



## Background Document 1

# Regional Forum on Local Water Governance “Water is every body’s business”

## Forum Rationale and Recommendations for Policy and Practice

June 6+7, 2007- Amman

Peter Laban and Patrick Moriarty

## Regional Forum on Local Water Governance

“Water is every body’s business”,

June 6+7, 2007- Amman

### Contents

1. Objectives of the Regional Forum
2. Key issues to be addressed in the MENA water sector
3. Rational of the Forum
4. A Long-term vision
5. Recommendations for policy and practice

*Annex 1. Summary recommendations Cairo Symposium/November 2005*

*Annex 2. Policy and institutional background in 3 MENA Countries (Jordan, Egypt and Palestine)*

## 1. Objectives of the Regional Forum

The Forum will focus on enhancing **"Policy support for local level ownership and involvement in Sustainable Local Water Governance in the Middle East and North Africa (MENA) region through participatory planning and stakeholder approaches"**. Policy support is understood in a broad sense and as referring to national and governorate policies and the necessary practices to support these at the institutional and implementation level. The Forum has the following three objectives:

- To explore modalities for embedding participatory stakeholder approaches in local and national planning and policy formulation in different countries of the MENA Region.
- To enhance a policy environment conducive for such approaches in countries of the MENA Region.
- To initiate initiatives to up-scale participatory stakeholder planning approaches in other countries of the MENA Region (including funding support).

The Regional Forum on Local Water Governance is organized by the EMPOWERS Partnership, a 4 year programme funded by the MEDA Water programme of the European Commission and CARE International.<sup>1</sup>

## 2. Key issues to be addressed in the MENA water sector

Although there are trends towards national level planning for IWRM and policy shifts towards decentralisation, many countries in the Middle East are faced with low levels of stakeholder involvement, and highly fragmented water sectors involving many players. Centralized and top down management persists so that intermediate level government staff and end-users are usually confronted with top-down implementation of instructions, little autonomy, meagre planning, intermittent communication, limited capacity for interaction, and an overemphasis on trouble-shooting and complaint management. Moreover, the specific needs for quality drinking and irrigation water, as well as water rights of poor communities and women are largely ignored. Validated information on water resources, water supply infrastructure, and demand for, and access

---

<sup>1</sup> The aim of the EMPOWERS Partnership is to improve water rights and long-term access to water by populations who currently experience scarcity and insecurity. It does so through ensuring that all stakeholders participate in important decisions about water, and by increasing dialogue and coordinating actions. The project strengthens connections between stakeholders, improves decision making at all levels, and empowers people and institutions at intermediate (district and governorate) and community levels. EMPOWERS promotes integrated water resource management (IWRM) at the local level, a broad approach that considers water for agriculture and household use as well as water sanitation. While developing experience and practical tools to plan for Local Water Governance, the project also involves national level stakeholders to ensure that local activities relate to national policy formulation. The EMPOWERS Partnership was implemented from September 2003 to August 2007 in Palestine (Jenin Governorate), Jordan (Balqa Governorate) and Egypt (Beni Suef Governorate).

to, water services is either not available or incomplete, while simple systems to update information are almost inexistent. Taken together, these issues constrain effective planning, decision-making and management of water resources and services. There is an important need to address these issues in order to tackle the increasing scarcities and conflicts in the region, both at local, governorate and national levels. Addressing such issues and enhancing local water governance implies important commitments at both national and governorate policy levels. Annex 2 provides a short overview on the policy and institutional background of activities in the water sector in Egypt, Jordan and Palestine.

### **3. Rationale of the Forum**

Improving local water governance, which we understand to include all aspects of management, decision making and planning around sustainable water resource management, water demand management, and water service delivery, is crucial to achieve equitable development and management of the MENA region's scarce water resources. Many different actors, from national governments to local end-users, have an important role to play in creating the necessary enabling environment (policy, legislation, accountability, funding, capacity development) to allow for the required improvements in local water governance.

Different approaches - from state-controlled to community bottom-up – have been tried to make water resource management more effective. This workshop will look into the policy and institutional arrangements necessary to enable local government and community organizations to engage in a planning and management of water resources that is equitable, effective and sustainable. As a basis for discussions, recent experiences in Jordan, Palestine and Egypt with participatory stakeholder approaches to planning and implementation (EMPOWERS) will be considered as a case study. Emphasis will be given to:

- Decentralization of planning and decision-making to appropriate levels.
- Facilitation of the participation of all stakeholders and end-users.
- Development of capacity in relevant stakeholders at intermediate level (local government, NGOs, CBOs) to enable end-user involvement in water resource management.
- Ensuring that marginalized groups (men and women) are not excluded from water governance;
- Ensuring that locally appropriate solutions and tools are developed through the use of participatory action-research.
- Enhancing transparency in information on water resource management.
- Developing educational materials and resources for all levels and sectors (mass media, children, youth, local government, etc.).

