

# **Environmental Management of the Iraqi Marshlands**

## **COMMUNITY LEVEL INITIATIVES**

### **TRAINER'S HANDBOOK**



**UNITED NATIONS ENVIRONMENT PROGRAMME  
DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS  
INTERNATIONAL ENVIRONMENTAL TECHNOLOGY CENTRE  
UNEP-DTIE-IETC**

**In collaboration with**

**Centre For Environment And Development For Arab Region And Europe (CEDARE)**

**Training Kit**

**COMMUNITY LEVEL INITIATIVES**

This training kit responds to the following need:

Support for Environmental Management of the Iraqi Marshlands Project

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# SUPPORT FOR ENVIRONMENTAL MANAGEMENT OF THE IRAQI MARSHLANDS

## A. Overview of the Iraqi Marshlands and their environmental priorities

The Iraqi Marshlands constitute the largest wetland ecosystem in the Middle East, with considerable environmental and socio-cultural significance. Recent assessments of environmental conditions in Iraq, as reported by UNEP and the UN/World Bank Needs Assessment Initiative for the Reconstruction of Iraq, have identified the destruction of the Iraqi Marshlands as one of the major environmental and humanitarian disasters facing Iraq (United Nations and World Bank, 2003). Critical problems and associated priority needs for the Iraqi Marshlands identified by the Iraqi authorities and the UN assessments include, among others, the following:

**Marshland degradation:** While the re-flooding of dried areas started in 2003, only 20 to 30 per cent of the original area has been re-inundated to date, with varying degrees of ecosystem recovery. Marsh water is contaminated with pesticides, salts, and untreated industrial discharges and sewage from upstream. Haphazard breaching of embankments has also resulted in contaminated water stagnating in some areas, impacting the recovery of both vegetation and fish. Water quality and marshland management is an urgent priority to protect human health and livelihoods, and to preserve biodiversity and the ecosystems.

**Lack of drinking water:** The 2003 UN/World Bank Needs Assessment and a public health survey by the US Agency for International Development (US AID) found that the provision of safe drinking water is the critical priority for the residents of the Iraqi Marshlands (United Nations, 2003). While some residents are able to purchase tanker water, many, particularly those living within the marshes, currently obtain drinking water directly from the marshes without treatment (US AID, 2004).

**Lack of sanitation:** Assessments found that most settlements lack basic sanitation systems, and wastewater is often drained through open channels to the nearest stream or to the street. The presence of human waste in the streets was noted in 50 per cent of villages in the region. Outbreaks of water-borne diseases are prevalent. The provision of wastewater treatment services is therefore a critical necessity for protecting the public health. In addition, the return of displaced persons to the marshland area continues to place an increasing burden on the provision of drinking water and sanitation.

The Iraqi authorities have recognized the above issues as priorities, and have submitted the following as project priorities, among others, to the Donor Conference: Management of Biodiversity in the al Hwaize Marshland (Project number 706), Provision of Treatment Units for Water and Sanitation (Project numbers 592 and 594), and Training Programme Development (Project number 704).

The need for immediate environmental relief in the Iraqi Marshlands was also raised as a priority by the high-level Iraqi delegation to Japan. In December 2003, Prime Minister Koizumi was requested in person to prioritize marshland management and restoration by a visiting Iraqi dignitary. In March 2004, the Iraqi Minister of Environment met with the Japanese Foreign Minister and Environment Minister and, again, requested that Japan prioritize support for marshland management and restoration. **Specifically, the Iraqi Minister of Environment requested assistance in the improvement of water quality, as well as in the provision of technologies, equipment, and training.** To respond to such requests, the Government of Japan made contributions to the UN Iraq Trust Fund, and earmarked funds for this project. In addition,

within the UN Iraq Trust Fund framework, the need for coordination of activities and strategy formulation for longer-term marshland management has been identified.

