WaDImena Regional Water Demand Initiative
Initiative de la Demande en Eau

WaDI*mena* - Regional Water Demand Initiative for the Middle East and North Africa

Final Project Review

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Acknowledgements

The Review Team would like to thank the WaDI*mena* core team for its relentless support on completing this end-of project review. Our cooperation was based on open discussion and adequate provision of information.

The Review Team would also like to thank all local teams involved in the implementation of pilot activities. Their dedication to their pilot projects was extended to the field visits and discussion that were conducted with the Review Team, which made it possible to collect considerable insight into the WDM situation in the individual beneficiary countries as well.

Moreover there was a very fruitful interchange of information and ideas with partners not directly involved in the implementation of the project, such as regional organisations, authorities and above all water users and local communities. The Review Team expresses its gratitude for the willingness of all these partners to discuss WDM and the WaDI*mena* project.

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EXECUTIVE SUMMARY

Introduction and background

The review in question is part of the final assessment of the WaDI*mena* project and presents an independent opinion of the two experts that formed the review team. The report gives a short overview of the background of the project and its objectives and briefly discusses the review methodology (logframe methodology vs. outcome mapping and the respective fusion between the two). As its major contribution it makes a comprehensive analysis of the project implementation, covering the objectives and design of the project, the management of the project, the engagement of partners and beneficiaries, the relevance of the project compared with WDM development in the region, the efficiency and effectiveness of project actions, and the sustainability of project achievements. The report closes with general conclusions and recommendations. The Review will help the WaDI*mena* project team and the Project Steering Committee (IDRC, CIDA and IFAD) to assess the achievement of objectives, intended outcomes and impacts. It will also capture the contribution of the project to WDM policies and WDM capacity building and will identify remaining gaps in policy and action in the region.

The project started its activities in April 2005 and will complete its activities in June 2010 after more than 5 years of activities. It was financed jointly by IDRC, CIDA and IFAD. The total available budget was CAD 4.85 million (including an IFAD earmarked grant of CAD 0.27 million exclusively used for water awareness in gulf countries and Yemen).

It should be noted as a general context that despite the progress being made by the WaDI*mena* project, much remains to be done on Water Demand Management. Regardless that WDM is now high on the agenda of most MENA countries, the process of implementing WDM has only just started.

Design and objectives of the WaDImena project

Also because WaDI*mena* was preceded by almost three years of discussions on WDM in the so-called Water Demand Management Forums, there is no confusion about what the project wants to achieve, namely an improvement of WDM capacity and better awareness with policy- and decision-makers on how WDM can be further promoted.

However, the original WaDI*mena* project proposal presents considerable shortcomings in the project design. There are inconsistencies in the formulation and logical sequence of the objectives at different levels, but more importantly, there is a weak link in the project design between the actions of the project and the impact of these actions on WDM in the region. Although certain deficiencies were noted by the Mid-Term Review and subsequently were taken up by the Project Steering Committee, Project did not make all necessary corrections.

The deficiencies in the project design have not necessarily negatively impacted the project results; the Project Team seems to have intuitively implemented the correct activities, according to their realities and leading to the achievement of the project objectives. However, an inadequate project design significantly increases the risk of failure and should therefore be avoided.

Management and organisation of the project have been adequate in general. Administratively and organisationally, the project was well managed. Small deficiencies can be observed in the functioning of the Project Steering Committee, which exercised to some extent insufficient control on achievement of objectives, and in the fact that no Project Management Committee was installed and therefore, in the opinion of the Review Team, WaDI*mena* missed in some countries opportunities to consult with beneficiaries and enhance "ownership" of the project.

Relevance of the project

Within a context in the MENA region of ever increasing pressures on water resources and fierce competition between different water uses, the WaDI*mena* project has been extremely relevant. It has attacked and largely solved problems of insufficient, scattered and not well disseminated knowledge, and with that the project has covered lacunas in the base conditions for successful implementation of WDM.

As WaDI*mena* has been the only comprehensive regional programme on WDM for the last five years, the regional aspect of the project has been extremely relevant to promoting WDM. It enabled collecting experiences in all involved countries and beyond; studying aspects of WDM that were until then not yet fully explored, such as the governance issues of WDM and financial aspects and make these experiences available to a large community of research, education and governance on all levels. As such, WaDI*mena* has been highly relevant for the promotion of WDM in the individual countries.

In this context, WaDI*mena* has been in perfect synergy with the new water demand management policies of the different countries and the challenges that are involved.

Engagement of partners and beneficiaries

The project has a number of different partners and beneficiaries.

The institutional partners of the project implemented the pilot activities and supported WaDI*mena* to promote WDM in their respective countries. All these partners were highly motivated and took initiatives on WDM promotion beyond what was strictly required from them. Due to the regional character of the WaDI*mena* project and therefore the limited funds available in each country, the capacity to promote WDM was limited.

Governance beneficiaries were properly engaged in the project, on the regional level (AWC, etc.) as well as on the national level (ministries, etc.). However this is a slow process and more needs to be done in future on the engagement of such beneficiaries.

The pilot projects worked intensively with local communities and farmers alike. For the implementation of WDM in the field, this engagement is extremely important; without the full involvement of water users, WDM cannot become a success story. The WaDI*mena* project was aware of this, but had its own limitations in time and budget and concentrated more on improvement of the knowledge base and the promotion of WDM with policy- and decision-makers. Nevertheless it is important that what has been learned in WaDI*mena* is transferred to end users as well, in a holistic approach that takes into account the whole cultural and socioeconomic environment that surrounds WDM.

In general it can be concluded that the WaDI*mena* objective to engage partners in field and research activities (and in dissemination) have been largely achieved

Achievement of objectives and outcomes

WaDI*mena* has largely achieved the objectives and outcomes that were planned.

Eight pilot projects have been implemented in Morocco, Algeria, Tunisia, Egypt, Palestine, Jordan, Lebanon and Yemen. These pilot projects have largely achieved their objectives; most have done more than expected, some could not implement all activities (vs. the different annexes to this report). The pilot projects covered different subjects on irrigation, wastewater reuse and grey water use and included participatory approaches and adequate end user involvement. They have made significant contributions to the WaDI*mena* knowledge base and helped promoting WDM in their countries.

A knowledge base has been developed that contains the experiences collected in the pilot activities, WaDI*mena* technical reports (studies, synthesis papers, two books, working papers, policy briefs and dissemination materials), over 80 pages of WDM text, more than 100 Web links, almost 200 external publications, etc. The knowledge base is impressive, but still lacks information on other WDM activities, particularly those applied in the field.

Knowledge networking took place through the trilingual WaDI*mena* website and dissemination materials, with regional organisations, research and education institutes, government authorities, NGOs and interested water users. WaDI*mena* staff participated in over thirty regional seminars in order to promote WDM issues.

Dissemination to policy-makers took place in events such as First Arab Forum, WWF4 and WWF5 and its preparatory meetings. An important contribution was made by the local partners in their pilot activities, that all sought contacts with policy- and decision-makers.

Capacity building took mainly place at the personal level through training of staff of local partners (increasing research capacity) and staff of national authorities (increasing policy-making and implementation capacity). Moreover, farmers and other rural community members were trained in a variety of aspects of practical WDM implementation. Training covered research management aspects, gender aspects, and field application of WDM technology. A successful executive training was developed and implemented in partnership with the Arab Water Academy, Al Akahwwayn University in Morocco and The National Water Research Centre.

The project largely achieved its goal of improving WDM capacity in the MENA region. It has not done this on its own – many other WDM activities took place at the same moment – but played a unique (kind of activities done by no one else) and leading role in the increase of this capacity. In the whole region, knowledge and awareness on WDM has significantly improved during the last five years, in a large part due to WaDI*mena.*

Efficiency and effectiveness

Despite some insufficiencies in its design, the actions of the WaDI*mena* project have in general been extremely efficient and effective. This holds in particular for the actions of collecting and organizing knowledge (knowledge base) and creating instruments (networking, web platform, capacity building) to pass on this knowledge to local researchers, government agencies and the rural communities alike. The actions of the project have been extremely relevant and efficient in this respect, with real applications in the field with regard to the adaptation of WDM techniques, participative management of water

resources, public dialogue and capacity building of water users. During project implementation, the project team consistently monitored and evaluated project activities and efficiency and effectiveness improved towards the end of the project.

Although the subject was certainly not neglected, the emphasis of the project on issues related to irrigation water efficiency has not always been adequate in all its aspects. This was partly due to a somewhat random choice of pilot activities and also to insufficiently embedding the pilot activities in the achievement of WaDI*mena* objectives.

All-in-all this leaves the impression of WaDI*mena* as a project that has created a strong knowledge base, the instruments to disseminate this knowledge, a decent impact on the regional governance level, but has been less effective (with admittedly large variations from country to country) where it comes to the implementation of collected knowledge on the national level.

Sustainability

In order to be sustainable, the WDM capacity developed by WaDI*mena* will need to be maintained without the presence of the project. The capacity developed in the partner institutions on issues such as research methodology, improved documentation, improved technology, experiences beyond the technological implementation of WDM related to socio-economic aspects like governance (user involvement), farm economic approaches (crop choices, marketing, financing), etc. will largely remain; the partner institutions give the impression to be serious on their (research and dissemination) tasks and WDM remains an important spear point activity for all of them.

However, it is believed that WDM capacity with government institutions in quite a number of countries may not further develop if (also) not promoted by external actions. Moreover, the knowledge base developed by WaDI*mena* will not be improved or upgraded without the support of donors, regardless if in a WDM or other (food security, climate change) context. IDRC has in this context committed itself to maintain the knowledge base within other related activities, which is elemental for the further development of WDM capacity.

There is also the question in how far the impact of WaD*Imena* activities on water governance will be maintained:

- On the regional level and on the level of national water governance institutions, there is the feeling that WDM has now become a firm constituent of IWRM or water management in general. Governments have now significantly increased their knowledge on WDM and embedded WDM in their national water governance policies and action plans.
- WDM is present now in curricula of universities and it may be expected that the knowledge will maintain itself without too much external support.
- On the level of local communities all this is less clear. A huge effort is needed to really bring WDM towards the center of attention of local communities and farmers. In particular the issue of wastewater reuse and the issue of efficient use of water resources needs much more focus in the local communities and moreover a holistic approach taking into account socioeconomic aspects as well. Without such effort, a wide scale application of WDM will not realize any time soon.

Recommendations

Recommendations are discussed in the last chapter of the report and the most important briefly repeated here in summarized form.

- As the improvement of irrigation water use efficiency can save more water or economically use it than any other WDM application, it should get more attention in WDM programmes; Governments should look for ways how to deliver this in a holistic approach.
- WDM should adapt to the realities of climate change and the requirements of food security; management of rain-fed agriculture (including rainwater harvesting and water conservation cultivation techniques) and how to optimise rainwater use should be better integrated in WDM.
- The learning process in WDM pilot actions in the field should be enhanced by avoiding short-lived action research projects and instead aim for longer projects that cover all aspects of development, including problem analysis, planning of measures, implementation, evaluation and user participation.
- In setting up a regional project with an overall objective to make changes to governance, it is of crucial importance to involve local partners also in the participative guidance and management of such a project.
- Apart from promotion work with senior water management staff and decision-makers to mainstream WDM in national policies, capacity building in medium-sized projects like WaDI*mena* should concentrate on young professionals that may have policy and decision tasks in future, on training of water users (on a pilot scale) and on Training of Trainers (ToT; as was already done in WaDI*mena* in Tunisia, Algeria, Jordan and Sudan) as a means to scale up knowledge to larger groups of water users; For extension of water saving measures in irrigation ToT is probably the most adequate capacity building measure.
- Sustainability of project achievements should be enhanced by embedding relatively short life projects (up to five years) in programmes that have more long-term objectives and last at least 10-15 years.
- Due attention should be given to project design and above all the introduction of proper indicators. Experiences of almost all donors clearly indicate that also for process oriented projects like WaDI*mena*, the logframe methodology can be used very well and proper indicators can be developed.
- In order to enhance sustainability of WaDI*mena* actions, it is strongly advised to maintain the knowledge base and dissemination tools developed under WaDI*mena* within other future programmes.
- Socio-economic aspects and holistic approaches are just as important as the pure transfer of technology or even more so. This should be taken into account In future project designs.
- Pilot activities should be embedded in project design and not be considered as stand-alone activities.
- The collection of knowledge on WDM in WaDI*mena* is still not complete. The knowledge base should be enhanced with more information of the practical implementation of WDM in the field.

1 INTRODUCTION

The present intervention aims to review the WaDI*mena* project, after 5 years of implementation from April 2005 to March 2010, while determining systematically and independently the relevance, the effectiveness, efficiency, the impact and the sustainability of the activities, taking into account the objectives and outcomes defined at the start of the project.

The Review Team consisted of two experts contracted by the regional IDRC office in Cairo: Eng. Gert Soer, specialist in water resources management with a many years experience in evaluation of projects and programmes for among others GTZ, KfW and the EU, and Prof. Fethi Lebdi, specialist in water resources management and irrigation. The team visited Cairo mid-February 2010 for a briefing by IDRC and discussion with Egyptian WaDI*mena* partners and the local CIDA office, among others. During the following 7 weeks, the team visited 5 different countries (Morocco, Tunisia, Palestine, Jordan and Lebanon) and held telephone interviews with partners in Algeria and Yemen. Additionally telephone interviews were held with IFAD and IDRC main offices staff. The planned participation in the final WaDI*mena* Forum unfortunately did not place, due to illness of one of the team members and travel restrictions due to the Island volcano eruption for the other team member.

The review was carried out in three distinct stages, information collection, analysis and synthesis. Although the stages are distinct from the methodological point of view, they were largely overlapping. The analysis started immediately after the collection of the first information. In the same way, the preparation of the final document started already during the analysis stage. The methodology used by the Review Team is described in more detail in Chapter 3.

According to the Terms of Reference of the Review, the team compared (as is usual in end-of-project reviews) originally planned outcomes and objectives with what was actually achieved. It should however be noted that the WaDI*mena* project is basically a “process project”. This means that the project may have a distinctive objective of its own, but the achievement of this objective can be difficult to measure. Correspondence between the WaDI*mena* core team and the Review Team on the outset of the review mission indicates that complementary to the assessment of the achievement of objectives, outcome mapping could be used as part of the review to assess the behavioural change. This asks for a fusion of logframe (objective achievement) methodology and outcome mapping, as also describe on the IDRC website. The Review Team sees outcome mapping as a valuable addition to the logframe methodology, provided that it can be logically reasoned that the so mapped outcomes at the end also contribute to the achievement of objectives.

In the analysis, the Review Team discusses the design of the Project, its management, the engagement of partners and beneficiaries, the relevance of the project in the context of WDM in the region, the achievement of objectives and results, the efficiency and effectiveness of implementation, and its sustainability. The report closes with conclusions and recommendations. In this last chapter, the future of project activities around WDM is discussed and technical and organisational recommendations are given.

2 BACKGROUND

2.1 Water Demand Management in the MENA region

The MENA region is an arid and semi-arid zone, with relatively low rainfall which is highly variable in time and space. In the past, water policies were implemented that conquered these irregularities by an ambitious program of water mobilization. This program included dam construction, deep wells and water harvesting where groundwater or dam sites are not available.

Around sites of water mobilization, irrigated areas were developed with traditional irrigation techniques at the beginning (traditional surface irrigation and unlined distribution channels). With growing population, drinking water supply as a priority according to the millennium objectives and supply for economic activities like tourism and industry became important in terms of water consumption (quantity and particularly quality).

The success stories of water mobilization in the MENA region cannot hide the current situation, in which it is necessary to preserve efficiency and sustainability of the water sector by balancing demand and supply. The increase of supply (mainly through unconventional water resources such as desalination and wastewater reuse) can only support a small part of the water needs for drinking water supply restricted irrigation. It is therefore increasingly important to manage demand as well, to avoid its uncontrolled and unsatisfied increase.

The increase of water demand in both domestic and industrial water supply and irrigation creates a conflict between the different sectors of which agriculture is the biggest consumer of water (on average in the region about 80% of total resources mobilized) and results in a shortage and water scarcity situation, according to the balance between water supply and demand.

The current situation of the water sector in the MENA region is characterized by the following, depending on the region (Middle East or North Africa) or sub-region:

- Underground water resources are over-extracted. Their sustainability (quantity and quality) is threatened.
- Uncontrolled sedimentation decreases the capacities of dams
- Increasing competition between socio-economic sectors end environment
- Degradation of irrigated areas showing decreasing outputs (especially with brackish water)
- Participatory management is still at the beginning
- Water tariffs are not generally applied as an economic instrument

The MENA governments, aware of the interest to conduct WDM policies, have established programs and, depending on each country, taken the following actions:

- Technical: Programs of conveyance and on-farm water saving and subsidies policies to enhance introduction of drip irrigation where possible.
- Institutional: Promotion of participatory water management and water accounting.

- Legal: texts for water user associations and water code.
- Financial: government incentives to adopt technical and institutional measures and water tariffs for some of the MENA countries, in order to control water consumption.
- Organizational: bridges between public institutions and farmers, users and water associations and programs for capacity building to bridge the skill gaps.

Actually, these programs are conducted in different ways in the various MENA countries, according to their land-use, water and socio-economic characteristics. Each country is aware of the principle of water demand management, but the process to establish the tools of WDM is not yet optimal and much remains to be done, to assure efficiency and sustainability of water resources systems.

Due to the different regional and national activities, Water Demand Management in the MENA region has advanced forward as a key approach to efficient, equitable and sustainable water management strategy under water scarcity conditions. A few examples illustrate this.

In **Morocco**, the new water strategy has also taken up WDM. Not only have agricultural and domestic water tariffs increased, but it is planned to convert 480,000 ha of irrigated land to drip irrigation over the next 10 years. The reuse of treated wastewater is also part of the Moroccan water strategy.

In **Tunisia**, WDM was established after a first phase of water mobilization. Participatory irrigation management by water user associations, water tariffs, water savings and incentives from the government to boost drip irrigation where possible (the goal is to reach 200,000 ha before 2014) are the main tools of the WDM strategy. The reuse of treated waste water and desalinization of brackish water became a main sub-strategy in the water sector. A WDM unit is established in each region of Tunisia.

In **Egypt**, the MWRI involved stakeholders in discussions on water governance including issues of transparency, accountability and inclusiveness. A breakthrough is taking shape with improving performance of the Holding Company for water and wastewater. Water loss reduction in the distribution networks and leakage control is progressing steadily. The agricultural development strategy 2030 is emphasizing the necessity to implement systematic agricultural water demand measures, but progress is slow.

In **Jordan**, a WDM policy has been approved and WDM is now an integrated part of the 2009 National Water Strategy. A WDM Unit was established within the Ministry of Water and Irrigation (MWI) in 2002. However, where some progress is made over the last decade in attacking urban unaccounted for water, progress in agriculture is still slow.

In **Syria**, recently there is a strict enforcement against horizontal extension of irrigation plans until 2020 and incentives are provided to farmers to shift from surface to drip irrigation. Research activities towards water savings have recently been intensified.

The same type of efforts can be found in **Lebanon**, **Saudi Arabia** and the **United Arab Emirates**.

Water cost recovery has been advancing in a number of countries, including Tunisia, Morocco and Yemen. In drinking water supply recovery of real costs and tariff incentives for low consumption have proven to reduce water use. However, in irrigation - where the

costs of providing irrigation water is relatively low compared with drinking water - price mechanisms do not always lead to water savings. This is mainly due to insufficient irrigation know-how of farmers who apply forms of risk management that favour over-irrigation. Only extensive training of farmers could overcome this know-how gap.

