

**Report**

# **Water Policy Reform Program**

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## **Report**

# **Water Policy Reform Program**

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## **I. Water Resources Under Pressure**

To date, Egypt's Nile water resource and the investments made in the management of that resource have been sufficient to meet the country's demand for freshwater and to sustain the productivity and quality of this precious resource. But this appears to be changing. Under existing policies, the demand for freshwater is approaching available supply. Because of expected population and income growth, urbanization and industrialization, and projected expansion of the area under irrigation in the Western Desert and Sinai, it is now possible that the demand for freshwater will soon exceed available supply.

Fortunately, the Ministry of Public Works and Water Resources (MPWWR) has an excellent track record of successfully responding to looming freshwater shortages. In the recent past, water has been saved by reducing outflows to the sea (associated with the generation of electricity and support for navigation) and by recycling agricultural drainage water. Because these relatively easy and low cost ways of meeting new demands may soon be exhausted, the MPWWR is considering more difficult and more costly ways to meet new demands for water. These include, among other things, crop substitution and additional drainage water reuse. As water savings from these are exhausted, even more difficult and costly ways of conserving water may well be needed. In fact, it is increasingly clear that the MPWWR will have to make substantial irrigation infrastructure investments and invest heavily in improved irrigation system management if it wants to meet all of the projected future demands for freshwater while sustaining the productivity and quality of freshwater. What is troubling about this is that it is not yet clear how or from where the MPWWR can obtain the resources needed to meet the investment requirements to do this.

## II. USAID Support for Water Policy Reform: The APRP and the MPWWR

In view of the above, it appears that water management in Egypt is at a major crossroad. Existing policies and practices, especially the ambitious plans for *expansion in irrigated area* in the Western Desert and Sinai, are adding to existing demand pressures on available water supplies. Population and income growth, and urbanization and industrialization contribute to growing water demands, and to a *mounting water pollution problem*. Managing these developments is not easy, even under the best of circumstances. In Egypt's case the management problem is complicated by the real *need of the Ministry to attract additional resources* to address these issues. For this reason alone, it needs to consider options for decentralizing, cost recovery and privatizing some of its irrigation services.

In this context, the MPWWR and the U.S. Agency for International Development (USAID) recently agreed to a water policy and institutional reform program. This Water Policy Reform Program (WPRP) focuses on three objectives: (1) improving water allocation; (2) enhancing the long term sustainability of Egypt's intensive irrigation based agricultural production system; and (3) improving the capacity of the MPWWR to formulate and manage water resource policies.

Under Objective 1, the MPWWR is expected to (a) improve procedures for balancing water demand and supply with water allocation; (b) increase water use efficiency in the Nile River Irrigation System; (c) improve procedures for assessing water resources potentially available for augmenting supplies; and (d) improve irrigation system management.

Under Objective 2, the MPWWR is expected to develop strategies, policies, and plans for improving water quality, reducing soil salinity and water logging, and increasing crop productivity per unit of land.

Under Objective 3, the MPWWR is expected to (a) enhance its capacity for policy assessment and planning; (b) expand public participation in policy dialogue; and (3) increase user involvement in planning and policy-making.

Taken together, these objectives are expected to enhance the ability of the MPWWR to develop strategies and implement policies and plans for balancing water supplies with water demands.

### **III. Policy Benchmarks and Technical Assistance: Implementation of the Water Policy Reform Program**

To assist the MPWWR in meeting the goals and objectives of the WPRP, USAID is providing financial support and technical assistance (TA). The TA is meant to assist the MPWWR in policy analysis and policy implementation. TA support is focused on mutually agreed upon policy benchmarks. Current (tranche II) benchmarks include development of a strategy or policy for: (1) optimal use of water in rice agriculture; (2) optimal use of water in sugarcane; (3) assessment of the irrigation improvement project program; (4) agricultural drainage water re-use; and (5) promotion of water users associations (WUAs) in non-IIP areas.