## **B. Project goal and components**

Owing to the uniqueness of the Iraqi Marshlands ecosystem and its socio-cultural heritage, the technical and programmatic responses needed to address the above priorities may be quite different from those most appropriate for other settings. Also, an underlying factor that hinders the response is the limited capacities of, and availability of credible information for, policy makers, experts, and communities to assess and implement solutions. Given these observations, the goal of this project is to support the sustainable management and restoration of the Iraqi Marshlands by facilitating strategy formulation, monitoring and analysing current conditions, raising capacities for policy and technical management, and implementing environmentally sound technology (EST) options on a pilot basis. This project is an integrated package of five component activities, as follows:

- **Component 1: Support for strategy development and coordination**  
This component facilitates strategy development for marshland management by analysing the current policy and institutional frameworks, and by providing initial support to assess the integration of environmental dimensions into the national marshland management coordination mechanism. Stakeholder and donor coordination activities also are supported.
- **Component 2: Data collection and baseline analysis**  
This component addresses the need to establish a baseline for the marshland environment, and to collect and analyse the data needed to determine the potential intervention options required to meet the immediate needs for water, sanitation, and marshland management.
- **Component 3: Capacity building**  
This component addresses the need to raise the capacity of Iraqi decision-makers in government and communities to develop and implement a policy and strategy framework for marshland management, as well as technical options for immediate mitigation of critical concerns.
- **Component 4: Pilot implementation**  
This component addresses the need to identify suitable options, and provides support for the pilot implementation of such options in drinking water, sanitation, and marshland management.
- **Component 5: Awareness raising and follow-up**  
This component addresses the need to raise awareness of marshland conditions, and the efforts to manage and restore this critical ecosystem. These issues are described in more detail in the project approach section below.

UNEP experiences relevant to the project, as well as indications of UNEP's implementation capacity, are summarized below:

- **Promotion of environmentally sound technologies (ESTs):** UNEP, through the International Environmental Technology Centre (IETC) of the Division of Technology, Industry, and Economics (DTIE), has provided technical and policy expertise for applications of ESTs in water and wastewater management and wetland management in developing countries. IETC has also supported related capacity-building activities, and provides guidance for decision-makers on appropriate policies and strategies (UNEP IETC, 2004). The Division has directly implemented over 1,000 cleaner technology assessments and demonstrations in 24 developing countries (UNEP DTIE, 2004).
- **Assessments of the Iraqi Marshlands:** Assessments carried out by UNEP have catalogued the degradation of the Iraqi Marshlands for several years, and alerted the

international community to its potential destruction. UNEP has been the lead agency in monitoring and reporting on the recovery of the Marshlands (UNEP, 2001 and 2003).

- **Post-conflict assessments:** UNEP has provided environmental assistance to post-conflict countries since the late 1990s by investigating the environmental impacts of conflicts and pre-existing conditions, supporting decision-making, and initiating follow-up action. Locations of post-conflict operations include Afghanistan, Albania, Bosnia and Herzegovina, Kosovo, Liberia, and the Occupied Palestinian Territories (UNEP PCAU, 2004).

UNEP also has the experience and mandate to coordinate policy dialogue so as to ensure that environmental issues are adequately addressed within the scope of problems that encompass both environmental and non-environmental dimensions. Further, given the special constraints on local implementation in Iraq, additional measures taken to ensure the implementation of the Iraqi Marshlands project include the following:

- Establishment of a Project Implementation Unit (PIU) to be anchored within the Ministry of Environment, to provide technical support, to liaise with national and governorate institutions, and to oversee the project at the local level
- Employment of a national project coordinator, to operate out of the PIU
- Building the capacity of Iraqi experts and decision-makers first, and utilizing that capacity for implementation during the second stage of the project
- Contracting with UNOPS for assistance in local implementation, monitoring, and evaluation
- Coordination within Cluster 5 to evaluate the development and use of a common implementation framework
- Coordination with other UN agencies operating in Southern Iraq to carry out pilot projects in complementary and mutually beneficial locations, and to employ their local staff and contractors for implementation assistance on an as-needed basis.

### **C. Project approach**

This project is an integrated package of five components, and specific activities under each component are summarized in the logical framework. The following section provides some key additional information on the linkages among specific activities.

