

**Water Resources Sustainability Project
(WRS)**

**MARKETING STRATEGY
FOR DRARGA WASTEWATER AND
REUSE PILOT PROJECT**

**Deliverable for
United States Agency for International Development**

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Environmental Alternatives Unlimited (E.A.U.)

B.P. 8967, Agdal - Rabat

Tel : (037) 77 37 88 / 77 37 98

Fax : (037) 77 37 92

E-Mail : proprem@iam.net.ma

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REUSE PILOT PROJECT**

Ministère de l'Aménagement du Territoire, de l'Urbanisme
de l'Habitat et de l'Environnement
United States Agency for International Development (USAID)

WRS Project

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1. Introduction

The goal of the Water Resources Sustainability (WRS) project is to support the Ministry of Environment's (MOE) priority to protect water resources, as outlined MOE's National Strategy for Environmental Protection, and USAID/Morocco's environmental strategic objective to improve water resources management. Much of the focus of the WRS project during the first five years has been to develop and test three pilot projects. One of these was the Drarga wastewater and reuse pilot project, located in the Souss-Massa river basin.

The Commune of Drarga, near Agadir, is typical of the fast growing areas in the Souss-Massa. Before the WRS project, Drarga's untreated wastewater was discharged into ponds which was contaminating ground water, creating unsanitary conditions and emitting unpleasant smells. The Souss-Massa river basin is experiencing a water deficient situation and, therefore, it was important that wastewater be treated and reused. Drarga is also close to the tourist city of Agadir located on a bay and, therefore, it is extremely important that the ground water and the tourist beaches not be contaminated.

In early 1997, WRS conducted a feasibility study and assessed the characteristics and discharge practices of wastewater being generated by Drarga. The decision was made to go forward with a recirculating sand filtration wastewater treatment system. This system was selected because of the need to implement an easy to operate treatment plant that can be adapted to the local environmental needs, requires minimum resources for operations, and minimizes the risk of aquifer pollution of nitrites. This pilot project is a demonstration model and, therefore, includes a full range of possible processes. When replicating this pilot project, it is likely that some of the processes (such as the denitrification pond, tertiary treatment and maybe others) would not be needed which would reduce the capital investment and operating costs.

CLIN 7 of the WRS project is to create "a marketing strategy" for handing over to Moroccan organizations the replication of the three pilot projects. This report provides the marketing strategy for the Drarga wastewater treatment and reuse pilot project.

2. Summary of the Drarga Wastewater Treatment and Reuse Pilot Project

This pilot project can be adapted and tailored to small cities throughout Morocco. The technology is practical, operating costs are low and there are many opportunities for cost recovery. There is a considerable amount of interest expressed for this type wastewater treatment facility by other municipalities and various stakeholder groups. Therefore, there are many opportunities for replicating this pilot project. The city of Agadir is building a large plant using the same technologies as the Drarga pilot project.

2.1. The Methodology Used for the Pilot Project

As with the other pilot projects, the design and implementation of this project was built around the following WRS pillars:

- Participation of beneficiaries and stakeholders
- Identification, testing and adoption of appropriate technologies
- Establishing effective institutional partnerships

The feasibility study evaluated various options for the wastewater treatment for Drarga and selected the recirculating sand filtration system which in this pilot project includes grit removal/screening, sand removal, anaerobic ponds, denitrification ponds, flow equalization pond, sand filtration beds, reed marsh for tertiary treatment, effluent storage tanks, methane recovery, and sludge drying beds. The plant capacity designed for Drarga is 1,000 m³. The capacity can be easily increased with adjustments in the design.

In 1998 agreements were signed with the stakeholder groups specifying the responsibilities of each in implementing the project. Also that year, the design and construction of the main collector for bringing the wastewater to the treatment plant was started. The design, drawings and specifications for the treatment plant were completed in 1998, equipment ordered, construction contract negotiated and site preparation was begun.

In 1999, the excavation of the basins were completed; concrete poured for the anaerobic lagoons, the denitrification basins, and the flow holding basins; the geosynthetic liners were installed in the sand filtration basins, storage ponds and reed beds; and the equipment was shipped to Drarga.

