

## Project Design and Management I.

Time	Event	Content
1 hour & 30 min	<b>Session 1 Opening Session</b>	<ul style="list-style-type: none"> <li>• Introductions and sharing expectations</li> <li>• Sharing experience in project design and management</li> <li>• Presentation of your project idea</li> <li>• Overview of training objectives and five day schedule</li> <li>• Terminology, vocabulary, language of workshop</li> <li>• Creating working teams</li> </ul>
1 hour	<i>Session 2</i> <b>Successful Projects</b>	<ul style="list-style-type: none"> <li>• What is a project?</li> <li>• Characteristics of successful projects (Group discussion)</li> <li>• The role of project designers</li> <li>• Analysis of the Case Study: What has made it successful? (Group discussion)</li> </ul>
45 min	<i>Session 3</i> <b>Seven Steps of Problem Solving</b>	<ul style="list-style-type: none"> <li>• How do we solve problems? (Problem solving activity)</li> <li>• Seven steps of problem solving</li> <li>• The problem solving cycle &amp; the project cycle</li> </ul>
1 hour	<i>Session 4</i> <b>Problem Statement, Goal Setting</b>	<ul style="list-style-type: none"> <li>• Articulating the problem you want to solve</li> <li>• Analysing the problem (Group discussion)</li> <li>• Developing alternative solutions (Group discussion)</li> <li>• Selecting the best solution</li> <li>• Defining your project goal</li> <li>• How does the project goal match your organization's priorities, strategy?</li> </ul>
1 hour	<i>Session 5</i> <b>Setting Objectives</b>	<ul style="list-style-type: none"> <li>• Characteristics of good project objectives (SMART)</li> <li>• Assessing objectives (Group discussion)</li> <li>• Defining your project objectives</li> <li>• Relationship between goal, objective, outcome, output</li> </ul>
15 min	<b>End of Day 1</b>	<ul style="list-style-type: none"> <li>• Reflection on Day 1</li> <li>• Overview of Day 2</li> </ul>

## Project Design I.

### Objectives

By the end of Day 1 you will be able to:

- define what you mean by a project
- characterise a successful project
- describe what makes a project successful
- list the key steps of project design
- explain what kind of cycle your project will go through
- develop the goal and objectives of your own project

### Activities

#### **Session 1 – Opening**

Activity 1: Share your expectations, project idea and PDM experience

#### **Session 2 – Successful project**

Activity 2: Brainstorm on elements of and obstacles to successful projects

#### **Session 3 – Seven steps of problem solving**

Activity 3: Explore how people solve problems

#### **Session 4 – From problem statement to goal setting**

Activity 4: Define your problem statement, possible causes, alternative solutions and project goal

#### **Session 5 – Setting objectives**

Activity 5: Assess and improve objectives: practice

Activity 6: Develop your own objectives

Activity 7: Apply your knowledge on goal and objective: case study

### Resources

Case study: Lake Manzala

Handouts:

- Charting Discussion Flow
- Charting Discussion Dynamics
- Determining Project Goals
- Writing Objectives
- Objectives - Examples

