action is comprised of the following work items: 1. Make annual report of oil pollution prevention project (OP3). 2. Publicize annually the progress status of OP3 in the media like the Egypt State of Environment Report, the website of EEAA, or others.
Work Description	• Annual report of oil pollution prevention project (OP3) is made and issued publicly to present the monitoring result of oil pollution and the progress status of the project. The section of monitoring result of oil pollution in this module action can be prepared by digesting the content of the annual monitoring report for oil pollution made in the module action 1.2.4. • It is considered that several media are possibly available for publicizing the progress status of the project. While the Egypt State of Environment Report (issued by EEAA H/QS every year), the website of EEAA, and awareness raising materials issued by Suez RBO are among them, most appropriate media is selected for that purpose.
Time Frame	Annual actions, starting from Year 3.
Required Inputs	Staff cost Expenses for material preparation
Units in Charge	EMD, EQD, PAD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Trunk Action 2.1

Title of Trunk Action	**2.1 Information system of oil pollution sources**
Narration of Trunk Action	Develop an information system for all oil pollution sources covering stationary and moving sources.

Expected Output of Trunk Action	All oil pollution sources are clarified and their data/information are stored in the database.
Justification of Trunk Action	• There are many oil pollution sources (including stationary and moving sources) in the sea and the land in Northern Gulf Region. However, complete data & information of pollution sources are not available at present. Thus, developing of the database covering all pollution sources is essential for planning, implementing and evaluating the countermeasure against oil pollution. • Together, the inventory which covers all pollution sources are required to profile and identify suspected pollution sources in the event of oil discharge incidents. As such, the establishment of the database of oil pollution sources is a essential element of ISOS (Identification System of Spilled Oil Sources) which can prevent oil discharge by finding out oil polluters. • The database of pollution sources should be constructed employing GIS (geographical information system) so as to facilitate the profiling of suspected pollution sources, considering geographical locations.
Module Actions	The trunk action is comprised of the following module actions: 2.1.1 Develop the inventory of stationary oil pollution sources covering land-based and sea-based sources in cooperation with concerned parties. 2.1.2 Collect the statistic data of moving oil pollution sources in cooperation with concerned authorities. 2.1.3 Construct and maintain the database for all oil pollution sources employing GIS.
Strategy to be Attained	Strategy 2: Oil discharge prevention Management of oil discharge prevention from various oil pollution sources in Northern Gulf Region are reinforced.

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.1.1

Narration of Module Action	2.1.1 Develop the inventory of stationary oil pollution sources covering land-based and sea-based sources in cooperation with concerned parties.

Work Items	This module action is comprised of the following work items: 1. Gather preliminary data & information for stationary pollution sources. 2. Pick out firms and sources of possible pollution sources. 3. Formulate the questionnaires and the inventory sheet on which collected data & information are recorded. 4. Make an agreement with concerned parties on data collection (where necessary) 5. Collect data & information of pollution sources from pollution source firms by using questionnaires (with holding workshops, if necessary). 6. Develop and maintain the inventory covering all stationary pollution sources by using collected data & information.
Work Description	• The pollution source inventory must cover all stationary sources which possibly cause oil spill (oil leakage) and oily wastewater discharge. For example, they may be categorized by: - Offshore platform - Offshore pipeline - Onshore pipeline - Oil storage facility (including loading & unloading facility) - Fuel storage facility (including bunkering facility) - Oil refinery plant (including wastewater treatment facility) - Oily wastewater-discharging plant (including wastewater treatment facility) - Reception facility • The inventory should contain not only the data & information of facilities but also kinds of oils handled. Among data & information in the inventory, the information on locations in which pollution sources are situated is especially important in light of profiling suspected sources in the identification of pollution sources. • Data & information collected are used for profiling suspected sources in the identification of pollution sources. Therefore, the inventory should be constructed so as to make it possible to easily retrieve every data and information stored. • During the period of REMIP, the preliminary pollution source inventory storing minimum data & information was prepared. Based on this results, the formulation of the inventory should be tackled once again to cover complete data & information. • Good cooperation should be essential for obtaining data & information. Especially, the cooperation with regional councils is required in data gathering of the oil sector.
Time Frame	Year 1 (Periodical maintenance is required, afterward)
Required Inputs	Staff costs
Units in Charge	EMD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.1.2

Narration of Module Action	2.1.2 Collect the statistic data of moving oil pollution sources in cooperation with concerned authorities.

Work Items	This module action is comprised of the following work items: 1. Make an agreement with concerned parties on data collection (where necessary). 2. Collect annual statistic data for ships (oil tankers, cargo ships, etc.) calling at ports in the Gulf of Suez or passing the Suez Canal. 3. Collect annual statistic data for fishery boats calling at ports. 4. Arrange and compile the collected data of moving sources in a central data file.
Work Description	• Unlike stationary sources, it is impossible that specific data & information of each pollution source are gathered for moving pollution sources, beforehand. Therefore, the information system should be furnished to know general status (shipping routes, numbers of passing ships, sizes of calling ships, etc.) based on annual statistic data. • To obtain data & information necessary for moving sources, good cooperation should be constructed between governmental authorities. The cooperative actions with RSPA (Red Sea Port Authority) and SCA (Suez Canal Authority) are required for data gathering of ships (oil tankers, cargo ships, etc.). On the data gathering of fishery boats, the cooperation with Fishery Authority is required.
Time Frame	Year 1 (Periodical maintenance is required, afterward)
Required Inputs	Staff costs
Units in Charge	EMD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.1.3

Narration of Module Action	2.1.3 Construct and maintain the database for all oil pollution sources employing GIS (Geographical Information System).

Work Items	This module action is comprised of the following work items: 1. Construct the database covering all oil pollution sources (including stationary and moving sources), by using collected data & information. 2. Acquire data, information and geographical maps necessary for constructing GIS system from COR of H/QS. 3. Maintain the database periodically.
Work Description	• The database is constructed by using gathered data & information on all pollution sources including stationary and moving sources. The database are used as an essential source of oil pollution sources in profiling suspected pollution sources in identification of spilled oil source. • Because the geographical information in data & information stored in the database is very important in profiling, the database system should be constructed employing GIS. Because, these data are being used in COR, Suez RBO should access and utilize these data.
Time Frame	Year 2 (Periodical maintenance is required, afterward)
Required Inputs	Staff costs
Units in Charge	Information Unit, EMD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Trunk Action 2.2

Title of Trunk Action	**2.2 Oily wastewater control**
Narration of Trunk Action	Strengthen the control for oily wastewater discharged from oil-related industries.