In 2000, the construction was completed and the equipment installed. The plant began operation in October. On October 30, 2000 the Minister of Environment and U.S. Ambassador inaugurated the facility. In May 2001, the reuse component was inaugurated.

In 2002, the WRS team continued working with the municipality of Drarga to monitor the efficiency of the plant, develop procedures for automatic billing, prepare for reuse activities, and implement reuse of the treated water to farmers.

2.2. Key Stakeholders Involved

WRS and the Ministry of Environment managed this pilot project. The key stakeholders involved in this pilot project included:

- The Wilaya of Agadir and the Municipality of Drarga provided the land and the building permit for the facility; and will manage the wastewater treatment facility and sell treated effluents to farmers for irrigation.
- ERAC-Sud provided the funding and oversaw the design and construction of the sewer that brings the wastewater to the treatment facility; compensated farmers who were using the land; and widened the Oued Larba for floor protection.
- WRS financed the construction of the wastewater treatment plant and provided technical assistance at all stages of the process.

2.3. Results of the Pilot Project

The Drarga pilot project is aimed at treating domestic wastewater produced by the Commune of Drarga and reusing the treated effluent for agricultural irrigation.

The performance indicators for this pilot project include:

- The amount of pollution reduction as measured by BOD₅, total nitrogen, and fecal coliforms.
- Quantity of water for agricultural reuse.

Once each quarter the WRS team has conducted checks to verify that the system is working trouble free and collect and test wastewater samples before and after treatment. These tests showed that the plant was achieving or surpassing the design specifications and targets for TSS, BOD₅, NNH₄, N-NO₃, and Fecal Coliform. The quantity of water for reuse before the plant became operational was zero m³/day. The plant is currently treating 500 m³/day, well above the projected levels.

In addition to the technical results, the plant has several built-in cost recovery mechanisms. Methane gas from the anaerobic basins will be recovered and converted to energy, residual sludge will be converted to compost and sold, the reeds will be harvested and sold, and the treated water sold to farmers for irrigation. This is in addition to the municipality charging their water/wastewater customers for the sewerage services.

The treated wastewater from the Drarga plant meets the WHO Class A standards for irrigation. Crops that can be irrigated with this treated wastewater include wheat, forage crops, and cash crops. The fertilizer value of the treated effluent will also result in a cost savings to the farmers.

3. Preparing for the Replication Program

From the beginning of the project, the WRS team knew that the experience gained with the pilot projects would serve as the base for replicating them in other areas of Morocco. Therefore, careful records were kept of the process followed as well as what was actually done, what worked and what didn't work. This involved a participatory process with all the stakeholder groups. In the last two years, the WRS team began to prepare for the replication program by carrying out the following activities:

3.1. WRS Dissemination Strategy Paper

In January 2000, the WRS team prepared a dissemination strategy paper which presented an overall framework for designing and implementing the replication process which included:

- **Successful pilot projects as demonstration examples** – Documenting how the pilot projects were created through a participatory approach, using appropriate technology, involving cost recovery, securing institutional partnerships and monitoring the progress. The successful pilot projects would be used as a base for preparing tools and replication manuals on lessons learned, beneficiaries to become advocates to others, technologies shown to work, and demonstration of financial viability.
- **Financing** – Using the pilot projects as demonstrations of financial viability, to encourage public, private and international financial institutions to support replication projects.
- **Training** – Identifying and building capabilities of partner institutions to replicate the pilot projects over the long term.
- **Communication** – Identifying policy makers, influential groups, partner institutions and target beneficiaries to disseminate information about the pilot projects and encourage these groups to replicate the pilot projects in their own settings.

3.2. WRS Communication Strategy and Action Plan

The Communication Strategy for replicating the pilot projects was completed in October 2000. It provided an overall approach for designing and implementing communication programs for replicating the pilot projects including identifying target audience groups, primary communication tasks, and the basic tasks required to successfully implement the strategy.