## ■ Session 1

### Opening Session

#### Objectives

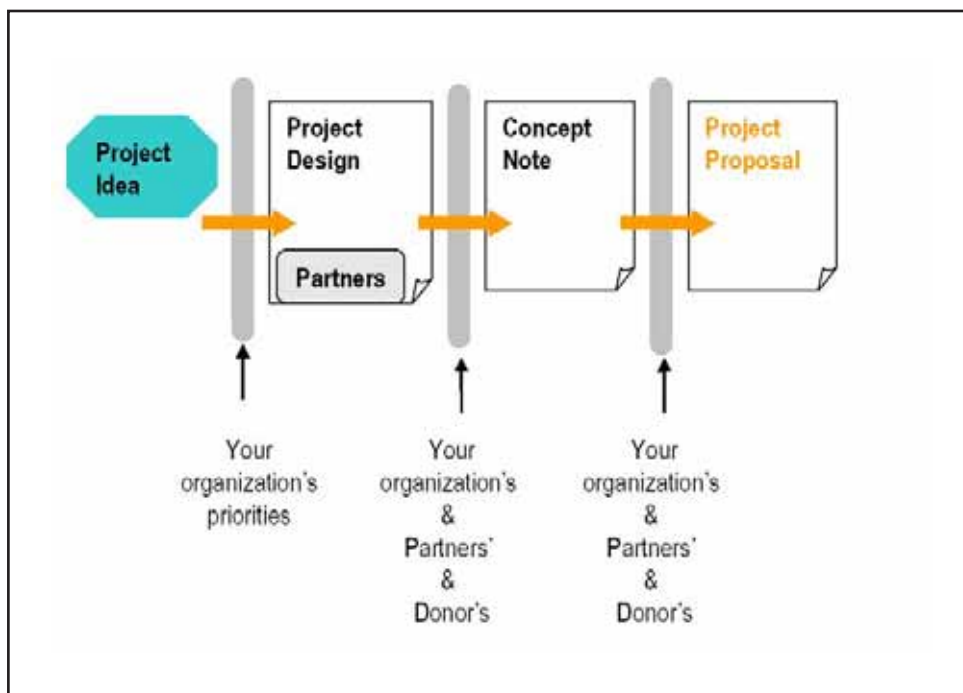
By the end of this session you will:

1. get to know all other participants
2. share your expectations of the workshop and learn about other participants' expectations
3. review the pre-workshop online session, the objectives, schedule and working style of the five day training workshop
4. introduce what project idea you want to work on during the workshop

The first session of the training workshop summarises the events and lessons learned from the online session, and also gives you the opportunity to meet all participants in person, 'put faces to names', establish a good relationship by sharing expectations, reviewing expertise, and discussing the way this workshop invites you to learn.

This workshop applies the 'learning by doing' principles. This means you are encouraged to use your project idea from the very first session, develop it to a project proposal during four days, and on the fifth day you will explore what management issues you might face in your project as shown in Figure 1.

**Figure 1. From Project Idea to Project Proposal**



This workshop adopts a cyclical - versus linear - approach to project development and management. According to the cyclical approach your project, shown in Figure 2 does not end up with the final evaluation. Although you conclude your project with the final evaluation but you take your learning forward to develop a better project plan and better proposal for your next project ideas. You can improve your future projects by lessons learned in your past and current projects. The cyclical approach facilitates a continuous improvement.

## ☑ Activity 1

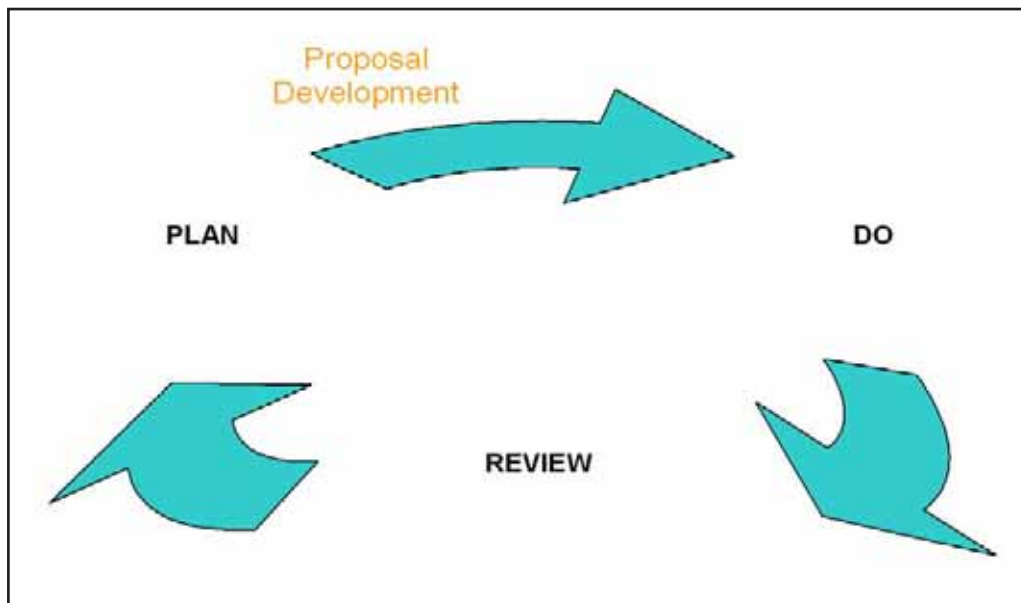
1. You will receive yellow and blue papers, and a marker.
2. Write only one idea per paper as follows:
  - Yellow: Your expectations of the workshop (knowledge, skills & issues)
  - Blue: Your project idea
3. The facilitator will ask you, as well as all members of the group to introduce yourself; where you work, and read out your expectations and project idea