Expected Output of Trunk Action	Oil discharge from oil-related industries is reduced by enforcing strict supervision for wastewater and introducing the improvement of production process.
Justification of Trunk Action	• Oil pollution in Northern Gulf Region is caused by not only oil spills (leakage) in the event of incidents but also continuous discharge of oily wastewater from oil refineries, petrochemical industries and other oil-related industries. Despite periodical environmental inspection by Suez RBO, it has been found that many industries oftentimes release oily wastewater which often exceed the effluent standard (oil 15 mg/l) specified in the Law No. 4, at present. • Therefore, it is required that more strict control through the supervision by self-monitoring is enforced so as to meet the effluent standard in oil-related industries. • As specific actions to address this issue, awareness raising and upgrading of skills in managing wastewater treatment plant are also proposed. • Together, the reduction of pollution loading generated in the production process by introducing the production process improvement is proposed.
Module Actions	The trunk action is comprised of the following module actions: 2.2.1 Enforce more strict supervision by means of self-monitoring for oil-related industries to comply with the effluent standards of Law No. 4. 2.2.2 Open the seminars for enhancing the skill of oil-related industries in managing oily wastewater treatment, in cooperation with oil sector and local universities. 2.2.3 Take actions to support H/Qs for promoting CP (Cleaner Production) technologies for industrial process improvement.
Strategy to be Attained	Strategy 2: Oil discharge prevention Management of oil discharge prevention from various oil pollution sources in Northern Gulf Region are reinforced.

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.2.1

Narration of Module Action	2.2.1 Enforce more strict supervision through the self-monitoring system for oil-related industries to comply with the effluent standards of Law No. 4.

Work Items	This module action is comprised of the following work items: 1. Constitute the instruction protocol of self-monitoring report for oily wastewater and sets forth it to oil-related industries (refineries, petrochemical and other oil-related industries). 2. Discuss causes for incompliance with the effluent standard (if incompliance is found in the self-monitoring report), based on periodical self-monitoring report from oil-related industries. 3. Recommend appropriate remediation of wastewater treatment plant and its operation & maintenance to industries, based on the discussion on the results of self-monitoring. 4. Follow up the results of remediation by checking the self-monitoring report.
Work Description	• At present, Suez RBO receives the self-monitoring reports from part of industries which discharge oily wastewater. Through complete enforcement of self-monitoring, this module action aims to make thorough and strict supervision against oily wastewater discharge by giving specific recommends for solving problems in hard provisions and management for oily wastewater treatment. • As a result of complete enforcement of self-monitoring, it is expected that the awareness of industries for the compliance with the effluent standard be raised, self-dependently. • The instruction protocol of self-monitoring report should be prepared as the first step by Suez RBO. The instruction protocol of self-monitoring report should allow Suez RBO to be well informed of operation status of wastewater treatment so as to discuss problems which industries encounter.
Time Frame	Work item 1: Year 2 (Afterward, the supervision through self-monitoring system is continued)
Required Inputs	Staff costs
Units in Charge	EMD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.2.2

Narration of Module Action	2.2.2 Open the seminars for enhancing the skill of oil-related industries in managing oily wastewater treatment in cooperation with oil sector and local universities.

Work Items	This module action is comprised of the following work items: 1. Make a plan of seminars for management of oily wastewater treatment. 2. Open seminars for management of oily wastewater treatment.
Work Description	• Opening of the seminar aims to enhance the knowledge and skills of staffs of oil-related industries for the management of oily wastewater treatment. The seminar should focus on the points to allow participants to ensure the operation and management of oily wastewater treatment. As a indicative information, the agenda to be addressed in the seminar are shown as follows: - Generated volume of wastewater - Water quality parameters and their significances - Wastewater treatment units and their management (physical & chemical treatment, biological treatment, sludge treatment, etc.) - Actual application of oil-related wastewater treatment (petroleum refinery, petrochemical industry, edible oil industry, etc.) • The role of Suez RBO in this module action is to open the seminar, with organizing, planning, and arranging. • Lecturers for the seminar should be experts with professional expertise in management of oily wastewater treatment, who are invited from oil sector and/or local universities.
Time Frame	Year 2
Required Inputs	Staff cost of Suez RBO, (Expenses for seminar opening)
Units in Charge	EMD, PAD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.2.3

Narration of Module Action	2.2.3 Take actions to support H/QS for promoting CP (Cleaner Production) technologies for industrial process improvement.

Work Items	This module action is comprised of the following work items: 1. Survey the current situation of industrial process in oil-related industry in Northern Gulf Region and clarify the possible opportunities for introducing CP technologies. 2. Support H/Qs to open the seminar for introducing CP technologies in cooperation with industrial associations and academic institutes.
Work Description	• In the long view, this module action aims to reduce the pollution loads released to the environment by the introduction of CP technologies into oil related industries for production process improvement. In oil-related industries, it has been known that the following options for CP technologies can improve production process to reduce the pollution load released to the environment: - Pollution preventions: Good housekeeping practices, production process modifications, material substitutions. - Recycling options: Recycle and regeneration of spent materials, use oily sludges as feedstock, control and reuse of catalysts and cokes, recycle - Treatment options: Thermal treatment of sludge, recovery of oils from oily sludges, reduction of tank bottom sludges, regeneration 0r elimination of filtration clay, minimization of decant oil sludge. • To promote such CP technologies in Northern Gulf Region, Suez RBO should support Industrial Unit which is responsible for promoting the diffusion of CP technologies in Egypt, because this module action requires specialized expertise in this field. • Prior to opening the seminar to diffuse CP technologies, it is required to support activities of H/QS that Suez RBO clarifies the real and practical needs in this field, making survey to know of the present situation and the possibilities. • Coordinate in opening the seminar for introducing CP technologies with H/QS (Industrial Unit) and support its activities as a frontline base.
Time Frame	Work item 3: Year 4
Required Inputs	Staff costs of Suez RBO
Units in Charge	EMD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Trunk Action 2.3

Title of Trunk Action	**2.3 Awareness raising and cooperative actions**
Narration of Trunk Action	Take actions for raising awareness of all stakeholders and take cooperative actions with RSPA for oil pollution.