## 4. A long-term vision

While it is increasingly recognized that water shortages are a given in the Middle East, it becomes ever more important that such scarce water resources are well managed and equitably used by all segments of society. The existence of many competing interests in the use and allocation of water is a fact of life. These different interests have to be respected and taken into account through a process of dialogue and concerted action. At the same time such different interests need to be reconciled by adequate allocative and regulatory policies that are accepted and implemented by the formal and informal institutions that exercise authority over water. This is what can be called **shared local water governance**. It means coordination and integration of the actions and interventions of different actors: among different government agencies, at the interface between government and civil society institutions, at different levels and scales. It also means defining the levels at which different decisions can best be taken. Decisions at different levels need to complement and strengthen each other (principle of subsidiarity). It is important that action is taken to promote such shared local water governance by developing methodologies and approaches tailored to the needs of local water resource developers, managers and end users, while taken into account national interests and priorities.

In such a vision it is important to enable organizations at the district and community level to take a larger share, and ownership, of the management of local water resources. This is part of the decentralization and delegation processes that can enhance good water governance in the countries of the Middle East. Accountability for management measures - needed to improve access to and use of water resources - need to be strengthened at both the level of end-users, communities, and local government agencies. **Local level ownership and accountability** for the management of local water resources often depends on the degree that direct benefits, adequate knowledge and access to resources are ensured. Access and control at local levels over an important resource such as water can be considered as a basic human right. Indeed "Water is everybody's business" and shared control implies a seat at the table, including for the underprivileged. The starting point as well as goal, therefore, is the realization that integrated water resource management can only be effective and sustainable if responsibilities of relevant government agencies are shared with communities and other local stakeholders who directly use, draw benefits from, but are also largely dependent upon such resources. At the same time there is a need to empower local government (and other intermediate level organizations) – to support communities and adopt adaptive management. In the long run it may be envisioned that such situations of local water governance and adequate access and rights to water by more vulnerable populations can be realized in the different Governorates of the countries of the Middle East and the Mediterranean Basin.

## 5. Recommendations for policy and practice

This brief background document for the Regional Forum on *Water is everybody's business and shared control implies a seat at the table*, provides a number of recommendations based on the experiences of the EMPOWERS programme which are presented here as a starting point for discussion during the Forum.

These recommendations have been developed over the past two years, with the input of several hundred leading practitioners from the three countries in which the EMPOWERS project was active, as well as the wider region. An initial set of policy recommendations was developed based on a regional symposium on "*End-Users Ownership and Involvement in Integrated Water Resources Management (IWRM)*" held in Cairo in November 2005. These were subsequently discussed intensively during national meetings in Egypt, Jordan and Palestine in late 2006 and early 2007. The recommendations presented below therefore incorporate a first round of critical feedback on the original proposals from 2005.

The starting point for the development of these proposals (as indeed for the EMPOWERS project and the current regional Forum) was that stakeholder involvement, particularly of water users, is an essential step towards improved water resource management and water service delivery. The recommendations are therefore geared primarily towards HOW to make such involvement effective; about how to create an enabling environment for participatory local water governance.

### ***General recommendations for an enabling environment***

At the level of the general recommendations of the 2005 Cairo symposium, all have been re-affirmed by the national consultations. One important addition to the list relates to the need for improved harmonization of the efforts of water sector actors (government, donors, civil society) around locally owned and agreed water development visions and strategies. The six key recommendations are as follows:

- Local water governance should be based upon the integrated participation of all stakeholders and end-users at all levels, while especial efforts are required to include the marginalized
- The efforts of all actors (government, donors, civil society) should be harmonized and contribute to achieving agreed and locally owned visions and strategies (informed by, and linked to, similar visions and strategies at higher levels)
- Capacity to enable end-user involvement should be developed in relevant stakeholders at the intermediate level
- Water information should be considered a public good; and access to information be enabled for all citizens
- Locally appropriate solutions and tools should be developed through the use of participatory research and action.
- Awareness must be developed for informed participation in water governance

**The Regional Forum on Local Water Governance would like to make a call on its participants to support the six principles or recommendations that are mentioned above.**

Each of these recommendations is briefly elaborated upon below, with specific recommendations for action highlighted:

***5.1. Local water governance should be based upon the integrated participation of all stakeholders and end-users at all levels***

Given that local ownership and control over the use and management of water resources by end-users is a prerequisite for sustainable IWRM and good water governance, it is recommended that this be enabled through participation in management and governance related activities (planning, decision-making, monitoring and evaluation)

Water's special nature means that while essential, participation at the local level is on its own not enough. Scale related issues including, but not limited to up/downstream equity, require platforms for integrated decision making at levels from the international (trans-boundary) to the local. It is essential for good water governance that the visions and strategies developed at different levels are informed by, and do not contradict each other. Water management cannot be seen as being either purely 'bottom-up' or 'top-down'. Rather, the principle of subsidiarity should apply: that is that management decisions are decentralized to the lowest **appropriate** level. What is essential is the flow of information between the levels to ensure internal consistency.