Expectations and project ideas will be posted on the wall throughout the whole workshop. A transcript of all expectations and project ideas will be also copied for all participants.

Resources needed:

- Papers (3-5 yellow, 1 blue per participant)
- Thick pen for every participant

Figure 2. Cyclical project development and management: Plan – Do - Review



## ■ Session 2

### Successful Projects

#### Objectives

By the end of this session you will:

1. be able to define what a 'project' is
2. develop a shared understanding of a 'successful project'
3. develop a shared understanding of what elements make a project successful
4. identify possible common obstacles to making a project successful
5. discuss what made the Lake Manzala project in Egypt successful

Session 2 gives you a definition of 'project', and takes you to a tour to explore the alchemy of successful projects.

#### You can make a difference!

We tend to associate 'projects' with something new, something technical. However, all of us have been involved in project design and management from the early years of our life. Just think of your experience of a wedding party. The design and the management of this traditional 'project' have been passed on from one generation to the other through cultural norms, processes. You have not even noticed when you learned how to plan or 'implement' a wedding. You just know who should do what, by when and where, and what resources are needed to make things happen on time and to make everyone happy.

You are also very familiar with projects that address water scarcity, e.g. by building dams or irrigation systems. The design of these well tested projects has been passed on from earlier generations of experienced engineers, and you learned the planning and implementation process at university. Unlike at a wedding, in these projects you have more opportunities to suggest alternative solutions. And this is where learning about the steps of project design and management comes into play: you can create new solutions to long-known needs. You can make a difference.

#### What is a project?

The word 'project' comes from Latin: *projectum* 'something thrown forth', from *pro-* 'forward' combined with *iacere* (pp. *iactus*) 'to throw'.

So, as the roots of the word show, a project is an active, purposeful thinking process that 'pro-jects' - throws forth - a goal in a specific time in the future and aligns resources as well as monitoring mechanisms to ensure that the goal is achieved.

**A project can be defined as an initiative to achieve specific goals in order to meet an *identified need*.**

Project goals are related to but often go beyond the mandate of an organization. Projects require additional resources to the usual capacity of the organization.

A project usually also has:

- a fixed **time span** with a clear beginning and end
- specific **activities** designed to achieve certain objectives
- provision for **evaluation** to ensure the project meets its goals

For an example of a good project, read the Case Study about Lake Manzala (p.115). Don't worry if your area of expertise isn't in wastewater treatment or surface water quality. The example is designed to demonstrate the process of identifying a need, acknowledging resources, selecting a strategy to meet the need, forging partnership(s), developing a project concept, and preparing a funding proposal.

### What is a successful project?

What can be considered as a successful project from the point of view of donors, project implementers/ participants and project beneficiaries?

Ideally it would be a project that is:

- **Delivered as promised.** Project produced all the deliverables stated in the project proposal
- **Completed on-time.** Project completed within the agreed schedule
- **Completed within budget.** Project completed according to the agreed budget
- **Delivered quality.** Project deliverables meet all the functional, performance, and quality specifications
- **Achieved original purpose.** Project achieves its original goals, objectives, and purposes
- **Met all stakeholders' expectations.** Expectations of each key stakeholder were met, including donor acceptance criteria, and each key stakeholder accepts the project results without reservation
- **Maintains "win-win" relationships.** Needs of the project are met with a "people focus" and do not require sacrificing the needs of individual team members. Participants on successful projects should be enthusiastic when the project is complete and eager to start a new project together<sup>1</sup>.