Expected Output of Trunk Action	Awareness of stakeholders including fishery industries and small workshops is raised and cooperative actions with authority concerned are taken for oil pollution.
Justification of Trunk Action	• To success oil discharge prevention, the awareness for oil pollution of all stakeholders should be raised to generate good cooperation among all stakeholders based on PPP (Public-Private Partnership). • Given the fact that many oil discharges are caused by small ships for fishery industry and small workshops located along shorelines, the campaigns especially for small-size pollution sources are required to raise the awareness for oil pollution. • Operating of receiving facility to deal with waste oils and oily wastewater generated from ships is the responsibility of RSPA, as stipulated in Law No. 4. It is required that Suez RBO provides adequate technical consultation to RSPA so as to ensure the construction and operation of receiving facility meeting the required performance in oil pollution prevention.
Module Actions	The trunk action is comprised of the following module actions: 2.3.1 Open annual risk communication meeting in the attendance of all stakeholders (like citizens, children, public sectors and private sectors). 2.3.2 Launch the awareness raising campaign for fishery industries on oil pollution. 2.3.3 Launch the awareness raising campaign for small workshops on oil pollution. 2.3.4 Provide technical advice on the reception facilities to RSPA.
Strategy to be Attained	Strategy 2: Oil discharge prevention Management of oil discharge prevention from various oil pollution sources in Northern Gulf Region are reinforced.

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.3.1

Narration of Module Action	2.3.1 Open annual risk communication meeting in the attendance of all stakeholders (like citizens, children, public sectors and private sectors).

Work Items	This module action is comprised of the following work items: 1. Make annual plan for opening risk communication in the attendance of all stakeholders. 2. Make a preparation for opening annual risk communication, and carry out an annual risk communication meeting.
Work Description	• Annual meeting of risk communication is opened to raise awareness of all stakeholders for oil pollution in the attendance of all stakeholders (like citizens, children, public sectors and private sectors), as the trial meeting was held during the period of REMIP. • Materials for awareness raising (like leaflet, pamphlet, video, etc.) should be made in the preparation work.
Time Frame	Work item 1: Year 1 Work item 2: Periodical actions once a year
Required Inputs	Staff cost of Suez RBO, (Costs for material preparation, miscellaneous cost for opening meeting.)
Units in Charge	PAD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.3.2

Narration of Module Action	2.3.2 Launch the awareness raising campaign for fishery industries on oil pollution.

Work Items	This module action is comprised of the following work items: 1. Make an agreement with the fishery industry on awareness raising (where necessary). 2. Survey and clarify oil pollution caused by fishery industries. 3. Make a plan of awareness raising campaign for fishery industries. 4. Prepare materials for awareness raising for fishery industries. 5. Carry out the awareness raising campaign for fishery industries.
Work Description	• There are so many fishery ships operating in Northern Gulf Region. For example, Atakah port in Suez Governorate is accessed by a total of around 940 fishing ships and boats, annually. Although fishery ships are considered to be one of possible oil pollution sources, actual status has little been known up to know. Therefore, prior to launch the awareness campaign, the present situation of oil discharge and current practices should be surveyed and clarified. • A campaign plan for raising awareness to address oil discharge from fishery ships is formulated, including frequency and time of campaign, methodologies of campaign, materials to be prepared, etc. • The awareness raising campaign should be conducted in cooperation with fishery industries in respective zones located in Northern Gulf Region.
Time Frame	Work Item 1 and 2: Year 1 Work Item 3 and 4: Periodical actions to be taken, annually.
Required Inputs	Staff cost of Suez RBO, (Costs for material preparation, miscellaneous cost for campaign.)
Units in Charge	PAD, EMD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.3.3

Narration of Module Action	2.3.3 Launch the awareness raising campaign for small workshops on oil pollution.

Work Items	This module action is comprised of the following work items: 1. Make an agreement with the small workshop industry on awareness raising (where necessary). 2. Survey and clarify oil pollution caused by small workshops. 3. Make a plan of awareness raising campaign for small workshops. 4. Prepare materials for awareness raising for small workshop. 5. Carry out the awareness raising campaign for small workshops.
Work Description	• There are so many small workshop operating in Northern Gulf Region. Although small workshops (repairing and manufacturing equipment and machineries) are considered to be one of possible oil pollution sources, actual status has little been known up to know. Therefore, prior to launch the awareness campaign, the present situation of oil discharge and current practices should be surveyed and clarified. • A campaign plan for raising awareness to address oil discharge from small workshops is formulated, including frequency and time of campaign, methodologies of campaign, materials to be prepared, etc. • The awareness raising campaign should be conducted in cooperation with the association of small workshops in respective zones located in Northern Gulf Region.
Time Frame	Work Item 1 and 2: Year 1 Work Item 3 and 4: Periodical actions to be taken, annually.
Required Inputs	Staff cost of Suez RBO, (Costs for material preparation, miscellaneous cost for campaign.)
Units in Charge	PAD, EMD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.3.4

Narration of Module Action	2.3.4 Provide technical advice on the reception facilities to RSPA.

Work Items	This module action is comprised of the following work items: 1. Study appropriate type of receiving facility meeting the conditions of Northern Gulf Region. 2. Provide technical consultation on reception facility, as needed.
Work Description	• Receiving facility is comprised of rigging, equipment and basins which are appropriated for the purpose of receiving sediment and draining polluting materials or balancing waters. A typical reception facilities comprises three elementary building blocks: - Oily water reception and treatment and storage of recovered oil, - Oily residues treatment, - Sludge dewatering. • To prevent oil pollution to result from the discharge from ships and port-related facilities, the Article 56 of Law No. 4 stipulates that ports of shipment and ports to receive oil tankers, as well as ship repair docks shall be provided with adequate facility for receiving unclean balancing waters and the water resulting from process of washing tanks of oil tankers and of other ships. • Though RSPA has simple storage basins to receive waste oils and oily wastewater, at present, this is not considered to be appropriated for the purpose as receiving facility due to the lack of treatment functions. Thus, it is required that RSPA be provided with appropriate receiving facility with treatment functions. • Now, RSPA started to study the construction of reception facility. While the construction and operation of the receiving facility is the work to be undertaken by RSPA, it is requested that Suez RBO provides technical consultation to RSPA, as needed, in order to ensure appropriate management of waste oils and oily wastewater discharged from ships and other related facilities.
Time Frame	Year 1 (as needed by RSPA)
Required Inputs	Staff cost
Units in Charge	EMD, EQD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Trunk Action 2.4

Title of Trunk Action	**2.4 Launching of marine inspection**
Narration of Trunk Action	Launch marine inspection for sea-based and coastal pollution sources.