#### **Component 1: Support for strategy development and coordination**

The development of a marshland management plan is a long-term process that encompasses various disciplines and perspectives, including transboundary resource allocation, agriculture, industry, food production, land use, socio-cultural heritage, and displaced persons, as well as environmental issues. Formulating such a plan will require individual strategy formulation and coordination within the above areas, consensus building, allocation of substantial resources, political will, and considerable institutional capacity.<sup>1</sup>

Nevertheless, there is a current need to strengthen the coordination mechanism, and to provide environmentally sound input and objective analysis. There is also an urgent need to find and apply suitable options for immediate environmental relief, and to build the necessary capacity in Iraq for longer-term environmental management. This project aims to initiate this process by addressing such needs through various activities within this component.

UNEP is in the process of submitting another proposal that focuses on coordination, building upon the results and insights generated from this component. This additional proposal, which is in the UN Iraq Trust Fund pipeline, will support the development of the national, regional,

and international strategies and action plans for marshland restoration, utilizing the practical knowledge and capacity from this project as building blocks. Discussions on activities to be undertaken within the next proposal are underway with the relevant Iraqi authorities.

Activities to be undertaken within this component include the following:

- **PIU establishment:** The project will establish the Project Implementation Unit (PIU) within the Ministry of Environment, and provide support to strengthen the institutional capacity of the ministry to address marshland management, and to establish an anchor for this project within Iraq. The PIU will, among other tasks, facilitate dialogue among various line ministries and stakeholders for the coordination of marshland activities, and provide implementation support.
- **Survey of policy and institutional frameworks:** The project will conduct a survey to assess the current policy and institutional frameworks for marshland management, and identify the roles and responsibilities of stakeholders. The clarification of the framework will articulate the decision-making process and actors, and help identify areas where priority actions and support may be needed by the national government and donors.
- **Roundtable organization:** Among UN organizations there is a need for a coordinated response for sound marshland management. To address this need, UNEP organized a Roundtable on Marshland initiatives during 2004 with Iraqi ministries and stakeholders, relevant clusters, and bilateral project personnel. Held in Amman, the Roundtable discussed the current status of various initiatives, both environmental and otherwise, that are taking place in/for the Iraqi Marshlands, and supported the dialogue for management plan development.
- **Support for environmental integration:** UNEP will provide support for assessments that aim to ensure that environmental dimensions are adequately reflected into the ongoing management strategy formulation within the country. Such support is intended to provide objective counter-analyses that are based on sound environmental science and policy perspectives.
- **Donor coordination:** As there are other bilaterally supported initiatives underway for marshland restoration and management, coordination of international activities is important to find and exploit synergies and avoid duplication. (See the section on specific assessments for further detail.) Such coordination has already been initiated, beginning with a meeting in early 2004 sponsored by the Italian government. UNEP participated in this meeting. Additional meetings will be organized regularly, with US AID sponsoring one in mid-2004. UNEP plans to host a further such meeting, scheduled for early 2005, to be confirmed upon full consultation with other organizations.
- **Post-phase needs assessment and strategies:** At the end of this project phase, results and observations will be used to formulate a report that identifies areas where further strengthening of institutional and policy frameworks may be warranted. In addition, the results of the pilot project will be used to develop a strategy for the wider implementation of suitable options for the provision of water supplies, sanitation and marshland management. This strategy will include a listing of priority areas and their current conditions, data on specific applications, current institutional capacities and identified needs, and recommended policies and strategies to support longer-term applications. This strategy will be submitted as a component of the marshland management plan.

Activities to be undertaken within this project cannot be put on hold until the master plan is developed, as immediate relief is needed as soon as possible. UNEP will ensure that this project

will not jeopardize the intended objectives and outcomes of a longer-term management plan. UNEP will also ensure that project activities, particularly the pilot implementation activities, are in locations and conducted under operating conditions that will not be impacted by future re-flooding that may be stipulated in the longer-term marshland management plan.

### **Component 2: Data collection and baseline analysis**

This component will focus on the collection of necessary data to establish the baseline conditions of the Iraqi Marshlands.