### What makes a project successful?

The key elements which make a project successful are the same for all projects, no matter whether the project is small or large, well-funded or under-funded. The processes which contribute to the success of a project include the following:

- Involving the stakeholders in all phases: project planning, implementation and evaluation
- Making sure the problem identification is based on thorough needs analysis (the analysis must include opinions of various stakeholders such as representatives of government, non-governmental organizations, the public, business, academia)
- Selecting a project leader who is respected by partners and followed by all participants
- Creating a logical and effective structure of project design and management
- Identifying realistic project goals and 'SMART' (Specific, Measurable, Achievable, Realistic and Time-bound) objectives
- Identifying clearly defined project tasks and responsibilities for all project team members involved
- Planning for early sense of achievements to motivate participants, i.e. making sure that some tangible results are achieved and celebrated during the early phase of the project

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<sup>1</sup> Horine, Greg. 2005. Absolute Beginner's Guide to Project Management. Que Publishing. USA  
<http://www.quepublishing.com/articles/article.asp?p=389717&rl=1> (Accessed September 2007)

- Developing the timeline and the budget realistically so the objectives are met within time and resource limits
- Developing an effective monitoring system that measures progress, identifies problems and provides a mechanism for necessary changes in the project
- Evaluating each phase of the project and the entire project after it is finished, based on indicators set during project planning

## ☑ Activity 2

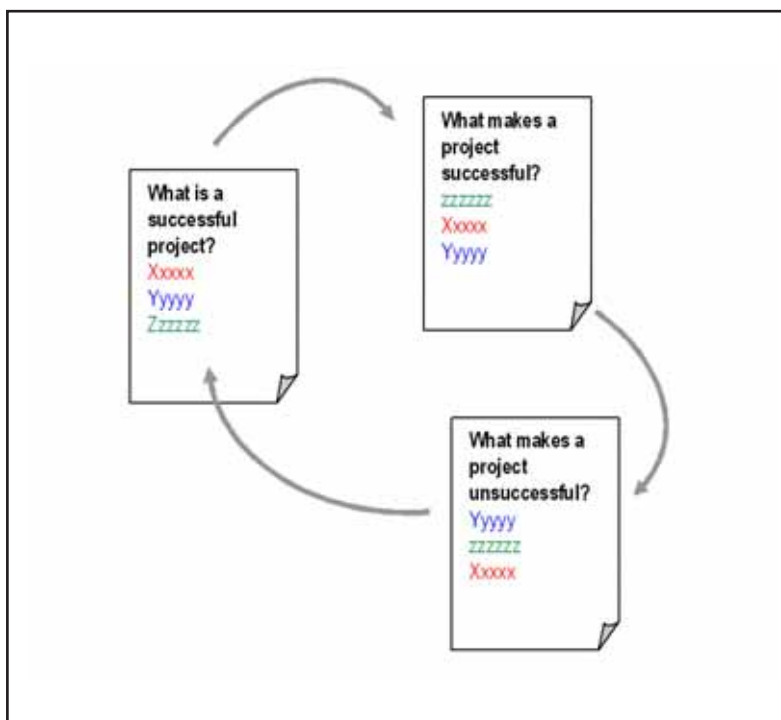
You will work in one of three small groups in this carousel exercise as in Figure 3. Each group has their own coloured pen.

1. Select someone who records what your group says
2. Start brainstorming - 10 minutes - on one of the following three questions:
  - What is a successful project?
  - What makes a project successful?
  - What makes a project unsuccessful?
3. At the end of the 10 minutes move on - like a carousel - to another question and read what the previous group listed. You can add to, delete or revise the previous group's list. Make sure to use the pen of your group's colour
4. After 10 minutes move on again and repeat the brainstorming and the editing process.
5. Whole group discussion is to be done at the end of the 30 minutes

Resources needed:

- 3 flipchart papers: each flipchart has one of the three questions above
- 3 thick felt tip pens (different colours)

Figure 3. Carousel exercise



## ■ Session 3

### Seven Steps of Problem Solving

#### Objectives

By the end of this session you will be able to:

- explain the steps from identifying a project need to designing a successful project
- describe the 'project cycle'

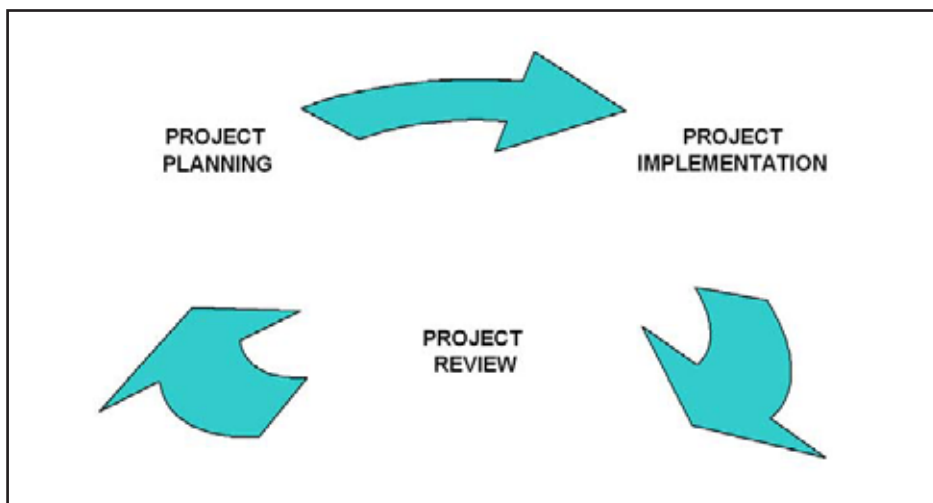
This session is based on a model referred as the 'Seven steps of problem solving':

- STEP 1: Identify, State and Clarify the Problem
- STEP 2: Analyse the Problem by Gathering Facts and Information
- STEP 3: Develop Alternative Solutions
- STEP 4: Select the Best Solution
- STEP 5: Design a Plan of Action: Define the goal, objectives and tasks, timeline and budget, roles and responsibilities, monitoring and evaluation
- STEP 6: Implement the Solution
- STEP 7: Evaluate the implemented solution

These steps are actually part of a cycle, the 'project cycle' where evaluation (lessons learned) is used to improve the next planning phase as presented in Figure 4.

In the previous session you agreed on the characteristics of successful projects. If any of those characteristics are missing, your project may solve a problem (which was not a priority) but might not accomplish the project goal (if it was too ambitious) or would waste financial or human resources or miss the deadlines. Therefore sufficient time must be devoted to gathering and analysing relevant information, organizing teamwork, and developing a clear problem statement. In the following activity you will explore a problem solving process.

**Figure 4. Project cycle**





### ☑ Activity 3

1. Depending on your group assignment, you will be given one of the following two handouts:  
(i) Charting a Problem Solving Discussion or (ii) Charting Discussion Dynamics
2. Follow the instruction of the handout and facilitator
3. Share your observation on the types of steps and the sequence of the steps people took in this problem solving activity. Photo 1 shows the problem solving activity in Syria workshop

Handouts needed:

- Charting Discussion Flow
- Charting Discussion Dynamics

**Photo 1. Seven steps of problem solving in Syria workshop**



## ■ Session 4

### From Problem Statement to Goal Setting

#### Objectives

By the end of this session you will develop:

- the problem statement and
- the goal of your own project through examining the possible causes and solutions.

In this session you will apply the Seven Step model of the previous session to your own project idea. Below you will find some examples from the Lake Manzala case study.

#### **STEP 1: Identify, State and Clarify the Problem:**

This step involves clear definition of the problem, clarifying what seems to be involved, locating where the difficulty is, deciding on the main issues of the problem.