Expected Output of Trunk Action	Marine inspections for sea-based and coastal oil pollution sources are launched and implemented periodically.
Justification of Trunk Action	• It has been known that large portion of oil discharges are generated from sea-based and coastal sources of stationary facilities like offshore platforms, sea-bed pipes, oil terminal, loading & unloading facilities and bunkering facilities, and moving sources like oil tankers, fishery ships, etc. • Although Suez RBO conducts periodical environmental inspection against land-based facilities like industries, tourism facilities and others, the inspection against these sea-based facilities (defined as marine inspection) has not been realized, at present. To realize this trunk action, appropriate technical trainings are, first of all, required to enhance knowledge and skills of staffs in marine inspection for such pollution sources. • It is also required that Suez RBO enforces marine inspection against sea-based and coastal pollution sources to reduce oil discharges in Northern Gulf Region, enhancing inspection skills and establishing necessary procedural protocol and mobilization system.
Module Actions	The trunk action is comprised of the following module actions: 2.4.1 Take action to provide staffs with opportunities for technical trainings for enhancing their skills for marine inspections. 2.4.2 Establish the operation protocol of marine inspection in cooperation with concerned authorities. 2.4.3 Establish and operate the mobilization system for marine inspection by using a patrol ship in cooperation with RSPA.
Strategy to be Attained	Strategy 2: Oil discharge prevention Management of oil discharge prevention from various oil pollution sources in Northern Gulf Region are reinforced.

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.4.1

Narration of Module Action	2.4.1 Take action to provide staffs with opportunities for technical enhancement for marine inspections.

Work Items	This module action is comprised of the following work items: 1. Make an agreement with concerned parties on launching of marine inspection and its inspection protocols (where necessary). 2. Survey and pick out sea-based and coastal pollution sources which are possibly subject to marine inspection. 3. Enhance knowledge and experience concerned with oil discharge from sea-based and coastal pollution sources through visits to sites and workshops inviting experts specializing in respective fields.
Work Description	• Many of possible sea-based and coastal pollution sources are existing, ranging from stationary sources (like offshore platforms, offshore pipes, oil terminal and loading & unloading facilities) to moving sources (like oil tankers, fishery ships, etc.). Prior to launching marine inspection, Suez RBO should survey and select possible major pollution sources which are subject to the inspection. • Because Suez RBO has little conducted marine inspection at present, staffs are lack in knowledge about sea-based pollution and coastal sources. Thus, staffs of Suez RBO, step by step, need to enhance their knowledge and experience in this regard, with receiving the support from sectors concerned (like RSPA, oil sector, etc.).
Time Frame	Year 3
Required Inputs	Staff cost of Suez RBO
Units in Charge	EMD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.4.2

Narration of Module Action	2.4.2 Establish the operation protocol of marine inspection in cooperation with concerned authorities.

Work Items	This module action is comprised of the following work items: 1. Establish the operation protocol of marine inspection for stationary sources like offshore platforms, offshore pipes, oil terminal, loading & unloading facilities, bunkering facilities, etc. 2. Establish the operation protocol of marine inspection for moving sources like oil tankers, fishery ships, etc. in cooperation with RSPA, SCA, etc.
Work Description	• In the Article 52 of Law No. 4, the responsibility of companies and organizations for preventing oil discharge from stationary sources (sea-based and coastal sources) is prescribed, as follows: *Companies and organizations for exploitation and extraction of oils (including oil carrying means) shall be prohibited to discharge any polluting substance resulting from drilling and prospecting testing of wells, or production. They shall use safe methods which do not result in causing harms to water environment, and shall treat all discharged wastes and polluting substances and materials according to the latest available technical systems.* • Regarding the moving sources, Law No. 4 gives variety of requirements to the ship owners conforming international conventions concerned to prevent oil pollution. Especially, the Article 58 states that the ship owners have the responsibility for maintaining an oil register, clarifying the following operations: - *Carrying out loading or delivery operations, or other transport operations of oil loads, along with indicating the type of oils.* - *Discharging the oil or oil mixture along with indicating the type of oil.* - *Leakage of oil or oil mixture as a result of a collision or an incident, along with indicating the percentage of oil and the volume of leakage.* - *Throwing the waters containing oil gathered in the engine room outside the ship, during its presence in the harbor.* • In this module action, Suez RBO prepares and establishes the operation protocol for marine inspection necessary for the inspection of stationary and moving sources, by using knowledge learned in the module action 2.3.1. The operation protocol should include inspection items, methodologies for inspection, judgment criteria for inspection results, frequencies of inspection, at least. • Given the numbers of passing ships in the region, it is not considered to be realistic that Suez RBO directly conducts the marine inspection for oil tankers and other ships. Therefore, it should be examined that Suez RBO supervise the results of marine inspection made by RSPA and SCA.
Time Frame	Year 4
Required Inputs	Staff costs of Suez RBO
Units in Charge	EMD

Design Sheet of:

Action Plan for Strategy 2: Oil Discharge Prevention

Module Actions 2.4.3

Narration of Module Action	2.4.3 Establish and operate the mobilization system for marine inspection by using a patrol ship in cooperation with RSPA.

Work Items	This module action is comprised of the following work items: 1. Establish the system for maintaining and operating a patrol ship for marine inspection. 2. Make an agreement with RSPA on the mobilization of a patrol ship for marine inspection. 3. Carry out marine inspection for sea-based pollution sources by mobilizing a patrol ship.
Work Description	• A patrol ship is essential for realizing marine inspection. However, purchasing, operating and maintaining it requires much financial resources, including not only initial cost but also operation & maintenance costs for fueling, mooring, navigating, etc. • Therefore, it is recommendable that Suez RBO uses a patrol ship of RSPA in a specializing cooperation with RSPA
Time Frame	Year 5
Required Inputs	Staff cost
Units in Charge	EMD

Design Sheet of:

Action Plan for Strategy 3: Oil Spill Response

Trunk Action 3.1

Title of Trunk Action	**3.1 Development of draft ROSCP**
Narration of Trunk Action	Work as a leading player to organize the regional committee and develop the draft ROSCP.