Once the communication strategy was completed, an Action Plan for Communication Support to the Replication of the Drarga Wastewater and Reuse Pilot Project was prepared. The action plan identified stakeholder groups to involve in the replication process and the actions they needed to take, suggested steps in supporting the replicating program, and recommended what communication programs/materials that needed to be produced.

3.3. Lessons Learned

At the current time the WRS team is in the process of handing over the wastewater treatment plant to the municipality of Drarga. This involves monitoring the operations, helping with financial recover program, and ensuring that the reuse program with farmers is working correctly.

The WRS team working with all the stakeholders is in the process of preparing a lessons learned report so that others can learn from this experience. In May 2001, a workshop was conducted with partners and stakeholders to review what was done, successes, failures and why, and formulate revised approaches so that the replication process would be more successful. A workshop report has been prepared. The information from the workshop will be combined with inputs by the WRS team and consultants and integrated into a lessons learned manual which will be made available to groups interested in replicating the Drarga wastewater treatment and reuse pilot project.

3.4. Guidelines for Establishing New Projects

Building upon the above materials, the WRS team is in the process of producing a guidelines manual which will be used, tested and refined during the replication process, which will take place during the WPM project. The target for this guidelines manual will be the organization that will provide the leadership in replicating the Drarga wastewater treatment and reuse pilot project.

4. Overall Marketing Approach

To successfully continue the replication program over the long-term, a single organization needs to be identified who will carry out the functions that were performed by the WRS team in identifying, designing, constructing and putting into operation the Drarga wastewater treatment and reuse project.. In other words, be the “engine” which drives the replication process. This group will be the “champion” of wastewater treatment plants using appropriate technology and reuse of the treated effluent, the “facilitator” to get communities and key stakeholder groups committed to implementing these programs, and the “dealmaker” to put together the financial package and technical support required to successfully implement wastewater treatment and reuse programs.

For replicating the Drarga wastewater treatment and reuse pilot project, it is recommended that ONEP, the National Portable Water Agency, be the “facilitator/dealmaker.” ONEP is parastatal organization which, among other duties, is responsible for water/wastewater programs for small and medium sized communities. Since agricultural water reuse is not within ONEP’s mandate, they will have to enter into agreements with the Ministry of Agriculture, farmers associations, directly with farmers, or other groups for implementing this component. ONEP was involved in the Drarga pilot project, including presiding over the technical committee for the project. The Commune of Drarga has requested that ONEP to take over the management of the wastewater treatment plant.

ONEP is an autonomous body which utilizes many private sector practices and approaches. It has good working relationships with Government of Morocco (GOM) agencies such as the Ministry of Equipment’s Department of Hydrogeology, local communities, engineering consulting firms, funding agencies and other important stakeholder groups. In some cases ONEP sells water it buys from the Ministry of Equipment to local water utilities and in other cases it actually sets up and operates the local utilities. Therefore, it appears that ONEP is an excellent organization to become the “engine” taking over the role WRS has performed with the Drarga pilot project.

During the WPM project, ONEP will be the primary partner in replicating the Drarga wastewater treatment and reuse pilot project. The WPM team will share experiences and assist with the process of identifying new communities wanting similar projects, assembling the stakeholder groups, doing the feasibility studies, construction of facilities, training those involved in implementation of the program, and implementing the reuse program.

The Ministry of Environment (MOE) has been the primary partner to the WRS project and has a lot of talented staff who can contribute much to the replication program. Therefore, it is envisioned that MOE will be involved with ONEP in replicating the Drarga wastewater treatment and reuse pilot project. MOE will in this case have special roles related to environmental assessments, monitoring pollution, and providing special technical advice. ONEP should draw upon MOE staff who worked on the Drarga pilot project with WRS. It is expected that MOE will be an advocate as well as providing technical support to the replicated projects.

ONEP could be well advised to establish some type of advisory board which would include MOE, Ministry of Interior, Ministry of Equipment, Ministry of Agriculture, financial institutions and other key stakeholders who would provide advice on and support to new potential replicated projects.