To date, the MPWWR has relied on the EPIQ TA team to assist in the identification of strategies and of policies for meeting these benchmarks. So far, the EPIQ TA team has carried out literature reviews and field visits, and it has gathered data and developed conceptual approaches for examination of issues surrounding each benchmark. Early draft reports on problems and issues are now, or will soon be, available for the irrigation improvement and the drainage water reuse benchmarks. The work completed in these areas to date is impressive. Because of staffing problems, work on water use in rice and sugarcane and on promotion of WUAs in non-IIP areas is only beginning.

Despite these important accomplishments, several problems have emerged in the implementation of technical assistance. Most importantly, because of a late start, much of the work of the EPIQ TA team has focused on the pressing need to meet tranche I and II benchmarks. This has diverted attention away from work designed to enhance the capacity of the MPWWR to identify strategic issues and to develop and implement policies and plans to address them. This is unfortunate, but it can be corrected.

There are two important objectives that need to be considered in the preparation and evaluation of the benchmarks. One is that policies designed to achieve the benchmarks should enhance the economic efficiency of irrigated agriculture, and/or improve broad (to be defined) social impacts, and/or protect, enhance, or sustain the quality of Nile waters. The second is to conserve Nile waters so that they can be transferred for use in irrigated agriculture in the Western Desert or Sinai. There should be full discussion between USAID, the MPWWR, and the EPIQ TA team on the overriding objectives and the tradeoffs required to satisfy each of the two objectives.

Economic efficiency requires evaluating the impact of pricing policies and trade policies on the present value of net economic returns of various cropping patterns (including rice and sugarcane). It might also include developing one or more mechanisms (such as cost-sharing or quantitative water allocations) for communicating to farmers the scarcity value of water. It would include evaluating the economic feasibility of IIP type projects (under a range of assumptions) and of developing water users' associations in non-IIP areas (again under a range of assumptions). And it would include comparing the present value of net economic returns to improving irrigated agriculture in the old lands (vertical expansion) to the present value of net economic returns of developing irrigated agriculture in new lands (horizontal expansion).

If the objective is to “save” water so that it can be transferred to new lands, then cost effective policies for doing this would be more appropriate. This might require, for example, (1) assessing IIP type projects in terms of their real water savings, and comparing the cost of those savings to the cost of alternative investments (such as drainage water re-use) that save water; (2) turning price and trade incentives against rice and sugarcane as a way of discouraging farmers from growing these crops; (3) focusing on the development of cost-sharing water users associations so that the MPWWR can allocate more of its resources to horizontal expansion and less to sustaining or enhancing the productivity of irrigated agriculture on old lands; (4) developing estimates of the costs (in terms of the present value of foregone net benefits) associated with various levels of water transfer from the Nile River Irrigation System to new lands in the Western Desert and Sinai; and (5) assessing what investments in irrigation infrastructure and in the management of that infrastructure will be necessary to sustain the present value of net benefits in irrigated agriculture in the Nile Valley and the Delta with different levels of reduced water allocated to these lands. In each instance it will be important to assess and evaluate the environmental implications and environmental costs of new policies designed to save water.

It is important that the EPIQ TA team, including the Policy Advisory Group (PAG), have discussions with senior policy-makers in the MPWWR to understand their priorities. The recent publication of several MPWWR Task Force reports prepared for the Minister on such topics as drainage re-use can be used as a starting point. An effort should be made by the EPIQ TA team, USAID and MPWWR not to miss any opportunities for dialogue on policy objectives and issues.