Expected Output of Trunk Action	The regional committee for ROSCP is organized and the draft ROSCP for Northern Gulf Region conforming to NOSCP (National Oil Spill Contingency Plan) is developed.
Justification of Trunk Action	• The Article 25 of Law No. 4 stipulates that EEAA shall set an emergency plan to cope with and confront environmental disasters. The emergency plan shall specifically contain the following: - Collecting and gathering the information available locally and internationally on the method of confronting environmental disasters, and alleviating the damages resulting there from. - Surveying and determining the potentials available at the local, national and international levels, and defining the method of resorting to them in a way securing prompt confrontation of the disaster. • In terms of oil pollution, EEAA has been furnished with NOSCP which covers the national plan against oil spill incidents classified to Tier 1, the regional plan against oil spill incidents classified to Tier 2 has not been existing. Thus, ROSCP to be applied to incidents of Tier 2 in Northern Gulf Region should be formulated. • The development and implementation of ROSCP should be made by all parties concerned like authorities concerned, private sectors and citizen groups. Among them, Suez RBO is required to discharge a leading role by Law No. 4, in preparing and carrying out ROSCP. • Thus, it is required that Suez RBO leads to organize the regional committee with working out the draft framework of ROSCP. In this action, it is also required that roles and responsibilities of each member in the development and implementation of ROSCP be clarified. • ROSCP for Northern Gulf Region should be finalized in the public consultation in the participation of all stakeholders. Before the public consultation, the draft ROSCP should be prepared in the discussion in the regional committee. Suez RBO is requested to play a leading role for developing ROSCP in the regional committee.
Module Actions	The trunk action which is taken by Suez RBO as the leading player of the regional committee is comprised of the following module actions: 3.1.1 Set up Emergency Unit and work as a leading player to organize the regional committee for ROSCP, preparing the framework of the draft ROSCP. 3.1.2 Work as a leading player to conduct information gathering and compile data & information necessary for developing the strategy and operation plan. 3.1.3 Work as a leading player to develop the draft ROSCP conforming to NOSCP.
Strategy to be Attained	Strategy 3: Oil spill response Contingency responses against oil spill incidents in Northern Gulf Region are implemented after the establishment of ROSCP.

Design Sheet of:

Action Plan for Strategy 3: Oil Spill Response

Module Actions 3.1.1

Narration of Module Action	3.1.1 Set up Emergency Unit and work as a leading player to organize the regional committee for ROSCP, preparing the framework of ROSCP.

Work Items	This module action which is taken by Suez RBO as the leading player is comprised of the following work items: 1. Set up Emergency Unit to work as a leading player when oil discharge events happen. 2. Work out the framework of ROSCP to be referred at the time of organizing the regional committee for ROSCP. 3. Lead to organize the regional committee for developing ROSCP. 4. Make an agreement with concerned parties on the development and implementation of ROSCP (where necessary).
Work Description	• As of today, designated persons EMD of Suez RBO at the time of events work for oil discharge events. In this countermeasure plan, Suez RBO sets up Emergency Unit which is specialized in oil spill response. • Development of ROSCP should be made in the participation of all parties concerned with oil spills in Northern Gulf Region. Parties to be consulted are EEAA COR, EMUs (of 5 governorates), RSPA, SCA, oil sectors, PESCO, general citizens, etc. After the completion of the development of ROSCP, this regional committee should continue to work to steer and coordinate oil pollution-related matters in Northern Gulf Region. • As a preparation for initiating the discussion of ROSCP development, Suez RBO works out the framework of ROSCP. This framework should describe necessary points so to give the overall image of ROSCP and respective roles and responsibilities of parties concerned in combating oil spills. • ROSCP plan is a plan for action prepared in anticipation of an oil spill. ROSCP is essential because it establishes practical plans of action for all types of oil spills so that, when spills do occur, a quick response can minimize the damage. The first step in developing a plan is to learn as much about the area as possible. Regardless of the geography or the size of an area, contingency plans normally include: - Identification of authority and a chain of command, - A list of persons and organizations that must be immediately informed of a spill, - An inventory of available trained spill personnel and spill response equipment, - A list of jobs that must be done (in order of priority), - A communication network to coordinate response, - Probable oil movement patterns under different weather conditions, and - Sensitivity maps and other technical data. To make such ROSCP, planners need to know about: - Situation of pollution sources (locations, characters of oils, scales of handled oils, etc.) to predict possible oil discharges, - Important or sensitive physical and biological resources within or near the area, such as marshes, unusual flora (plant life) and wildlife resources such as fish, shellfish, marine mammals and birds, - Important habitat areas required by particular species for spawning, feeding or migration, tides, currents and local climatic conditions, such as wind and severe weather patterns, shoreline characteristics, and - Proximity to roads, airports, trained response personnel, oil spill clean-up equipment, etc.

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	• The framework of actual ROSCP covers and explain the main contents of the following 3 basic sections, as follows: Data & information section: Contains all relevant maps, resource lists and data sheets required to support an oil spill response efforts and to conduct the response according to an agreed strategy. Strategy section: Describes the scope of the plan, including the geographical coverage, perceived risks, roles & responsibilities of those charged with implementing plan and proposed response strategy. Action and operation section: Sets out the emergency procedures that allow rapid assessment of the spill and mobilization of appropriate response resources. The framework of ROSCP prepared by Suez RBO is used for discussing and confirming the task of the regional committee and roles of each party in developing and implementing ROSCP. • As the first step, Suez RBO takes actions to organize a regional committee specializing in developing ROSCP, calling all parties concerned in Northern Gulf Region. Three working groups specializing in data & information, strategy and action & operation section should be formed in the regional committee.
Time Frame	Year 1
Required Inputs	Staff cost
Units in Charge	EMD

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Module Actions 3.1.2

Narration of Module Action	3.1.2 Work as a leading player to conduct information gathering and compile data & information necessary for developing the strategy and operation plan.

