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PARTICIPATORY WATER MANAGEMENT IN EGYPT: COUNTRY REVIEW

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SUMMARY – The main stakeholders and participants dealing with water resources issues are agriculture, domestic, industrial, water transport and hydro-power parents and beneficiaries. More than twenty years have been elapsed since the participatory management approaches have been considered. The progress has been gone gradually and smoothly. Participatory Water management in Egypt has been carried out in different ways and projects such as Irrigation Improvement Project (IIP), Fayoum province water Management Project, the Agriculture Policy Reform Program (APRP) approach, and Water Boards Project (WBP). It has been also encouraged through land drainage water management and ground water management. The Irrigation Advisory Services have been established in the Ministry of Water Resources and Irrigation to provide the different services to the Water User Associations.

Key words: Water Resources Management, Water User Associations (WUA), Water Boards, Irrigation Improvement Projects (IIP), Irrigation Advisory Service (IAS), Reuse of Drainage Water.

INTRODUCTION

The total Egypt's surface area is about one million square kilometers, confined almost meanly between longitudes 34° & 25° E and latitudes of 22° & 31° 30˙N, and is lying within an arid and semi-arid zone, with mean air temperature of 30 °C in summer and 18 °C in winter times. The mean total annual precipitation is about 150 mm per year, limited to the northern strip of the country along the Mediterranean Sea Coast, and diminishes to nil South of Cairo. Accidental torrential rains occur from time to time during the fall and spring on the Eastern Desert and Sinai Peninsula which may produce flash floods towards the Nile valley, Red Sea and its gulfs. In general, the mean total annual rainfall is estimated by 4-5 billion cubic meter, of which the total runoff is in the range of 1.0-1.5 billion cubic meters and hardly captured or harvested. The River Nile is the main and sole renewable surface freshwater source of Egypt's water, with an annual share of 55.5 billion cubic meters at Aswan according to the 1959 Nile agreement. The shallow underground water aquifers in Egypt's Nile Valley and Delta are mainly replenished through irrigation water seeps. Deep aquifers in Western and Eastern Desert and Sinai Peninsula had been stored since ancient times during the rainy eras, and hence it is almost un renewable and costly accessible. The total safe and economic extraction from all these aquifers could be the range of 11.5-12.0 billion cubic meter a year, of which about 4.5 billion cubic meter are now made available, of which the great part is from the Nile Valley and Nile Delta aquifers. Other sources for reuse are the agriculture drainage waters that have proper quality, with an estimated amount so far by about 5.0 billion cubic meter a year, out of a total amount of 9.0 billion cubic meters that could be reused, if its quality is secured and pollution sources are controlled and properly managed. Hence, the total annual water extraction is in the range of 65.00 billion cubic meters, of which at least 80% is allocated for irrigation and agricultural requirements and the remaining is allocated for industrial and drinking water requirements.

To cope with the socio-economic plan during the next coming fifteen years (by year 2017), an amount of 20-23 billion cubic meter should be secured and reallocated for reclaiming and irrigating more additional area of about 3.4 million feddan and water needed for urban domestic and industrial developments. The main stakeholders and participants, dealing with water resources issues (developing, managing & using), are Agriculture, Domestic, Industrial, water Transport and Hydro-

Power partners and beneficiaries. Egypt's Ministry of Water Resources and Irrigation is the sole responsible entity for developing and securing water requirements for different uses. Nevertheless, this Ministry is mainly managing the irrigated land water infrastructures and hydraulic systems, and other entities are managing other systems (El Quosy, 1996). The coordination, integrity and harmony between all those entities need to be ensured; on national, regional, and local levels. Pollution control, securing water quality and water saving issues should be the concern of all bodies, partners and users. In order to achieve such goals and objectives, integrated national water resources policy plan is being considered. The policy plan is considering different required tools of managerial, institutional and regularity issues.