Example from the Lake Manzala case study in Egypt:

The water quality of Lake Manzala is poor. The polluted water threatens:

- (1) Health - causing diarrhoea, hepatitis, kidney failure and other water born diseases (e.g. malaria)
- (2) Economy - due to
  - (a) Absence of high value fish varieties with lake water sweetening
  - (b) Sedimentation which makes fishing difficult for large fishing boats
  - (c) Weakened livestock which is threatened by contaminated drinking water
- (3) Habitats - resulting in losing ecosystem services and the international status of being 'Important Bird Area'
- (4) Mediterranean Sea - as Lake Manzala communicates with the Mediterranean Sea

### **STEP 2: Analyze the Problem by Gathering Facts and Information:**

This step involves gathering data needed to work on the problem in order to get to know all the possible causes.

Example from the Lake Manzala case study in Egypt:

The pollution is directly related to the incoming drainage water discharging mixed industrial, communal and agricultural contaminants into the lake.

Five major drains carry irrigation return flows to the lake. The Bahr El Baqar Drain is the largest and most polluted one. It travels 150 kilometres from Cairo to Lake Manzala and drains approximately 270 000 hectares, including Cairo. The average flow is approximately three million cubic meters per day.

The water carries particulates, nutrients, metals, organics and toxic compounds from used irrigation waters, municipal and industrial discharge, and non-point sources of pollution. In addition, the local communities living on the five big and several smaller islands in the lake generate further pollution.

### **STEP 3: Develop Alternative Solutions:**

This step involves listing and examining all the various ways of solving the problem and an analysis of all the positive and negative impacts of each alternative solution.

Example from the Lake Manzala case study in Egypt:

Efforts to improve Lake Manzala's water quality included:

1. Improving the current wastewater treatment of municipal and industrial point sources, primarily in Cairo
2. Treating the polluted drain water directly before it enters the lake
3. Creating an engineered wetland with artificial transitional zones between terrestrial and aquatic systems which could trap sediments and pollutants, cycle nutrients, and reuse treated water in agriculture

**1. Improving the current treatment process and installing new facilities**

To further improve wastewater treatment of municipal and industrial point sources, primarily in Cairo would require improving the current treatment process and installing new facilities which are resource intensive and very expensive large scale investments.

However, even if the improvement of current facilities and the installation of new ones had been implemented satisfactorily, the pollution of Lake Manzala would still persist because of the small villages disposing raw sewage directly to the drains connected with the Lake. Moreover, hundreds of scattered houses along the drain-banks would also continue contributing to non-point pollutions.

**2. Direct treatment of the polluted drain water before it enters the lake**

For this solution, we need to consider that treating polluted water is much more effective and economic when the treatment takes place as close as possible to its source rather than being far away, a long distance down the drain.

In addition, this solution would also require finding appropriate treatment technologies that could cope with mixed (domestic, agriculture and industrial) pollutant loads. Separating different types of pollutant is the key of selecting treatment facility at a reduced cost. Mixing more than one pollution type also means increasing treatment cost.

**3. Engineered wetland**

Having studied other engineered wetlands, it is anticipated that this solution could provide an economically and environmentally sound alternative to traditional wastewater treatment facilities (e.g. items 1 & 2).

Other similar engineered wetland projects studied for sewage treatment in Egypt are:

1. Abu Atwa, Ismailia Governorate - Constructed wetland
2. Samaha village (12 000 ) - Subsurface wetland with alum application and sand filtering

Benefits of engineered wetlands:

1. The treated water may be reused in agriculture production and aquaculture
2. Harvested vegetations from the wetland - e.g. reed, cattail - may be recycled through bio-gas production or as fodder when environmentally safe

**STEP 4: Select the Best Solution:**

This step is a process for choosing the best solution from all the alternative solutions or their combinations. The ideal alternative may not be the best alternative at the moment. The best alternative is judged best based not only on the basis of highest effectiveness, or the fastest solution, but also considering factors such as budget, time, economic situation, etc. The best solution is most of the time comprises elements of several possible solutions.

In order to select the best solution, feasibility studies are also required for the short-listed options.