Work Items	This module action which is taken by Suez RBO as the leading player is comprised of the following work items: 1. Collect data & information necessary for examining environmental risks and required responses against oil spills. 2. Make the sensitivity map for oil pollution in Northern Gulf Region. 3. Analyze data & information gathered and compile them so as to use for the data directory of the draft ROSCP.
Work Description	• Suez RBO works as the leading player for this module action, but actual works of this module action should be shared and performed by member parties of the regional committee. • Data & information for hazard identification to be caused by oil spills are gathered and compiled, as follows: - Historical data of oil spill incidents. - Pollution sources: kinds of sources (stationary or moving), geographic locations, quantities of oils, oil properties, etc. - Weather and sea conditions (including current and wind data). - Locations of equipment for oil spill response and trained personnel. The information system including pollution source inventory (to be developed in the trunk action 2.1) is utilized as part of data & information mentioned above. • Computer trajectory modeling: The computer model is able to make prediction of trajectory and fate of spilled oil. This can be used for making decisions concerning the strategy development and the identification of necessary capability. However, it should be noted that, though the use of computer trajectory modeling may be desirable, this is not absolutely essential for planning and response, especially in the beginning stage of ROSCP. Thus, the application of computer modeling should be considered in the long-term to make ROSCP more effectively and precisely. • Making sensitivity map is essential for the development of strategy and operation plan. The sensitivity maps convey essential information for oil spill combating by showing where the different coastal resources are existing and by indicating environmentally sensitive areas. Data & information on commercial, ecological, recreational resources, etc. are gathered to make sensitivity maps. Areas with special values to be identified are as follows: - Ecological: coral reefs, saltmarshes, estuaries, fish spawning zones, bird breeding/feeding and roosting zones, mangrove stands, seagrass beds. - Recreational: tourist areas, bathing beaches, marinas, water sports. - Commercial: water intakes, shipyards/ports, fish farms, other mariculture. • Data & information for hazard identification and the sensitivity map mentioned above are used for examining the environmental risk in developing the strategy and operation plan. • Data & information gathered and analyzed should be compiled as the data directory of the draft ROSCP. The contents of the data directory of the draft ROSCP is as follows:

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	Maps/charts: 1. Coastal facilities, access roads, telephones, hotels, etc. 2. Coastal charts, currents, tidal information (ranges and streams), prevailing winds 3. Risk locations and probable fate of oil 4. Shoreline resources for priority protection 5. Shoreline types 6. Sea zones and response strategies 7. Coastal zones and response strategies 8. Shoreline zones and clean-up strategies 9. Oil and waste storage/disposal sites 10. Sensitivity maps/atlas Lists: 1. Primary oil spill equipment: booms, skimmers, spray equipment, dispersant, absorbents, oil storage, radio communications, etc (manufacturer, type, size, location, transport, contact, delivery time, cost and conditions) 2. Auxiliary equipment: tugs and work boats, aircraft, vacuum trucks, tanks and barges, loaders and graders, plastic bags, tools, protective clothing, communications equipment, etc (manufacturer, type, size, location, transport, contact, delivery time, cost and conditions) 3. Support equipment: aircraft, communications, catering, housing, transport, field sanitation and shelter etc (availability, contact, cost and conditions) 4. Sources of manpower: contractors, local authorities, caterers, security firms (availability, numbers, skills, contact, cost and conditions) 5. Experts and advisors: environment, safety, auditing, (availability, contact, cost and conditions) 6. Local and national government contacts: (name, position and responsibility, address, telephone, fax, telex) Data: 1. Specifications of oils commonly traded 2. Wind and weather 3. Information sources
Time Frame	Year 1
Required Inputs	Staff cost
Units in Charge	EMD

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Module Actions 3.1.3

Narration of Module Action	3.1.3 Work as a leading player to develop the draft ROSCP conforming to NOSCP.

Work Items	This module action which is taken by Suez RBO as the leading player is comprised of the following work items: 1. Develop the strategy section of the draft ROSCP. 2. Develop the action and operation section of the draft ROSCP.
Work Description	• Suez RBO works as the leading player for this module action, but actual works of this module action should be shared and performed by member parties of the regional committee. • Viable response strategies for oil spills should be developed and described in the strategy section. These may have to be adaptable to different locations, under different conditions and at different times of the year. They must be established in consultation with the relevant authorities and stakeholders. The strategy prescribed here must conform to the contents of NOSCP. The strategy section should include the following contents: 1. Introduction and scope 1.1 Authorities and responsibilities, coordinating committee 1.2 Statutory requirements, relevant agreements 1.3 Geographical limits of plan 1.4 Interface with other plans/representation at joint control centres 2. Oil spill risks 2.1 Identification of activities and risks 2.2 Types of oil likely to be spilled 2.3 Probable fate of spilled oil 2.4 Development of oil spill scenarios 2.5 Shoreline sensitivity mapping 2.6 Shoreline resources, priorities for protection 2.7 Special local considerations 3. Spill response strategy 3.1 Philosophy and objectives 3.2 Limiting and adverse conditions 3.3 Strategy for offshore zones 3.4 Strategy for coastal zones 3.5 Strategy for shoreline zones 3.6 Strategy for oil and waste storage and disposal 4. Equipment, supplies and services 4.1 On water oil spill equipment 4.2 Inspection, maintenance and testing 4.3 Shoreline equipment, supplies and services 5. Management, manpower and training 5.1 Crisis manager and financial authorities 5.2 Incident organization chart 5.3 Manpower availability (on-site, on-call) 5.4 Availability of additional labor 5.5 Advisors and consultants 5.6 Training/safety schedules and drill/exercise programme