The main approaches to implement an Action Plan that support such endeavors, would embrace the following:

1. Formulation and implementation of an Integrated National Water Management Policy Plan;
2. Improving water related infrastructures including Irrigation and Drainage Systems and other related water systems;
3. Introduce, apply and motivate the participatory actions in an integrated water management approach;
4. Optimization and best use of water resources by introducing and adopting appropriate technologies, know-how and learned lessons in water management and use that would realize actual and substantial water saving including supply and demand management integral approach;
5. Effective water quality and quantity management;
6. Considering greater attention to public awareness, communication, education and skills.

IRRIGATION AND DRAINAGE SYSTEMS IN EGYPT

The total irrigated area in Egypt, for time being, is about 8.0 million feddans (acres). Most of this area is located within the Nile Valley and Delta. The cultivated area is irrigated and drained through tremendous and complex public network of irrigation canals and drains, of total length of almost 60.0 thousand kilometer. Beside that, and on the micro and farm levels, there are hundreds of thousands of kilometers of tertiary irrigation (Mesqas) and subsurface (tile) drainage systems. There are also about 1600 main public irrigation and drainage pumping stations, to support irrigation and drainage water management facilities and infrastructures. The managing of these complex systems is carried out through tremendous system of hydraulic structures including dams, barrages, regulators, pumping stations, etc. The system could be simulated as the veins and the arteries of the human body, in closed system fashions, and with the High Aswan Dam (HAD), as the Heart or Central Bank of Egypt surface water. Considering the HAD location and function, the defined water share agreement, and operational criteria vis-à-vis the daily water requirements, distribution and supply to everywhere, the water release and management strategies should be very carefully and skillfully tackled.

Irrigation Management

Water for irrigation requirements should be secured all the time and everywhere of the arable land nationwide. This is done in accordance to a daily program of water release from the HAD into the Nile and canal system from the far South to far North to the Mediterranean outlets. The main and major canals may have continuous flow, but secondary and tertiary canals are subject to water scheduling and rotations according to time tables and regional programs and cropping patterns. Most of irrigation practices, especially in the old land of Nile Valley and Delta are surface (flood) irrigation systems and most of the newly reclaimed and desert areas should be irrigated by pressurized irrigation systems.

Both systems aren't efficiently operated due to the following concerns and practices:

1. Water losses in the delivery systems through seepage, evaporation and aquatic weeds;
2. Mismanagement, misuse, mismatching and inequity in water distribution and use;
3. Over irrigation, overload of the flowing drainage water to drains and drainage pumping stations;
4. Negative environmental water related issues and water quality degradation;
5. Public investment burdens and high costs for operation and maintenance of the system.

To tackle such issues and implications, national water resources policy plan were considered since late seventies, and have been updated many times. The concept and initiatives have been undergone the following historical activities:

- The 1975 Egypt's Water Policy and its Updates (1986, 1992 and 1999);
- System improvements and participatory approaches on pilot and regional scales (EWUP, ESAWIP, IMS, FWMP, IIP, APRP and WBP).

Impacts of the EWUP Research and Experiments under the Regional Irrigation Improvement Project

The final recommendations of EWUP (EWUP, 1984) based on extensive field research stated the following:

- "Farmers should be involved whenever any proposed water delivery system improvements are considered";
- "The legitimacy of such improvements must be established with local farmers to help ensure efficient operations, routine maintenance and long life";
- "Farmers should be encouraged to become involved in the management of water delivery at the mesqa level";
- "This will require active professional assistance to help farmers organize and help Ministry officials identify leaders and utilize these valuable resources";
- "Farmers involvement is necessary for efficient land leveling, distributor canal and mesqa renovation, water scheduling, mesqa maintenance and implementing recommended changes to long level basin or furrow irrigation."

The most recent developments have been the legislative approval providing the legal basis for WUAs micro-system cost recovery and the establishment of a special fund in the MWRI for irrigation improvement programs and project. A major contribution of the proto-type HP assisted by USAID was this action taken by the People's Assembly on June 17, 1994. A Ministerial Decree has been issued with the by-laws for this legislation which will be fully implemented in 1996. Another achievement has been the extension of the IIP by a World Bank Loan Project for three additional Canal Commands of over 250,000 feddans.