*A number of specific recommendations can be made relating to this principle:*

- Develop a clear model for water development and management, with platforms for stakeholder participation at relevant levels from the trans-boundary to the local
- Create a culture of participatory water planning and management within relevant institutions at all levels through mainstreaming of participatory approaches, methodologies and guideline
- Identify and implement mechanisms for public (or representative) participation in planning for the management of water resources, including:
  - the development of appropriate programmes and practices;
  - the allocation of adequate budgets, resources and capacity to decentralized levels;
  - the creation of the necessary legal frameworks, with a particular focus on the development of legally recognized mechanisms for participation, and the legal recognition of local water management bodies (such as water user associations)
- Develop mechanisms and incentives for service providers to actively listen to and take into account the opinions of water users

### **Especial efforts are required to include the marginalized**

Larger, more organized, and wealthier water users will always find ways to make their voice heard during discussions and decision making about water management. However, for many poor and marginalized groups (especially poor women), special efforts are required to ensure and enable their participation. This is particularly the case where the increased trend towards privatization (and cost recovery generally) may bring additional burdens to the poorest and lead to them becoming more marginalized. Central and local governments have a special responsibility for ensuring that those groups do not suffer from additional burdens.

*A number of specific recommendations can be made to this end:*

- Ensuring flexibility in the enforcement of requirements to make contributions to project costs, and in payment of user fees
- Explicitly targeting the enhancement of the economic status of women and other marginalized groups through implementation of water based income generating projects.
- Establishment of women's associations, and providing them with a role in water related decision making.
- Ensuring transparency in the distribution of projects, taking into consideration marginal locations. Increasing transparency in the selection of beneficiaries, based on objective needs based criteria.

### ***5.2 The efforts of all actors (government, donors, civil society) should be harmonized and contribute to achieving agreed and locally owned visions and strategies***

The efforts of all actors (government, donors, civil society) should be harmonized and contribute to achieving agreed and locally owned visions and strategies, which are themselves embedded in and linked to similar visions and strategies at higher levels. Once a series of interlinked water development visions and strategies exist at levels from the local to the international it is essential that all key actors (government, donors, civil society, water users) harmonize their actions and avoid overlapping or contradictory activities to achieve the vision.

*To achieve this, a number of specific recommendations are made:*

- Ensure that national IWRM plans, and other water development policies and strategies are reflected in linked strategies and plans at intermediate and local levels; and that local level plans are developed in a fully participatory manner
- Ensure that at all levels of government, a clear commitment exists to achieving goals based on agreed visions and strategies, together with the necessary monitoring frameworks to clearly identify progress.
- Generate buy in to local plans and strategies by decision makers within both national and international agencies through continuous advocacy for the attainment of the right to have enough and healthy water at a suitable price for all citizens



- Create adequate management information systems to support integrated planning, and to allow monitoring and feedback on the achievement of strategies at all levels
- Ensure community participation in the development of local strategies, supported by facilitators who are experienced in planning and evaluation at all points in the planning and implementing process
- Create platforms (or new institutions) to bring together different water agencies, particularly those relating to water, agriculture and
- Apply pressure to donor institutions (multilateral, bilateral, and INGOs) to harmonize their approaches and reduce bureaucracy

***5.3 Capacity to enable end-user involvement should be developed in relevant stakeholders at intermediate level (media, local government, NGOs, CBOs).***

To enable decentralized local water governance, capacity building and organizational change is required, particularly in decentralized levels of government. Capacity for communication and facilitation is of particular importance, and should be developed to enable full end-user participation and to narrow the gap between policy and practice. To this end it is essential that resources be allocated for capacity building and awareness raising programmes, especially targeting mid-level and low-level management of governorate and non-governmental institutions

*Specific recommendations relating to this principle include:*

- Creation of mechanisms to support government institutions in making the necessary changes, and developing their policies.
- Capacity building programmes in the effective facilitation of local water governance processes, for example through the creation of national level groups of trainers
- Development of the capacities of selected national civil society associations (NGOs) to play the role of the “facilitator” in local water governance, and recognition that this is a valid and credible role for NGO intervention

***5.4 Water information should be considered a public good; and access to information should be enabled for all citizens.***

Participation of all stakeholders, including water users, in water governance can only be made meaningful if there is equal and open access to information regarding the status of water resources and water services. This is equally true at the transboundary and village level. There are strong tendencies to treat water information as a strategic (and hence restricted) good, however this is completely incompatible with efforts to develop integrated and participatory water governance.

For water information to be useful in the decisions making processes surrounding water governance, it needs to be:

- Reliable
- Uncontested
- Freely available
- In a format that is relevant to the particular stakeholder

*To achieve this principle, the following actions are necessary:*

- Advocate for the recognition of water related information as a freely accessible public good
- Build the capacities in management and treatment of information particularly in data collection and analysis and in transforming the same into useful information that can be then disseminated to others.
- Systematically follow up and evaluate the impact of water related programs and projects, and collect and make available data regarding the water status all levels, and establish feedback mechanisms between intermediate level institutions and end-users;
- Promoting a culture and ethics of providing feedback vertically and horizontally; and requiring inter-agency/inter-departmental information sharing
- Harmonize the use of different information collection and storage approaches between countries, levels and institutions. This is particularly important for electronic data (i.e. GIS) which is currently highly fragmented.