- **Data and analysis:** The following data collection and analysis will be carried out: analysis of ongoing hydrologic data and biodiversity assessments; water quality sampling and assessment; and monitoring and reporting of re-flooding and ecological changes using satellite imagery. The baseline data will be used to determine the patterns of re-flooding, community locations and changes in size, water quality and water availability for residents, and impacts on biodiversity. For example, various bilateral initiatives have undertaken hydrological assessments, developed models, and analysed scenarios for re-flooding. In addition, biodiversity assessments are being carried out to establish the geographical distributions of plant and animal species, and threatened areas. Such information will be collected and analysed to help identify areas where targeted actions by this project may be warranted. If needed, this analysis may be supplemented with small scale assessments of targeted areas. Based on these data, a water-quality sampling protocol will be established. Sampling and analysis will then be carried out to determine the extent of water contamination in various communities and locales. Such data will be used to determine suitable options and locations for the pilot project, as described in more detail under component 4. Monitoring and reporting on re-flooding will generate regular reports on changes within the Marshlands. Equipment will be provided to the line ministry to support remote sensing and GIS applications, so that the monitoring data on re-flooding will be available for analysis inside the country.
- **Marshland Information Network establishment:** The project will establish a web-based Marshland Information Network (MIN), which will: provide stakeholders with a forum to share information; provide a common point of access to tools for technical assessments and management; and facilitate the identification of solutions and the development of common strategies and partnerships among stakeholders. The system will be available in Arabic and English. The establishment of the MIN is expected to address the barrier of limited availability and sharing of environmental and social information regarding the Marshlands identified during UNEP's discussions with relevant Iraqi ministries. The system will use the EST Information System (ESTIS) framework, developed by UNEP IETC (UNEP IETC, 2003). ESTIS is one of the only information systems in the world with multilanguage compatibility, and is already utilized by various developing countries' agencies and organizations.
- **MIN node establishment:** To facilitate the active engagement of stakeholders at the local level, in data sharing, and monitoring, the project will provide equipment and support to establish MIN nodes at the PIU, and within relevant southern governorates.

### **Component 3: Capacity building**

Identifying and implementing technical and policy responses for sustainable marshland management requires capacity. This project will provide capacity-building opportunities in multiple areas that are deemed necessary to develop a cross-cutting response to sustainable marshland management. Such capacity building will be carried out in policy and institutional development, technical capability, and data management and analysis areas.

In addition, study tours will be conducted to provide opportunities to examine at first hand the following two areas: community-level actions and capacity-building activities, and EST applications. Given the current security concerns, these training activities will be carried out outside Iraq, in the region and elsewhere. Individual participants will be selected from key government agencies, governorates, and communities. Criteria for the selection of participants will be developed and used to identify suitable candidates. Institutional agreements and arrangements with employers will be negotiated, so that trained experts will be assigned to take part in the actual implementation and management of the pilot projects.

- **Policy and institutional development:** Sound environmental management of marshlands, including EST applications, must be based on an integrated water resource management (IWRM) approach. The relevant Iraqi authorities and decision-makers in communities and NGOs currently have limited understanding of this approach, and the formulation of practical policies and strategies to operationalize IWRM in the Iraqi context. Initiatives for marshland management must be anchored in the local communities. To address this need, capacity building will be conducted within the communities on the following topics: water quality management; wetland management; community-level initiatives; and IWRM policy integration. Thirty placements per topic will be made available to line ministries, communities, NGOs, and other organizations, resulting in a total of 120 training placements.
- **Technical training:** Identification, implementation, and management of EST options to provide water, sanitation, and marshland water quality management require specific skills in four key areas: ESTs for drinking water provision; phytotechnologies for wetland management (i.e. the use of plants and vegetation to manage wetland conditions and water quality – constructed wetlands being a prime example); sustainable sanitation options; and EST assessment methodology and implementation. A training curriculum and training materials will be developed for each area, based on the best current knowledge in the field and drawing, where appropriate, on existing UNEP and other products. For each skills area, a team of 30 technical experts will be selected to undergo this specialized training, resulting in a total of 120 training placements. For both policy- and technical-oriented training, the training curriculum will have a train-the-trainer component, and will supply materials to enable the trained experts to carry out site-specific training of local teams and communities at the pilot sites. Follow-up training on the above subjects will be supported.
- **Study tours:** Two study tours are planned within this project. The first study tour will provide opportunities to see and evaluate the integration of capacity building programmes into policy-making and community-level actions, while the second study tour will provide opportunities to visit and evaluate ongoing EST implementation projects.
- **Data management and analysis training:** Training on MIN utilization will be provided. The MIN system will be used to disseminate regular reports of satellite and remote sensing data on marshland re-floodings and their subsequent ecological changes. A training programme on remote sensing data analysis will also be conducted.
- **Support for local training:** Support will be provided to local organizations that provide training on wetland management, technical response, and community initiatives within Iraq. The aim of this support is to ensure the localization and ownership of training activities to educate a larger number of citizens and communities on the practical options for wetland management. The scope of support and selection criteria will be established upon consultation by the PIU with relevant local communities.