Decree No. 14900 of 1995 issued by the Minister of the MWRI provides the by-laws for the amendments to the Irrigation and Drainage Law Number 12 of 1984 By-Law No. 213 of 1994. This legislation deals with WUAs in the old and new lands, cost recovery of improved works at the mesqa level and the establishment of a special fund for irrigation improvement in the MWRI.

TOWARDS IMPROVING IRRIGATION WATER MANAGEMENT AND USE: PILOT AND SELECTED PROJECTS

Irrigation Improvement Project (IIP)

Building on the experiences, the outcomes and lessons learned from the EWUP Project, twelve pilot areas, in Upper and Lower Egypt, of total area of 130,000 feddans were selected for system improvement, mainly on the tertiary canals and secondary ones. Involvement of farmers were carried out through WUAs and motivated by IAS and WCU. Since 1995, the project have gained impetus through an agreement with the World Bank and other donors to implement the IIP in an area of 250,000 feddans in Northern Delta (Beheira and Kafr El-Sheikh Provinces), beside other areas and projects that are being implemented by local funds. The Japanese International Cooperation Agency (JICA), is considering studies programs for improving an area of 800,000 feddans of Bahr-Shebeen Canal in the Middle Delta, and 700,000 feddans of Bahr-Yousef Canal in Middle Egypt. The Ministry of Water Resources and Irrigation is conducting studies and programs for Bohia Canal of 125,000 in North East Delta. According to year 2000, report the work progress and farmers' involvement are as follows:

- No. of Improved Mesqas and Turned to farmers are 1205;
- No. of organized WUA's are 2548;
- No. of Mesqas under design/construction are 1343.

The total area where implementations have been carried out is about 240,000 feddans; and the area under consideration is about 95,000 feddans. It is anticipated through expanded program that by year 2017, about 3.5 million feddans will undergo the IIP and participatory water management. The rate of implementation should be increased from about 50.0 thousand feddans to 180.0 thousand feddans annually. Almost 7.0 billion Egyptian pound (about U$ 2.1 billion); will be needed to implement this program. About 2.5-3.0 billion cubic meter of water use a year could be saved, and land productivity could be increased by 10-15%. Considering the nature of the irrigation system the policy program will give priority to Northern Delta areas, then South of the Delta, and later the Nile Valley and south Egypt (Mokhtar et al., 1996).

Fayoum Province Water Management Project

The 1st Phase of the Project (1993), had considered involvement in the system improvement and participatory management approach. In the 2nd Phase of the Project, ten pilot areas in nine irrigation districts, covering an area of 25,000 feddans have been experienced the involvement in water management, O&M through water boards (WB), including the Secondary Canals. The Programs has been implemented hand by hand through participation of water users and Ministry staff on the Secondary Canals. Planning, monitoring, implementation, tendering and follow-up, went on in a cooperative fashion between these stakeholders. Irrigation, drainage and re-use systems and related issues were considered. Integration of gender issues in Water Boards Program was tackled and Workshops, training programs, study tours, know-how, and Rehabilitation Master Plan were carried out to enhance the policy implementation. In the 3rd Phase, that is presently underway, special consideration is given to improve water distribution and management for both Irrigation and Drainage, in a sustainable and environmentally Sound Manner (El Kashab, 2001). The project will consider the consolidation and expansion of Water Boards up to the district level. A total number of about 30 Local Water Boards (LWB) will be established including federation to district level, and testing of the integrated water management concept. Attention is being given to Institutional strengthening of Ministry's concerned Departments and to the regulations, legislative issues and reforms (Ismeil, 2001).

The Agriculture Policy Reform Program (APRP)

The Agriculture Policy Reform Program (APRP) is designed to achieve certain areas towards achieving an effective water management and use. Under tranche III, Benchmark C-3 had foreseen testing program on pilot scale that would include branch canal in the IIP and non-IIP area. The benchmark had considered that the Ministry would decree a policy and initiate an action program for formation of water user organizations at the distributaries and branch canal levels (BCWUA).