Despite the progress being made, much remains to be done on Water Demand Management. Regardless that WDM is now high on the agenda of most MENA countries, the process of implementing WDM has only just started.

The WaDI*mena* project promotes the tools of this concept, on the local, national and regional levels, according to what each concerned country puts as a priority (Morocco: Water saving and capacity building; Tunisia: Built local knowledge and capacity building; Algeria: Built local knowledge about treated waste water reuse, to increase local resources and capacity building; Egypt: Adopt participatory irrigation systems around groundwater; Palestine: The reuse of treated wastewater and capacity building; Lebanon: The use of unconventional water resources and capacity building ; Jordan: The use of grey water in the urban environment; Yemen: The reuse of grey water in the urban environment and participatory management.

2.2 Other programmes with similar activities

In 2005, WaDI*mena* was one of only a very few programmes in the region looking into WDM as a governance issue, and the only one completely dedicated to this task. Today, a number of countries, organisations and donors have conducted programmes and projects on Water Demand Management. There are too many to mention them all, but a few programmes with regional aspects like WaDI*mena* should be noted:

IFAD: One of the important tools of Water Demand Management is the participatory management in agriculture but also in other uses. IFAD has developed a regional project of PIM (participatory irrigation management), in collaboration with CIHEAM/MAI-Bari (International Centre for Advanced Mediterranean Agronomic Studies/Bari Mediterranean Agronomic Institute), which included 4 countries: Morocco, Tunisia, Egypt and Armenia. The objective of this project is capacity building and addressing knowledge gaps in participatory irrigation management and enhancing the process of the empowerment of water user associations. The PIM project focused on pilot areas, with cooperation between public institutions (ORMAT of Tafilalet in Morocco or CRDA of Zaghouan in Tunisia). The results are satisfactory despite some difficulties due to the inflexible financial and other management by public institutions and weak involvement of end users. The capacity building program was very comprehensive and concerned the training of trainers, the council of water user associations and end users (among others, how to elect the council, how to conduct a council meeting, financial training, technical training, maintenance and operation, water measurement, accounting…).

FAO: With respect to Water Demand Management FAO works in the MENA region on water saving techniques, training of trainers and end users, studies on water tariffs and water costs, and participatory irrigation management. Technical work implies water savings using modern irrigation techniques and improving irrigation methodology at on-farm level. No specific regional WDM programme is conducted.

World Bank: The World Bank has contributed substantially to WDM in agriculture by providing loans for infrastructures, rehabilitation and modernization of hydraulic networks, in order to minimize leakage and saving precious water resources.

EU: Many research development projects focused on regional water saving, such as WASIA (Water Saving in Agriculture) leaded by CIHEAM/MAI-Bari, or WASAMED (Water Saving in Mediterranean Region). The objectives were to integrate the research and development sectors, to build development on the research results, and to create a network of water management partners in the region.

In a different context, important pilot and dissemination actions took place in the EU MEDA Water Programme for local water management (2003-2009) in which seven out of nine regional projects incorporated substantial WDM elements and tools such as participatory irrigation management, wastewater reuse, grey water use, rainwater harvesting and improvement of irrigation efficiency.

USAID: The *Advancing the Blue Revolution Initiative* (ABRI) works in the Middle East on transboundary cooperation and international knowledge sharing, capturing and dissemination of best practices. One of the focuses under the Initiative is WDM.

In Jordan USAID implements the IDARA project as an example of bilateral cooperation on WDM in urban areas with the aim of institutionalizing WDM.

German Government: Inwent's *Reforming the Water Sector in the Middle East and North Africa* programme aims at developing integrated water resource management systems in the region and adapt technologies for water supply and wastewater disposal. Its training programme includes important WDM components.

GTZ carries out water demand management projects, but without a clear regional component.

None of the aforementioned initiatives, programmes and projects has a clear regional mission, comparable with what was entrusted to WaDI*mena*. In this sense, WaDI*mena* has had a unique position in the MENA region.

2.3 The WaDImena project

Background

IDRC involvement in WDM started in the early 1990s as it was realized that WDM can be a tool to alleviate pressure on scarce water resources, while at the same time contributing to poverty reduction, better health, sustainable agriculture and social equity. In the year 2000, an extensive needs assessment was undertaken by IDRC with a visit to policy-makers within five countries of the region. This assessment culminated in the implementation of the *WDM Forums* during the period May 2001 - June 2004.

The last phase of the WDM Forums, together with country consultation visits undertaken during September 2003 - January 2004, was equally used for setting the stage for follow-up activities under the WaDI*mena* project.

Participating countries

WaDImena was to a more or less extent engaged in activities in a total of 15 countries in MENA region. At the start of the project, Algeria, Egypt, Jordan, Lebanon, Morocco, Palestine, Syria, Tunisia and Yemen were involved in the project. The Gulf countries benefited from a separate grant by IFAD alone with no contribution from CIDA or IDRC.

Financing

The Project was financed jointly by IDRC, CIDA and IFAD. Total available budget was CAD 4.85 million (including an IFAD supplement of CAD 0.27 million to be exclusively used to include Gulf countries and Yemen in the project). Until the end of March 2010, approximately CAD 4.20 million was spent.

Beneficiaries

Beneficiaries include different groups.

The ultimate beneficiaries of the project are the water users that have learned how to make more socio-economic benefit of each cubic meter of water they have available. These water users include more specifically vulnerable groups in the society such as the poorest people and the women. This includes also water-related community-based organizations, water-users associations and/or water boards.

Other direct beneficiaries of the Project are the policy and research communities of the MENA countries, in particular, ministries of water and irrigation, water authorities, universities, research centres and others as may be specific to the national context, that have increased their capacity to deal with WDM issues. The same holds for NGOs that work on WDM.

Project objectives

(Quoted from the TOR of the Final Project Review)

WaDI*mena* is a network of partners aiming at contributing to effective water governance in the countries of the MENA region by promoting WDM tools, approaches and strategies to enhance water-use efficiency, equity and sustainability and subsequently contribute to poverty alleviation. The project is expected to result in significant WDM capacity in the region and enhanced abilities of institutions to translate knowledge into concrete shifts in the way water decisions are made and how water is managed, as well as to influence water policy in specific national and local contexts, with the following objectives:

- Objective 1: To deepen the knowledge of the opportunities, challenges and incentives of WDM from a multi-sectoral and multi-disciplinary perspective;
- Objective 2: To improve capacities among individuals and institutions from the policy, research communities and CS to propel the WDM agenda;
- Objective 3: To provide an inclusive forum to foster dialogue, promote partnerships and enhance networking; and
- Objective 4: To strengthen and complement national and regional initiatives.

Specific outcomes

The specific outcomes are defined as follows:

1. Improvements in research and the knowledge base on WDM and its associated challenges, opportunities and incentives for its practical application in specific contexts, with particular focus on women and the rural poor.
2. Enhanced skills development, and strengthening of individual and institutional capacities to positively affect WDM application.
3. Creation of a viable network to share experiences, foster dialogue and promote partnerships among key actors.
4. Strengthened relationships and collaborative arrangements with national, regional and international water governance programmes to motivate the WDM agenda.

Main activities

Main activities include action research, field-level pilot activities, setting up a regional exchange facility, capacity development, and knowledge networking (including visibility and communications). More detail can be found in the project planning and progress documents.

Important dates

The project started its activities in April 2005, somewhat behind the original scheduled starting date of September 2004.

A comprehensive mid-term review was completed in March 2007. The Review assessed the project's progress at the midway point and suggested ways to strengthen the project's performance during its remaining lifespan. A new project coordinator as well as a communication officer was hired.

The project will complete its activities in June 2010 after more than 5 years of activities.

2.4 Objectives of the review

The objectives of the review can be read from the Terms of Reference for the Final Review, which is attached as Annex 5. These objectives can be summarized as follows:

The Review will help the WaDImena project team and the Project Steering Committee (IDRC, CIDA and IFAD) assess the achievement of objectives, intended outcomes and impacts. It will also capture the contribution of the project to WDM policies and WDM capacity building and will identify remaining gaps in policy and action in the region. The FPR will also offer stakeholders an opportunity to capture the lessons learnt from this experience. The specific objectives of the FPR are to:

- To review the project overall impact against its goal and objectives;
- Capture the outcomes and outputs of the project in terms of knowledge, capacity; networking and policy influence on WDM;
- Critically assess the value and effectiveness of these outcomes and outputs against the intended outcomes/outputs of the project;
- Identify and assess the value and effectiveness of programming responses to emerging issues and opportunities (unintended outcomes and outputs);

- Identify the challenges the project faced and that could have affected its overall performance and efficiency;
- Support organizational learning by assessing project activities and methodology ;
- Inform the project on potential partners that can benefit from, consolidate and sustain WaDImena achievements

3 REVIEW METHODOLOGY

3.1 General

The review methodology consists of a number of steps that partly interact and overlap.

The review started with a briefing meeting in the Cairo main office of the WaDI*mena* project, which was attended by WaDI*mena* core staff and the Review Team. During this mission, the methodology of the evaluation was discussed and the time line of the review activities drawn up. It was in particular agreed that the Review Team would use for this review a fusion between logframe methodology and outcome mapping as described in the relevant documents that can be found in the IDRC Evaluation Unit website (http://www.idrc.org/en/ev-26266-201-1-DO_TOPIC.html).

The next step in the review process has been the collection of information on the implementation of the project and its impacts. This information collection has been mainly done by collecting and studying project documents and by conducting interviews with a large number of persons and holding discussions with them on the implementation, results and impacts of the project. During the review, the Review Team collected and studied more than 120 different documents, including terms of reference, progress reports, technical reports, and others. A list of these documents is presented in Annex 4. In addition, around 50 different interviews and discussion meetings took place with different interlocutors, project implementers, authorities, other stakeholders and beneficiaries. An overview of the interviews and discussion meetings is presented in Annex 2, the respective contact details in Annex 3. The meetings were structured by using a guiding questionnaire template as presented in Annex 7. The questionnaire was used to structure the interviews but not always presented question for question to the persons being interviewed. Consequently, questions asked and subjects discussed differed from person to person, depending on their capacity and role as actor in the WaDI*mena* context. In the telephone interviews with Algerian and Yemeni partners, the questionnaires were largely followed. In the face to face interviews, many questions from the questionnaire are already answered during first discussions and a more free approach was possible.

The following step in the review process consisted of analyzing the documents and the information obtained by aforementioned interviews and discussions. Information obtained from the documentation was compared to information from the interviews and discussion, to find and remove eventual discrepancies between both. During the analysis, questions were put about the relevance, the effectiveness, efficiency, the impact and the sustainability of the activities. The collected answers are deferred in the conclusions on the various activities. Based on these answers, the team of evaluation proposed recommendations for second half of the Program of Support.

The final step of the review process has been the synthesis of what was learned by the Review Team from studying documentation and interview and discussion accounts, which synthesis is presented in the report in question and includes recommendations.

Although the different review steps are distinct from the methodological point of view, they have been carried out in an integrated way, in which the not purely sequential steps

are largely intertwined with each other, particularly the information collection-analysis-synthesis sequence. Analysis starts immediately when the first information is collected, triggers information collection and study again and even during the synthesis phase, additional discussion is necessary.

It is good to mention that the review team has tried to conduct the review in a participatory approach in which the interviewees have been confronted with the review questions and try to answer these questions themselves with the Review Team as facilitator. This process does not reduce the responsibility of the Review Team to produce a final analysis and synthesis, but enables the relevant stakeholders to be involved more intensively in the analysis process.

3.2 Logframe methodology and outcome mapping

A project design normally consists of a logical sequence of intervention levels and means necessary to implement project activities. There is an overall goal or development objective to which the project contributes; there is a project objective which should be achieved by the project on its own and which represents the concrete benefits to the target groups of the project; there are specific outcomes that are delivered by the project and largely under control of project management; and there are activities that need to be carried out to enable achieving the defined outcomes. This all is put into the context of a Logical Framework (LF), basically a table matrix or flow diagram that represents the interconnection of aforementioned elements.

Most donors in the international development context now use the Logical Framework Approach, but obviously not always in the same form. There are however basic principles in the Logical Framework Approach that need to be respected, such as the level of intervention, the means-ends relation or logical sequence between activities, outcomes and objectives, and the use of indicators and assumptions as a means of project management and monitoring and evaluation. The design of the project does not stop with the preparation of the LF, but also needs management tools to follow up and achieve progress during project implementation and appropriate means (budget, human resources) to carry out the required activities.

During the kick-off meeting in Cairo on 15 and 16 February 2010, the Review Team agreed with the WaDI*mena* core team to use for the review a fusion between the traditional logical framework approach and outcome mapping methodologies. The reasoning behind this was that the logical framework approach would concentrate too much on achievement of objectives, which would, in a process project like WaDI*mena,* be difficult to measure.

The Review Team, studying the IDRC documentation on this subject[1,2, IDRC Website], observes that the propagated Fusion Model is very similar to what other donors like the EU, EIB, USAID, ADB and KfW usually apply for *process projects*, using the logical framework approach with indicators that resemble very much the progress markers used in outcome

[1] Ambrose, K. and Roduner, D (2009). A conceptional fusion of the logical framework approach and outcome mapping. OM Ideas, Paper No. 1.

[2] IDRC (2008). Outcome mapping and Logical framework Approach: Can they share a space?

mapping. Other donors do not call this a fusion model, but rather an improvement to the logical framework approach. The Fusion Model presented in the paper of Ambrose and Roduner resembles in detail the logical framework approach used by most donors, with the only difference that two levels of results are presented, called "Outcomes" and "Outputs" respectively. These two levels are not properly explained however in the available documentation and may therefore lead to some confusion. The Review Team believes that "outcomes" largely resemble "indicators" in the classical logical framework approach, provided that these indicators are properly formulated to represent processes of change rather than concrete deliverables. If the indicators follow the description of outcomes in an earlier paper of IDRC[3], the result is a classical logical framework matrix with improved indicators

In order to have a clear framework for the end-of-project review, the Review Team has therefore decided to basically use the logical framework approach with an emphasis on outcome mapping as a special tool to assess outcomes that do not immediately lead to measurable impacts. One should note however that outcomes can never alone describe the success or failure of a project; if there is no measurable impact, there should at least be a logical explanation why project outcomes would lead to the achievement of project objectives.

3.3 Document recherche

The document recherche has been an important activity during the Review. Apart form the documentation provided by the WaDI*mena* team - such as planning documents and progress and technical reporting - the Review Team has studied a multitude of documents provided by the WaDI*mena* partners that have implemented the pilot projects, and some documents on WDM provided by the interviewed national authorities.

The consulted documents can be divided into 7 different categories:

1. Administrative documents of the Project, such as the WaDI*mena* proposal, the progress reports, the minutes of the Steering Committee, etc.;
2. The technical proposals of the pilot projects and the final reports of these projects;
3. Planning documents, such as the annual work plan and budget;
4. WDM studies and research documents;
5. Evaluation reports (Mid-term review, IFAD Supervision Mission Report of March 2006);
6. Video materials and other promotion materials.
7. Other documents such as country strategies papers or local experiences (such IFAD projects on PIM); and

A complete list of consulted documents is presented in Annex 4.

[3] Earl, S. et al. (2001) Outcome mapping – building learning and reflection into development programs

3.4 Interviews

The Review Team has conducted a large number of interviews, with WaDI*mena* staff, staff of donors, government officials in target countries, staff of WaDI*mena* partners responsible for pilot projects and beneficiaries (water users). Annex 3 presents a list of persons interviewed. The interview and field visit calendar is presented in Annex 2. The "compte-rendu" of the interviews and field visits are presented in Annexes 7 to 14. Due to travel and budget restrictions, part of the interviews (Algeria, Morocco, Egypt, IDRC Canada and IFAD) has been done by telephone.

As a support tool, the Review Team has prepared a questionnaire, which was used as a guideline for interviews, but not integrally presented to the persons that were interviewed. The questionnaire is part of the Inception Note, which is annexed to the report as Annex 15.

3.5 Analysis and synthesis

The analysis and synthesis are two integrated processes that can intellectually hardly be separated. During the analysis the synthesis slowly takes form and an active interaction exists between the two methodological steps.

The analysis in this report is structured as follows and contains the following elements:

- Discussion of the design of the project; it assesses if the project is properly designed in terms of logical sequence of activities >> outcomes >> project objective >> development goal, or in other words if the design is appropriate to achieve the project objective.
- Discussion of the management of the project; it assess if the management structure of the project has been adequate and if management has been implemented properly in the terms of taking responsibilities and monitoring, evaluation and steering of the project on all management levels.
- Discussion of the engagement of partners and beneficiaries; it assesses what the role has been of partners and beneficiaries and if they have been sufficiently involved in project activities and management.
- Discussion of the relevance of the project; it assesses the needs of the region for WDM activities and in how far the WaDI*mena* project has fulfilled these needs.
- Discussion on the achievement of objectives and outcomes; it assesses the question if the project has achieved its outcomes and whether the outcomes have lead to the achievement of objectives.
- Discussion on the efficiency with which project activities have been carried out and the effectiveness of different project actions.
- Discussion on sustainability of project outcomes; it assesses whether the delivered outcomes are sustainable after closure of the project and what is needed to enhance this sustainability.
- Discussion of the visibility of the project; it assesses the visibility and communication actions of the project and if the project has sufficiently achieved to "profile" itself to the outside world.
- Conclusions that summarize the aforementioned discussions.

4 ANALYSIS OF THE PROJECT

4.1 Design of the Project

Logical Framework, objectives, results

Regardless of including outcome mapping as a tool in the review methodology, the logical framework still should be properly formulated to enable assessing actions, project results and achievement of objectives in their logical sequence and relation. In this sense a number of observations should be made:

The **development objective** of the WaDI*mena* project is not well formulated in the sense that it contains a means-end relation:

Promoting effective water governance by enhancing water use efficiency, equity and sustainability in the countries of the MENA region.

The underlined part is a "means" to achieve the objective and should therefore not have been included in the objective formulation. Also, the literature on the logical framework approach generally states that objectives should not be formulated as actions, but as short sentences that describe an improved status. It would therefore be better to define the development objective as "*Water governance in the countries of the MENA region has become more effective"*

The **project goal** of the WaDImena project is formulated as follows:

To facilitate the adoption and implementation of water demand management strategies, policies and tools in countries of the Middle East and North Africa

The Review Team observes that, apart from its description as an action, this formulation does not sound like an impact of benefit of all WaDI*mena* activities and could therefore need reformulation. A better and even shorter description of WaDI*mena* impact could be that "*WDM capacity in the MENA region has improved*".

Furthermore there are four **objectives** in the logical framework of the WaDI*mena* project, which seems to represent **results** in the classical framework approach used by other donors. These are:

1. To deepen the knowledge of the benefits, opportunities, challenges, and incentives associated to WDM from a multi-sectoral and multi-disciplinary perspective.
2. To improve capacities of the policy and research communities, institutions, water users and civil society.
3. To provide an inclusive forum to foster dialogue, strengthen partnerships, share experiences and enhance networking.
4. To strengthen and complement national, regional and global initiatives.