5. Recommended Organizational Structure for Marketing Community Wastewater and Reuse Programs

The experience from the WRS project showed that a number of stakeholder groups had to be brought together to successfully design and implement the community wastewater treatment and reuse program. The following is a summary of the groups who will have to be involved in this marketing program. The specific organizations will vary by each replicated project, but these types of groups will have to be involved:

5.1. Catalyst/Dealmaker

In selecting the “engine” for the replication program the following characteristics of the organization were considered important:

- **Entrepreneurial** – The organization should be private or autonomous with a desire and ability to sell or market its services to others for pay.
- **Flexible** – It is important that the organization not be tied down with many bureaucratic constraints.
- **Quick Response** – The organization should be able to identify and respond quickly to opportunities in replicating the pilot pilots and putting together “deals.”
- **Dedicated to the Program/Technology** – The staff of the organization should be motivated and technically qualified to promote the replication program and the technologies involved.
- **Strong Management** – The funding agencies, especially, will be looking for a well managed organization that can identify and move forward replication projects, prepare proposals and budgets, oversee effective implementation, and provide the required reporting.

ONEP appears to be especially well suited to serve as the “engine” which was the role WRS provided for establishing the Drarga wastewater treatment and reuse program. ONEP is familiar with the Drarga project and WRS program. ONEP has good working relations with local communities, GOM agencies, funding agencies and engineering firms. It also has an enlightened management team who can provide the leadership needed to replicate the Drarga pilot project.

5.2. Local Community Leaders

It is important that community leaders, municipality officials and local water user groups are informed about the Drarga pilot project. Those interested should be invited to visit the Drarga plant. There have already been some communities who have expressed interest in replicating the Drarga pilot project. The WPM team should help ONEP staff establish contacts with these groups.

The local leaders must be committed to establishing wastewater treatment plants and to become advocates to the citizens to participate in this program and to pay their share of the costs.

5.3. Financial Inputs

The WPM team will have to work with ONEP and local community officials to develop the financial package which will have a number of inputs including customers paying a fee for sewerage disposal, municipality inputs, outside loans and the cost recovery from the wastewater treatment plant. ONEP will have to learn how to become the “dealmaker” putting together all the financial pieces. Loans could come from government agencies, parastatal funding agencies, private banks and/or international donor agencies.

5.4. Technical Inputs

ONEP has technical capabilities itself. They will also need to draw upon the Ministry of Environment (MOE) and other line ministries as needed. ONEP also has contacts with engineering consulting firms and construction companies.

5.5. Ultimate Beneficiaries

In this case the ultimate beneficiaries are the commune residents who are receiving wastewater treatment services and the farmers who will have access to the treated effluent. They must be informed early on what is happening and participate in the program as much as possible. It is essential that they buy-into the program and are willing to support it financially.

5.6. International Agencies

There are several international agencies that might provide assistance to this replication program. These include:

- **USAID** – USAID has a new program in Morocco, Development Credit Authority (DCA), which provides guarantees to private banks for loans for development projects. One of their priority targets is wastewater treatment plants, especially in the rural areas.
- **US Trade and Development Agency (TDA)** – TDA is interested in providing financial support to countries such as Morocco where there is an opportunity to import American goods as part of the program. Therefore, there may be good opportunities in the replication process to draw upon TDA grants.
- **World Health Organization** – WHO has done a lot of work in rural water and wastewater programs. Mr. Hamed Bakir, Advisor, Rural Environmental Health (Sanitary Engineer) is based in the WHO Regional Centre for Environmental Health Activities (CEHA) has done some work in Morocco and is particularly interested in learning more about the Drarga pilot project. WHO could play a role in being an advocate to GOM to promote this type of community wastewater

treatment plants and to donor agencies to provide funding for these types of projects.

- **U.N. Food and Agricultural Organization (FAO)** – FAO is heavily involved in irrigated agriculture and is also very interested in the utilization of treated effluent for agriculture irrigation. FAO and WHO work closely together on establishing standards and guidelines for the use of treated effluent for irrigation.
- **United Nations Environmental Programme (UNEP)** – UNEP has collected a considerable amount of information on water quality and other environmental areas. They are advocates of all kinds of environmental activities, including wastewater treatment programs. They would be in direct contact with the Morocco Ministry of Environment.
- **Other Bilateral Funding Agencies** – In addition to USAID, there are a number of other bilateral funding agencies (German, Swiss, French, etc.) who are involved in support development programs in Morocco. They should be informed about the Drarga wastewater treatment and reuse pilot project and asked to support its replication.