***5.5 Locally appropriate solutions and tools (IT, PRA, participatory planning) be developed through the use of participatory research and action***

As well as capacity and proper support from the national level, local water governance also requires a wide range of tools and methodologies, only some of which currently exist, or have been made relevant to a MENA context. Those developed by the EMPOWERS programme go some way towards filling this gap as do those developed by others, however, they have been tested in relatively limited fashion and need to be re-contextualized for use in other countries and settings. Development of such tools, preferably within the context of ongoing nationally driven decentralization programmes is a priority. It is also important to develop a mindset among local government and other institutions that is open to actively searching for, experimenting with, and learning about innovative approaches as part of their daily work.

*Specific recommendations relating to this principle include:*

- Further development and replication of the EMPOWERS methodology and approach, as well as tools and methodologies developed by others working on water governance.
- Creation of easily accessible (electronic, Arabic) sites where tools and experiences are collated and explained
- Advocacy and capacity building of local actors to adopt an adaptive and learning based approach to their work – to actively experiment with new approaches

### ***5.6 Awareness must be developed for informed participation in water governance***

Effective participation in water governance can only happen where all actors are aware of the relevant issues, challenges and constraints facing water development in their region. Awareness covers a huge range of topics from the specialist to the more general, key amongst which are awareness of the basic functioning of the water cycle and up/downstream linkages; rights and responsibilities of water users and water service providers; implications on other users of water use, particularly of pollution; and the need to recognize the value of water services to eco-systems. Awareness raising takes many forms, from mass media to inclusion of key aspects in school and professional curricula.

*Some specific areas of focus include:*

- Development of educational materials and resources for all levels and sectors (mass media, children, youth, local government, etc.).
- Development of mass media campaigns relating to
  - IWRM and the water scarcity situation in the region, particularly the current status, and likely future trends of water availability and use;
  - the importance of multi-stakeholders participation in water management;
  - innovative approaches for water demand management; and
  - reporting of best practices and lessons learned.
- Establishment of a regional network on participatory and local-level approaches to water governance.
- Collection, consolidation and making available of existing environmental education materials developed in the region
- Inclusion of non-traditional (non-engineering) aspects of IWRM within higher education curricula (including local level participation, water demand management, cultural and socio-economic aspects of water governance).
- Development of specialized training programmes in local-level IWRM for practitioners with emphasis on public participation approaches
- Encouragement of research institutions to focus on demand-led research (end-user guided and policy oriented), and of decision-makers to adopt research results in formulating policies.

## Annex 1.

### Summary recommendations Cairo Symposium/November 2005<sup>2</sup>

Many different actors, and particularly national governments have an important role to play in creating the necessary enabling environment (policy, legislation, financing, capacity development) to allow for the necessary improvements in local water governance. The recommendations set out below are aimed at creating such an enabling environment. They include that:

- Local water governance be based upon the participation of all stakeholders and end-users
- Capacity to enable end-user involvement be developed in relevant stakeholders at intermediate level (media, local government, NGOs, CBOs)
- In particular, capacity for communication and facilitation be developed to enable full end-user participation and to narrow the gap between policy and practice.
- Water information be considered a public good; and access to information be enabled for all citizens
- Especial efforts be made to:
  - ensure that marginalized groups (men and women) are not excluded from water governance
  - build upon the special knowledge and role of women in water management
- locally appropriate solutions and tools (IT, PRA, participatory planning) be developed through the use of participatory research and action
- Educational materials and resources be created for all levels and sectors (mass media, children, youth, local government etc.)

---

<sup>2</sup> *'EMPOWERS Partnership' Regional Symposium on "Water is everybody's business"; End-Users Ownership and Involvement in Integrated Water Resources Management (IWRM) – Cairo, November 13-17, 2005*

## Annex 2. Policy and institutional background

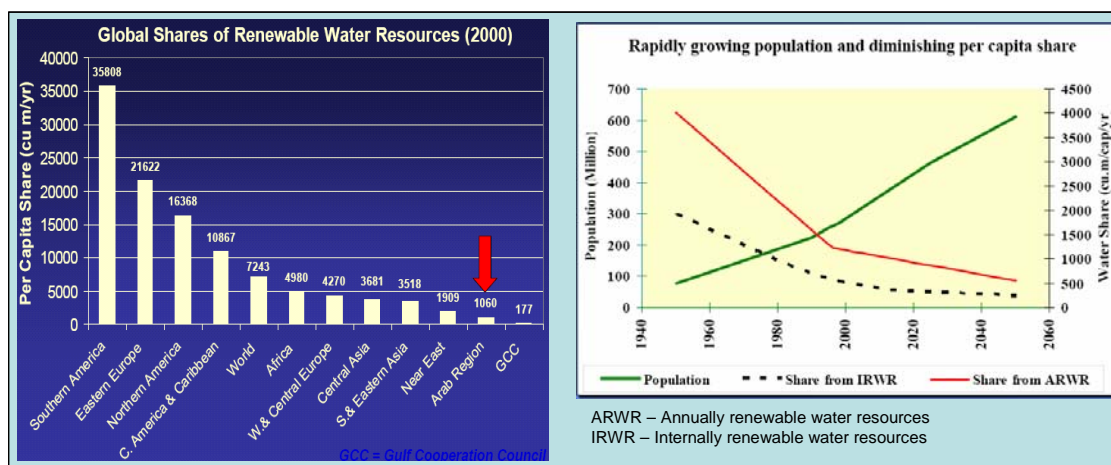
### Outline

1. Background, current status and trends in water governance in the region	13
2. EMPOWERS Country Profiles	15
2.1 Egypt	15
Egypt's water resources	15
Egypt's water demand	16
Egypt's national-level water institutions and water management	16
Egypt's water policy	17
2.2 Jordan	17
Status of Jordan's water resources	17
Jordan's water demand	18
Jordan's national water institutions and management	19
Jordan's water policy	19
2.3 Palestine	20
WBG's water resources	20
WBG's domestic water demand	21
WBG's water Institutions and management	21