On top of that there are five **programme components** (action research, pilot activities, regional exchange facility, capacity development, and knowledge networking) that almost all relate to all four aforementioned "objectives", and (in the last version of the logical framework of the project) four **outcomes** that are defined as follows:

1. Improvements in research and the knowledge base on WDM and its associated challenges, opportunities and incentives for its practical application in specific contexts, with particular focus on women and the rural poor.
2. Enhanced skills development, and strengthening of individual and institutional capacities to positively affect WDM application.
3. Creation of a viable network to share experiences, foster dialogue and promote partnerships among key actors.
4. Strengthened relationships and collaborative arrangements with national, regional and international water governance programmes to motivate the WDM agenda.

It is obvious that outcomes and objectives largely overlap in formulation.

Furthermore, there is no firm link between the activities implemented by the project and the objectives and outcomes as activities are not properly grouped under outcomes or objectives. This is a serious shortcoming from the management point of view; the Review Team fails to see how project management can carry out activities without knowing exactly to what result or objective these activities should lead. This issue was also observed by the PSC in its first meeting, but very few of the aforementioned observations have actually been addressed.

The deficiencies in project design mentioned before can be partly tracked back to differences in application of the logical framework approach used by the different donors at the time the Project was conceived[4]. For IDRC at that time it was not clear how to integrate concepts such as outputs, project components and outcomes into a properly built logical framework. IDRC headquarters reports that since then this situation has much improved and their logical framework approach resembles much more that of other donors, without giving up its own characteristics and the fusion with outcome mapping.

From the latest progress reporting it turns out that the project has actually been managed around the **programme components** (particularly in its second phase after the MTR). This is clearly visible for instance in the last progress report covering the period April 2008-March 2009. It distinguishes seven programme components of whom the last two could be combined:

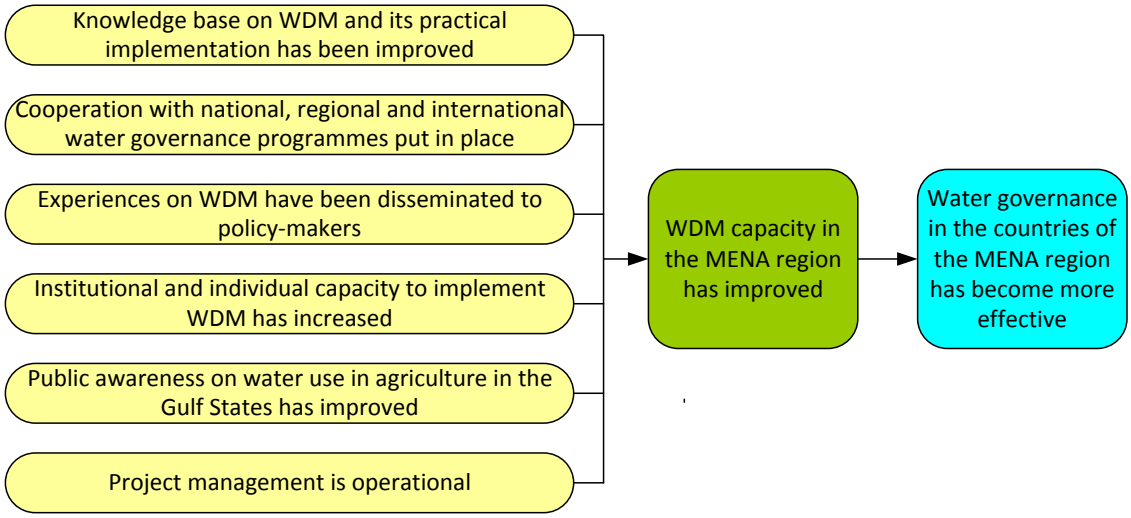
- Applied research and pilot projects
- Knowledge networking
- Regional policy forums and regional exchange facility
- Capacity development
- Public Awareness in Gulf Countries (added later with IFAD funding)
- Project coordination & Monitoring and Evaluation

Lately, the yearly activities planning of project was also built around these seven programme components. On the contrary, earlier progress reports suggest that the project was managed around outcomes; this creates certain confusion for the review. All the aforementioned implies that the logical framework as presented in the project proposal

[4] CIDA and IFAD are very much LFA oriented where IDRC at that time was (and to some extent still is) outcome mapping oriented

complicates the review of the project. Because of the considerable formulation overlaps between "objectives" and "outcomes", the inconsistencies in the formulation of development and project objectives, and the failing link between activities and objectives, the Review Team has (for review purposes only) tried to simplify the existing logical framework and added "results" to the LF, representing the logical connection between the activities level and the objectives level". This is not an attempt to copy the logical framework approach of other donors; the term "results" is chosen in order to not confuse with "objectives" and "outcomes".

The so adapted logical framework is represented in the figure hereafter. Together with the activities as mentioned in the respective progress reports, it forms the logical base



for the review.

Notwithstanding the critical review of the logical framework formulation of the WaDI*mena* project, the Review Team would like to stress that the revised LF does not fundamentally deviate form the original design and the actual implementation practice of the WaDI*mena* project. It is merely a simplification of the logical framework that allows to produce a more clear and concise review and avoid confusion on the real objectives and results of the project and the link between project actions and objectives.

Pilot activities

The pilot activities (applied research and pilot projects grants) play a very special role in the implementation of the project. When looking at the action fields that have been implemented inside the pilot activities, one sees as a matter of fact mini projects that resemble to some extent the larger WaDImena project. All pilot activities contain, within their own countries, elements of improvement of the knowledge base, networking to share experiences and promote WDM, building relationships with national water programmes, and capacity building. The pilot activities can therefore not be placed under one result of the project, but have a special place, contributing to more than one results and outcome.

The pilot activities have been chosen after the start of the WaDI*mena* using an open invitation for concept notes from which one pilot activity was selected for each country (Mo-

rocco, Algeria, Tunisia, Egypt, Palestine, Jordan, Lebanon and Yemen). This resulted in two pilot activities on wastewater reuse, 3 pilot activities on grey water use, and 3 activities on irrigation efficiency. On average (all pilot activities had about the same budget) CAD 120,000 was spent on each.

Despite the fact that water use efficiency in irrigated agriculture is clearly the most significant target for water demand management in terms of water savings, but also in socio-economic sense, the emphasis of the pilot activities is more on the use of non-conventional water resources (wastewater/grey water) than on improvement of irrigation efficiency. This was not a deliberate choice, but due to the fact that the selection of the pilots was done in an open selection procedure abd the outcomes depended very much on what proposals had come in. This procedure did not allow making necessary corrections.

Although this cannot be proven, there is a feeling that larger but fewer pilot activities could have had a larger learning and knowledge creating effect. However the decision to have a small pilot for each country has been very effective to actively build partnerships between all countries and IDRC in Cairo. This has created a critical mass of experts in the Mediterranean and has contributed to the regional promotion of WDM principles and tools.

Management set-up

The main management structure of the project is described hereafter.

The **daily management** of the project is implemented by the WaDI*mena* core team in the IDRC office in Cairo. Directly responsible to the IDRC Middle East Regional Office (MERO) Regional Director, the team is composed of the WaDI*mena* project coordinator, supported by a project administrator, a research assistant and a (communications) assistant. As far as this can be judged during such short encounters, the team is adequately staffed, makes a harmonious impression and communicates properly. The ENRM program officer (also based in the IDRC Cairo office) has spent 30% of her RPE time on the WaDI*mena* project, giving scientific and programmatic support to the project. As the project is managed by IDRC (regardless the tripartite financing), IDRC staff in Ottawa also gives thematic and administrative support to the project.

The **Applied Research Scientific Committee** (ARSC), consisting of a group of MENA water experts and IDRC programming officers, has supported the project team in validating the research grants process, assist in making the final selection of the pre-proposals and provide comments to the revised proposals to ensure effective implementation. The Committee has only been active during the period February-June 2005 and met twice. There is no specific comment on their work.

The **Project Management Committee** (PMC), consisting of the nine National Coordinators, the Project Coordinator and the ENRM Programme Officer, was intended to be put in place to discuss progress at the national level, agree on activities and programme components, enhance regional networking and to disseminate results. Due to lack of funds, the PSC decided not to establish the PMC. The Review Team considers however that the original design was adequate and a PMC could have played an important role in the project. This will be further discussed in the next chapter.

The **Project Steering Committee** (PSC), consisting of a representative from each of the core donors (IDRC, CIDA and IFAD) with the Project Coordinator as an observer, has provided the project with overall strategic direction; reviewed and approved annual work plans, budgets, financial reports, progress reports and terms of reference for the mid-term and final evaluation; carried out (as required) dispute resolutions; and recommended solutions to problems as they arose. The PSC has met in total four times at regular intervals. No further meeting of the PSC is planned; reports (technical and final, narrative and End-of-project Review) will be reviewed by each donor separately.

The protocols of the PSC meetings show a Steering Committee that is actively and intensively involved in planning of activities and suggestions on how to make activities more effective. What is lacking (at least there is little evidence in the minutes/notes of the PSC meetings) is a discussion on achievement of objectives, i.e. the direct and indirect impact of the activities carried out by the project. The Review Team estimates that in part this is due to the aforementioned deficiencies in the logical framework of the project, in which the link between actions and impact is rather weak.

Conclusions

The original WaDI*mena* project proposal presents considerable shortcomings in the project design. There are inconsistencies in the formulation and logical sequence of the objectives at different levels, but more importantly, there is a weak link in the project design between the actions of the project and the impact of these actions on WDM in the region. Certain deficiencies were noted by the mid-term review and the PSC; the project team has corrected a number of these deficiencies. The corrected logical framework is more clear, but still contains to a certain extend a mix-up of objectives, outputs, outcomes and , but the corrected logical framework is still not very strong.

It is not said that the deficiencies in the project design have necessarily affected project outcomes; the Project Team seems to have intuitively implemented the correct activities leading to the achievement of the project objectives. However, an inadequate project design significantly increases the risk of failure. IDRC should therefore in future pay more attention to proper design of the project right from the start eventually and review its logical framework approach[5].

The design of the project management organisation is in itself adequate. However, parts of it, such as the Project Management Committee have not been implemented and could have had added value in the sense of ownership.

4.2 The management of the project

Recommendations of the Mid-term Review

The recommendations on the management structure of the Project made in the Mid-term Review (MTR) have been largely followed up.

The recommendations with regard to the internal IDRC management organisation (position of ENRM Director of Programme Area in Ottawa, position of ENRM programme Of-

[5] Interviewed IDRC main office staff indicated that this has been done already

ficer in Cairo, relations with the Project Coordinator) have been implemented. The Review Team observes that the new structure in which the RPE Programme officer in Cairo exercises the responsibility for the project has been a large improvement; communication and decision-making has greatly improved because of that.

The Review Team also notes that recommendations on the involvement of MENA recipients in the PSC have not been put into practice. Although this cannot be changed anymore, the Review Team strongly supports this recommendation; it was observed during field visits and discussions with authorities that WaDImena is very much considered as being donor-driven and an involvement of MENA recipients would have increased ownership with the expected positive impact of that. This should be a lesson learned for future IDRC enterprises[6].

The in itself correct assessment of the MTR that project design was poor was not sustained with proper analysis of the design and logical framework of the Project; the MTR assessment of the project design and logical framework lacks profundity and does not give sufficient support for a thorough revision of the logical framework. Based on the scarce recommendations of the MTR, the Project Team has produced a revised logical framework that shows a thoroughly increased understanding of underlying causes for the uphill battle to advance WDM and the connected project goals. However the logical framework still presents a somewhat confusing mixture of partly overlapping project objectives and outcomes, and later progress reporting is based on project components that are not mentioned in the logical framework.

The Project has however adequately followed up recommendations on strengthening of the networking, visibility of WaDI*mena* and strengthening its policy influence. The WaDI*mena* website has been significantly upgraded, the new Project Coordinator has built stronger ties with the WaDI*mena* partners that implement the pilot activities and ha shifted the emphasis of his work from research and knowledge management to networking and policy influencing. The MTR has triggered a number of important improvements to the WaDImena project, which are clearly visible in the second phase of the project, which worked much better towards achieving the objective “to bring improvement to WDM policy-making and water governance in the MENA region”.

Internal project management

Apart from a somewhat complicated management procedures in which the roles of IDRC programme managers in Ottawa and Cairo was not always clear (but which was improved after the MTR), internal project management has been adequate. Staff and budget were well managed and activities largely implemented according to plan.

In the first two years of the project, until the MTR, the management of the project mainly concentrated on getting the pilot activities starting and running properly. Tasks like visibility, networking and mainstreaming WDM issues were therefore somewhat neglected and delivered outcomes below expectations. After the recommendations of the MTR and the decision of the second PSC meeting to follow-up on these recommendations, the management of the project improved and became much more objective-oriented.

[6] Obviously also for IFAD, but in IFAD projects such involvement is actually standard

The briefly functioning **Applied Research Scientific Committee** did actually in its composition[7] not represent a separate entity and was therefore rightfully dissolved.

The Review Team regrets that the **Project Management Committee**, foreseen in the original project management structure, was never established. Even though it would have been costly to bring the Committee together, consensus-building and methodological discussions in the Committee could have had added value for the achievements of WaDI*mena* objectives and have triggered a better integration of the pilot activities in the WaDI*mena* overall concept. To compensate for this missing instrument, the Project Coordinator did work on involving national coordinators in agreeing on activities and programme components and disseminate results, but direct meetings would in the opinion of the Review Team, have been more effective.

Project Steering Committee

The WaDI*mena* Project Steering Committee met four times during project implementation, basically after each progress report. The first time was in March 2006, one year after the actual start of the Project. Apart form the fact that the first planned meeting half a year after project start-up was not realised, the PSC did play an important role in the steering of the Project.

In its discussion on progress and activities planning, the PSC largely concentrated on making recommendations on the design and implementation of activities. Seen the fact that also additional activities were proposed by the PSC, the PSC must have had the project objectives and outputs clearly in mind when making such recommendations. However, the minutes of meeting of the PSC show little evidence of a systematic discussion of the achievement of the project objectives, nor of the indicators that would have been the measurement of that achievement. The answer on the question “are we on the right way to achieve our objectives” cannot be entirely found back in the minutes of meeting of the PSC.

The Review Team observes that the PSC has in that sense rather been functioning like a board of directors or an extra management level in the project (which is per definition not wrong), but has not fully fulfilled its tasks to give strategic guidance to the project. Most of what changed in the strategy of the project was triggered by the MTR in March 2007.

The PSC has also been active outside the formal meetings. Apart from its function to look at progress reports and annual planning, its members were consulted on a number of documents, such as ToR and technical reports and on carrying out activities/opportunities that were not planned and budgeted, but considered important for the achievement of project objectives.

Management by the donors

In the day-to-day management of the project, which was the responsibility of IDRC, CIDA and IFAD played a subordinate role as stipulated in the agreement. Their only impact on the management of the project was through the PSC, which has met only four times and

[7] Originally a setup with three independent research representatives from the region with one IDRC staff was foreseen, but in reality the Committee was mainly manned with IDRC staff

the separate interventions mentioned in the Chapter before. All donors played an active role in the PSC. Moreover, IDRC main office in Canada has given all the requested support that was needed.

4.3 Engagement of partners and beneficiaries

One of the sub-objectives of WaDI*mena* is the involvement of partners, for each level of participation in the project and ultimately to stimulate ownership of the process of water demand management and its results.

There has been proper engagement from public institutions (ministries, agencies, research centres and universities), despite the fact that at times inflexible internal regulations hampered effective management of the pilot activities. This engagement indicates that there is a clear need to better promote national programmes for water management including WDM as an important part of pilot activities.

The mission of the partners – next to action research activities – has been to strengthen the implementation of the technical, legal and institutional framework in the field, locally, under complex circumstances and behaviour constraints, depending on the end users' conditions and the implementation of national policies and programmes. The teams worked jointly with other partners such as water user associations, farmers, NGOs, etc., to analyze and implement the WaDI*mena* process.

Together, the WaDI*mena* national teams have developed an interactive planning tool in the field of WDM that will be a comprehensive and visible toolbox for the engagement of farmers, rural communities or water user association including:

- Creative new ideas and practices (according to the local zone) to strengthen local water stewardship
- Success stories around the process of water demand management gathered from WaDI*mena* pilot sites
- Methodology for reuse of wastewater (grey or black) to enhance food security and improve the economy of poor rural communities
- Methodology for using grey water in urban environment for landscaping
- Applicable and important research to what will communities convince to use their grey water resources (socio-economic, but also practical)
- Water saving equipments installed on-farm (mostly drip irrigation)
- Capacity building to conduct irrigation (irrigation dose, frequency and on-farm distribution) and fertigation
- Guidance and procedures for encouraging farmers to count water as a volume for water saving and as a discharge and pressure for efficient irrigation conduct
- Applicable and important academic research materials regarding water demand management, what is effective in engaging farmers (especially financial matters) and changing their behaviour to consider water as an economic factor of production

It should be realized in this context that farmers and rural communities and their organisations are the most important partners in the WaDI*mena* project; they provide a framework for the implementation on a larger scale of WDM. The research partners of

WaDI*mena* have been merely (but very important) intermediaries in the process of bringing WDM to the community and the farm. Awareness of water scarcity and water shortage (in case of over-extraction from groundwater tables) and government incentives for some countries help a lot to spread WaDI*mena* tools and objectives.

The engagement of the institutional partners that implemented the pilot activities was very high. It showed by spending more time on the pilot activities as being paid for, taking initiatives beyond what was strictly required from them and a certain tenacity to involve government entities in their pilot activities (which paid off well in terms of mainstreaming WDM). Institutional partners have been concentrating mainly on their own pilot activities, without paying too much attention to "central" WaDI*mena* business, but have been very responsive in case the WaDI*mena* core team asked to make corrections such as more involvement of authorities and further promotion of WDM in their respective countries.

The engagement of the beneficiaries was shown mostly by the local shared stories and successes with water saving techniques, such as water metering upstream of the farm, planning for fertigation and irrigation, soil preparation and intensification of crops, acceptance and adaptation of grey water systems, etc. It should also be noted that lessons are more rapidly learned when there is clearly demonstrable increased revenue, one of the major indicators for WDM technology implementation success. Lessons learned also from other programmes (EMPOWERS for instance) is that involvement of water users in the whole process of knowledge collection, analysis, synthesis, planning and implementation will largely enhance success of WDM implementation.

The WaDI*mena* pilot activities have in general been too short to apply these principles. Another lessons learned here is that the learning process of on-field implementation requires longer project periods that hover around 4-5 years to enable a proper implementation of all phases of the planning process. Experiences in most of the pilot activities show that sustainability is negatively affected by going too fast and skipping phases of this process.

In general it can be concluded that the WaDI*mena* objective to engage partners in field and research activities (and in dissemination) have been largely achieved. In the timeframe of pilot activity implementation, a full engagement of beneficiaries was not possible. This is something that should be corrected in future projects. Water user involvement needs a partnership with research and capacity building institutions or public agencies, to introduce proper state of the art methodology, to provide norms for development and to be a dialogue partner for the implementation of WDM in the field. Without such partnerships, WDM is set to fail its objectives.

4.4 Relevance of the Project

The MENA region faces an increasing threat of water shortage, given the present scarcity and likely future negative impact of climate change. Water security is a primary goal and a priority for every country in the MENA region.

Over the recent decades, the authorities of the countries have pursued an active mobilization of water resources through the construction of dams, deep boreholes and shallow

wells. This policy has been dictated by the development of irrigated agriculture, drinking water supply of and the satisfaction of emerging sectors such as tourism or industry.