#### **Component 4: Pilot implementation**

The project will identify suitable options for marshland management and for the provision of water supply and sanitation on a pilot scale. Technical options that are considered to be environmentally sound; i.e. environmentally sound technologies (EST), will be the focus of such implementations. ESTs are defined in Chapter 34 of Agenda 21 as technologies that: protect the environment; are less polluting; use resources in a more sustainable manner; recycle more of their wastes and by-products; and handle residual wastes in a more acceptable manner than the technologies for which they substitute (United Nations, 1992). ESTs go beyond individual technologies, and encompass total systems that include the technical know-how, operational procedures, and organizational and managerial procedures. The need to facilitate EST transfer and accessibility, and to build capacity for EST deployment and use, particularly in developing countries, is clearly set out in Agenda 21. ESTs cover a wide spectrum and many can be described as ‘low-tech’ or appropriate technologies that may be widely used in developing countries. ESTs that are suitable for developing countries tend to have low energy intensities, require less maintenance, create increased employment, are culturally acceptable, and often cost less to acquire and operate.

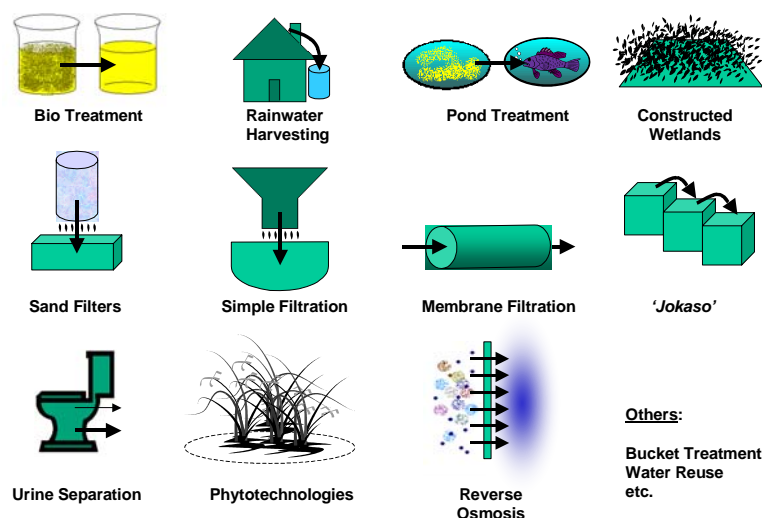
For example, constructed wetlands have been used to treat wastewater before direct discharge, or as part of a more comprehensive treatment process.<sup>2</sup> Sustainable sanitation, such as urine separation, enables faster and more efficient recovery of nutrients for agricultural applications, with lower risks of diseases and contamination. Grass plots have been used to process human wastes in communities with relatively low wastewater volumes that possess the necessary areas, with highly impermeable soils, for treatment. Figure 1 shows a range of appropriate ESTs. Many of these ESTs could be used effectively in rural areas, such as the Iraqi Marshlands. During the pilot phase of this project, UNEP will identify two or three ESTs for implementation. The selection criteria and strategy are described in the Project Approach section below.