# 1. Background, current status and trends in water governance in the region

This background paper is intended to briefly outline the current physical situation in terms of supply and demand, as well as the policy environment (legal and institutional) relating to how water is managed. This is put in a context of the main trends and future challenges within the MENA region. It does so with a particular emphasis on trends to more decentralized water management, local water governance and the participation of water users. In addition it does this in more detail for the three countries in which the EMPOWERS partnership has been working.

As mentioned in Background Document 1, the overriding physical reality coloring water management in the region is one of increasing water scarcity – driven primarily by population growth and shifting patterns of water use and demand. As a whole the region has by far the lowest per-capita renewable fresh-water resources in the world, and while there is considerable variation between countries the reality is one of current and increasing water scarcity.



Source: the Middle East water report, 2006

On the institutional side, the overriding reality is one of a tradition of centralized and top-down government, in which government has seen it as one of its key duties to manage water resources and provide water services. In addition, there has been a tradition (as in most other parts of the world) of fragmented and sub-sector focused development of water, particularly as relates to domestic and agricultural water use. This is reflected in the Middle East water report, presented in 2006 at the fourth world water forum in Mexico which identified three main areas of challenge in the governance of water within the region, namely:

- Dominance of centralized sectoral water management
- Reliability and accountability problems in service provision
- Insufficient financing of recurrent costs of water control and distribution systems.

While, in 2001, the GWP-MED programme had identified the main water governance challenges in the region as including:

- Establishing proper governance of water as a common good
- Overcoming fragmentation of institutions, and the single sector approach
- Correcting inappropriate legislative frameworks
- Promoting enforcement mechanisms
- Mobilizing financial resources and attracting investment
- Promoting effective multi-stakeholder participation
- Improving accountability and transparency in water management
- Utilizing education and capacity building and developing knowledge and skills

However, this picture is now changing, with a number of important trends visible throughout the region, as governments seek to come to grips with the impending water crisis that they all face to a greater or lesser extent. Most important among these are:

**Integration** – breaking down inter-agency barriers in the water sector. In a number of countries this is leading to the creation of single ‘super-ministries’ or to various forms of collaborative and coordination platforms.

**Demand management and rationalization** – while the approach in the past has tended to be one of ever increasing supply augmentation, the reality of the current (and worsening) situation means that it is widely accepted that this is no longer tenable. As a result there is an increasing interest in demand management, and the rationalization of water use. Most important in this is a slow but perceptible swing away from prioritizing agricultural use (together with explicit or implicit policies of import substitution), and towards a prioritization of domestic and industrial use. Also important within this are efforts to prioritize waste (and pollution) minimization and improved water use efficiency.

**Increased use of non-conventional sources** - Linked to the above, but important in its own right is the rapid growth in interest in and use of non-conventional water sources. While desalination gets much publicity, it is probably waste-water re-use that in the short term will have the greatest impact.

**Decentralization** – across the region there is a tendency to decentralize responsibility for service provision and increasingly also resource management. However many challenges remain, particularly in the development of decentralized capacity, integration between decentralized ministries, and the release of real decision making power to the decentralized levels.

**Stakeholder involvement** – related to decentralization, there is also increasing policy recognition of the need to involve stakeholders at all levels in the planning and management of water resources and services. For service provision, this is also supported by an increased interest in improving the accountability of service providers to service users. As with decentralization, this policy is severely tested by lack of capacity, tools

and methodologies for stakeholder involvement, together with residual resistance in many circles to giving water users anything more than the most tokenistic involvement.

**Private sector involvement** – while still strictly limited, there are moves in some parts of the region to greater involvement of the private sector in service delivery. However, this trend remains largely nascent, with few if any practical examples of large-scale privatization (except maybe in Morocco)...

This, in brief, is therefore the context of the water sector in the Middle East and North Africa, a chronically water short region, with a strong tradition of centralized state managed water resource management and water service provision. But one that is slowly but inevitably moving towards more decentralized and inclusive methods, driven by a (sometimes reluctant) recognition that what has worked in the past is no longer appropriate or able to meet the challenges of the future. And while the long term direction of change may be clear, a context in which in the short term disruptions and abrupt reverses are common – often driven by the regions volatile politics.

The next sections provide brief sketches of the water resource, water supply and institutional environment of the three countries in which EMPOWERS was most active, starting with Egypt.

## 2. EMPOWERS Country Profiles

### *2.1 Egypt*

Egypt has a total Area of 1 million km<sup>2</sup>; although only about 4% of this (the Nile valley and delta) are habitable. Egypt has a desert climate, with very limited rainfall. Population is estimated at 73.4 million (2004) with an average annual growth rate of 1.8%, and rural population making up 58% of the total. Of the three EMPOWERS countries, Egypt has by far the highest per-capita availability of water resources, with these estimated to be some 750m<sup>3</sup>/person/year, which nevertheless puts it squarely in the category of a water-stressed country.