These efforts have achieved a breakthrough in conventional water resources mobilization. This policy has achieved its objectives of social and economic development and quality of life including food safety (irrigation agriculture in the region covers 50% guarantee of the dietary needs, apart from the contribution of rain-fed agriculture). However it has also pushed exploitation of traditional resources to its limits or even beyond and has often gone at the cost of deterioration of river and wetland and ecosystems and the depletion of groundwater aquifers. Today, in many countries of the MENA region, conventional water resources development has reached its limits or is close to its completion, with many instances of overexploitation that threaten the sustainability of water resources exploitation.

Where the policy of increasing supply reached or surpassed its limits, a number of countries have shifted towards managing demand in order to master the balance and equilibrium between supply and demand. These countries started each within their own local conditions, to initiate a policy of demand management, including the essential components based on the following actions:

- Giving an economic value to water as a factor of production and initiate a policy of charging volumes collected and distributed.
- Implementing participatory management as a system of water management through water users associations, for surface water as well as for groundwater.
- Stimulating public-private partnerships as a tool to improve the efficiency of water use.
- Pursuing the reuse of non-conventional water, particularly treated wastewater treatment, for restricted irrigation.
- Pursuing the recharge of aquifers as a means of storage for drought events.

Even though a lot of work is being done by the different countries, the knowledge base at time is insufficient and regional exchanges on experiences with WDM are not well developed. This was in particular the case when WaDI*mena* started its work in 2005 and was one of the reasons of the respective donors to implement the project.

The technical basis for implementing WDM is in general well known, although action research is till needed (also now in 2010) on issues like the impact of wastewater reuse and grey water use on soil characteristics. What is equally important however is research on socio-economic aspects of WDM, including action research on constraints in implementing wastewater reuse, grey water use, water saving methodology in irrigation and water saving measures on the household level. *WaDImena has implemented action research in most of its pilot activities on these subjects. None of the pilot activities was purely technical in this sense and most had strong socio-economic aspects including financial aspects, participatory approaches, financial aspect, marketing, etc. Action research by WaDImena* has therefore been highly relevant.

As WaDI*mena* has been the only comprehensive regional programme on WDM for the last five years, the regional aspect of the project has been extremely relevant to promoting WDM. It enabled collecting experiences in all involved countries and beyond; studying aspects of WDM that were until then not yet fully explored, such as the governance

issues of WDM and financial aspects and make these experiences available to a large community of research, education and governance on all levels. As such, WaDI*mena* has been highly relevant for the promotion of WDM in the individual countries.

As a conclusion, the WaDI*mena* project has been in perfect synergy with the new water demand management policies of the different countries and the challenges that are involved.

4.5 Achievement of objectives and outcomes

Pilot activities

The results and impacts of the different pilot projects are briefly discussed hereafter.

Morocco: The Moroccan pilot project is implemented in the Tafilalet region (South-east of Morocco and an arid region), where, in the year 2005, IFAD collected the first experience in this region on participatory irrigation management. In that time the main objective was capacity building to overcome knowledge gaps in water user association organisation. The WaDI*mena* pilot project introduced the technical concept of drip irrigation in the oasis, associated to a cropping system and soil fertility management (fertigation). The actual water saving strategy in Morocco gives incentives to each farmer to install on-farm water saving equipment. The context of the Moroccan strategy has helped the WaDI*mena* pilot project very much to achieve its objectives of water saving and water valorization. The lesson learned for WaDI*mena* is that it is extremely important to have an enabling institutional and legal environment for WDM.

Algeria: The WaDI*mena* pilot project focused on treated wastewater reuse for supplemental irrigation of wheat, using field experiences collected by Algerian institutions and the ICARDA on-farm protocol. The Algerian team focused on treated wastewater reuse impacts on the soil (salinity, pollution) and crop yield (comparison between two varieties of wheat). Lessons were learned about mobilization and reuse of unconventional resources and management of their environment and production impacts. These experiences were locally highly important in the context of limited wastewater reuse in Algeria but do not seem to present a large learning impact for WaDI*mena* regionally.

Tunisia: The context of the Tunisian WDM strategy has given the Tunisian WaDI*mena* team the opportunity to focus on two main objectives: farm economic water valorization and gender mainstreaming in water management. The local assessment of farmer's income, irrigated crops, marketing and capacity building on economic aspects are also the local lessons learned in the Zaghouan region. These subjects are important and complex according to the stochastic characteristics of markets and the sustainability of irrigated farms, even if water is available. Water use efficiency is technical but has to be also economical on the farm level. From this WaDI*mena* pilot project, the concept of water demand management moves from technical aspects to social and economical aspects. It is therefore a step towards integrated water resources management on the farm level and many lessons can be learned from it.

Egypt: The Egyptian pilot project started as a general attempt to improve the efficiency of water use in the Farafara oasis) which derives its irrigation water from (largely fossil) groundwater), in a participatory set-up, establishing a water user association. Originally the emphasis of the project was on technical aspects, such as lining of earth irrigation

canals, which lead to a reduction of loss in the distribution network and subsequently an extension of the irrigation area. The project team however soon realized that in using available water resources in the most efficient way (added value per m3 water used), the implication of socio-economic and agronomic parameters such as marketing, financing and crop choices is extremely important. Relevant activities were started up within the pilot project with some additional funding, but could not be carried on in the required development project context due to lack of relevant funds. In the larger context of the WaDI*mena* project, the main lesson learned was that improvements in irrigation efficiency do not come without approaching rural communities in a holistic approach that includes socio-economic aspects, next to water and agronomic aspects.

Palestine: The Palestinian pilot project, originally designed as a project to demonstrate reuse of treated wastewater of Al Bireh WWTP, has developed largely as a national dialogue exercise on wastewater reuse. It was the first time such a dialogue of this extent took place in Palestine on a water issue and the Review Team found that the pilot project was well-known and very positively judged by all involved stakeholders. The impact of the dialogue on the national level is a much better understanding of wastewater reuse issues with all stakeholders, authorities, universities, NGOs and farmers alike. In the larger WaDI*mena* context, the impacts are the addition of the national dialogue to the WaDI*mena* "toolbox", and the increased knowledge on the use and implementation details of such national dialogues.

Jordan: The pilot project in Jordan concentrated on grey water use of larger buildings/consumers for urban agriculture or landscaping in an urban context. Where in Jordan experiences with grey water use on the rural household level are abundant, this approach was relatively new for Jordan. The experience shows that this is particularly feasible for urban landscaping. With increase of prosperity, urban landscaping will become more important and the use of grey water is a valuable alternative for its irrigation. In the larger WaDI*mena* context this has been a valuable contribution to the WaDI*mena* toolbox as this technique is so far little practiced in the region.

Lebanon: The pilot project is a de facto continuation of an earlier IDRC grant, with the footnote that lessons learned from earlier exercises have been integrated in project design. The project has tested improved methodology that was originally developed through an IDRC grant in Jordan. The project has been successful in installing 74 grey water treatment kits in households in 4 villages. Moreover, the project has monitored the functioning of the grey water systems, conducted socio-economic surveys, built capacity with the households on operation and maintenance, conducted an intensive promotion campaign, and taken influence in national policy matters. Even though there is some doubt about the sustainability of grey water systems installed in this specific area, the project has learned important lessons on the interaction of new technology with socio-economic characteristics of particular villages, lessons-learned that are now successfully implemented in other parts of the country. These lessons learned, and the social approach to implement grey water reuse on village level, are valuable contributions of the project to the wider WaDI*mena* context.

Yemen: The pilot project aims to restore urban agriculture gardens that were in the past irrigated with grey water from the mosques. As this water is not always available anymore, alternative grey water resources are exploited, like the grey water from households. The project also has been working on setting up and strengthening user organisa-

tions. Where the grey water use will not solve Yemen's water resources problems, which are marred by strong competition between irrigated agriculture and domestic use, the project has a strong spin-off effect in the sense that Yemeni authorities have become more aware of the use of alternative water resources.

More information can be found in the brief country visit reports in the Annexes 7 to 14.

Although this information is certainly available, the Review Team prefers not go into details on the implementation of the pilot activities; these have been completed some time ago and have been properly reported to the WaDI*mena* team and administratively consolidated. It is sufficient to say that all pilot activities have been properly implemented with a lot of effort from the side of the local WaDI*mena* partners. They have largely achieved their objectives and sometimes delivered outputs beyond expectations, particularly seen their relatively modest budgets.

What is interesting to discuss is the role the pilots play in the WaDI*mena* context.

More technical pilot activities, such as the installation of grey water treatment systems do not seem to contribute to a large extent to the WaDImena objective to improve WDM capacity in the region. Such pilots are certainly needed and are – according to the experience of pilot projects in Lebanon, Yemen and Jordan – definitely pro-women and pro-poor and therefore certainly not lost investments. The pilot on grey water in Jordan could be disseminated and applied at a larger scale and save water in institutional buildings like universities, hospitals, hotels, schools, etc. The pilots in Lebanon are very well received by local population and the pilot in Yemen has triggered an important rethinking on WDM in government institutions. Nevertheless, the lessons learned that can be disseminated to policy-makers are limited and it would be better to implement such pilots in a context different from WaDI*mena*.

Activities such as those implemented in Morocco where the legal and institutional context had strong emphasis, Tunisia on farm economic concepts, Egypt on water user participation and Palestine on national dialogue seem to be more useful for a project as WaDI*mena* that fosters WDM policy-making and governance issues. This should be an important lesson learned for donors. Projects like WaDI*mena* should concentrate on major issues like institutional and legal framework, economic aspects, water user participation and dialogue. Research on technical improvements and scaling-up should be conducted on a different scale, more reasonably on a national scale with a strong dissemination link to the regional context.

Knowledge base

The building up of a comprehensive knowledge base is an essential part of the project, which forms an indispensable base for "Networking", "Capacity building" and "Dissemination".

The project has collected new experiences and knowledge from the eight **pilot activities** that were mentioned before. In **Morocco**, research was done to test and develop improved water-saving irrigation techniques and methods for the efficient use of available saline groundwater. At the same time stakeholders' awareness on adequate irrigation and cultivation under such circumstances was improved. The project prepared a number of technical reports that describe the research activities and their results. In **Algeria**, irrigation with treated wastewater was followed up in the pilot area and intensively studied.

The results are presented in a technical report. In **Tunisia**, the research team investigated the socio-economic aspects of irrigation under water stress conditions from an overexploited groundwater aquifer. The research results are carefully documented and available for other users. In **Egypt**, the research team assisted farmers in improving their water user association in order to allow a more efficient use of fossil groundwater sources and enhance the sustainability of oasis agriculture. In **Palestine**, the original research concept using treated wastewater for irrigation was abandoned and instead a national dialogue was conducted on the reuse of treated wastewater. The results of this dialogue are extensively documented. In **Jordan**, new concepts of grey water use from large building complexes were introduced and tested; the results are available in technical reports. In **Lebanon**, available grey water use technology was improved and tested under different socio-economic conditions; research results are well documented and applicable fro other regions. In **Yemen**, grey water use that traditionally existed around mosque grey water was revived and adapted for use under changing social and economic conditions. These experiences all together form a valuable contribution to the WaDI*mena* database, together with extensive information collected from other sources.

The project supported the pilot projects with guidance and scientific expertise. ICARDA joined the pilot exercise in Algeria; in five other pilot projects external expertise was provided (e.g. INWRDAM in Lebanon and Yemen). Two (research project management) capacity workshops were conducted in Marrakech and Amman, shortly before the pilot activities started.

WaDI*mena* has collected a large number of publications from other institutions, consulted literature on WDM, policy papers, research papers and has conducted some research of its own, within the context of limited funds available. Based on all this information, but also on discussions in a large number of seminars, workshops, etc., including the WDM forums preceding WaDI*mena*, the project has produced a considerable number of **synthesis documents**. These include inter alia the following:

- Two political economy studies have been conducted, one on wastewater and grey water reuse in Jordan and one on decentralisation of water management in Yemen. Both studies were presented and intensively discussed in workshops held in Amman and Sana'a respectively.
- One case study for each of the aforementioned pilot activities; the case studies are still under preparation and not yet published.
- Three synthesis papers: (1) Outcomes of the Political economy studies and workshops; this synthesis paper is considered by the Review team of very high quality and extremely useful as a paper to consult on this issue. (2) A regional study on WDM, climate change and food security; this study was not yet available at the time of the Review, but has meanwhile been completed and distributed. (3) A regional research study on indicators and benchmarks of WDM; this study was also not available at the time of the Review, but has meanwhile been completed and distributed.

- Two books on WDM issues: (1) a book on grey water[8]; the book was distributed in March 2010 and the Review Team could briefly revise the book during the field visit to Lebanon; the Review Team considers the book to be a valuable contribution to the grey water issue in MENA as it provides interesting experiences and reading. However many grey water experiences in the region are not presented in the book and it cannot be considered to be a fully comprehensive study on grey water issues. (2) A book on WDM in the MENA region. The book has not yet been published.
- Working papers and policy briefs, although these should be considered to be dissemination documents and will be discussed later in the relevant chapter.

On the WaDI*mena* website, an impressive knowledge map gives access to more than 80 pages of concise text on all aspects of WDM, all WaDI*mena* reports as mentioned above, more than 160 leading publications on WDM in all its aspects and more than 100 URL links to other websites of interest for WDM.

At the moment of writing this report, WaDI*mena* had not yet completed its case studies and the book on WDM in MENA. Without these important outputs, the knowledge base would still be incomplete. Moreover, even though the knowledge map gives an impressive amount of information, there is insufficient attention for the knowledge on grey water use, wastewater reuse and irrigation efficiency that has been collected in other programmes and projects over the last 10 years. This is the kind of knowledge that could have been collected by the local WaDI*mena* partners in the participating countries; it would have been impossible for the WaDI*mena* core team itself to have found out what has been going on there. However, there has also been no systematic and guided process in the project to collect such information through the different local partners. In this sense, it can be concluded that the local partners may not have been sufficiently "embedded" in the knowledge collection and knowledge synthesis actions of the project.

Knowledge networking

The networking has been an important activity that has strongly interacted with knowledge collection and knowledge dissemination.

Project staff has actively participated in around thirty **regional and international seminars, symposia and workshops**. A list of these participations can be found in Annex 17. With these activities, the target to actively participate in 2 to 3 workshops per year has been amply exceeded. In most cases, WaDI*mena* staff had the opportunity to present the project and relevant WDM issues. The participation was also used to acquire knowledge from third parties on WDM issues and mutually discuss findings. As such, the activity significantly contributed to the understanding and knowledge of the project on WDM issues and the dissemination of information, findings and synthesis of the WaDI*mena* project team.

A significant number of **dissemination materials on WDM** have been prepared and distributed. This concerns different materials such as:

[8] Stephen McIlwaine, S. and Redwood, M. 2010. Greywater Use in the Middle East; Technical, Social, Economic and Policy Issues. Practical Action Publishing/CSBE/IDRC. 200 pp.

- Branding items such as banners, posters, pops, etc. for WaDI*mena* regional and on the national level in most pilot projects
- A WaDI*mena* brochure in three languages; brochures and leaflets of the national pilot projects
- Seven working papers (*Institutions for Effective WDM*; *WDM, Poverty and Equity*; *Gender & WDM in MENA*; *Defining WDM from a Social Innovation Perspective; WDM, climate change and food security; Water Food Climate Nexus; and Benchmarking WDM in the MENA region*)
- A technical bulletin on grey water reuse in MENA in three languages
- Seven policy briefs in 3 languages (*What is WDM*; *WDM and Poverty*; *WDM and Gender*; *Effective WDM Institutions; Inequalities and Power Asymmetries in Yemen and Jordan; WDM, climate change and food security; and Benchmarking WDM in the MENA region*)
- Trilingual Glossary
- Success stories for Yemen and Egypt
- A media kit in three languages (English, French, Arabic) including info briefs, success stories, policy briefs and Q&A sheets
- Two long video films: *From Waste To Water: Greywater Reuse in the Middle East*; *Wastewater Treatment and Effluent Reuse for Agricultural Irrigation in Palestine*
- Book on Grey Water

The dissemination materials are in general of high standard and contain adequate novel information.

WaDI*mena* has developed an attractive trilingual website with a knowledge map that gives access to more than 80 pages of concise text on all aspects of WDM, all WaDImena reports and most dissemination materials as mentioned above, more than 160 leading publications on WDM in all its aspects and more than 100 URL links to other websites of interest for WDM. The number of monthly website hits hovers around 3,000, which is quite respectable for a project the size and mandate of WaDI*mena*. Compared to the very significant amount of information offered on the website, the number of hits seems relatively small however.

Although the website is commendable (there is no similar complete and adequate website on WDM in the MENA region or beyond), a few critical remarks need to be made: (1) The website insufficiently covers action research efforts on WDM from external parties and other donors, (2) Due to the ample coverage of web links and documentation, the inexperienced visitor lacks guidance to what are the most important links and documentation; this is fine for scientists, but not for users and decision-makers, (3) A general news section on WDM (what new things on WDM are happening or going to happen soon in the MENA region) is missing. (4) There is, among possible other such deficiencies, no link to EMWIS, which is the most important web platform on IWRM in the Mediterranean region with a number of monthly hits over 100,000. Having proper links with such important websites would almost certainly promote the use of the WaDI*mena* website. In general the narrative on pilot projects on the WaDI*mena* website there are no links to documentation, institutions and websites, and only two websites of partners (Birzeit University and Cairo American University) adequately report on their WaDI*mena* pilot

project. This is probably also due to considerable weaknesses of the partner websites in general; it is not a coincidence that the two mentioned websites are among the best.

On the **national level** a number of dissemination activities were carried out by the partners involved in the pilot activities. This included well-visited dissemination workshops in Morocco, Egypt, Palestine, Jordan and Lebanon; regular information of policy-makers in Tunisia, Yemen and other countries; meetings with municipalities in Lebanon and other countries; pilot project posters and brochures and film material and media coverage. Particularly in Palestine, due to the character of the pilot activity being a national dialogue, a larger part of the local population was reached. In other countries, dissemination was more directed towards researchers, education, authorities, NGOs and donors.

A two day workshop was organised for Arab journalists and communication officers on *Capacity Building in Effective Communications* in which WaDI*mena* convened a session on better awareness on WDM issues. The Project Coordinator was interviewed several times on regional satellite TV channels (Al Jazeera and Al Manara, Al Hadath, 2M Morocco, O-TV, Sawt Al Arab, Jordan National TV).

Overall, dissemination from WaDI*mena* has been very effective, particularly in the second half of the project life span, after the PSC imposed a different role for the project Coordinator and nominated a full-time Communication Officer for the project. Some work needs to be done on completing internal WaDI*mena* reports and improving certain features of the WaDI*mena* website. The target groups of the dissemination were researchers, education, authorities, NGOs and donors. More than 30 newspaper articles were published and some video material distributed. However the shear size of the region (around 15 countries and over 250 million people) leaves some doubts about whether the general public has been adequately reached by the WaDImena awareness efforts.

Dissemination to policy-makers

WaDI*mena* actively participated in the last two **World Water Forums**, 2006 in Mexico (WWF4 and 2009 in Istanbul (WWF5). Six persons from local WaDI*mena* partners attended WWF4 and the project was consulted on the preparation of the Forum. In WWF5, WaDI*mena* played a much more active role. The project took part in the preparatory meetings, among others in Cairo (organized by AWC), Stockholm and Montpellier (June, Aug. and Sept. 2008 respectively). The project was also actively involved in the MENA/Arab Region's contribution to WWF5. The Project Coordinator was the lead author of chapter 3 in the MENA report and has contributed to other chapters. Moreover, WaDI*mena* and WDM were extensively promoted during WWF5. The participation in WWF5 paid off for the project as it enabled more recognition of WaDI*mena* achievements and improved visibility.