Example from the Lake Manzala case study in Egypt:

The Egyptian Environment Affairs Agency has selected the engineered wetland as the best solution based on the following:

- The reduced treatment cost compared with the high costs of conventional treatment options
- The availability of lands for wetland constructions (donated from government)
- Flexibility of wetlands for treating mixed wastewater which can not be achieved through conventional treatment techniques
- The model value of replacing high cost, difficult-to-operate sophisticated conventional treatment systems with more low or no maintenance natural systems, i.e. wetlands

### **STEP 5: Design a Plan of Action:**

This step involves defining the goal, outlining specific objectives and tasks, timeline and budget, roles and responsibilities, monitoring and evaluation system.

Example from the Lake Manzala case study in Egypt:

The Egyptian Environmental Affairs Agency (EEAA) has translated the engineered wetland idea into a project with the following goals:

- To improve the health conditions of communities living around Lake Manzala
- To provide a non-conventional water source for fishing, irrigation, and raising livestock
- To protect the Mediterranean Sea through improving the Lake Manzala water quality

EEAA has approached the Global Environmental Facility / United National Development Program (GEF/UNDP) for funding to construct a wetland that could treat 25 000 m<sup>3</sup> per day of polluted drainage water as a demonstration of low cost technique for wastewater treatment to protect Lake Manzala and the Mediterranean Sea.

### **STEP 6: Implement the Solution:**

This step involves putting the project plan into action and monitoring its progress.

Example from the Lake Manzala case study in Egypt:

GEF has provided funding to construct the engineered wetland. An Environmental Impact Assessment (EIA) study was conducted prior to the project implementation

The construction included the following infrastructures:

- Pump station with screw pumps.
- Two sedimentation ponds - 1.5 m depth
- Ten free water surface cells (250x50x0.5 m ) for secondary treatment.
- Two reciprocating gravel bed cells for tertiary treatment.
- Two fingerling ponds
- Four fish farms for fish production
- Two drying beds for pond dredging sediments

## STEP 7: Evaluate the implemented solution:

This step involves the evaluation of how the objective was reached, determining the effects or ramifications of the solution, positive and negative implications of the process as well as each phase of the process.

Example from the Lake Manzala case study in Egypt:

To evaluate LMEWP a follow-up performance evaluation project was initiated by NWRI with the same project partners and stakeholders as above.

The performance evaluation project had two major goals:

- (1) To assess the feasibility of wetland treatment systems for improving drain water quality, public health, and the aquatic ecology of Lake Manzala;
- (2) To assist the transfer of wetland treatment technology to other parts of Egypt.

A performance evaluation included a research project with the following objectives:

- To carry out a sensitivity analysis for a computer model - PREWet - to find out what major parameters affect the wetland's capacity of treating pollutants.
- To compare the computer model results with field results
- To study the applicability of the PREWet model to estimate pollutant removals for constructed wetland design purposes

Having gone through the example of Lake Manzala, now it is time for you to repeat the process for your own project idea in the next activity. First work alone, then exchange ideas with your colleagues.

Clarification of terminology, however, is necessary before you express your thoughts. Many languages do not differentiate between aim, purpose, goal, and objective. Often the same word is used for these concepts. Let's define the goal here and deal with objectives in the next session.

### What is a goal?

The goal describes what the project hopes to achieve *in broad terms*. The goal is generally associated with the 'outcome.' In other words, it describes how the situation will change as a result of your project being implemented.

A goal can be described as a

- broad statement of what is to be accomplished
- the solution to a problem you described earlier
- vision towards which everything is directed
- result(s) or changes that the project will bring about
- subjective statement (not necessarily measurable)
- statement which must be understandable to everybody
- statement which tells us 'where we want to go / what needs to be solved'

### Activity 4

1. Work individually to describe the need for your project and list three possible causes using the handout 'Determining Project Goals'

2. Swap your handouts with your neighbour. Read her/his need statement and possible causes and provide potential solutions
3. Swap back your handouts, discuss your inputs and select the best solution - jointly or alone.
4. Develop the goal of your project

Handout needed:

- Determining Project Goals

Examples of project goals:

- To provide safe drinking water by protecting the water wells from sewage pollution in Aden (Yemen)
- Increasing irrigation efficiency by introducing modern technologies in the Jordan valley (Jordan)
- Improving Aleppo's water supply by reducing water losses in the distribution system (Syria)

**Photo 2. Participants work on their project goal - Jordan workshop**



## ■ Session 5 Setting Objectives

### Objectives

By the end of this session you will:

- be able to explain why project objectives are important
- be able to list the characteristics of a good project objective
- develop objectives for your own projects based on your own organization's priorities
- develop a shared understanding of what the 'project cycle' is

Once the problem has been identified, causes analysed, alternative solutions selected, best solution selected and project goal defined, the next step is to set project objectives. Objectives state, in measurable terms, what the project will accomplish.