## IV. A Strategic Alternative

If the WPRP is to achieve its dual objectives of enhancing the capacity of the MPWWR to (a) identify the strategic challenges it faces and (b) develop cost effective strategies, policies, and plans to successfully meet those challenges, several changes are recommended. First, understanding on the objectives of policy change at this point in Egypt's history is required. Second, members of the EPIQ TA team, including the Policy Advisory Group (PAG), need to be working more collaboratively with researchers, analysts, and operators of the Nile River Irrigation System, and with policy-makers. This will insure that the EPIQ team will meet the strategic objectives of the WPRP and that the policy recommendations are developed in accordance with GOE and MPWWR objectives.

Two recommendations are proposed here. They are:

1. **Adoption of an overriding policy objective that recognizes both the government's political objective of horizontal expansion and the need to assess the economic, social, and environmental impacts of existing policies and of policy change on water use in the Valley and the Delta as well as in the Western Desert and Sinai.**

This can be accomplished by explicitly recognizing that an important issue currently facing the MPWWR is: **How can it reconcile demands for additional water to meet plans for expansion of irrigated agriculture in the Western Desert and Sinai with the need to protect the productivity and environmental quality of water used in agriculture in the Nile Valley and the Delta.** For the most part, tranche I and tranche II benchmarks can easily be analyzed this way. This is also consistent with what the Ministry has been and is trying to do.

From this perspective, the Ministry must develop short and long run strategies. In the short run, its task is to identify relatively low cost policies and practices (such as reducing area growing rice) for saving water for transfer outside the Valley and the Delta. But past some point, it will be increasingly difficult to meet demands for new water for horizontal expansion without either (a) sacrificing the productivity and environmental quality of water used in agriculture in the Nile River Irrigation System or (b) undertaking substantial investments in irrigation infrastructure and irrigation system management. **Stated this way, the strategic objective of current policy should be to identify the benefits, costs, and trade-off associated with a wide range of policies designed to meet expansion objectives, while protecting the productivity and environmental quality of water used in agriculture in the Valley and the Delta.**

2. **Developing a sustained process for engaging the EPIQ TA team, including the Policy Advisory Group (PAG), in dialog with policy-makers in the MPWWR. Elements of that process include:**
  - a. Holding of a workshop involving members of the **EPIQ TA** team, including the PAG, senior members of the MPWWR and representatives from USAID to (i) identify the strategic challenges facing the ministry; (ii)

begin the process of identifying strategies, policies, and plans for meeting those challenges; and (iii) define how senior members of the MPWWR and the **EPIQ TA** Team, including the PAG, will work together in ways that enhance the capacity of the MPWWR to identify the strategic challenges it faces and to develop strategies, policies, and plans to address them. This draft report could provide the basis for an initial workshop.

- b. Following this, work sessions should be held for the purpose of identifying tranche III benchmarks and the discrete set of analytical studies necessary to support the development of strategies, policies, and plans to meet strategic challenges those benchmarks embody.

Because the MPWWR, USAID, and the **EPIQ TA** team is in the midst of work on tranche II benchmarks, it is important that both of these recommendations be considered and acted upon soon.

## **V. Integrating the Policy Advisory Group (PAG) into the WPRP**

An important aspect of the EPIQ TA accompanying the WPRP is reliance on a small but experienced group of senior policy advisors (the Policy Advisory Group or PAG) to assist both the larger EPIQ TA team and the MPWWR in strategic thinking, in the choice of studies to be undertaken, in the completion of those studies, in seminar and roundtable discussions of policy options, in preparation of benchmarks, helping to achieve these benchmarks and laying out and explaining policy reform concepts to senior MPWWR officials.

## **Annex A: PAG Member Activities**

In what follows, the next steps for engaging members of the PAG are outlined.

### **A. Dr. Robert A. Young**

#### **1. Analytic study to develop strategy for managing rice production and associated water use**

With the partial liberalization of Egypt's agricultural policies, farmers have been free to plant which crops they wish. The price of rice has been favorable -- helped by government policies -- while neither a quota nor a charge for excess water use is in place to discourage rice planting. A consequence has been that the area planted to rice -- mainly in the well-adapted heavy soils in the northern Delta -- has expanded to nearly 1.7 million feddans, which is more than double that preferred by the MPWWR. Because of the heavy demands for water by rice, the area currently planted to rice brings about a demand for water that taxes the capabilities of the water delivery system and what some regard as an excessive use of Egypt's scarce water supply on a non high-valued crop.