WaDI*mena* has worked intensively on improving its relation with the **Arab Water Council** and promoting WDM ideas with the Council members. The project had a significant number of direct contacts with the Chairman of AWC (also being in Cairo) on WDM issues and chaired a session on Water Governance in the 1st Arab Water Forum in November 2008 in Riyadh (in which forum also six local partners presented their pilot activities).

Moreover the Project Coordinator has been involved in the revision of the MENA/Arab regional policy paper on water (still not published).

The project has **promoted WDM at the national policy level** through end of project dissemination workshops held in six out of eight beneficiary countries in which policy- and decision-makers participated. In all countries, contacts took place with staff of Ministries and other authorities took place on a regular base and pilot projects report fruitful discussions without however giving many details. In some countries (Lebanon, Egypt, Yemen) it is reported that ties were knotted with municipalities and regional authorities as well. In Yemen, the Ministry of Agriculture actively participated in project work, as was to some extent the case also with authorities in Morocco, Tunisia and Palestine. In Jordan, the local partner contributed to the revision of Greywater use standards and prepared guidelines for practical implementation of grey water use.

WaDI*mena* held a final WDM Forum on 19 and 20 April 2010. Unfortunately the Review Team could not participate in the Forum due to respectively illness and travel restrictions related to the Island volcano eruption. The presentations of the Forum are on the WaDI*mena* website, but no account of discussions and recommendations has been made public yet. The eventual outputs of the Forum are therefore not included in this review.

The promotion of WDM at the policy level, locally and regionally is an ongoing activity in which WaDI*mena* has scored some important successes. In particular the good relation with regional fora such as AWC should be noted. On the local level, the achievement of the project shows a somewhat diverse picture. Contacts have been good and fruitful in some countries; in other countries local partners concentrated on their research activities and could have done more on promotion with policy- and decision-makers. Based on remarks of the local teams on this issue (some of them reported lack of guidance from the WaDI*mena* core team, even though specific trainings were organized on setting up and implementing communication plans), the Review Team observes that the communication strategy of WaDI*mena* was not clear to all partners and there was a lack of implementation of dissemination plans in some of the pilot activities as well.

Capacity building

One of the objectives of WaDI*mena* was to strengthen the capacities of actors involved in WDM, enabling them to use the presented WDM tools in the context of their own countries.

The project prepared **training modules** for short WDM training courses held by selected partners *Arab Water Academy* and *Regional Center for Training and Water Studies*. The training modules were used on two or three occasions (as according to progress reporting). It is not clear if the training modules will be further used or will be integrated permanently in relevant academic and training programmes.

The project supported **training activities of other organisations** such as AWC, GTZ, GWA, InWEnt, UNEP, UN-Habitat and FAO with training modules and expertise. Regional Training of Trainers (ToT) exercises on gender mainstreaming were supported in 2008 and 2009. Another two ToT exercises were organised in December 2009 and May 2010 respectively. The first being on water awareness to the GCC countries plus Yemen and the second on agricultural water demand management to 30 senior managers in Algeria. The Project reports that both were successful.

WaDI*mena* participated actively in the Capacity Development Workshop on Wastewater Treatment and Reuse by INNOVA-MED in December 2008; in the Water Governance Training to Egyptian water professionals in January 2009, in regional media professional training by UN-Water in Egypt and in the National Course on Water Demand Management for water practitioners in March 2010 in Egypt.

Joint activities on **capacity building for gender mainstreaming** were implemented with GWA in Tunisia, Jordan and Morocco (2008-2009). Some of the project partners form Yemen, Algeria, Egypt and Yemen were nominated to attend regional training activities on this issue organised and funded by GWA, GTZ and USAID. In only three beneficiary countries, the project implemented training on gender related issues: In Lebanon, the project trained women in food processing (in order to enable processing of fruits produced with grey water) and household environmental management; in Yemen a one day training was held for the female part of the project team on data collection and gender issues; in Palestine a largely female team was trained in questionnaire and data collection activities.

WaDI*mena* stimulated **platforms** of other organisations in the region to present WDM content; for this a number of discussions apparently took place with governmental and regional organisations. However, the reporting on this issue is somewhat vague and it is difficult to judge if this activity has achieved its goals.

Support was provided for **12 young professionals** from the region (including 6 women), to prepare presentations or scientific papers and participate in five different regional symposia /events. The support for young professionals is considered by a large number of interviewees as a sound capacity building exercise, provided that a sufficient number of such professionals keep working on WDM issues (this seems to be the case until now).

Local training exercises took place in all eight beneficiary countries:

- In Morocco, farmers have been trained to use water-saving tools on the farm in a comprehensive and integrated technical package that included different aspects of water, soil and plant management.
- In Algeria, the local team has received advice and on-the-job training from ICARDA staff in project formulation and management and research methodology. Standards for the use of treated wastewater for cultivation of cereals have been established and disseminated among researchers. The WaDI*mena* partner plans to disseminate these standards under farmers as well.
- In Tunisia, farmers have been trained in the use of a technical package for drip irrigation of gardens; this package also included the role of women in decision-making and economic parameters and market conditions in the assessment of harvesting. Relevant support and training documents have been prepared.
- In Egypt, farmers have been trained in the participatory management of groundwater and the formation of an association with rules of technical and organizational management, as well as in the preparation of action plans for improving water management and irrigation systems.
- In Jordan, project staff participated in international training and students have been trained in all aspects of WDM, including the management and evaluation of small grey water plants. It is assumed that training of students, who may become sector leaders in future, will have a long-term sustainable effect.

- In Palestine, WDM elements have been included in the regular curriculum of Birzeit University. A local team was trained on conducting questionnaires and surveys. Moreover, the WaDI*mena* partner has organised 9 workshops with capacity building elements on different issue related to wastewater reuse.
- In Lebanon, village inhabitants have not only been trained in the operation and maintenance of grey water treatment plants, but also in economic activities related to the surplus harvest triggered by the use of grey water, such as conserving fruits, etc.
- In Yemen, training sessions were provided to the association on organisational aspects. Farmers were trained on irrigation and cultivation aspects.

In general, the project can be commended for the substantial capacity building that has taken place. At the start of the project, an Institutional Capacity Development Assessment[9] was made that produced the following recommendations:

- Give a number of young professionals an intensive up to 6-monhs training on WDM that changes their outlook on how to handle WDM issues in a policy- and decision-making context.
- Delivery of short courses to explain the potential and the power of water demand management to division chiefs, directors and other senior staff of key ministries and agencies in each country.
- Bring WDM to the attention of members of parliament.
- ToT – Teaching of Teachers – with emphasis on agricultural water use and rural water demand management in general.
- Sharing experiences with countries in the Nile basin and West Africa.

There has been ample discussion in WaDI*mena* on the training to be implemented and the practicability of such within the limited project context. This resulted in a number of adequate training exercises. However, the project did not prepare a comprehensive and systematic training plan that weighted efforts and impacts and set priorities for WDM issues. As a result, important recommendations such as ToT in irrigated agriculture were not consistently followed up and practiced in the pilot projects; the training of young professionals took place, but was more driven training opportunities offering itself then by carefully analyzed needs. This is not meant as a reproach for the project team; some of the recommendations were difficult to implement in the context of a relatively modest project. Nevertheless, it should be learned from this that a more systematic approach to capacity building is needed in future projects. WaDI*mena* has made a good start with the Institutional Capacity Assessment, but has not made full use of the analysis in this report to configure its capacity building programme[10].

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[9] Brooks, D. and Abu Qdais, H. 2006. Institutional Assessment for Capacity Development in WaDI*mena* Nations; Summary Report.

[10] These are just a few stray thoughts: For instance in the call for proposals for the pilot activities there should have been more clear guidelines on capacity building; in the various capacity building actions there should have been more priority for water savings in agriculture, etc.

Public awareness in the Gulf States

This activity could be considered as a separate small project that is embedded in WaDI-*mena* for practical reasons. Financing of the activity is from IFAD only.

The project has conducted surveys on public awareness in Oman, Saudi Arabia, Kuwait, United Arab Emirates, Qatar, Bahrain and Yemen and organised a workshop to discuss results and design awareness campaigns accordingly. Moreover, the project has assisted the Gulf States in the preparation of dissemination materials and the organisation of their public awareness campaigns. Further, a ToT on public awareness was organized to media representatives. A summary report has been prepared to summarize WDM experiences in the Gulf States and set a scenario for future WDM actions in the Gulf States.

Project goal and development objective

The project goal to improve WDM capacity in the MENA region has been largely achieved. This is illustrated by the following:

- The project has implemented 8 pilot activities that have delivered improved knowledge on issues like how to economically use saline groundwater for irrigation, how to safely use treated wastewater for supplemental irrigation of cereal crops, the on-farm economic aspects of treated wastewater reuse, user participation in irrigation water management, national dialogue on wastewater reuse and grey water use in all its technical and socio-economic aspects.
- The existing knowledge on WDM in the MENA region has been assessed and made accessible for researchers, decision-makers, NGOs and water users in the form of a very accessible and sustainable web-platform.
- Networking has taken place with a large number of key persons and institutions in WDM, such as research and education institutes, NGOs, authorities, and regional and international organisations.
- Personal and institutional capacity has been improved through training events in different forms, participation of young professionals in major training courses, active participation in training courses of other organisations with particular emphasis on WDM and numerous formal and on-the-job training events for selected water users. The latter have taken place on a pilot scale an were not intended to raise capacity of water users on a large scale.
- Preparation of dissemination materials (summary reports, books, policy briefs, etc.) and a media kit that can be used by anyone to promote WDM and strengthen WDM capacity.

However, as the project has no clear quantifiable indicators in the logframe that could measure this, the achievement of the project goal cannot be measured by theses. However, the Review Team would judge that considering the resources, capacity and realistic possibilities, the project goal has been fully reached, without significant reservations.

The achievement of the project goal has unquestionably contributed to the overall objective of enabling a more effective water governance in the MENA region. During the last decade there has been a wide range of WDM activities, growing awareness on WDM, and increasing pressure on governments to apply WDM principles in situation where op-

tions to develop additional conventional water resources became very limited. The single effect of a relatively modest project like WaDI*mena* is therefore difficult to quantify.

Nevertheless there are clear indications that WaDI*mena* has played a leading role in the promotion of WDM principles and tools in the MENA region. There is however a mixed picture in different countries in the region. The Review Team has questioned government officials in a number of countries on the role of the project in mainstreaming WDM. Answers differed from country to country. In the Maghreb countries, WaDI*mena* is appreciated, but it is noted in Morocco and Tunisia that WDM was already a clear policy before WaDI*mena* started its work. The added value (from WaDI*mena*) for national water governance in Morocco is not clear; Moroccan authorities appreciate WaDI*mena* activities, but ways of governing water at the national level have not effectively changed because of the project. However, when WDM is requested to be implemented at the local level, WaDI*mena* has had an important role in boosting the involvement of stakeholders. In Algeria, the project has recognition in the scientific community and plays a role in scientific awareness on WDM, but did not have any significant impact on water governance, due to the hermetic policy environment. In Tunisia, WaDI*mena* has added an important socio-economic aspect to the existing government WDM policy which was very technically directed so far. In Egypt, impact on water governance has been very limited, maybe also because the pilot project did not exploit the major problem of irrigation water efficiency in the Nile irrigation systems. However the project has had an important spin-off for participatory irrigation management of underground water resources. In Palestine and Yemen, WaDI*mena* has been an eye opener, in Palestine because of the first national dialogue ever that was set up in the WaDI*mena* context on wastewater reuse, in Yemen as the government was confronted with grey water issues and made it a policy on its own as a follow up on the WaDI*mena* project. In Jordan, WDM activities are well developed in the urban context (and WaDI*mena* certainly made a contribution to that), but failed so far to tackle the more complex problem of WDM in irrigation. In Lebanon, as water resources are more abundant there and not all conventional water resources are exploited yet, WDM does not have the place in water governance it deserves. However, grey water use is now better known as an option to enhance local water supply and food security and it could become a more important issue in the upcoming IWRM strategy in Lebanon.

An issue that was mentioned during interviews is certainly that in all countries in the region, knowledge and awareness on WDM issues has improved because of WaDI*mena*, but also because of other projects and programmes which were locally linked with WaDI*mena*. Although its impact on water governance is not always measurable, it may logically be expected that such increased knowledge and awareness will bear fruits in future, provided it will be further cultivated and grow.

It can also be noted that because of intensive WaDI*mena* promoting activities, WDM has been placed higher on the agenda of international and regional organisations, like the Arab Water Council as an example. It is obvious that there will be a certain spin-off effect of this on national water governance in future, even if this cannot be measured concretely at this moment.

Water Governance is a process and WaDI*mena* activities played a role to emerge the importance of WDM in this process, with international agencies involved in MENA countries projects and with national or local level decision makers.

4.6 Efficiency and effectiveness

In a post project evaluation, the emphasis of the analysis is usually not so much on efficiency, but more on effectiveness, i.e. are there tangible outputs that lead to achievement of originally set objectives. When all activities have been implemented already, the efficiency question is rather academic and has a limited learning aspect.

The **efficiency** of a project is measured by the fact that the project results have been achieved at reasonable cost, i.e. how well inputs/means have been converted into activities, in terms of quality, quantity and time, and the quality of the results achieved. Measuring the efficiency generally requires comparing alternative approaches to achieving the same results, to see whether the most efficient process has been adopted. In the case of WaDI*mena* this would be extremely difficult as it is quite a unique project that can hardly be benchmarked against other similar exercises.

A number of criteria answer positively: Quality of day to day management was adequate, particularly in the second phase of the project after the management structure had been changed conform the recommendations of the MTR; relations and coordination with counterparts on the regional level was excellent and improved towards the end of the project; inputs from donor headquarters were largely adequate, both in the PSC and beyond; the knowledgebase acquired and distributed was adequate for the WDM problems at hand; a number of unplanned interventions by the project Coordinator (particularly on the regional level) improved the efficiency of the WaDImena actions; etc. Not all pilot projects were completely efficient; some of them were still too research directed and did not present a fully correct balance between knowledge collection and the application of this knowledge in the field in a wider context on the national scale.

However, comparing the expense of the project and the number and quality of outputs produced, the Review Team judges that efficiency has been high in general, as well for the pilot exercises as for the work of the team in Cairo. The efficiency of the project was somewhat lower during the first two years of implementation, but improved after the MTR when better control procedures were put in place by the PSC.

The **effectiveness** of the project is an assessment of the contribution made by results to achievement of the Project Purpose, and how assumptions have affected project achievements. This should include specific assessment of the benefits accruing to target groups, including women and men and identified vulnerable groups such as children, the elderly and disabled.

Much of effectiveness should be perceived form the point of view of the target groups. In a regional project like WaDImena, this is extremely difficult to investigate in the limited context and time frame of an End-of-project Review. Nevertheless, the Review Team has collected some impressions which are shared here.

An important observation is probably that during the lifetime of the WaDI*mena* project behavioural patterns have changed in the beneficiary organisations (project partners, government agencies) and groups of population of pilot areas in most partner countries; it was clearly indicated by most interviewed people that their attitude towards WDM had changed for the better under influence of the WaDI*mena* project. It is difficult to assess in how far this has produced concrete changes in policy and development strategies; it is measurable, but there are many factors outside WaDI*mena* that have an impact on this.

The assumptions from the original logical framework mainly relate to the capacity of stakeholders to absorb information and ideas developed by WaDI*mena*. Obviously such absorption also depends on the quality of the activities of the Project. The review team notes that on the level of decision-makers and academics, quite some of the WaDI*mena* messages have indeed been absorbed by the stakeholders. On the level of water users, farmers, etc. this is less clear. Participation can be a vehicle for increasing the effectiveness of development projects or programs. If people have a genuine stake in a development activity and are actively involved in decision making, they are likely to give a greater degree of commitment, and shared objectives are more likely to be met. This participation took place in most pilot projects, but the Review Team observes that the implementation periods were too short to take maximum profit from this participation.

This leaves WaDI*mena* as a project that has created a strong knowledge base, the instruments to disseminate this knowledge, a decent impact on the regional governance level, but less effectiveness (with admittedly large variations from country to country) where it comes to the implementation of collected knowledge on the national level in the field.

This observation should obviously be related to the very modest funds that were available for implementation in the different beneficiary countries (on average CAD 120,000); it would be unfair to expect that such minor funding would trigger large impacts. Nevertheless it is felt that these observations need to be made as it is difficult to see how an excellent knowledge management effort like WaDI*mena* can have a long-lasting sustainable effect without a further in-depth implementation on the local (rural community) level.

4.7 Sustainability

In the case of WaDI*mena*, sustainability would be best defined at the level of project goal and overall objective of the project. In this sense, two questions emerge:

1. Will the capacity developed by WaDI*mena* be maintained during the next 5-10 years without the presence of the project?

   The capacity that has been developed is mainly within the partner institutions and with the respective government entities that were in one or another way involved (actively or passively through dissemination and training.

   The partner institutions have gained knowledge by implementing WDM pilot activities. This knowledge includes research methodology, better overview of available documentation on the subject, improved technology, experiences beyond the technological implementation of WDM, related to socio-economic aspects in particular like governance (user involvement), farm economic approaches (crop choices, marketing, financing), etc. Where the partner institutions in the various countries are for the most part research institutes or NGOs, it is expected that such newly acquired knowledge is relatively easily integrated institutionally and will become sustainable in case there is proper staff continuity (which is predominantly the case in the institutions that partnered with the WaDI*mena* project). Whether such partner institutions will be able to continue playing the dissemination and promotion roles they had under the WaDI*mena* pilot activities, remains an open question as this depends on

funding, priorities in research and education programmes, etc. Some of the partner institutions depend in their research and action research programmes unfortunately very much on donor money and acquiring donor funds at times looks like a lottery with many blanks!

The situation with government institutions (ministries, authorities) that were involved in the WaDI*mena* project is somewhat different. The staff in such institutions may have acquired similar knowledge as in research institutes and NGOs. However, the integration of such knowledge is not an easy process and depends on many other factors like ways of management and political pressure from outside. Also, rigid top-down structures may hamper spread of knowledge in government institutions. There is also a factor of staff turnover which is a serious problem in most government institutions in the MENA region. The Review Team believes that therefore, even if government institutions have acquired knowledge, a continuous support from outside (action research, dissemination, promotion of technology and policies) will be needed over the next decades and therefore a continuation of WaDI*mena*-like activities will still be needed in the next generation of projects.

Initiatives like the Union for the Mediterranean, Arab Water Council agenda and strategy, UNEP Plan Bleu are all striving to promote WDM explicitly either through funding, capacity building or networking. The Obama Initiative for Middle East has set WDM as a priority topic and many USAID project are doing so, as well as EU regional initiatives like MED-EUWI. It can therefore be expected that considerable funding will be available and more opportunities for governments to support their WDM policies and strategies.

In conclusion, it is believed that knowledge generated through WaDI*mena* in research institutes and NGOs is sustainable, but the dissemination and promotion of such knowledge into the policy and decision-making sector of society will, in most MENA countries, still need support from outside. It is therewith recognized that the situation differs considerably from country to country and that strategies will need to be developed for each country individually. Regardless of that, regional networking should be considered as a necessary and productive addition to national strategies.