#### **Egypt's water resources**

Egypt's renewable water resources are essentially limited to its share of the river Nile which is completely controlled inside Egypt by a series of dams – starting with the Aswan high dam which Egypt uses to maintain its annual share of 55.5 BCM, agreed with Sudan and other up-stream riparian states. Important quantities of fossil groundwater are also found, estimated to be at least 200,000 BCM of fresh water. However, groundwater occurs at great depths and the aquifer is generally non-renewable. Current abstraction is estimated at 0.84BCM/year



To date desalination of seawater has been given a relatively low priority in Egypt due primarily to cost (which renders it unsuitable for irrigation). Currently, approximately 0.03 BCM/year of water is desalinated.

Three sources of 'non-conventional' water exist, none of which represent 'additional' water resources, and all of which comes with potential environmental consequences. They are: reuse of approximately 25-30% of applied irrigation water as agricultural drainage; reuse of treated waste water; and Nile water that recharges shallow groundwater aquifers.

### **Egypt's water demand**

**Agricultural use:** Average annual consumptive use for 1995/96 was estimated to be 40.82 BCM. In that year about  $7.8 \times 10^6$  feddans ( $3.2 \times 10^6$  ha) were irrigated with an average water consumption per hectare of about 12000 m<sup>3</sup>/year (1,200 mm).

**Domestic Water Requirements:** All cities are provided with piped fresh water, while 42% of villages are fully provided, 52% of villages are partially provided and only 6% percent are not provided. The average efficiency of the municipal water distribution network is as low as 50%, and even less in some areas. Total domestic water use was estimated to be 4.54 BCM in 1995/96. Domestic demand (calculated on the basis of 150l/p/d) is currently 4 BCM, and is expected to grow to 5.5 BCM.

**Industrial Water Requirements:** The estimated water requirement for the industrial sector during the year of 1995/96 was in the order of 7.5 BCM/year. A small portion of the diverted water for industrial requirement is consumed through evaporation during industrial processes while most of the water returns to the system.

Water use in Egypt is formally prioritized for Industrial and Domestic use.

In summary the renewable resources available for use are 55.5 BCM/year, whereas water demands for all the sectors are in the order of 65 BCM/year, and can be expected to grow.

### **Egypt's national-level water institutions and water management**

The Ministry of Water Resources and Irrigation (MWRI) is in charge of water resources research, development and distribution, and undertakes the construction, operation and maintenance of the irrigation and drainage networks. It is also responsible for ensuring reliable quantity and quality of water at the intakes of all drinking water treatment plants. In addition to MWRI, several other ministries have some role in developing or using water, these include: the Ministry of Agriculture and Land Reclamation (MALR); the Ministry of Housing, Utilities and New Settlements (MHUNS) ; the Ministry of Health and Population (MHP); the Ministry of Local Development (MLD) and the General Organization for Industrialization (GOFI), affiliated with the Ministry of Industry, is responsible for industrial wastewater drainage. + Holding Company for Potable Water!!

## **Egypt's water policy**

The Government has indicated its intent to shift emphasis from its role as the central (or sole) actor in developing and managing water supply systems, towards cost sharing and promoting participatory approaches in which water users will play a more active role in the management of water (particularly irrigation systems). Important institutional and legislative measures have been taken recently to promote the establishment of sustainable participatory irrigation management (PIM) associations. However, despite these measures, the development of water users' associations (WUAs) as effective partners in irrigation management remains at an early stage.

## ***2.2 Jordan***

Jordan has a total area of about 89,210 km<sup>2</sup>, of which cultivable land is estimated at 381,740 ha, or 4.3% of the total area of the country. The climate is characterized by a long, dry, hot summer and a rainy winter. Rainfall varies considerably, due mainly to the country's topography ranging between 50 mm in the eastern and southern desert regions to 650 mm in the northern highlands. Over 90% of the country receives less than 200 mm of rainfall per year.

The total population was almost 5.5 million in 1995 of which 29% was classed as being rural. Population growth is estimated at 3.4% not including fluctuations caused by international political events. Currently, about 90% of the population is concentrated in the north-west quadrant of the country, where rainfall is highest and where most of the water resources and economic activity are located. Per-capita renewable freshwater resources are estimated to be some 190m<sup>3</sup>/year, among the lowest in the world.

### **Status of Jordan's water resources**

**Surface water:** Surface water resources are unevenly distributed among 15 basins. The largest source of external surface water is the Yarmouk River (a tributary of the Jordan). Originally, the annual flow of the Yarmouk River was estimated at about 400 million m<sup>3</sup> (of which about 100 million m<sup>3</sup> are withdrawn by Israel), although it is now much lower due to upstream Syrian development works. The Yarmouk River accounts for 40% of the surface water resources of Jordan, and is the main source of water for the King Abdullah canal and is thus considered to be the backbone of development in the Jordan valley. Total internally generated surface water resources are estimated at 400 million m<sup>3</sup> /year.