The pilot-scale implementation of ESTs will focus on three areas of application: drinking water provision, sanitation provision, and wetland water quality management. At least three communities will be chosen for pilot projects within each application area. For each community site, up to three suitable EST options will be identified, and one or two will be implemented. The selection of candidate sites for the EST pilot projects will be carried out by the PIU, in consultation with the line ministry, other relevant ministries, and stakeholders, reflecting domestic priorities. The baseline data to be collected under component 2 will be used for the feasibility analysis. The site selection criteria to ensure sustainability include the following:

- Demonstrated need for interventions
- Size of the community
- Probability of re-flooding, and physical and population stability
- Access and security for implementation and monitoring
- Likelihood of replicability and wider application (i.e. how typical are the geographic, population, social, lifestyle, and environmental characteristics? How relevant is the experience at a particular site to other communities?)
- Availability of basic materials, energy, and physical space for technology installation
- Level of community willingness to participate
- Existence of water collection and wastewater discharge systems
- Linkage with ongoing initiatives for synergy and collaboration

Once the candidate sites and EST options have been identified, UNEP will convene a meeting during 2005 with Iraqi and international stakeholders to present and discuss the planned

activities, and ensure that they are compatible with the ongoing planning of marshland restoration activities.



**Figure 1: Examples of Environmentally Sound Technologies**

The actual pilot implementation is expected to commence during 2005, and will be coordinated by the PIU with guidance from UNEP and UNOPS. Hands-on training will be provided for on-site pilot teams on pilot installations, operations, and maintenance.

The protocol for pilot project assessment and evaluation will be developed and utilized to assess the suitability of the EST options from various angles, including performance, environmental impact, community acceptance, maintenance, and ease of operation. Finally, a monitoring mechanism will be put into place to continue the operation and maintenance of the pilot project technologies, to be coordinated by the PIU.

### **Component 5: Awareness raising and follow-up**

UNEP's experiences show that the long-term success of pilot applications – and thus the sustainability of the outputs and results of a project – requires the involvement of, and ownership by, the communities. UNEP's experience further shows that awareness-raising activities are key to ensuring such involvement. Therefore, this project will undertake information dissemination and outreach programmes to inform and involve communities in EST applications. In addition, UNEP believes that broad public understanding of the issues confronting the Iraqi Marshlands and of the programmatic responses to date is critical in two areas: securing further international support for wetlands activities, and securing support within Iraq for moving beyond the pilot stage to broader implementation. Therefore, public relations materials will be prepared and media coverage solicited. Further, two public meetings will be organized to discuss the state of the Iraqi Marshlands and the restoration and management efforts. In these efforts, the project team will develop and disseminate information utilizing a wide variety of media (including audio-visual materials, reports, brochures, and the internet), adapted appropriately to key audiences.

UNEP also expects to consult with stakeholders in the development of a proposal for a second phase of this project. The second phase, which must be demand driven, will build upon the first-phase pilot projects, the lessons learned, and focus on wider implementation. UNEP

would seek to mobilize additional international technical cooperation resources for such a second phase.

#### **Development goal and key immediate objectives**

The development goal of this project is to support the sustainable management and restoration of the Iraqi Marshlands, with the following immediate objectives:

- To monitor and assess baseline characteristics of the marshland conditions, to provide objective and up-to-date information, and to disseminate tools needed for assessment and management.
- To build the capacity of Iraqi decision-makers and community representatives in the area of marshland management, including: policy and institutional development, technical capability, and analysis.
- To identify EST options that are suitable for the immediate provision of drinking water and sanitation services, as well as wetland management, and to implement them on a pilot basis.
- To identify the needs for additional strategy formulation and coordination for the development of a longer-term marshland management plan based on the results of the pilot project and cross-sectoral dialogue.

The project is expected to raise the basic capacity of communities, institutions, and key personnel in technical and policy aspects of water quality and wetland management. Utilizing such expertise, suitable EST options will be identified and implemented on a pilot basis to meet the urgent need for water and sanitation in a number of marshland communities. Based on these activities, a strategy for the wider application of technical options for marshland management will be developed. The strategy, as well as relevant expertise and knowledge, will provide valuable input for the eventual development of a master plan for the Iraqi Marshlands, and its subsequent implementation by domestic institutions.



















































































































