One obvious potential strategy for managing the amount of water used for rice irrigation is liberalization of rice pricing policy. Others might include regulation or taxation of rice production area. Still another approach to reduce area under rice might focus on water management strategies such as limiting water supply, pricing water or imposing a tax on "excess" water use.

Evaluation of alternative strategies conclude: first, review the policy environment for rice production and marketing; second, study the costs and returns to production of rice (and competing crops such as cotton and maize) under alternative price and policy scenarios; third, estimate the diversion and consumptive use of water for rice and competing crops; fourth, employ the cost and return and water use studies and the Agricultural Sector Model-Egypt to assess the economic and water use tradeoffs; fifth, consider the costs of implementation and enforcement of alternative policy options; and sixth consider possible "social" factors on why farmers prefer to grow rice.

#### **2. Analytic study to develop strategy for managing sugar production and associated water use**

The GOE has long had a policy to assure a significant degree of self-sufficiency in sugar production. Because sugar cane is produced in the hot climate of Upper Egypt and is in heavy vegetative state the year around, it is a high consumer of water. It has been suggested that substituting sugar beets grown in the Delta area for sugar cane -- perhaps by removing the subsidy for cane production together with encouraging investments in sugar beet processing capacity -- could yield as much sugar but with less water. Such a step would involve costs: investments in new sugar processing capacity as well as the closure of existing (admittedly older technology) cane mills, with associated employment and income effects in the cane producing regions. A

study of the strategy for sugar production would involve several steps: first, review the GOE policy on sugar; second, analyze the farm-level costs and returns to sugar beet and sugar cane production and that of other crops to replace cane and compete with beets; third, estimate the costs of providing new beet processing capacity in the Delta; fourth, estimate the social costs of closing existing cane sugar mills and the displacement of sugar mill workers; fifth, estimate the consumptive use of water for cane and a full year rotation including beets; and finally, consider the costs and problems of implementing a strategy emphasizing beet sugar.

### **3. Tranche III benchmark development**

As the MPWWR and USAID engage in tranche III benchmark development, Dr. Young will participate as time permits.

Suggested economic analyses to consider in support of Tranche III benchmarks include (in no particular order of priority):

- Economic evaluation of proposed irrigation improvement project program;
- Economic evaluation of proposed drainage water reuse plans, including estimated economic damages associated with using such waters for irrigation;
- Estimation of the costs of lifting deep ground water from the Western Desert and also of moving such waters to the Nile Valley;
- Irrigation cost recovery;
- Impacts of reduced quantities and qualities of drainage water on fisheries and aquaculture in northern lakes;
- Approaches to dealing with M & I sewage effluents.

Dr. Young will participate in the completion of these studies by consulting with the resident team by E-mail and fax on request and by engaging in two-week TDYs every two to three months. His first return trip will be approximately April 20. A second return trip will occur in late June.

## **B. Dr. Jack Keller**

### **1. Agricultural Drainage Water Reuse and Irrigation Improvement**

The Tranche II benchmarks for drain water reuse and irrigation improvement call for recommending policies and new (or the policing of existing) regulations that will promote drainage water re-use and irrigation improvement by using appropriate incentives and technical support. It is implicit that the policies for drain water reuse and irrigation improvement should result in: conserving water that would otherwise be lost to pollution or salt sinks; protecting human health; improving the environment; assuring the sustainability of the irrigation system; and sustaining or increasing the productivity of irrigated agriculture.