The program has been tested on three branch canals, namely:-

- Qemery Canal (Sharkia Governorate), with improved Mesqas and total command area of 7,500 feddans.
- Bahr El-Darham Canal (Dakahlia Governorate), with no physical improvement and command area of 6,400 feddans.
- Balaqtar Canal (Beheira Governorate), with command area of 11,500 feddans, and partially improved Mesqas.

Cost-Sharing Plan in a negotiated process for O&M and water management had been carried out.

The significant recommendations were to replicate the program, amend irrigation and drainage law no. 12/1984 and to initiate Pilot Program on transferring irrigation system management to farmers and end-users. The transfer program had been considered as benchmark in tranche IV of the APRP program activities. The project had considered pilots for district level for integrated water management and public participation in decision making

Water Boards Project (WBP)

Building on the outcomes and experiences from Fayoum Water Management Project (FWMP), the IIP approach, the APRP policy objectives and benchmarks, and the recommendations of PIM Workshop in Cairo 1996, the Water Boards Project was initiated within the Netherlands/Egypt Assistance Cooperation Program. The Project is considering at least four pilot areas on eight secondary canals, as follows:

- One pilot area where IIP-World Bank and KFW is going on;
- One pilot area in Upper Egypt (IIP is optional);
- One pilot area in "Old New Lands or "New Lands";
- One pilot area in The Nile Delta where Drainage Collector User Association is initiated.

The Water Boards (WB) are organized at the level of secondary canal, which have logical hydrological boundaries of both: Irrigation and Drainage. The area irrigated by the secondary canal would be in the range of 3,000 to 8,000 feddans. The concept of the WB project is to:

- Motivate and encourage the participatory approach;
- Complementing and enhancing other similar projects and objectives;
- Have a role in progressing towards water management improvement and optimization;
- Recommend institutional and legislative reforms.

Four secondary canals pilot areas have been selected according to the approved criteria. An extension for the project is considered the scale of district level and integrated water management approach. Work preparation and implementation programs are going ahead, with integration and coordination between those concerned stakeholders (Abdel Aziz 1996).

The National Water Resources Plan (NWRP)

Within the objectives of enhancing water supplies and improving water management with considerations given to both its quantity and quality, and in the best way to ensure the socio-economic and environmental requirements, a National Water Resources Plan was formulated and considered to be implemented within the integrated water resources style and sustainable development requirements. The Plan is embracing in its terms of reference, considerations to appropriate policies and strategies that include the long-term objectives of different sectors utilizing water resources, water resources availability, most effective and efficient water use, equitable water allocations between users and co-ordination an harmony between all stakeholders.

Issues of concerns

Issues of concerns are:

- The socio-economic aspects;
- Concepts of water policies and implementation programs;
- Water resources management that would include supply and demand management, legal and institutional proper frameworks;
- Involvement of stakeholders at all levels;
- Harmony and co-ordination between different sectors;
- Sectorial water-use priorities and programs.

It's envisioned that the objectives and policies outlined by the NWRP, would be the proper guidelines for Egypt's water development, management and use nationwide by involving all concerned stakeholders. The involvement should warrant that all relevant interests are taken into account in a balanced way and is intended to create a broad acceptance of the plan implementation and commitments. The stakeholders that would be considered in this plan are:

- Stakeholders at Central Government level - *All Ministries which have a responsibility with respect to water issues are considered. In Egypt, some 12-14 Ministries are involved.*
- Stakeholders at Regional Government level - *These are the Governorates (26), and in each Governorate the elected Local Council, and the Local Unit representing the Ministries concerned.*
- Public and Private Water Users - *Agriculture, drinking, sanitation, industry, etc.*.

From experience during the last period of the life of the project, the involvement of other Ministries and other stakeholders would be enhanced and activated though a sort of national water council that would guide, monitor and evaluate the polices and implementation requirements. The proposal was considered in a separate study for water policy integration and harmony.