**Groundwater resources:** Total internally produced renewable groundwater resources have been estimated at 500 million m<sup>3</sup>/year, of which 220 million m<sup>3</sup> constitute the base flow of rivers. The safe yield of renewable groundwater resources is estimated at 275 million m<sup>3</sup>/year. Most of it is at present exploited at maximum

capacity, in some cases beyond safe yield. Average groundwater depletion was estimated at 190 million m<sup>3</sup>/year in 1990. Over-abstraction of groundwater resources has degraded water quality and reduced exploitable quantities, resulting in the abandonment of many municipal and irrigation water well fields.

The main non-renewable aquifer presently exploited is the Disi aquifer (sandstone fossil), in southern Jordan with a safe yield estimated at 125 million m<sup>3</sup>/year for 50 years. Other non-renewable water resources are found in the Jafer basin, for which the annual safe yield is 18 million m<sup>3</sup>. In total it is estimated by the Water Authority of Jordan that the safe yield of fossil groundwater is 143 million m<sup>3</sup>/year.

**Dam capacity:** Total dam capacity in Jordan is estimated at 143 million m<sup>3</sup>. The largest dam (the King Talal dam on the Zarqa River) has a total capacity of 80 million m<sup>3</sup>.

**Wastewater:** Wastewater production was estimated at 232 million m<sup>3</sup>/year in 1993, of which 50 million m<sup>3</sup> was re-used (48 million m<sup>3</sup> for irrigation and 2 million m<sup>3</sup> for industrial).

### **Jordan's water demand**

**Overall demand:** In 1993, total annual water withdrawal was estimated at 984 million m<sup>3</sup>, up from 619 million m<sup>3</sup> in 1986. Agricultural water withdrawal accounted for 74.9 % of the total water withdrawal. Industrial and domestic use accounted for 3.4% and 21.7%, respectively including the use of treated wastewater.

**Agricultural water use:** In 1995, the total area equipped for irrigation was estimated at 72,850 ha, of which about 55% was irrigated from groundwater, 39% from surface water and 6 % from treated wastewater. The techniques used by farmers have gradually changed from surface irrigation (furrow and basin) to micro-irrigation. Apart from in the Disi-Mudwara area, the vast majority of irrigation in Jordan occurs on small farms, generally less than 10 ha each, covering a total area of 57,900 ha. Since 1994, farmers pay \$US 11.4 for 1,000 m<sup>3</sup>, with water distributed by shares. The agricultural sector uses about (62-65%) of the total amount of used water.

### **Domestic water supply**

95% of the population of Jordan is served by the public piped water supply, however this supply is not reliable or continuous. With an average of two days' supply per week, this has increased the demand on high price bottled water and tanker water for household use and thus put more pressure on the household water bill. Water losses from the supply network, which suffers from both corrosion and damage, are significant. The unaccounted-for water associated with the municipal and industrial network exceeds 50%, and is most

likely to be due to leakages and overflows from reservoirs, unreliable meters and meter reading problems as well as to illegal use. The percentage of served people with sewage network is 65%.

### **Jordan's national water institutions and management**

The **Ministry of Water and Irrigation** (MWI) is responsible for the monitoring and management of the water sector in general including irrigation, domestic water supply and wastewater. Its role also includes the standardization, consolidation and provision of centralized water-related data. The MWI was established in 1992 in response to Jordan's recognition of the need for a more integrated approach to national water management

The Ministry of Water and Irrigation includes two of the most important entities dealing with water in Jordan, namely:

- **Water Authority of Jordan** (WAJ). **WAJ** is an autonomous corporate body, with financial and administrative independence, responsible for public water supply and wastewater services, as well as for overall water resources planning and monitoring.
- **Jordan Valley Authority** (JVA). JVA is responsible for development of the Jordan Rift Valley (including water development and distribution of irrigation). **JVA** is responsible for the development and utilization of water resources in the Jordan Valley for irrigated farming, municipal, industrial and tourist purposes, and generation of hydroelectric power and other beneficial uses. Its responsibilities include water resources protection and conservation.

Other agencies with important stakes in water management include:

- The **Ministry of agriculture**, which is responsible for developing the agricultural sector to increase Jordan's self-reliance in basic foodstuffs assuring sustainable production and resources without damaging the environment
- The **Ministry of Environment** which has a number of entities relevant to the water sector, all coming under the General Corporation for Environmental Protection (GCEP) and which aims to promote protection of the environment and the improvement of its various elements
- The **Ministry of Health** which has the task of decreasing the incidence of water-borne diseases, primarily through increasing the quality of health related monitoring of domestic water, and to ensure that this corresponds to international and local standards.

### **Jordan's water policy**

The Government of Jordan has adopted a comprehensive water strategy supplemented with a set of policies and measures to help mitigate the extreme water crisis created by being one of the most water scarce countries in the world. The government adopts a dual approach of demand management and supply augmentation. Priority in water resources allocation is given to the basic human needs; as such first priority

is given to allocation of a modest share of 100 litres/capita/day to domestic water supplies, followed by tourism and industry.