The Drarga wastewater treatment and reuse pilot project has many appealing elements for international agencies – serving rural communities, multiple cost recovery mechanisms, reusing scarce water resources, appropriate technology with minimal mechanical equipment and no chemicals, low operating costs, easy to operate, etc. The international agencies could perform several roles: (1) be advocates to GOM leaders to support the replicate of the Drarga pilot project; (2) provide financial support; (3) provide technical support; and (4) help share this experience throughout Morocco and to neighboring countries. Therefore, it seems important involve the international agencies in this replication process.

It is recommended that ONEP, with WPM assistance, organize a one day briefing meeting in Agadir for representatives of these and other appropriate international agencies which would include a tour of the Drarga wastewater treatment plant. The meeting would include presentations on the technology, construction and operating costs, cost recovery, results, etc. There should be specific recommendations presented to these international agencies on where they can help as advocates, providers of technical information and assistance, and potential for funding support.

5.7. Role for WPM

As part of implementing this marketing strategy, the WPM team will perform a different role than under WRS. Under WRS, the project team performed the catalyst and dealmaker roles. Under the WPM project the team will provide assistance to ONEP to become effective as a catalyst and dealmaker in replicating community wastewater treatment and reuse projects.

During the WRS project, the team utilized the “process consultation model” of guiding stakeholder groups through the decision making process of identifying, designing, implementing and monitoring results of the pilot projects. Now, the WPM team will focus

the process consultation model on the ONEP team who in turn will integrate this management consulting model into their program for working with the stakeholder groups. The goal is that at the end of the WPM project ONEP will be capable of identifying communities for replicating the Drarga pilot project, enlisting the required stakeholders, putting together financial and technical packages, overseeing the construction, training the operators, if needed actually managing the plant, monitoring the results and reporting results to stakeholder groups, especially the funding agencies. The marketing process for community wastewater treatment and reuse programs will be transferred to the National Portable Water Agency (ONEP) to continue in the future.

6. Support to the Marketing Program

While the WPM team will take on a new role in replicating the Drarga wastewater treatment and reuse pilot project, they will continue to support the involved organizations.

6.1. To ONEP

The WPM team will serve as partners to ONEP. Since ONEP is an on-going operation the first step will be to learn more about their program and capabilities. The outcome of this review will be a plan of what ONEP can do and where they might need technical and other assistance from WPM and other groups to build the required capabilities and capacities. As time permits, the WPM team will backstop ONEP in identifying at least one new community wastewater treatment and reuse project and provide assistance to them in implementing it.

6.2. To the Replication Institutional System

In this new phase, the WPM will have direct contact, along with ONEP, with the stakeholder groups in the Souss-Massa region that they had with the Drarga wastewater treatment and reuse pilot project. However, in other regions WPM will working primarily through ONEP with these stakeholder groups. The approach will be to help ONEP to learn and adapt the process to their program which WRS developed in creating the Drarga wastewater treatment and reuse pilot project so that ONEP can continue the replication process successfully in the future for community wastewater treatment and reuse programs.

7. Action Plan

The following are the recommended steps which the WPM team working in partnership with the Moroccan National Portable Water Agency (ONEP) should carry out:

7.1. Establish a Formal Agreement with ONEP

Since ONEP is an on-going organization and has been somewhat involved in the WRS program, there will need to be a series of discussions with them exploring how they can take over the leadership in promoting the community wastewater and reuse programs. This should result in a formal agreement between ONEP and WPM as to what each will do and what types of outside assistance may be needed by ONEP.

7.2. Develop a Community Wastewater Treatment and Reuse Action Plan for ONEP

The WRS/WPM team will share with ONEP where there are opportunities for replicating the Drarga wastewater treatment and reuse pilot project. This will include information on locations, stakeholders, funding possibilities, other inputs needed, and a suggested schedule for follow up action. This plan should state the roles ONEP will perform, types of services it will provide, any fees it might charge, and information that clients and funding agencies should have. ONEP will have to decide if it should establish an advisory board, if they do not already have one, to provide advice and assistance in developing community wastewater treatment and reuse programs.