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	6. Communications and control 6.1 Incident control room and facilities 6.2 Field communications equipment 6.3 Reports, manuals, maps, charts and incident logs • Disposal of oils is one of major problems, which Suez RBO must be prepared beforehand. ROSCP needs to include details of all oil disposal techniques which can be utilised for the region. Planning such disposal of oils should be examined under the following basic considerations: - Sites and methods for the temporary storage of both liquid and solid waste should be identified to act as a buffer between collection of waste from the sea or shore and final disposal. - Disposal of recovered oil and oily waste should only be considered after all possibilities of processing it for use as a fuel or raw material have been exhausted. - The costs of disposal, including handling, separation and transport, are likely to be high and make up a significant proportion of the overall costs of the clean-up operations. - The action and operation section of ROSCP set out the emergency procedures that will allow rapid assessment of the spill and mobilization of appropriate response resources. • The action and operation section should include the following contents: 7. Initial procedures 7.1 Reporting incident, preliminary estimate of response Tier 7.2 Notifying key team members and authorities 7.3 Establishing and staffing control room 7.4 Collecting information (oil type, sea/wind forecasts, aerial surveillance, beach reports) 7.5 Estimating fate of slick (24, 48 and 72 hours) 7.6 Identifying resources immediately at risk, informing parties 8. Operations planning and mobilization procedures 8.1 Assembling full response team 8.2 Identifying immediate response priorities 8.3 Mobilizing immediate response 8.4 Preparing initial press statement 8.5 Planning medium-term operations (24-, 48-and 72-hour) 8.6 Deciding to escalate response to higher Tier 8.7 Mobilizing or placing on standby resources required 8.8 Establishing field command post and communications 9. Control of operations 9.1 Establishing a management team with experts and advisors 9.2 Updating information (sea/ wind/weather forecasts, aerial surveillance, beach reports) 9.3 Reviewing and planning operations 9.4 Obtaining additional equipment, supplies and manpower 9.5 Preparing daily incident log and management reports 9.6 Preparing operations accounting and financing reports 9.7 Preparing releases for public and press conferences 9.8 Briefing local and government officials 10. Termination of operations 10.1 Deciding final and optimal levels of beach clean-up 10.2 Standing-down equipment, cleaning, maintaining, replacing 10.3 Preparing formal detailed report

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	10.4 Reviewing plans and procedures from lessons learnt
Time Frame	Year 2
Required Inputs	Staff cost
Units in Charge	EMD

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Trunk Action 3.2

Title of Trunk Action	**3.2 Public consultation and implementation of ROSCP**
Narration of Trunk Action	Work as a leading player to open public consultation of ROSCP and implement it.

Expected Output of Trunk Action	An consensus for ROSCP in Northern Gulf Region is attained among the concerned parties and general citizens, and ROSCP is activated and maintained.
Justification of Trunk Action	• ROSCP should be discussed in the public consultation to reflect the comments and opinions of all stakeholders. At the final stage, it is required that the cooperation protocol be agreed among all stakeholders to ensure well cooperative implementation of ROSCP. • To ensure well-organized implementation of ROSCP, periodical drills are required in the participation of stakeholders concerned.
Module Actions	The trunk action which is taken by Suez RBO as the leading player of the regional committee is comprised of the following module actions: 3.2.1 Work as a leading player to open the public consultation meeting for the draft ROSCP in the participation of all the concerned parties and general citizens. 3.2.2 Work as a leading player to activate and maintain ROSCP with managing and reviewing it as needed, and conducting periodical drills.
Strategy to be Attained	Strategy 3: Oil spill response Contingency responses against oil spill incidents in Northern Gulf Region are implemented after the establishment of ROSCP.

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Module Actions 3.2.1

Narration of Module Action	3.2.1 Work as a leading player to open the public consultation meeting for the draft ROSCP.

Work Items	This module action which is taken by Suez RBO as the leading player is comprised of the following work items: 1. Prepare and opens the public consultation for the draft ROSCP in the participation of all concerned parties and general citizens. 2. Review and modify ROSCP based on opinions and comments released in the public consultation.
Work Description	• A public consultation for the draft ROSCP is opened in the participation of all concerned parties and general citizens to hear opinions and comments. • The first version of ROSCP in Northern Gulf Region is completed, after reviewing and modifying the draft based on opinions and comments released in the public consultation.
Time Frame	Year 3
Required Inputs	Staff cost Expenses for opening the public consultation
Units in Charge	EMD

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Module Actions 3.2.2

Narration of Module Action	3.2.2 Work as a leading player to activate and maintain ROSCP as needed, and conduct periodical drills.

Work Items	This module action which is taken by Suez RBO as the leading player is comprised of the following work items: 1. Arrange to be signed on for an agreement of the implementation of ROSCP among all concerned parties about the implementation of ROSCP, and activates it. 2. Take action to conduct periodical drills of oil spill contingency response. 3. Maintain ROSCP with managing and reviewing it, as needed.
Work Description	• An agreement on the implementation of ROSCP is prepared and signed on by all concerned parties to ensure its activation and sustainable implementation. • The planning of ROSCP is not a one-off event and ROSCP requires the maintenance with sustainable management and periodic review. ROSCP is subject to the necessary review and modification, based on the results of experimental drills and contingency responses against actual oil spill events. There are 4 fundamental elements that make up effective management to ensure the implementation of ROSCP, as follows: <u>Response organization:</u> Response organization must be clarified and recognized with functional teams to address command, planning, operations, logistics and finances. The key aim of the organization will be to obtain timely assessments to allow the response effort to rapidly move from reactive to proactive management. This may also be conceived as turning the oil spill emergency into a well-managed project. <u>Clear roles and responsibilities:</u> Functions and roles of each component of the response organization must be clearly understood. Typical functions of the response organization are comprised of: crisis management organization, incident command, safety, external liaison, legal affairs, public affairs, action planning, operations, logistics and finance. <u>Effective communications:</u> Information flow within the organization and to the outside world requires both modern technology and disciplined personnel. <u>Suitable resources for contingency response:</u> The availability of appropriate equipment and staff must be checked all the time. • Periodical drills for contingency response are an significant way to exercise and train personnel in their emergency roles and to test contingency plans and procedures. Valuable lessons can be learned from such exercises and these can be used to improve plans. Personnel will not only feel more comfortable after constructive exercising, they will also benefit from strengthened team spirit. Important relationships with external organizations are made during larger scale or multi-agency drills. During times of real emergency, a well-rehearsed team is expected to “hit the ground running” and be more effective. The drill should be accompanied by the training for personnel of concerned parties. It is vital that staff with an identified role in a response organization are familiarized with contingency plan and their roles. The training should include the appropriate level of tuition in oil spill response theory and equipment deployment, depending on their role.