Land Drainage Water Management

Due to the fact that the surface irrigation practices have been in use since long time ago, and due to the intensification of cultivation, the soil has suffered from subterranean water rise and salinity problems. Consequently, a program for soil improvement and conservation, and controlling the subterranean water level had been carried out. The overall program objectives are to introduce technologies and concepts for remodeling of the public open drains and to execute the field tile drainage (subsurface drainage) in an area of about 7.0 million feddan. So far, an area of about 5.4 million feddans have been covered by subsurface tile drainage, and an area of about 6.7 million feddans have undergone the development of the public open drains. The replacement of the old systems of the subsurface (tile) field drains is in the range of 600.0 thousand feddans.

The target of the Five-Years Plan (2002-2007), is to implement open drains improvement in 300 thousand feddans, and subsurface field drains in 800 thousand feddans, besides replacing an area of 350 thousand feddans of subsurface field drains. The monitoring, evaluation and reporting about the impacts of such program have proved productivity increase in crop yield, environmental water and soil effectiveness, better soil and drainage water management, and less cost for operation and maintenance. As a result, the program has been encouraged through the willingness of farmers' participation and cost sharing and recovery.

The participation approach in this context is to involve farmers and private sectors in operation and maintenance (O&M), and may be in implementation. This is going to be done in harmony and integration with the irrigation and water management. To this effect, successful pilot areas are being in implementation to involve farmers in the programs. This is being carried out on collector's scale, e.g. the INTESP Project which is considering the contribution to better O&M and stimulate the process of decentralization. The controlled drainage in IIP areas and rice cultivation is one of trials towards better water management.

Water Boards Program (WBP), and Irrigation Management Transfer (IMT) through APRP, is being considering approaches for an integral fashion in water management in all of its parameters and activities.

Drainage Water Re-use

Most of agriculture drainage water in the Nile Valley finds its way to the Nile. The estimated flow is in the range of 3.0 - 4.0 billion cubic meters a year. The other resources for re-use in the irrigated Nile Delta area is about another 5.0 billion cubic meters, other flows from main public drains in Northern part of the Delta, which find its way to Northern Lakes and Mediterranean, are estimated by 12.0 billion cubic meters a year, out of which another about 4.0 billion cubic meters is planned to be re-used to satisfy water requirements for the National Development Plan until year 2017.

To secure water quality, all necessary actions and compliance should be taken to alleviate and control water quality degradation.

GROUNDWATER MANAGEMENT

Groundwater resources in Egypt are contained in mainly six characterized aquifers. The most important ones are: The Nile Aquifer (Nile Valley & Delta), the Nubian Sandstone and the Carbonate one (Desert & Sinai).

The first is mainly shallow aquifer, with an estimated storage volume of about 500 km^3, and annual recharge is about 7.0 milliard m^3. The second is mainly deep aquifer with very limited recharge, in spite of the huge volume stored, which is estimated of more than 250,000 km^3. The abstraction from the Nile aquifer could be properly, safety and economically managed for sustainable development. On the contrary, great attention should be paid for the management and use of the deep desert aquifers.

Due to the complexity and problems incurred by mismanagement and use of the Western Desert Aquifers, the APRP Program carried out a study to adopt policies and procedures for reducing water loss and land degradation due to improper management and free-flowing. The present abstraction in the Western Desert is almost 700 million cu.m/year; used for agriculture, domestic and mining activities. Many of the western desert wells (200-1000 m) are free flowing at relative high rates and pressures, and consequently resulting in water losses and water logging. An improved policy framework to ensure appropriate management of the aquifer and free-flowing was considered. The policy includes the Groundwater Management Associations (GWMA), from Public and Private Sector stakeholders to operate and maintain the wells and irrigation and drainage system management.

El-Farafra Oasis was selected as a target model for monitoring, maintaining and rehabilitation of the system and motivation for participation and development of Groundwater Management through Associations.

THE NEED FOR SUSTAINABLE IRRIGATION ADVISORY SERVICES AND PRIVATE WATER USER ASSOCIATIONS

What is the IAS and its mission?