The government's policy guidelines can be summarized as follows:

Protection of surface and groundwater by sparing the use of these precious resources

- Efficient management of urban water and all environmental and irrigation aspects relevant to the water sector.
- Development of appropriate institutional capacity building and legislative framework for water management.
- Efficient and sustainable management of utilities by further involvement of the private sector.
- Further enhancement of efficient financial management, accounting and controlling tools in the utilities.
- Fostering of regional cooperation and donor coordination.
- Introduction of socially acceptable cost recovery tariffs for all types of water use depending on the quality and quantity of water consumed.

### ***2.3 Palestine***

The land area of the West Bank and Gaza is estimated at 5572 km<sup>2</sup> and 367 km<sup>2</sup> respectively. Palestinian population projections reveal that mid year population in 2003 totaled 3.6 million of whom 2.3 and 1.3 million resided in the West Bank and Gaza respectively. The West Bank and Gaza, in general, have a Mediterranean climate characterized by long, hot, dry summers and short, cool, rainy winters, which are modified locally by altitude and latitude. Though relatively small in area, the West Bank enjoys diverse topography, soil structure, and climate conditions. Olive groves cover most hilly mountains; field crops are mainly cultivated in the plains and plateaus.

The West Bank and Gaza (WBG) have been under Israeli occupation since 1967. As a consequence all aspects of water governance are controlled, or at the very least, strongly influenced by Israeli Military Orders. The net result being a huge imbalance in access to water. Domestic per capita water use in Palestine is nearly 20 m<sup>3</sup>/year (55 L/c/d) while it is nearly 98 m<sup>3</sup> / year in Israel.

#### **WBG's water resources**

Groundwater is the main source of water supply in Palestine. Estimated average annual ground water recharge in the West Bank and Gaza is 698 to 708 MCM/yr. The only surface water source in the West Bank is the Jordan River and its tributaries, to which Palestinians currently have no access.

The main source of groundwater in the West Bank, the mountain aquifer primarily consists of three basins: the west, northeast, and east. 83% of the recharge areas for these basins lie within the West Bank. Israel currently uses 93% of the annual recharge to the aquifer; Palestinians receive only about 17 percent of the water supply underlying West Bank territory and nothing from the Jordan River. Israel supplies Palestinians with 63 percent of the total water consumed in the West Bank via Mekorot pipelines

### **WBG's domestic water demand**

Current total water supply in the West Bank is nearly 135 MCM / year and in Gaza 110 MCM/year, however projected total demand in the year 2000 was 388 MCM /year. This shows the big gap between demand and use (currently limited by occupation), and the problem is likely to grow with the increase in population and the associated increase in the demand.

The lack of sewage systems in the West Bank has created a major public health risk due to the high levels of human faecal contamination in the water system. In 1995, only about 20 percent of the West Bank population had any form of a sewage system

### **WBG's agricultural water demand**

The total agricultural water supply is reported to be nearly 169.3 MCM / Year in the West Bank and Gaza. This water is being used to irrigate nearly 200,000 dunums (nearly 12% of the total cultivated land). Given the high population growth rate in Palestine, and the relation between population and need for increased amounts of food, it has been estimated that for each one million people there is a need to irrigate  $\approx$  75,000 dunum and this will require  $\approx$  61 MCM /year of water.

### **WBG's water Institutions and management**

The water sector in the West Bank and Gaza has remained undeveloped over the past three decades of occupation. Since 1967 water resources have been controlled and managed by the Israeli Military Authority through a number of Military Orders. These orders have barred Palestinians from participating in the planning and management of water resources and prevented them from developing local water resources in concert with growing water needs.

The existing situation shows that almost 43% of the population connected to water supply is served by six main utilities while 57% are served by 218 municipal or village councils. Water supply to these utilities and councils are secured from local sources (wells and springs) and /or purchased from the Israeli water company Mekorot through the West Bank Water Department (Salih 98). In the mean time wastewater services is not yet developed in most of these villages.

The current and future setup of the water supply and sanitation management is organized under four levels: decision-making level, regulatory level, development and supply level and service provision level. The first level, the National Water Council is headed by the President of Palestinian National Authority (PNA) and includes 11 representatives of almost all ministries, authorities, civil society organisations, research and development institutions that directly relate to the water and sanitation sector and one representative of the proposed future regional water utilities. While the NWC has been created officially, it is not really functional for the moment.

The second level includes Palestinian Water Authority (PWA) as a regulator of all water use, while the third level includes the West Bank Water Department and a similar one in Gaza, which are responsible for the monitoring and bulk supply development. The fourth level includes the water service providers. There are eight major water utilities that supply water to the public in the West Bank. Two of them are semi public water supply utilities: Jerusalem Water Undertaking (JWU) and Bethlehem Water Supply & Sewage Authority (WSSA) while six are water divisions of large municipalities (Nablus, Hebron, Jenin, Tulkarem, Qalqilya, Jericho municipalities).

The proposed future institutional setup almost preserves the first three levels as they are while anticipating some changes at the service provision level, proposing the creation of 4 or 5 Regional Water Utilities (RWU), 3 or 4 in the West Bank and one in Gaza to provide water and wastewater services in more efficient manner. The proposed RWU will potentially absorb all councils and utilities currently providing services in the sector. It will unify the service levels and will develop common regulations.