2. Will the impact on governance, respectively the improvements to water governance, be maintained without the presence of the project? Or otherwise formulated: Is there sufficient ownership of the WDM process within the governments of the participating countries?

   On the regional level and on the level of national water governance institutions, there is the feeling that WDM has now become a firm constituent of IWRM or water management in general. Governments have now significantly increased their knowledge on WDM and embedded WDM in their national water governance policies and action plans. IDRC has committed itself to maintain the knowledge base and its dissemination tools for many years to come. WDM is present now in curricula of universities and it may be expected that the knowledge will maintain itself without too much external support.

   On the level of local rural communities, the situation is less clear. Grey water use and small scale wastewater reuse have spread considerably in most beneficiary countries. However it is felt that it is still donor or NGO driven. Despite apparently positive re-

sults, so far no government has adopted a programme to further develop the use of grey water for rural communities[11]. This is also caused by the feeling that grey water use may be beneficiary for the single water users, but will, due to its limited quantitative scale, not solve the problem of imbalance between supply and demand.

The reuse of wastewater has a somewhat different dimension. For a number of countries (Tunisia, Palestine, Jordan), the reuse of wastewater is so to say for the national water situation a matter of life and death; without the reuse of wastewater irrigated agriculture in the Jordan Valley would for instance have virtually disappeared already, and its application is rapidly increasing, also in other more water-rich countries in the region. The success of wastewater reuse is however also due to the fact that to some extent wastewater reuse is a form of supply management, not WDM, and governments are obviously still more familiar with this type of management!

The most important issue within WDM is how to improve irrigation water use efficiency. Despite many efforts on switching to drip irrigation and agricultural extension on irrigation methodology, irrigation efficiency in the MENA region has only marginally improved. It is believed that this is mainly due to a lack of holistic approaches to improve also socio-economic conditions of irrigated farming, together with technological advances with regard to field irrigation. Despite all its efforts on knowledge collection and transfer, also WaDI*mena* has not really made a significant difference on improving irrigation efficiency and through that alleviation of rural poverty.

[11] Remark from the WaDI*mena* Project Coordinator: Contrary to the private sector (hotels, resorts, factories) where recycling water is growing fast. Private companies providing the technology are flourishing in Qatar, Bahrain, Morocco and Egypt. The business is growing fast in KSA too, as presented by The CEO ACWA Power International In the Singapore Water Week 2010

5 CONCLUSIONS AND RECOMMENDATIONS

Possible follow-up of WaDI*mena*

Before coming to concrete conclusions and recommendations, a few words need to be said on the continuation of development actions similar to WaDI*mena*.

Observing that on the one hand WaDI*mena* has been an efficient and effective project in a number of important aspects of the WDM chain, and that on the other hand much remains to be done to mainstream WDM with policy- and decision-makers, but above all with farmers and poor rural communities, one should reflect on possible options to extend certain actions in the WDM process beyond the present project end.

As the MENA governments will at this moment not have the financial and organisational means to set up and implement regional projects of the character and size of WaDI*mena*, it is obvious that this should be discussed from the point of view of the donor community mainly.

CIDA has announced that it will not support MENA countries anymore, except Palestine which is a special case. Hence there will be no support anymore from CIDA for any follow up action on WDM.

Because of the importance of water in combating rural poverty, IFAD is highly interested to continue actions that enable to gain maximum profit from available water resources for (irrigated) agriculture. This interest is again strengthened by the ever increasing pressure from other uses on water now still available for agriculture. Although IFAD tends to support programmes and project that directly alleviate rural poverty, action research, in particular on how to implement available technology at a larger scale will remain an important issue for IFAD. For the years to come it is most probable that WDM activities will be placed within the context of improving food security and alleviating the negative impacts of climate change.

IDRC's new priorities for the next decade include food security and climate change. Water, certainly for the MENA region, remains the most important cross-cutting issue and much of IDRC action research capacity will be directed to water issues within the food security and/or climate change context. It is therefore clear that WDM will not be a separate subject for action research anymore, but will certainly continue to play a major role in actions related to improving food security and adapting to climate change. In this context, IDRC has also committed it self to maintain the knowledge base acquired under WaDI*mena* and extend it where necessary.

The emphasis on food security and climate change also opens the door for a (obligatory) shift in emphasis towards implementation in the individual countries, an issue which was not fully developed (as discussed before) under WaDI*mena*. It is known that other donors (For instance the EU in ENPI South) take similar action now to scale up knowledge acquired in regional programmes (like MEDA Water) inside the individual countries of the region, using IWRM and climate change as motors for such scaling up. The Review Team therefore sees the changing conditions within the donor community as a positive development for WDM.

Technical recommendations

The single most important issue within WDM is how to improve **irrigation water use efficiency**. Despite many efforts on switching to drip irrigation and agricultural extension on irrigation methodology, irrigation efficiency in the MENA region has only marginally improved. It is believed that this is mainly due to a lack of holistic approaches to improve also socio-economic conditions of irrigated farming, together with technological advances with regard to field irrigation. Despite all its efforts on knowledge collection and transfer, also WaDI*mena* has not really made a significant difference on improving irrigation efficiency and through that alleviation of rural poverty, even though it has made significant quality contributions, which for instance were highly valued by the Ministry of Agriculture in Morocco. Future WDM actions should therefore concentrate on this issue in an holistic approach that includes use of water saving technology, the use of tariffs as an instrument to control water use, participatory irrigation management and its organisation in water user associations (also for groundwater resources) and mobilisation of unconventional resources. The emphasis should however be on the farm economic aspects, with the farmer, in order to make sure that water users adopt the necessary technical improvements.

There is a need for adaptation of WDM to the reality of **climate change**; it is necessary to reconsider the supply of water for the satisfaction of the needs of irrigated agriculture, considering extreme events and how to balance in this context demand and supply, to adapt to climate reality and reduce risks for farmers.

One needs to realize that water resources management and water demand management are the keys to **food security**. This does not simply stop with irrigation efficiency; the collection and management of rain water (water harvesting) and the reduction of soil evaporation through adapted cultivation practices are equally important water demand management tools to be applied to rain-fed agriculture which delivers 40% of the food production in the MENA region. Even though much work has been done on rainfed agriculture in the region, this aspect has been largely neglected so far in WDM exercises, which needs to be corrected. Managing the demand for irrigation needs to be evaluated from the contribution of irrigation during dry and wet events, complementing the rain-fed sector, in order to change demand management from a technical aspect to an inter-annual development aspect, which takes into account the succession of dry and wet years. Among other issues, knowledge management and dissemination will need to take rainwater harvesting to the point of use[12].

WaDI*mena* **pilot activities** have in general been insufficiently directed towards the capacity of local communities to absorb investigated technology. This includes all phases of this process from problem analysis, planning and implementation in which communities should be properly embedded. The learning process of on-field implementation requires much longer project periods that hover around 4-5 years to enable a proper implementation of all phases of the planning process. Experiences in most of the pilot activities show that sustainability is negatively affected by going too fast and skipping phases of this pro-

[12] The nexus food, climate and WDM is nicely analyzed in the Research Report Series no 6 produced by WaDImena that came with interesting policy recommendations

cess; it is recommended to avoid short-lived action research exercises that deliver scientifically interesting results but contribute little to actual implementation.

In setting up a regional project with an overall objective to make changes to governance, it is of crucial importance to **involve local partners** also in the participative guidance and management of such a project. WaDI*mena* has not fully exploited this opportunity: Despite frequent consultations with local partners, the project management has largely remained an exercise between three donor agencies (vs. composition PSC). This has lead to a focus on improving knowledge with less attention on how this knowledge can be used to decrease poverty, a main objective of all three donors. It is therefore recommended to open up steering committees of future projects also for decision-makers and water users, regardless of how difficult or costly that may be. It should be reminded in that context that WDM can only achieve its objectives if it is pursued within a framework of partnership between research and capacity-building institutions, government policy- and decision-makers, civil society and water users.

In relatively small projects (seen in a context of a large and complex region), **capacity building** should concentrate on young professionals that may have policy and decision tasks in future, on training of water users (on a pilot scale) and on Training of Trainers (ToT) as a means to scale up knowledge to larger groups of water users. The important ToT activities related to water use efficiency in irrigated agriculture did only take place to a limited extent. It is recommended to put more emphasis on this in future projects related to WDM.

With regard to the **sustainability** of its actions, WaDI*mena* can be considered as a project that has created a strong knowledge base, the instruments to disseminate this knowledge, a decent impact on the regional governance level, but less effectiveness (with admittedly large variations from country to country) where it comes to the implementation of collected knowledge on the national level. This aspect should be given more attention in follow-up actions in order to not negatively affect sustainability there. Dissemination and promotion of knowledge into the policy and decision-making sector of society will, in most MENA countries, still need support from outside.

Organisational recommendations

The urgent need for **improving food security** and proper **responses to the possible negative effects of climate change**, are issues that are intrinsically connected to an optimal use of water resources in terms of maximising outputs per cubic meter of water used. It is therefore believed that the new emphasis of the donor community on these issues will only enhance the application of WDM. The financing partners (for the MENA region largely IFAD and IDRC) are therefore commended on their choice of development topics but advised to maintain and properly embed WDM actions within their new projects an programmes on food security and climate change.

Project design has been weak for WaDI*mena* throughout project. This is best illustrated in the logical framework which is incoherent and not built up according to best available technology on this subject. As a result, actions of the WaDI*mena* project have not always been objective-oriented, although much improved during the course of the project and particularly after the mid-term review. Fortunately, much of the weak design has been compensated in WaDI*mena* by adequate management of the project. However, not us-

ing planning and management tools appropriately increases the risk of project failure. Donors are therefore strongly advised to give due attention to a proper design of future projects, including the use of the logical framework methodology[13].

WaDI*mena* has created an **excellent knowledge base**, tools to disseminate and promote and trained researchers, decision-makers and water users and also otherwise increased capacity on WDM in the MENA region. This increased capacity is measurable, but has not yet had a significant impact on changing water management in the MENA region. As examples it can be mentioned that grey water use is still not a mainstream technology and efficiency of water use in irrigation does not proceed very rapidly. The lessons learned are that socio-economic aspects and holistic approaches are just as important as the pure transfer of technology or even more so. In future project design this should be taken into account.

The weak design of the project with somewhat unclear objectives has most probably also lead to a **choice of pilot activities** that do not optimally support the achievement of objectives. Most pilots have undoubtedly contributed to (WDM or other) capacity development in some way, but the question "what will the pilot activity bring to enhance water governance in the region" has been insufficiently asked. Pilot activities have most probably also been too small and too short to score desired effects. These are all factors that should be corrected in future pilot activities.

The collection of knowledge and the preparation of a **knowledge base** started by WaDI*mena* have not yet been completed; much knowledge, particular on practical implementation of WDM is not yet available in the knowledge base. This is the kind of knowledge that could have been collected by the local WaDI*mena* partners in the participating countries; however, there has also been no systematic and guided process in the project to collect such information through the different local partners. In this sense, it can be concluded that the local partners may not have been sufficiently "embedded" in the knowledge collection and knowledge synthesis actions of the project. The donors are therefore recommended to maintain and extend the knowledge base in some form during future actions and better involve local partners in such exercises.

[13] It is clear to the Review Team that donors like IFAD and IDRC have the same feeling (and have already improved their project design procedures), but it is nevertheless felt that this recommendation should be made)

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ANNEX 1 LIST OF ABBREVIATIONS AND ACRONYMS

ABRI	Advancing the Blue Revolution Initiative
ADB	Asian Development Bank
ARSC	Applied Research Scientific Committee
AWC	Arab Water Council
CAD	Canadian dollar
CAU	Cairo American University
CIDA	Canadian International Development Agency
CIHEAM/MAI	International Centre for Advanced Mediterranean Agronomic Studies/Bari Mediterranean Agronomic Institute
CRDA	Commissariat Régional au Développement Agricole (Tunisia)
CS	Civil Society
EIB	European Investment Bank
EMPOWERS	Euro-Med Participatory Water Resources Scenarios (EU MEDA Water project)
ENPI	European Neighbourhood Partnership Instrument
ENRM	Environment and Natural Resource Management (program area of IDRC)
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FPR	Final Project Review
GTZ	German Technical Cooperation
GWA	Gender and Water Alliance
ICARDA	International Center for Agricultural Research in the Dry Areas (Aleppo, Syria)
IDARA	Instituting Water Demand Management in Jordan (USAID project)
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
InWEnt	Capacity Building International (Germany)
INWRDAM	Inter-Islamic Network on Water Resources Development and Management (Jordan)
IWRM	Integrated Water Resources Management
KfW	German Development Bank
LF	Logical Framework
MEDA	MEDA Programme: the principal financial instrument of the European Union for the implementation of the Euro-Mediterranean Partnership
MENA	Middle East and North Africa (region)
MERO	IDRC Middle East Regional Office

MTR	Mid-Term Review
MWRI	Ministry of Water Resources and Irrigation (Egypt)
MWI	Ministry of Water and Irrigation (Jordan)
NGO	Non Governmental Organisation
ORMVAT	Office régional de la mise en valeur agricole de Tadla (Morocco)
PIM	Participatory Irrigation Management
PMC	Project Management Committee
PSC	Project Steering Committee
RPE	Rural Poverty and Environment Program (IDRC)
RSS	Royal Scientific Society (Jordan)
ToT	Training of Trainers
UN-Habitat	United Nations Human Settlements Programme
UNEP	United Nations Environment Programme
USAID	U.S. Agency for International development
WASAMED	Water Saving in Mediterranean Region
WASIA	Water Saving in Agriculture
WDM	Water Demand Management
WWF	World Water Forum
WWTP	Wastewater Treatment Plant

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ANNEX 6 BIOGRAPHY OF THE EVALUATORS

Eng. Gert Soer has studied irrigation engineering at Wageningen University in the Netherlands, has a post-doctoral diploma in Water end Environment, and received extensive training in project cycle management, logframe methodology and monitoring and evaluation.

He has started his career as associate expert with FAO in irrigation projects in Algeria and Morocco and worked 5 years in evapotranspiration research in Wageningen University and the Staring Institute. After that he was head of the Water Management Department of the Water and Environmental Services of Groningen in the Netherlands.

From 1986 to 1993 he worked for GTZ in the Dominican Republic as team leader of an institutional strengthening project enhancing the national irrigation and water resources authority INDRHI. In 1993 he became an independent consultant, working in developing countries for a variety of donors, such as KfW, GTZ, the Netherlands Government, the World Bank and the EU. In that period he has worked on irrigation, river basin management, flood protection, water quality management and drinking water supply and sanitation, mainly on planning and management issues.

From 2005 until 2009 Mr. Soer was the technical coordinator of the EU MEDA Water Programme, comprising 9 large regional projects and working inter alia on issues of water demand management. Starting early 2010, he is now the team leader of the *Support to MED EUWI* project. He is familiar with most countries in the Mediterranean region in which he has worked in total for eleven years.

Prof. Dr. Fethi Lebdi studied rural engineering and water at INAT in Tunisia, got his master degree from ENSEEIHT (Toulouse), studied in ENGREF (Paris), got a PhD in water resources and irrigation form the Institut Polytechnique de Toulouse and Doctor ès-Sciences (Docteur d'Etat) in hydraulics from the Faculté Des Sciences de Tunis.

After receiving his master degree, he has worked for a few years at CEFIGRE (Tunis) and CEMAGREF (Anthony, France).

In 1987 he became a professor on water management and water saving, hydraulics and hydrology at the National Agronomic Institute of Tunisia (INAT). From 1991 to 2003 he worked as Director of Scientific Information Treatment of the Tunisian Agricultural and Water Resources Ministry.

In 2002 he became the Director and Coordinator of the Laboratory of Water Resources Management of INAT in Mejez-El Bab and in September 2003 he became the General Director of INAT, both functions he holds until now. He is a visiting professor at IAM Bari (Italy) since 1992 and the Delegate of the Tunisian Government in the CIHEAM Board.

Dr. Lebdi has been involved in a large number of international consultancy assignments for FAO/UNDP, World Bank, IPTRID, FIDA/Morocco, OADA, STUDI Office/Tunisia, Italian Cooperation, ENGREF, CIHEAM/IAM Bari, and the EU in many Mediterranean countries and in Burkina Faso. He worked in these assignments on education and training and subjects such as water savings in irrigation, salinity issues, water demand management, participatory irrigation, water harvesting, water management schemes, and drought management.

Dr. Lebdi has received the Tunisian President Prize of Engineer on Rural and Water Engineering in July 1980 and the FAO Water Award for Tunisia in October 2002. He is a *Chevalier de l'Ordre du Mérite au titre de l'Education et des Sciences* of the Tunisian Ministry of High Education, Research and Technology since September 2005.

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ANNEX 17 IMPLEMENTATION OF ACTIVITIES; COMPLIANCE WITH PLANNING

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Annex 3 - List of people interviewed and contact details

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Mme.Bejdoui Charifa	Responsible Dissemination and Gender Issues	Office de Mise en valeur du Tafilalet		

Annex 3 - List of people interviewed and contact details

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Annex 3 - List of people interviewed and contact details

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M. Habib Hammami	Directeur	Agriculture Department of Zaghouan		
M. Abderrazek Souissi	Professor	National Agronomic Institute of Tunisia		
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Critère d'évaluation

Pertinence

Efficience

Efficacité

Impact

Viabilité

Questions utilisées dans l'évaluation
Est-ce-que les objectifs du Programme correspondent avec les nécessités du pais? Est-ce-que les objectifs du Programme correspondent avec la politique algérienne de l'eau? Est-ce-que le Programme a été préparer bien (cadre logique, indicateurs, hypothèses, etc.)? Est-ce-que le Programme montre une cohérence interne de conception? Dans quelle mesure les objectives de la intervention correspondent à la politique de la Commission Européenne?
Est-ce-que les résultat aient été obtenus a un cout raisonnable Est-ce-que les approches techniques utilisées ont été correctes, trop simples ou trop lourdes? Est-ce-que les conseils techniques ont eu une qualité suffisante? Est-ce-que la durée des activités et son intensivité ont été suffisantes? Est-ce-que c'est possible de comparer les activités du programme avec les autres activités similaires?
Est-ce-que les résultats accomplis contribuent à la réalisation de l'objectif spécifique? Est-ce-que les hypothèses ont affecté cette réalisation? Comment les hypothèses ont affecté cette réalisation? Est-ce que les résultats ont eu certain avantages des groupes cibles (femmes/hommes) ainsi que les groupes vulnérables?
Est-ce-que l'accomplissement de l'objectif spécifique a changé quelque chose dans la disponibilité (quantitative et qualitative) des ressources en eau Est-ce-que les décisions dans le secteur des ressources en eau sont de meilleure qualité? Est-ce-que le personnel du Ministère fournit-il un meilleur travail ? Est-ce-que les instruments légaux sont utilisés plus effectivement?
Est-ce-que le Ministère est suffisamment préparé pour utiliser les outils développés par le Programme? Est-ce-que le budget disponible pour le secteur des ressources en eau est suffisant pour maintenir le système de gérance développé Est-ce-que la technologie introduit par le Programme est adaptée au niveau de formation personnel du Ministre? Est-ce-que il y a des facteurs internes qui pourraient avoir un impact importante sur la pérennité?