The Irrigation Advisory Service (IAS) is an organizational unit of the MWRI established to provide three major types of services to private WUAs. These services are:

- to facilitate and assist WUAs in improving and maintaining water delivery;
- to improve water use practices and
- to help farmers sustainable private WUAs around mesqa and branch canal systems.

The WUAs are organized around the basic hydrologic unit of the micro-system and its new technology and improved branch canals where WUA federations are established for giving WUAs a larger role and voice in canal operations and maintenance. The basic mission of the IAS is to facilitate and assist private WUAs in establishing, maintaining and managing their own organizations for improving irrigation system performance. The IAS assists the WUAs in planning, designing, implementing, operating, maintaining and managing the improved mesqa technology and the adoption of improved water user management technologies (El Quosy, 1996).

What are the WUAs major roles?

Private WUAs are defined as “organizations owned, controlled and managed by members for their benefits in achieving increased water control for increased production possibilities through improved irrigation system performance”. Major WUAs tasks after organization and election of their officers include:

a. Participating actively in planning, designing, implementing and formal approval of improved mesqa systems;
b. Operating, maintaining and managing the mesqa and branch canal WUAs;
c. Developing and implementing operational plans for irrigation scheduling, purchasing, operating and maintaining WUA pumps and implementing regular mesqa maintenance;
d. Improving continuous flow water supplies, mesqa water delivery and decreasing return flow;
e. Improving water use management through improved irrigation scheduling and practices;
f. Developing roles and responsibilities of mesqa and branch canal WUA council members and rules required;
g. Developing and maintaining close coordination and good working relationships with organizations for essential services;
h. Developing and maintaining good two-way communications with WUA members, participating organizations (Irrigation Departments) and other related organizations;
i. Mobilizing and managing finances for pumps, equipment and mesqa maintenance;
j. Federation of WUAs to the branch canal level and functional linkages with the irrigation departments.

Process Approach for Building Sustainable WUAs

The seven-phase process evolved by the IAS in 1989 has worked well where it has been used as a flexible process. The goals of the seven flexible phases are as follows:

PHASE I: ENTRY
Goal to be achieved: To gain the acceptance of unit command area leaders including farmers and those leaders in the public and private sectors.

PHASE II: INITIAL ORGANIZATION
Goal to be achieved: To establish a strong base for building a private WUA by assisting water users on a mesqa to select/elect their leaders, determine initial roles and responsibilities; meet on a regular basis to solve problems and consultations.

PHASE III: PREPARATION FOR MESQA IMPROVEMENT
Goal to be achieved: To involve the WUA council members actively in decision making regarding the planning, the designing and the approval of the final mesqa design.

PHASE IV: PARTICIPATION IN MESQA IMPROVEMENTS
Goal to be achieved: Preparation of WUA membership to monitor improvement activities and resolve problems which may arise between the private contractors and farmers.

PHASE V: REGULAR WUA OPERATIONS (CONTINUOUS)
Goal to be achieved: To increase farm income by saving of labor, improved water control for increased production possibilities, more equitable distribution of water and useful information related to water delivery, use and return flow of excess water, mesqa maintenance and savings of land.

PHASE VI: WUA FEDERATION ON THE BRANCH CANALS
Goal to be achieved: To increase the effectiveness of main system operations and communications between water users and water suppliers by assisting the irrigation authorities in maintaining and protecting the canal system, providing a two-way flow of communications and identifying and resolving mutual problems.

VII: CONTINUOUS MONITORING AND EVALUATION
Goal to be achieved: To assure that there is effective process documentation of all activities in the six phases and periodic internal and external evaluations of the total WUA/IAS program.

CONCLUDING REMARKS AND OBSERVATIONS (Promises, Constraints & Debates)

More than twenty years have been elapsed, since the participatory management approaches have been considered. The progress has been gone gradually and smoothly. This was essential due to the complexity and the many implications from social, economical, cultural, managerial, institutional, and legislative constraints and implications. Nevertheless, the policy went on through diversified approaches, namely:

- Water Policy initiative and Concepts;
- Trials and Pilot projects;
- Partial Publicity, Motivation, and Awareness Campaigns;
- Water Law Amendment (213/1996) as a step forward;
- WUA, WBP, APRP … etc., through IIP, FWMP, another projects.