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Time Frame	Work item 1 and 2: Year 3 Work item 3: Periodical action as needed.
Required Inputs	Staff-cost Expenses for conducting drills for contingency plan
Units in Charge	EMD

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Trunk Action 3.3

Title of Trunk Action	**3.3 Clean-up of oil pollution hotspots**
Narration of Trunk Action	Work as a leading player to establish a funding system and carry out clean-up operation of oil pollution hotspots beaches.

Expected Output of Trunk Action	Original beach statuses are recovered by clean-up operations by employing the finance from the appropriate fund.
Justification of Trunk Action	• At present, hotspots heavily polluted by oils are seen in Northern Gulf Region. Although clean-up operation for these spots are occasionally enforced in cooperation with Suez RBO and certain units suffering from their influences, several hotspots are left polluted. Together the implementation of ROSCP, these hotspots should be cleaned up. • To realize this, the establishment of appropriate funding system is required to ensure the clean-up operation. • Suez RBO is required to play a leading role in establishing an appropriate funding system and initiating clean-up operations in cooperation with firms concerned.
Module Actions	The trunk action is comprised of the following module actions: 3.3.1 Work as a leading player to establish the funding mechanism through PPP (public-private partnership) to cover the expenses of clean-up operation. 3.3.2 Carry out the survey of oil pollution hotspots and pollution sources. 3.3.3 Work as a leading player to carry out the clean-up operation of oil pollution hotspots.
Strategy to be Attained	Strategy 3: Oil spill response Contingency responses against oil spill incidents in Northern Gulf Region are implemented after the establishment of ROSCP.

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Module Actions 3.3.1

Narration of Module Action	3.3.1 Work as a leading player to establish the funding mechanism based on PPP (public-private partnership) to cover the expenses of clean-up operation.

Work Items	This module action which is taken by Suez RBO as the leading player is comprised of the following work items: 1. Raise the proposal of establishing the funding mechanism based on PPP (public-private partnership) to cover the expenses of clean-up operation and lead the discussion for realizing it in the regional committee. 2. Make an agreement for the funding mechanism, clarifying roles and responsibilities of concerned parties.
Work Description	• Although the hotspots heavily polluted by oils are observed in Northern Region at present, many of them are not cleaned up mainly due to lack of financial resources. To alleviate such situations, a common funding mechanism should be established. • It is considered that main sources for funding should come from firms which are possible oil pollution sources like oil sectors and other oil-related parties. Because such initiative based on PPP is the first trial in Northern Gulf Area, the first action to be taken by Suez RBO is to raise a conceptual idea which concerned parties agree with, especially in terms of contributing finance. • The funding mechanism to be raised is discussed and agreed among concerned parties in the regional committee for ROSCP, including principal roles and responsibilities of concerned parties, in terms of contributing finance and implementing clean-up operation.
Time Frame	Year 3
Required Inputs	Staff costs
Units in Charge	PAD

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Module Actions 3.3.2

Narration of Module Action	3.3.2 Carry out the survey of oil pollution hotspots and pollution sources.

Work Items	This module action is comprised of the following work items: 1. Identify oil pollution hotspots to be cleaned up. 2. Make the survey on causes for oil pollution and set out the strategies for cleaning-up of hotspots.
Work Description	• There are several hotspots chronically polluted by accumulated oils in Northern Gulf Region. First, Suez RBO surveys hotspot beaches to identify locations, status of pollutions, degrees of influences by pollutions, etc. • Suez RBO surveys to find out possible pollution sources, using fingerprint analysis (if it can be useful). • Based on the survey results mentioned above, Suez RBO set out the strategies for cleaning-up hotspots, including main players of clean-up operation, how to remove oils, how to deal with recovered oils, necessary equipment & materials, participants in the clean-up operation, necessary expenses, etc. • Generally, the following basic methods are applied to remove oils, depending on the places of polluted hotspots and situation of oils: <u>Mobile oils</u> The removal of floating oil from harbours and other accessible areas where it becomes concentrated against shorelines or sea walls can be relatively straightforward, using a combination of booms and skimmers and locally-available resources such as vacuum trucks and similar suction devices and manpower. <u>Sand beaches</u> Bulk oil can usually be removed without difficulty from hard-packed sand beaches, using a combination of well-organised teams of manual labourers assisted by front-end loaders and other mechanical equipment to transport recovered wastes. Care needs to be taken not to remove excessive quantities of sand or to mix the oil deeply into the beach substrate, and in this respect manual collection of the oil is far preferable to attempts at mechanical removal with machinery. Final cleaning options can include manual removal or sieving of tarballs or oil fragments or the use of specialist beach cleaning machinery. <u>Rocky shores</u> Cleaning of rocky shores close to amenity beaches or sea walls and slipways is normally straightforward. Bulk oil can be recovered manually or by using vacuum units or other skimmers on pooled oil. Low pressure flushing with sea water may also be employed to wash oil residues to collection points. Final cleaning usually requires high pressure flushing, the pressure needed depending on how firmly the oil is adhering to the rock. Salt marshes and mangroves Leaving residual oil to weather and degrade naturally is usually recommended for sensitive shoreline types such as salt marshes and mangroves, because they have been shown to be more easily damaged by the physical disturbance caused by clean-up teams and vehicles than by the oil itself. If any cleaning is attempted, it should be carried out with specialist guidance and advice.
Time Frame	Year 3
Required Inputs	Staff costs
Units in Charge	EMD, EQD

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Module Actions 3.3.3

Narration of Module Action	3.3.3 Work as a leading player to carry out the clean-up operation of oil pollution hotspots.

Work Items	This module action which is taken by Suez RBO as the leading player is comprised of the following work items: 1. Consult a main player about the implementation of the clean-up operation of hotspot beaches, making specific plans for clean-up operation. 2. Take action to carry out the clean-up operation with the main player, calling the participation of concerned parties.
Work Description	• Based on the survey results on oil pollution hotspot beaches, the discussions for carrying out clean-up operation are made in the regional committee for oil pollution. Suez RBO works as the leading player to initiate the clean-up operation and to implement it in cooperation with main players of each hotspot. • Specific plans for clean-up operation should be prepared by Suez RBO to clarify the methodology of clean-up, disposal of recovered oils, mobilization of equipment and materials, participants of the operation, financial arrangement, etc.
Time Frame	Year 4 and 5
Required Inputs	Staff cost
Units in Charge	EMD, PAD