Interviews and field visit to Morocco

Pilot project subject : Valorisation des eaux souterraines salines dans la plaine du Tafilalet – Morocco

Interviews and field visits took place in the period 2-7 April 2010

Interviews took place with:

- ORMVA Tf Office Rabat; Si Chatti, Si Ali, Si Boushoul, Si Baba Khouya
- ORMVA Tf Office à Erfoud ; Si Daoud (Chef coordination), Si Moulay Hassen (Chef de subdivision gestion des irrigations), Si Brachmi
- ORMVA Tf Office à Rissani : Si Kerroumi

Field visits took place to:

- Project site at Erfoud
- Project site at Rissani
- Project site at Tizwit

Synthesis of the interviews

Hypothèses du projet initial :

- Situation actuelle : Palmier dattier, luzerne et céréales. Maraîchages quasi existantes
- Marges d'Intensification possible
- Valorisation des eaux souterraines saumâtres possible
- Meilleure économie d'eau à travers le goutte à goutte
- Durabilité possible du système

Objectifs : gérer la demande à travers l'introduction de l'irrigation localisée avec des eaux saumâtres

Cadre : Le Plan National de l'Economie de l'Eau en Irrigation PNEEI

Gestion de la demande :

- Gestion des ressources souterraines de manière efficiente, sans demande des eaux de surface non disponibles au niveau de l'Office (organisation des lâchers à partir du barrage Hassan Dakhel)
- Meilleure efficience à la parcelle

Risques :

- Surexploitation de la nappe
- Il n'existe pas encore de contrat de nappe et de comptage, donc de contrôle direct des eaux souterraines en cas de surexploitation. Ceci pose la question de la durabilité.

Field visits, user and pilot area

Fadhili Brahim : He belongs to « Messaoudia Water User Association » at Tizwit (FAO Award for 2009)

- Equipment from the project: Hydraulic Head station and on filed trickle irrigation for 0.5 ha. According to the success of the crop driving (gain of harvesting time: between 20 days and 50 days of the time of cropping and the market providing), the project add 1 Ha and the farmer add 1 Ha on his charges.
- Augmentation de la densité de plantation du palmier dattier (7x7m), soit 204 Plants/ha.
- Suivi du pilotage des irrigations à l'eau saumâtre (4.8g/l) et des accumulations salines dans le sol, pour des cultures et des variétés locales résistantes (Gombo, melon, pas-tèque, …).
- Le travail en hors sol diminue l'impact des accumulations salines dans le sol
- Durabilité du système sol par :
  - **Lessivage par 3 à 4 apports du barrage**
  - Cultures Hors sol
- Introduction de la fertigation
- L'Etat subventionne les équipements d'économie d'eau (irrigation goutte à goutte) à hau-teur de 80% et jusqu'à 100% si la demande est faite par une WUA
- Mise en place d'une pépinière pour gagner le temps des récoltes. Elle est ir-riguée à l'au saumâtre et au goutte à goutte, en hors sol.
- Gain sur les prix puisque le système introduit donne la possibilité de primeurs : gain sur le melon de 10Dh par Kg (passage de 20Dh à 30Dh)
- Les variétés locales ont donné des résultats beaucoup plus intéressants, en termes de ré-sistance à la salinité, de qualité de produit et de maîtrise éco-nomique par les agricul-teurs, que les variétés hybrides. Le risque :
  - Des variétés hybrides peuvent apparaître un jour, à partir des mul-tinationales et on risque de perdre les variétés locales, adaptées aux événements extrêmes de la région
  - Proposition :
    - mettre en place une banque de gênes de la région
    - donner un label Bio aux activités agricoles
    - Jour sur les primeurs pour gagner des marchés, même à l'exportation et protéger les paysans de la région du gain rapide et non durable

NB : Pour l'administration (ORMVATf), la gestion de la demande en termes de bilan d'eau se ré-sume à :

- Disposer de 3 sources d'eau : le pluvial, la nappe et les eaux de surface stockées dans le barrage Edakhel ;
- Les eaux du barrage sont les plus aléatoires. De ce fait, les lachures du barrage deviennent des lachures d'appoint, de recharge des nappes et de lessivage des sels. Le barrage cesse de devenir la source principale d'eau. Il assure l'appoint aux eaux souterraines. Il reste à suivre l'équilibre piézométrique de la nappe pour ne pas tomber dans la surexploitation et le rabattement excessif, mais avec l'assurance que les nappes sont superficielles et ali-mentées par les eaux de pluie et le ruissellement et donc sont facilement renouvelables en cas de bonne hydrologie (cas de 2009/2010, où la nappe a gagné 17m de piézométrie).

Evaluation criteria :

Pertinence.

Les objectifs du projet WaDI*mena* correspondent aux nécessités du pays :

- Economie d'eau

- Valorisation de l'eau selon le Plan National de l'Economie de l'Eau en Irrigation (PNEEI)

Le PNEEI prévoit aussi la valorisation des eaux non conventionnelles, ce qui correspond aux finalités du projet WaDI*mena*

Le projet a été préparé comme complément du programme financé par l'IFAD pour le PIM (Participatory Irrigation Management)

La gestion du projet a été confiée au service central des expérimentations avec la mobilisation sur le terrain des agents de l'Office ORMVATf auprès des agriculteurs

Organisation des missions du terrain pour le soutien aux agriculteurs, en matière de pilotage des irrigations à l'eau saumâtre (brackish) et choix des cultures tolérantes à la salinité.

La gestion de la demande en eau en organisant l'irrigation autour des eaux souterraines saumâtres avec des systèmes d'économie d'eau, réduit la pression sur les eaux de surface incertaines, à partir du barrage Hassan Abdeldakhel, ce qui tend vers une gestion conjuguée (conjunctive use).

Efficience :

Nouvelle perception de l'eau à partir du comptage des volumes, alors qu'avant, les doses sont données sans comptage et par submersion.

Les approches de la gestion de la demande et de l'économie de l'eau sont plus visibles chez les usagers finaux (end users)

Le projet n'a pas eu tout le temps pour véhiculer tout le package technique, mais l'initiative a démarré sur le terrain et chez l'administration

Les activités de WaDI*mena* ont été comparables aux activités déjà entreprises avec l'eau douce

Efficacité :

Résultats accomplis pour la réalisation des objectifs spécifiques liés à l'introduction des cultures tolérantes à la salinité et la préservation des sols (soil preservation against salinity concentration)

Les hypothèses d'introduction des variétés hybrides ont montré la faiblesse de ces variétés par rapport à celles locales, qui sont meilleures et adaptées (melon, pastèque (water melon), …)

Le projet WaDI*mena* a introduit une dynamique chez les femmes qui exercent l'agriculture qui demandent à se faire encadrer et aider.

Impact :

L'usage des eaux saumâtres a permis d'économiser sur les eaux de surface et de commencer une gestion conjuguée (conjunctive use) eau de surface et eau souterraine.

La rentabilité des opérations de gestion de la demande a été assurée par l'introduction d'un package technique et les équipements d'économie d'eau et le pilotage des irrigations.

L'administration a pris en charge le package technique et son transfert aux usagers.

Viabilité :

Le Ministère de l'Agriculture s'est engagé dans cette voie de gestion de la demande à travers des lois et des incitations financières (entre 80 et 100% de subventions pour les équipements d'économie d'eau)

Il existe une stratégie de l'Etat : Plan du Maroc Vert et le Plan National de l'Economie de l'Eau en irrigation.

L'Etat prévoit d'atteindre 550,000 ha à irriguer en goutte à goutte sur tout le Maroc.

La région du Tafilalt est passée de 0.5ha en 2005 à 2000 ha en 2009, équipés en goutte à goutte.

Interviews and field visit to Jordan

Interviews and field visits took place in the period 2-6, 17-18 and 21-22 March 2010

Interviews took place with:

- IUCN Regional Office for West Asia; Dr. Odeh Al Yayyousi, Eng. Peter Laban
- INWRDAM; Dr. Murad Bino, Eng. Shihab Al Beiruti
- Eng. Rania Abelkhaleq, former head WDM in MoWI
- RSS, Environmental Research Center, Dr. Rafat Assi, Dr. Nisreen Al-Hmoud, Eng. Hameed Bani Hamad
- MoWI, Eng. Maysoon Zubi
- MOPIC, Eng. Maha Zoubi

Field visits took place to:

- Mutah University, Dr. Mufeed Batarseh
- Workshop "Assessment of Water Use Efficiency for the HK of Jordan"

Interview with IUCN

IUCN has not been directly involved in WADIMENA activities, but its senior staff is aware of WADIMENA and has been participating in one or two seminars (i.a. Aqaba seminar 20??).

IUCN does not implement WDM as a separate activity. However, in 2008 it started the *Regional Water Resources & Drylands Programme (REWARD)*, which deals with integrated water resources management within a participatory and decentralized setup. In this context, WDM is fully integrated in IWRM, but not mentioned as a separate activity. REWARD is, like WADIMENA, a network, but concentrating on local water governance in a holistic approach that emphasizes policy and socio-economic aspects.

IUCN recognizes the value of WADIMENA to mainstream WDM. This concerns in particular mainstreaming on the higher political level, and bringing WDM under the attention of young, inexperienced scientists, who had within WADIMENA a change to be confronted with the issue. However, it was also indicated to the evaluators that there is the impression that WADIMENA has too long clinched to WDM as a separate activity (like supply management) and not placed it within IWRM as would have been the policy direction in the last few years[1]. IUCN also finds that too much attention was given to grey water, which is an important aspect in rural communities, but does not contribute much to solving the overall problem of low water economy in rural areas.

In the vision of IUCN it is extremely important to look at WDM more from the perspective of the water users, get away from technical aspects and look more at socio-economic aspects of WDM and integrate it in food security issues as well. Also, in the view of IUCN, promoting WDM as an engineering solution, like supply management, will not deliver the anticipated results.

For the future, networking will remain important as well as knowledge creation. In the vision of IUCN, WDM should now be abandoned and be referred to as one of the aspects of IWRM. If not, the perception of the water managers (which is still very much that WDM can be implemented

[1] Remark from the evaluators: It may not be exactly true that this was not recognized by WADIMENA, but this is the perception of an outside observer

as a separate activity) will not change. There is also room to bridge the gap between science, practice and governance which, in Jordan, is still too large. Future IWRM projects should concentrate on this issue.

Interview with INWRDAM

INWRDAM has been involved in WDM, in particular grey water, action research in Jordan since the year 2000. Their activities have been funded mainly by IDRC (Head Office Canada). The high period of these activities was 2004-2007, although still some work is going on. INWRDAM was also member of the Project Committee of the WADIMENA pilot project in Karak and actively participated in a number of WADIMENA seminars and seminars of the WDM forum. INWRDAM also played an important role (being responsible for dissemination) in the EU financed EMPOWERS project on water user participation. EMPOWERS finished in 2008 and worked on water governance (and implicitly WDM) in a large number of communities in Egypt, Palestine and Jordan

With regard to Jordan, INWRDAM believes that the methodology for grey water use has now sufficiently been developed to be implemented on a larger scale and is economically feasible (pay back in about 5 years. Mainly the relatively large investment costs (between 500 and 1000 JOD per household) refrain people from implementing such systems.

In this sense, grey water use is not really embedded in Jordanian policy; although policy makers are slowly starting to think about it (it is an issue in the National Water Strategy 2009, but there is no real implementation). INWRDAM was able to introduce a national standard for grey water use in 2008 (JS1776/2008) and the developed technology has no difficulties to keep up with this standard.

INWRDAM suggests working more with the Ministry of Municipalities and the municipalities and rural communities themselves. In Jordan this would be a self-propelling process, as right at this moment a decentralization process has started up in the country that gives more responsibilities to the municipalities through the Municipal Development Committees. INWRDAM would be happy to assist this process, but international funding and networking would certainly be helpful as well. For the Ministry of Municipalities grey water in particular and WDM in general is a new subject, but it seems that the interest is there (in the setting of “making the best of what you have (for water resources)”).

Interview with Eng. Rania Abdelkhaleq (Former Head of WDM in MoWI

Eng. Rania is a young professional who has been working 6 years as head of WDM in the Ministry; she is now with UNDP. When she started WDM in the Ministry, this was a relatively new issue then. For herself, WADIMENA has been very helpful for orienting herself and the project has been a great support in terms of methodology, documentation, training and networking with other professionals. It is not clear what the management in the Ministry holds from this.

WDM in MoWI is concentrating on urban drinking water supply. It is felt in MoWI that irrigation is somewhat out of their jurisdiction, rather a responsibility of JVA and MoA. MoWI has had (and still has) support of USAID on urban WDM. This support is mainly in the form of public awareness campaigns on water saving and some pilot actions on simple water saving technology. From what Eng. Rania told us, it is estimated that the Ministry does not play a leading role in overall WDM in the country and the issue is fragmented and largely project (donor) driven.

Eng. Rania considers that it is very important that the networking possibilities of WADIMENA are maintained as even though the subject may be more or less mainstreamed now, much remains to be discussed and methodologies/approaches have not yet taken full shape.

Interviews with RSS

The Jordanian WADIMENA coordinator, the Environmental Research Center (ERC) of RSS provides technical services and consultations and promotes the adoption of sound and best environmental practices conforming with sustainable development concept. ERC also undertakes applied research and studies to serve the development process of Jordan with attention given to environmental protection. ERC consists of three divisions: Water quality division, Air quality division and Environmental studies division The Center was created in 1986 (but became more active during the last 10 years) and has been implementing almost 70 different projects, 9 of them directly related to WDM. The Center worked with many international donors, among others IDRC.

The RSS project coordinator supports the idea of MoWI that grey water use in urban areas should has the most potential with larger complexes such as universities, schools, mosques, etc. Grey water use in the single urban household will remain too expensive for some time.

RSS has initiated the idea to include grey water separation in the building code; at the same time, the guidelines for grey water use are in demand; RSS regularly receives requests for a copy and explanations. The issue of operation and maintenance still needs further development; there is still little experience in Jordan with this issue, particularly with different constituents of grey water for different types of buildings.

Interview with MoWI

The Secretary General of the Ministry, Eng. Maysoon Zubi was not aware of the existence of the WADIMENA project; most of the activities took place before she started her tenure in 2009. She explained that the 2009 National Water Strategy for Jordan emphasizes grey water use. However she indicates that for Jordan there are two dimensions of grey water reuse:

- Grey water use for rural households in villages not connected to central sewerage systems; the grey water could be reused for restricted irrigation. There have been experiments with that through at least 5 donor programmes during the last decade. The technology is ready for up-scaling but financing of such systems by poor households is difficult.
- Grey water use for larger complexes such as universities, industrial compounds, schools and mosques that have an option to reuse grey water for landscaping and eventually toilet flushing.

MoWI does not see much future in grey water use in single urban households as the water price in Jordan is relatively low (at least for households that are properly served by piped drinking water supply and the financial incentive is therefore minor. This needs more investigation.

Interview with MOPIC

MOPIC in principle coordinates all donor projects. However grants given directly at nongovernment organizations such as universities and NGOs sometimes escape the attention of the Ministry. This is explicitly not the case with WADIMENA, thanks to the adequate dissemination strategy of WADIMENA.

In Jordan there have been six or seven grey water projects in the past 10 years or so, all donor driven. At present the only ongoing project is the Merci Corps financed Community Based Initiatives for Water Demand Management Project (CBIWDM). The project trains communities in implementing all kinds of WDM projects such as rainwater harvesting cisterns and reservoirs, Roman cistern rehabilitation, residential network maintenance, drip irrigation, small agricultural canal maintenance, spring improvement and other small scale high impact water efficiency investments.

MOPIC has information that grey water projects implemented in the past suffer from inadequate operation and maintenance. The impression is that many of these projects have been implemented too fast; normally a community would need 5-8 years to accept the concept of grey water use and master operation and maintenance problems[2].

Field visit to Karak grey water project

The Prince Faisal Center for Dead Sea, Environmental and Energy Research of Mutah University was founded in 2002 to mobilize multidisciplinary thinking towards creative solutions to the most important and complex Dead Sea, water, energy and environmental challenges, through collaboration among scholars, decision-makers and water and environmental institutions. The Center lists 35 completed and ongoing projects of which three are directly related to WDM.

The Center has built two pilot grey water treatment plants which were visited. The plants are operational and produce effluent of a very good quality. Both concern sand filter type biological (trickling filter principle) treatment plants that treat grey water (showers units of a female students' dorm on the University grounds) and all grey water of a male students' dorm outside the University grounds. The treated water is reused for irrigation of ornamental plants in the first plant and of fruit trees in the second plant. The first plant remains under control of the university and student committee and the second plant will soon be transferred to the owner of the irrigation plot, who has an agreement with the owner of the male students' dorm in which both profit from the grey water reuse (less costs for emptying cess pits for the owner of the dorm) and free of-charge irrigation water for the irrigation plot owner.

The building that serves the first pilot plant is already (as most newer University buildings) equipped with separate grey and black water collection systems. Fully using the grey water collection system and treating and reusing this water would present considerable savings on black water treatment. There is however no proper planning on this issue within the University. The male students' dorm is now being connected to the municipal sewerage system and the profit for the dorm owner will vanish in future, unless he would receive an incentive for disposing himself of the grey water (usually not the case in Jordan).

The Center sees as a main spin-off of the pilot plants that students are confronted with the technology, talk about it and disseminate the idea in their own environment/villages. No investigation has been done however to measure this effect. It is considered necessary to create incentives for the use of grey water. At the moment that buildings are connected to the sewerage system (which is actually the standard situation in Jordan), there is no incentive to separate grey and black water as the sewerage charge is non-volumetric, coupled directly to the drinking water use. In-house reuse of grey water is hardly practiced, even for toilet flushing, which would give a proper incentive due to lower costs for DW.

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[2] Note of the evaluation team: This is an important observation that coincides with own observations of the evaluation team on the length of the pilot projects (particularly those working with communities).

The Center concentrates on students and sees them as vectors for promoting technology and as future decision-makers. Apart from personal relations and invitations to workshops there is no systematic institutionalized set-up for promoting GW reuse.

The Center has not really engaged in GW reuse at the household level and consider that the technology used by others (4 barrel, trench) may not be sufficiently sophisticated and produce water with a too high bacteria content.

Workshop on water use efficiency in Jordan

The Workshop, held by the MoWI project *Assessment of Water Use Efficiency in the Hashemite Kingdom of Jordan* to present its findings, indicates that about 100 million m3 per year can be saved in Jordan by WDM measures alone (improvement of irrigation efficiency, reduction of non revenue water, rainwater harvesting, recycling of wastewater, etc.). None of these measures is practiced at present. It is clear that more intensive promotion of WDM, not restricted to grey water reuse, would be of considerable benefit to the Kingdom.

Interviews and field visit to Lebanon

Interviews and field visits took place in the period 15-16 March 2010

Interviews took place with:

- LATA/MECTAT team, Eng. Boghos Ghougassian, Charbel Mahfoud, Lea Kai (now Min. of Environment), Nadine Haddad, Michele Harfouche (both from LATA partner Beatuna), Adel Abu Ghosh, Sajih Ghazai (both technicians responsible for maintenance)
- Village representatives (3 persons)
- Litani River Authority, Eng. Kamal Karaa
- Ministry of Energy and Water, Dr. Fadi Comair, Eng. Mona Fakih, Eng. Ghassan Noor Eddine

Field visits took place to:

- Rashaya Caza, in particular Tannoura, together with Eng. Boghos and the technicians

Interview with the LATA/MECTAT team

The WADIMENA local coordinator LATA/MECTAT is an NGO (international association according to Lebanese law), which was founded in 1982 as MECTAT (Middle East Centre for the Transfer of Appropriate Technology), an environmental resource centre, at the premises of MEEA Ltd., a consulting firm on environmental design. It is involved in promoting environmentally sound technologies (EST) and environmental awareness in Lebanon, Arab region and other countries. MECTAT is affiliated to the Environment & Development Magazine. Its fields of interest cover waste management (solid and liquid), renewable energy (solar, biomass, wind), clean production and waste minimization, organic farming and sustainable agriculture, small scale food processing and preservation, development of fresh water resources, habitation, environmental awareness and environmental management.