Essential Ingredients of Sustainable WUA

Based on lessons learned to date from about six years of experience in developing private WUAs, the following are some essential ingredients for making WUAs sustainable:

- Continuous orientation and reorientation of high-level officials to achieve continuous policy commitment and support;
- Positive and timely implementation of WUA and cost recovery legal basis, by-laws and policies Visible proven improvements implemented in a timely manner which provides increased water control and net farm income;
- Ownership of WUAs in planning, designing, operating, maintaining and managing their own mesqa;

- Clear understanding of roles and responsibilities and their own rules and procedure;
- A clear understanding of and participation in the cost sharing plan for resource mobilization;
- Regular process documentation and use of lessons learned from monitoring by WUA leaders and IAS staff;
- Continuous human resource development and training based on real needs of WUAs and IAS staff;
- Strong functional linkages with vital organizations and especially with district engineers of the Irrigation Department and agricultural extension staff.

Key Organizations and Stakeholders

The following are the type of organizations and stakeholders involved in building and maintaining successful private WUAs. The primary stockholders in establishing successful WUAs are water users and the MWRI. Other key actors include:

- Mesqa and branch canal construction and maintaining firms.
- Private and MOA precision land leveling organizations
- Agricultural cooperatives, credit banks and extension services
- Local village councils
- Irrigation and Drainage Departments of the MWRI
- .National Water Research Center.

In addition to these key organizations, there are a number of other organizations as well as influential leaders and the leaders of political as well as non-governmental organizations (Barakat, 1999).

Ambitions and Promises

The ambitions and promises should be built on:

- The NWRP framework and motivation of stakeholders;
- Expanded and enhanced publicity and public awareness;
- Successful implementation of many pilot areas (Fayoum Project, New WB Project, IIP Project, IMT Project, etc.);
- Focus on positive impacts, benefits and incentives, and gain public support;
- Efforts towards adequate staffing, technologies, coordination, integration, harmony and funds generation;
- Learned lessons and adaptable scenarios (Nation and Worldwide).

Actions and Requirements

The future actions and requirements should be oriented towards:

- Institutional and legislation reforms.
- Political and public will, support and enthusiasm.
- Adequate, cheap and simple infrastructures and systems improvements.
- Proper contractors and staffing capacity.
- Collective and integral approaches in planning and management.
- Re-structuring and re-organization of the departments to achieve the integrity and avoid overlaps, gaps and conflicts (teamwork).
- Water Policy integrity and commitment of different partners.

Concerns and Debates

The future concerns and debates should include the following items:

- Define and target the most important stakeholders;
- Consideration for Socio/economic, reluctance/acceptance, ethics/cultures, etc.;
- A Master Plan and program for system improvement and partial responsibilities transfer

(considering most reliable tools and costs);
- Empowerment and motivation of stakeholders (considering different means and approaches);
- Decentralization, localization, delegation and role of regional authorities;
- Quality, power and organization of staffing/and departments;
- Seek and define Types and sorts of incentives and means for gaining public support and motivation;
- Means for pollution control, e.g. polluter pays concept and compliance action plan;
- Concepts for Resources Planning and Management, Stakeholders classifications and sharing;
- responsibilities and participation (different levels) should be spotlighted and implemented in phases according to priorities and national plan.

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Abbreviations used in the text

HAD	High Aswan Dam
EWUP	Egyptian Improvement Project
WUAs	Water User Associations
IIP	Irrigation Improvement Project
MWRI	Ministry of Water Resources and Irrigation
IAS	Irrigation Advisory Service
WCU	Water Communication Unit
JICA	Japanese International Cooperation Agency
WB	Water Board
O&M	Operation and Maintenance
LWB	Local Water Board
BCWUA	Branch Canal Water User Associations
FWMP	Fayoum Water Management Project
NWRP	National Water Resources Plan
WBP	Water Boards Progress
IMT	Irrigation Management Transfer
GWMA	Groundwater Management Association