In this session you will develop objectives for your own project and analyse what types of objectives are necessary for successful project.

### What is an objective?

The objectives follow logically from the goal. They describe the benefits of the project in specific, measurable terms. Project objectives should be able to be assessed, even if not all of them lend themselves easily to quantitative analysis.

Objectives are generally associated with 'outputs'. In other words, they describe exactly what you and your partners will do if funded. It is important to invest some time and discussion in developing project objectives that will work over the long term.

In addition, project objectives serve as an important reference for all the project proponents for the duration of the project, especially if the project is complex. By questioning which course of action is most likely to support the project objectives, you can facilitate decision making throughout project implementation.

A good objective has to answer the following five questions:

- **Who** will benefit from the change? For whom is the change targeted?
- **What** needs to change?
- **How much** change is needed?
- **Where** will the change occur?
- **When** will the change occur?

Good objectives are also characterised as 'SMART':

- **Specific** – Is your project objective clear and easy to conceptualise in operational terms?
- **Measurable** - Can you evaluate, measure your project outputs against your objective?
- **Achievable** - Can you achieve your stated objective within the project's timeframe, and available budget and resources?
- **Realistic** - Can your objective be realistically tackled?
- **Timely** (time bound) - Have you stated clearly by when you want to complete your activities?

In other words, an objective can be described as:

- concrete and measurable
- a statement which tells us 'what has to be done to solve a problem'
- an accomplishment which solves part of the overall goal
- an endpoint not a process (a description of what will exist at the end of a project)
- a status which has to be reached by the end of the project (or before)
- a statement which provides a detailed picture of what is to be accomplished within a specific time frame

There are two major types of objectives: production oriented and capacity development objectives.

Production-oriented Objective:

- Rings about tangible products (database system, library, water treatment plant, irrigation system, e-Learning module, information centre, etc.)
- Is easy to measure (crop yield per hectare, number of houses connected to sewage treatment

system, water consumption in litres, etc.)

Capacity Development Objective:

- Brings about capacities which are less tangible, e.g. increased knowledge (enhanced skills, acquired new skills, new information, acquired certification, etc.)
- Measures change in quality, measurable through observation, individual interviews, questionnaire, demonstrated behaviour change

Capacity development objectives can result in quantifiable outputs (e.g. number of trained people on project design and management, number of trained local people who monitor water quality, etc.). However, quantifying results of capacity building objectives can not be restricted only to the number of people trained. When you want to measure whether you achieved your capacity building objectives you must look into how many of the people who participated in your training are really able to use their new knowledge and skills. In other words, you need to demonstrate behaviour change which could be much more difficult than demonstrating the achievement of production oriented goals.

### Activity 5

This is a very quick, whole group activity that you can follow up with individual consultation.

1. You - as part of the whole group - will be asked to assess and improve project's objectives: Are the objectives clearly identified, SMART? If not, how can you improve them?
2. For your practice a set of objectives are listed on the Objectives - Examples handout

Handouts needed:

- Objectives - Examples

### Activity 6

Work individually.

1. Create 2-3 objectives for your own project by using the Setting Objectives handout
2. Trainers and resource persons will provide you individual feedback on a one on one basis
3. Make sure your objectives are clearly identified: SMART

Handouts needed:

Writing Objectives

### Activity 7

For this activity you work in groups of five and apply your knowledge on the goal and objective of the case study.

Briefly discuss the following three questions with your colleague:

1. What is the goal of the project in the case study example?
2. What are the objectives of the case study project?
3. Are the objectives clearly identified, 'SMART'? If not, how can you improve them?

Resources needed:

- Lake Manzala case study