MECTAT has a wide regional network of affiliated organizations and has provided services (training workshops, consultancies, publications) to the following international organizations: UNEP, FAO, ILO, IFAD, UNIDO, UNICEF, UNDP, UNESCO and others in Lebanon, Syria, Yemen, Jordan, Egypt, Tunisia, Liberia, Zambia, Zimbabwe, Hungary, Italy and others.

WADIMENA support was used for the second phase of the GW project that was started up with a grant of IDRC Canada in 2002 for the project *Greywater Treatment and Reuse in a Cluster of Six Towns, West Bekaa*. Next to the two aforementioned grey water projects financed by IDRC, LATA/MECTAT has been involved (among multiple other subjects) in the x financed project *Establishing a Low Cost Wastewater Treatment Plant in Wazzani Village of South Lebanon* and is presently implementing three Italian Cooperation pilot projects (two grey water and one dairy whey treatment plant) in South Lebanon.

The team indicates that in total 50% more time was spent on the project than budgeted and paid by IDRC. Due to absence of men in the villages (working in the army or in Beirut), the role of women in the realization of the pilot plants has been very important. Contrary to experiences in Egypt and/or Jordan, Lebanese villages seem to be more liberal with respect to gender issues; meetings where men and women discussed together were never a problem. The team found working with the villages in the area relative easy after the first couple of meetings when friend-

ship bands were established. Nevertheless, particularly in Tannoura, the sustainability of the implemented GW plants is not always guaranteed as the community has complex and close-knit internal relations, with lots of small controversies that regularly hamper rational decision-making. Also, it was observed that if one person complains, many others may follow without much thinking.

The role of the mayor is considered to be very important and building the relation with him should be a first step in any such project, before works start. The team considered that they were pressed in a too short time frame in general. Additional activities, for instance on teaching food processing for fruits grown with treated grey water, were very much appreciated by the population and formed abridge for the success of the GW plants as well. The team concluded that in general the introduction of GW use would be more successful if implemented in a general context of community development.

Interview with LRA

LRA was not aware of WADIMENA but reacted positively to the project when explained. They knew however about the other LATA/MECTAC grey water activities in South Lebanon financed by Italian Cooperation (WADIMENA project area is somewhat outside the mandate area of LRA). LRA will be involved in wastewater reuse projects as many treatment plants are being built in the Bekaa Valley. LRA is also acting to some extent as a river basin authority responsible for water quality in the Litani river; in this function LRA is very interested in the wastewater reuse issue, but less in grey water reuse. At present there is a large USAID project working with LRA to transform LRA to a real river basin agency. LRA is not too satisfied about this project so far as it is very much a classical paper producing project.

LRA was obviously happy to get acquainted with LATA/MECTAC. They see an important role for NGOs to support farmers on the ground in improving irrigated agriculture and irrigation technology that would lead to water savings. Although Lebanon is not a water scarce country, water is irregularly distributed seasonally and geographically and savings and reuse will become important issues in the near future.

Interview with MoEW

MoEW has been involved in WADIMENA workshops and field trips. The Water Director of MoEW, Dr. Fadi Comair has delivered an opening speech in the WADIMENA final workshop in Lebanon and Engs. Fakih and Nour Eddine participated in the field trip and more than one workshop.

Even though the grey water potential is minor in terms of total available water resources, the Ministry finds grey water use important as Lebanon has considerable problems in providing drinking water supply and sanitation to remote areas without surplus water resources. In this sense, grey water use can be a relief for rural villages which are not yet fully connected to DW supply, as the government will not be able to solve all DW problems rapidly.

The ministry also sees a large advantage in grey water use as it diminishes the quantity of wastewater produced and can have positive consequences for sanitation design and costs. However there is an urgent need for a better integrated planning at the community and regional level for DW supply and sanitation in order to fine tune both systems to each other and avoid wrong dimensioning of sanitation systems. The Ministry is working with GWP-Med to enhance

IWRM in Lebanon and improve planning methodology, including institutional aspects like setting up river basin authorities.

The Ministry is aware that a better organisation around promoting grey water use and certain incentives from Government are needed, but does not yet have concrete plans for this. Municipalities/Ministry of Municipalities will have to play a significant role in this as well.

The Ministry also commented that in introducing grey water use in small communities, it would be better to install one demo plant first, let it run for 2 or 3 years and then slowly scale up in the rest of the community. Implementing 50 GW plants within 2 years in one village like Tannoura seems for them a too fast exercise and could lead to rejection of the methodology! At the same time a continuous presence (even a minor one) would be needed for a larger (than WADIMENA) number of years until the methodology has established itself.

The Ministry is also thinking of setting up technical committees on different issues (like for example grey water) that could establish a national dialogue on these subjects; this would avoid solo runs of different actors and make their efforts (and spending donor money) more efficient.

Field visit Rashaya Caza

The field visit concentrated on the larger scale GW treatment plant in Rashaya city and the village of Tannoura where 40 GW treatment plants were installed.

The large scale plant is basically a 4-barrel system with a capacity around 10-fold the capacity of the standard 4-barrel system. Apart from the pump being stolen, the plant functions properly and serves the irrigation of fruit trees (olives and others). The owner reports that the stolen pump does not pose him many problems as he now irrigates satisfactory with gravity pressure only[1].

The village of **Tannoura** suffers from completely inadequate water supply. There is a small spring in the centre of the village, which has insufficient quantity in summer and is moreover heavily contaminated from cess-pit discharges. A water distribution network with deep wells and water reservoir has been constructed but is not functioning while certain parts are still missing. The mayor of the village estimates that about USD 4,000 will be needed to complete the works. It is symptomatic for the community development level of the village that the inhabitants (200 households) are not able to collect this relatively small amount of money themselves and solve the problem. There is also still no system in place for collecting the necessary money for the operation and maintenance of the pumps.

With regard to the GW treatment plants: Due to the low water consumption, LATA experienced problems (odour) with the first 4-barrel systems installed in the village, due to transit times much longer than 2 days, and decided to install 3-barrel systems instead. These gave good results. In general, people in the village seem to be happy with their grey water plants and speak appreciative about them. However, it was observed that many of the plants[2] were not functional, were temporarily disconnected (deposit or hydraulic problems), displaced (due to complaints about odour and/or presence of insects), etc. All owners of plants that were out of order assured that they will repair these and make them functional again.

[1] Note of the evaluation team: it is believed that without pump the irrigation water distribution is less uniform and the irrigation efficiency, hence farm output, will be less.

[2] The visit did not allow for a accurate inventory

The evaluation team concluded that operation and maintenance is not yet well established as a routine and would need a certain follow up. LATA gives some support, but this can only be limited as no special funds are available for that. Also, the particular conditions, true for most Lebanese country-side villages, such as frequent electricity interruptions, fluctuation of voltage, absence of house owners during longer periods, etc. do negatively impact the operation and maintenance of the systems, and system design is not yet robust enough for such conditions.

Discussions however with the mukhtar (

Synthesis of the interview with the Algerian WaDI*mena* project team

Project subject: Wastewater reuse for complementary irrigation of cereals

Pertinence :

Les objectifs du projet WaDI*mena* correspondent aux nécessités du pays : effectivement, car :

- Utilisation d'une nouvelle source d'eau, disponible et moins chère
- Conserver le milieu écologique en minimisant la pollution.
- Changement de comportement des responsable et des paysans vis à vis de l'utilisation des EUT en agriculture
- Amélioration des revenues des utilisateurs
- Amélioration de la production des céréales en zones semi arides où les blés sont mené en pluvial.

Efficience :

Il a été noté une évolution certaine dans la perception et dans les attitudes des parties prenantes vis à vis de l'utilisation des EUT, entre la première étape du projet (prise de contact, sensibilisation) et les phases intermédiaire et finale. L'appréhension de la problématique par les institutions concernées a également évolué. Ainsi :

- Apprentissage en matière de protocole d'expérimentation de nouveaux procédés d'irrigation avec suivi, évaluation et interprétation des résultats.
- Expérience concluante de mise en synergie de compétences multi-institutionnelles et pluridisciplinaires à encourager pour développer des approches globales dans la résolution des problèmes de l'agriculture et dans la mise en œuvre de projets de développement, afin d'éviter les approches fractionnées qui donnent des résultats partiels difficiles à interpréter et à concrétiser sur le terrain. Ce qui permet un gain certain en temps, en efficacité et en crédibilité des institutions vis à vis des agriculteurs.

Les approches de la gestion de la demande et de l'économie de l'eau sont plus visibles chez les usagers finaux (end users)

- L'objectif du projet et la démarche adoptée pour sa concrétisation ont donc suscité des changements perceptibles dans l'attitude des chercheurs et des représentants des institutions impliquées. L'attitude hésitante du départ a évolué graduellement vers une adhésion et un engagement au fur et à mesure du déroulement des activités sur le terrain et de l'obtention des résultats expérimentaux.
- Cette évolution dans les attitudes des institutions, des décideurs et des usagers et non usagers, traduit une nouvelle vision dans les politiques à mener en matière de valorisation des ressources en eaux non conventionnelles, en vue de contribuer à la réduction de la pauvreté, grâce à un facteur facilement mobilisable pour l'amélioration du niveau de vie de la communauté rurale.
- Les procédés adoptés pour la conduite du projet sont facilement exploitables en vue d'une extrapolation appropriée à d'autres cas similaires.

- Le degré d'adhésion des décideurs et des usagers est d'autant plus prononcé que l'impact du projet est non seulement d'ordre économique et social mais également environnemental puisque tout en évitant la pollution de la zone, le procédé de la réutilisation des EUT assure la protection de la population en matière de santé publique.

Le projet n'a pas eu tout le temps pour véhiculer tout le package technique, mais l'initiative a démarré sur le terrain et chez l'administration

L'une des leçons à tirer, pour le futur, pour mener à bien les projets a trait :

- à la nature même du projet qui doit avoir un impact socio- économique évident sur la communauté concernée et présenter un caractère extrapolable.
- à l'adhésion des parties prenantes grâce à une approche participative.
- à la participation de tous les membres de l'équipe et de leurs institutions, à la conception et à la maturation du projet, afin de tenir compte de tous les aspects scientifiques, techniques, logistiques et financiers déterminants pour la bonne conduite des activités.
- à la prévision d'une phase préliminaire de pré choix du site avant le démarrage des activités afin d'éviter un éventuel changement de paramètres (site inexploitable, contraintes diverses…) pouvant retarder ou remettre en cause le déroulement des travaux.
- à l'engagement des bénéficiaires pour l'adoption et la mise en pratique des procédés mis au point, afin d'assurer la durabilité des effets induits et l'évolution positive des incidences socio-économiques

Efficacité :

Résultats accomplis pour la réalisation des objectifs spécifiques

Il est indéniable que la contribution du CRDI et de l'ICARDA, de la conception à l'aboutissement du projet, s'est avérée précieuse à plus d'un titre :

- Elle a aidé à la sensibilisation des décideurs à la valorisation des eaux non conventionnelles, par l'engagement et le poids de ces deux institutions
- Elle a permis la réactivation des installations d'épuration des eaux usées se trouvant à l'état d'abandon, par manque de conviction et absence de procédé de traitement et de réutilisation.
- Elle a assuré un apport scientifique et technique tout au long du déroulement des activités
- Elle a apporté une contribution financière déterminante pour la prise en charge des principales opérations.

Comme le démontrent les résultats obtenus, la réutilisation des EUT permet d'améliorer le sort des communautés rurales en situation de pauvreté, par l'ouverture de perspectives agro-économiques prometteuses.

Néanmoins, ce projet gagnerait en efficacité et en durabilité des effets et des incidences s'il pouvait bénéficier de possibilités de prolongement dans le temps, afin d'assurer un suivi plus appuyé aux parties prenantes et en même temps, de faire du site un pole de démonstration, d'élément d'acquisition de références scientifiques et techniques et de base d'extrapolation.

Interviews in Egypt

Interviews and field visits took place in the period 2-6, 17-18 and 21-22 March 2010

Interviews took place with:

- AUC project team; Dr. Tina Jaskolski, Dr. Richard Tutweiler, Eng. Hagar Rakha, Eng. Hassan Husseiny
- CIDA (Cairo); Mrs. Manal Guindi
- CEDARE; Dr. Khaled Abu Zeid
- AWC; Dr. Mahmoud Abu Zeid
- IDRC (Cairo); Dr. Eglal Rached

Field visits took place to:

Due to time constraints, no field visits could be made

Interview with the AUC team

AUC is WADIMENA partner and has implemented the pilot project in the Farafara Oasis with co-financing of IDRC. The project has been implemented by the Desert Research Centre of AUC.

AUC considers the pilot project to be very successful. Due to limited financial resources it was not able to continue the activities in the Farafara Oasis, although there was clearly a case to do so. The project delivered important lessons learned for areas in a similar situation (newly developed desert irrigation areas fed with non renewable water resources), which are not uncommon in Egypt. Part of the lessons learned can be transferred to a wider selection of areas (water user participation: to all newly developed areas).

At the start of the project, it was intended to be a rather technical project concentrating on the reducing the loss of water in the irrigation canals with some participatory aspects. It was soon realized that to improve the socio-economic situation in rural villages mainly depending on agriculture, a more holistic approach is needed, including looking at on farm irrigation efficiency, crop diversification, cooperative aspects, additional income sources, marketing, financing and others. Although some of this has been practiced in the project, funds were not sufficient to give this a large scale follow-up.

Where its main task is education, the University does not have sufficient funds of its own for extensive research and depends very much on funding from outside.

The project has delivered its required outputs and can therefore be considered as successful. One of the main successes of the project was to integrate the existing population with newly arrived settlers (settling was possible after the Government started exploiting the fossil groundwater in the oasis). Another important lesson learned was that lining of irrigation canals is economic, but questions arise on what to do with the surplus water and how to distribute that water over different users; ergo a strong water user association is needed. This lesson learned is in line with many other experiences in other areas. There are other aspects of how to transfer the acquired knowledge to other areas in the country and in the region, which have not yet been fully exploited.

The project can indeed be considered as more than average successful, but it is unfortunate that such field experiments have a limited lifetime and cannot be continued for a longer period

Interview with CIDA, Cairo office

Mrs. Manal Guindi has been a member of the WADIMENA Steering Committee on behalf of CIDA. She is very satisfied with the project and considers it as a good investment from CIDA side. She praises the open discussion in the Steering Committee and the responsiveness of the WADIMENA Project Team on suggestions of the SC members, also outside the formal SC meetings.

Unfortunately, CIDA has decided (in the framework of its "concentration" policy, not to serve the Middle East anymore, with exception of Palestine, which is a very special (political) case. There will therefore not be any follow up of CIDA financing for other regional (MENA) initiatives in future.

Interview with CEDARE

Dr. Khaled Abu Zeid, responsible for water management (including WDM) in CEDARE is aware of the WADIMENA project and has been regularly consulted on WDM issues and has participated in some events.

CEDARE considers that WDM is a particular important subject for the region and would like to see promotion of WDM measures in all planning documents (strategies, national water management plans, etc.). It considers that WADIMENA has done an excellent job in promotion of WDM with government stakeholders at the higher level and really made a difference. It is not sure however in how far WDM has arrived in the field, particular in the irrigation sector. In its opinion, much remains to be done there.

Interview with the Chairman of the Arab Water Council

Dr. Mahmoud Abu Zeid, Chairman of the Arab Water Council praises WADIMENA for its good communication with decision-makers and its support for the development of WDM strategies. It considers WDM as one of the most important policy elements in regional and national strategies, next to sector organization, financing and (where necessary) investments in newly developed water resources (desalination and wastewater reuse).

Interview with Dr. Rached, Director of the Middle East and North Africa office of IDRC

Dr. Rached indicates that she is satisfied with the WADIMENA team and the results of the project. On the remark of the Evaluation Team that the work on WDM is far from finished and more effort needs to be made in regional activities, like a continuation of WADIMENA-like activities, she answers that WDM as a separate activity will not be supported anymore by IDRC[1].

This does not mean that IDRC will completely abandon WDM. In future, WDM activities will rather be integrated in programmes and projects on food security and climate change, which are among new main fields of actions for IDRC for the coming years. IDRC Cairo will actively work on this integration and look for opportunities in this way to continue work on WDM.

[1] IDRC considers that it has worked 8 years on WDM (WDM Forums and WADIMENA) and that other issues should come more on the foreground now

Interviews with project staff in Yemen

Interviews took place with:

One telephone interview took place on 6 April 2010 with the coordinator of the pilot project, Frédéric Pelat from ONG Iddeales NGO.

A few technical issues

The main cause of deterioration of the gardens is actually groundwater overexploitation (limited available water resources; high demand for growing population and agriculture). Most of the water originally available for the gardens was spring water, either left over after use in the mosques or destined solely to the respective garden. The question also arises in how far government is able to control groundwater overexploitation. It is estimated that the possibilities for control are largely insufficient.

It looks like drying out of wells in wadi Sayla is rather related to deep groundwater overexploitation and lack of local infiltration only plays a reduced role. It could be that the recovery plan prepared by the project would not give the desired results. More numerical investigation would be needed that goes beyond the capacity of a small WaDI*mena* pilot project.

The gardens produce originally monocultures, leek and spring onions, as the gardens are exploited by a marginal small group of very poor people that are socially excluded from cultivating other crops.

In this sense, the grey water use in this pilot project is rather a pro-poor measure than a serious attempt to solve the country's water resources problems. It is questionable if the experience can be repeated in a different normal village environment.

There are positive spin-off effects however; government officials involved in the pilot project have become enthusiastic propagators of grey water reuse and intend to implement it in a different more generic context.

Achievement of objectives

Improvements can only be determined in one particular pilot garden. Good experiences have been achieved with regard to community work (user participation) and local extension. There is no real sign of integration of the gardens' model into national policies and the donor community. The pilot should be considered as a successful experiment, but its replication potential is not clear.

Achievement of results

The project has rehabilitated one demonstration garden in Sanaa old city. This is a good result, but somewhat below the original expectation to be able to renovate at least two gardens.

The project has established a community house to ensure that there is a place where communication between stakeholders can take place. The gardeners in the old city of Sanaa have profited from this and have definitely enhanced their knowledge on the possibilities of grey water use and other irrigation issues. The community house continues to be used as such.

Local population, local authorities, farmers in other areas were insufficiently involved in this exercise (difficult to interest them) and the spin-off to other groups outside Sanaa old city is limited.

Government officials did benefit from the pilot project; new positions have been created and GW use has been taken up in policy documents. The project team is still consulted by government officials who want to know about GW use.

Sustainability

The pilot project has generated genuine interest with government officials for GW use. It is not clear yet if this momentum will be maintained and if the Government will start promoting GW use on its own. It is estimated that support from outside would help to achieve GW use implementation on a larger scale