The elements of policy recommendations in both areas should address:

- private sector participation;

- public sector participation;
- MPWWR rules and regulations governing drainage water quality and irrigation improvement;
- MPWWR rules and regulations governing charges or incentives for re-use and for irrigation improvement; and
- required changes in the present institutional setting for both drain water reuse and irrigation improvement.

The necessary information for developing the criteria implicit in the above elements is not available. Therefore, at this stage policy recommendations can only provide a framework for recommendations and suggest how best to obtain the necessary information.

## **2. PAG Work Plan for IIP and Drainage Reuse.**

The first stage of the work plan for Dr. Keller will be to meet with the respective WPRP Teams and develop an outline of the respective frameworks for policy recommendations. This will be followed up by a two week TDY beginning in early March to work with the respective Teams in fleshing out frameworks and the necessary background materials for them. A second TDY will follow the March TDY in two months to consolidate the findings and to help develop draft statements for the two policy recommendations.

Dr. Keller will coordinate and work closely with Dr. Allam in both of these areas.

## **3. Tranche III benchmark development**

Dr. Keller will coordinate his visits and interactions so that he can contribute to tranche III benchmark developments.

### **C. Dr. Mohamed Allam**

#### **1. Drainage Reuse and National Strategy for Irrigation Improvement.**

The TA teams in both of these areas have carried out extensive and excellent literature reviews of Egypt's experiences in these areas. They have also made important field visits to selected sites. And they have completed a draft study of all of the issues to be addressed in developing policies for drainage reuse and for a national strategy for irrigation improvement.

The next step in the process is to work with the teams and with Dr. Keller to develop criteria for evaluating alternative policies for a national strategy for irrigation improvement and for drainage reuse. For irrigation improvement, criteria to be considered include: (a) whether the area to be improved lies over a salt sink; (b) the net benefits in particular mesqas; (c) impacts on equity; and (d) the impact on environmental quality. Criteria for assessing drainage reuse include: (a) the environmental impact; (b) the cost of mitigating the damage of polluted drain water and of drainage reuse; (c) the possibilities of private sector participation; and (d) the role of the

MPWWR.

Following development and acceptance of criteria for evaluating alternative policies for implementing a national strategy for irrigation improvement and for drainage reuse, attention will have to turn to developing alternative strategies for implementation. Candidates for consideration for irrigation improvement include: (a) privatization of mesqa level improvements; (b) providing support to water users associations to help overcome market, information, and coordination failures associated with developing collective action solutions to mesqa level irrigation problems; and (c) continuing the current level of government support for irrigation improvement. Candidates for drainage reuse implementation strategies include: (a) private sector participation and (b) public sector management.

Dr. Mohamed Allam will assist the drainage reuse and irrigation improvement teams in the development of criteria for assessing policy change and for identifying a range of appropriate policy choices for evaluation. This will require several intensive (one to two week at a time) work periods with the teams. Up to four such periods will be planned between mid-February and mid-June.

Dr. Allam will coordinate and work closely with Dr. Keller in both these areas.

## **2. Tranche III benchmark development**

Dr. Allam will participate in tranche III benchmark development. This includes participation in the February 25-26 APRP workshop on this topic.

## **Dr. Mike Rock**

### **1. Increase MPWWR knowledge and capabilities to analyze and formulate strategies, policies, and plans related to integrated water supply augmentation, conservation, and utilization, and the protection of Nile water quality**

Dr. Mike Rock will assist the EPIQ TA team to better understand current policies in this area; the state of development of policy change in this area, and how water policy is made in the MPWWR and the GOE. Definitive TA support by Dr. Rock will be developed around this effort in consultation with USAID and MPWWR.

## **2. Technical Management Support**

Dr. Rock will contribute to the EPIQ TA team by (a) participating in discussions in the broader APRP program around analytical agendas and the benchmark process; (b) participating in discussions within the EPIQ TA team and in the MPWWR on analytical agendas and benchmark development and setting; and (c) participating in all major workshops, seminars, and roundtables associated with the APRP and the WPRP.