7.3. Institutional Development Plan

As part of the WPM reviews with ONEP, an institutional needs assessment should be conducted to determine if some institutional strengthening is needed to carry out this replication program. If appropriate, a management/institutional development specialist might be used to assist in doing the assessment and institutional development plan. This should also look at the ONEP management and financial procedures in terms of working with various funding and donor agencies. The institutional development plan should spell out any staff needed, staff training, facilities expansion, equipment and supplies, transport and other resources ONEP might need. Once the institutional development plan is prepared, the WPM team should help ONEP develop proposals for submitting to appropriate funding agencies to implement the institutional development plan.

7.4. Establish Management, Financial and Reporting Procedures for the ONEP

The institutional development plan will indicate if there is a need for ONEP to strengthen their management, financial and reporting procedures, especially for working with funding and donor agencies. USAID and other donor agencies might be able to provide assistance to ONEP for these institutional strengthening activities.

7.5. Conduct Team Building and Other Staff Training

The institutional development plan will also indicate if there are team building or staff training needs. If so, the WPM team should help ONEP prepare training plans and secure

funding for these activities. WRS will provide ONEP the lessons learned, guidelines for replicating the Drarga pilot project, and other information so that the ONEP staff have a good understanding of how WRS guided the design, installation, operation and monitoring of the Drarga wastewater treatment and reuse program.

7.6. The ONEP Produce Advertising/Marketing Materials

The WPM should provide assistance to ONEP to develop promotional materials which it can use in its facilitation/dealmaker role. Of course, these should supplement and add to the promotional materials ONEP has already produced. In the early days there should probably be a flier/brochure describing ONEP and its services to communities wanting to establish water/wastewater treatment plants. There also should be a PowerPoint presentation with the same information which can be shown through a computer projector to large groups and as flip cards to small groups or individuals. As the program progresses, it will be important for ONEP to develop success story case studies. These case studies could be brochures and poster displays.

7.7. Establish Working Relationships with Clients, Partners and Financial Institutions

ONEP already has a network of contacts in communities, engineering firms, funding agencies and government. These should be reviewed and it determined if there are gaps which the WPM can help in establishing other critical contacts. This will be part of the “helping role” WPM will provide ONEP. It is recommended that three possible briefing meetings be held in Agadir, which include site visits to Drarga, for these groups:

- Community leaders and municipal officers who might be interested in replicating the Drarga pilot project.
- Moroccan stakeholder groups including engineering consulting companies, line ministries (including ministries of environment, interior, equipment, agriculture and health), funding agencies and others.
- International agencies such as USAID, US TDA, WHO, FAO, UNEP and bilateral funding agencies who are potential sources of funds and technical assistance.

7.8. Guide and Support First Replication Project

If ONEP uses one of the WRS/WPM prospective projects, especially in the Souss-Massa region, as a replication project then the WPM team should provide any assistance that is needed by ONEP. This could include helping establish contacts with stakeholders, preparing feasibility studies, developing proposals for financial packages, reporting procedures, etc.

7.9. Evaluate First Replication Project and Modify Business Plan

If the WPM team provides ONEP assistance for the first replication project, once the project is launched there should be a joint review meeting to evaluate the process. Based

upon this review, ONEP may want to modify its procedures and action plan. ONEP may also request additional technical assistance for strengthening its capabilities to carry out this replication program, which the WPM team can help ONEP approach donors for the funds.

7.10. Monitor On-Going Replication Program

Throughout the life of the WPM, the team should maintain contact with ONEP, maybe with quarterly meetings, to review progress they are making, problems encountered and identifying any needs for additional assistance they may have.

7.11. End-of-Project Reporting

At the end of the WPM project, a report should be prepared on the handing over the community wastewater treatment and reuse program to ONEP. This should contain any lessons learned and areas where ONEP may need additional assistance in the future.