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**Egypt Water Policy Reform**  
**Contract No. LAG-I-00-99-00017-00**  
**Task Order 815**

**PRIVATE SECTOR PARTICIPATION IN EGYPTIAN  
WATER MANAGEMENT**

Report No. 70

June 2003

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**PRIVATE SECTOR PARTICIPATION IN EGYPTIAN  
WATER MANAGEMENT**

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## Acronyms

AI	Anchor Investor
APRP	Agricultural Policy Reform Project (USAID)
BCWUA	Branch Canal Water Users Association
BCWB	Branch Canal Water Board
BOO	Build, Own, Operate
BOOT	Build Own Operate Transfer
BOT	Build Operate Transfer
CARANA	Corporation implementing <i>Partnership for Competitiveness Agreement</i> (USAID)
EPADP	Egyptian Public Authority for Drainage Projects
ERSAP	Economic Reform and Structural Adjustment Program
ESA	Employee Shareholder Association
EWUP	Egypt Water Use and Management Project (USAID)
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GOE	Government of Egypt
HC	Holding Company
IAS	Irrigation Advisory Service (MWRI)
IMT	Irrigation Management Transfer
IPO	Initial Public Offering
MALR	Ministry of Agriculture and Land Reform
MHUUC	Ministry of Housing, Utilities, and Urban Communities
MOFT	Ministry of Foreign Trade
MWRI	Ministry of Water Resources and Irrigation
NGO	Non-Governmental Organization
PIP	Privatization Implementation Project (USAID)
PSP	Private Sector Participation
PWLRHC	Public Works/Land Reclamation Holding Company
SOE	State Owned Enterprises
USAID	United States Agency for International Development
WPRU	Water Policy Reform Unit
WUA	Water Users Association



# **1. Introduction**

## **1.1 The Challenge**

It is the policy of the Government of Egypt (GOE) to promote increased private sector participation in the country's economy. In any economy there are roles that necessarily devolve to the public sector, such as establishing legal and regulatory frameworks for various economic activities. There are other roles that almost always fall to private entrepreneurs, such as the retailing of consumer goods. A multitude of other roles lie between these two poles and have been assigned either to the state or to the private sector by different societies at different times. In countries with a significant socialist legacy, the balance is often weighted toward the public sector, even for functions which could more efficiently be handled by the private sector (within an appropriate regulatory framework).

Programs have recently been mounted in many such societies to increase private sector participation (PSP) and to achieve a more efficient allocation of functions between public and private sectors. Such programs typically have components that address investment and ownership of infrastructure and productive facilities on the one hand, and their management on the other. Privatization of government-owned companies is an example of the first category, and a contract for managing a public utility, such as a water supply system, an example of the second. So-called BOOT projects combine elements of both.

Egypt has had an active program of economic reform and structural adjustment since the early 1990s. The United States has provided important technical and financial support for selected elements of this program. The GOE's PSP program involves divesting public sector enterprises, drawing in private investment capital and expertise, and involving the private sector in service delivery and management. In the water resource sector, this stream of effort joins another which also has a long history of Egyptian/American cooperation – the long-standing effort of the GOE and the Ministry of Water Resources and Irrigation (MWRI) to improve the quality and efficiency of water management and drainage in the country's irrigated areas. USAID has been an important partner in this effort since the late 1970s. These two streams converge in the challenge of applying the tools and incentives of PSP to the historically-public sector activity of water resource development, improvement, and management.

## **1.2 Purpose and Plan of Paper**

This report presents results of a study of opportunities for delivery system privatization, comprising Component 4 of the USAID Water Policy Bridging Activity. It reviews the current policy framework for private sector involvement in the sector and the outcomes of those policies to date. It also explores new approaches to the challenge of increasing PSP in the Egyptian irrigation management sector. In doing this it draws on international experience with privatization programs, while remaining grounded in the Egyptian context and recent Egyptian experience with irrigation reforms.

The objectives of the study are the following.

1. To describe the current policy context of PSP in Egypt
2. To assess strengths and weaknesses of existing pilot privatization activities

3. To identify new approaches to privatizing irrigation management

This report will only summarize or highlight many of the topics it touches on, as the scope of the overall topic is very broad. It will be reviewed in draft by Ministry and USAID officials and will be presented at a workshop reviewing results of all of the components of the Water Policy Bridging Activity in June 2003. Following revision, it will be incorporated into the final report of the Activity.

## 2. Overview of Private Sector Participation

### 2.1 What is Private Sector Participation?

Global economic events of the past 10 years have discredited central control of economies and established the overall effectiveness of market-based production systems. This has stimulated scores of countries around the world to expand the role of private sector in producing and providing goods and services for its citizens. Private sector goods production and service provision promises a number of benefits, including the following<sup>1</sup>.

- Lower costs of production
- Increased productivity
- More innovation
- Mobilization of private capital
- Higher quality goods and services
- Expanded markets and larger outputs
- Greater overall economic activity

**Privatization** for all its perceived benefits, comes with numerous challenges especially in developing countries. The change from state to private ownership brings with it a period of change and dislocation. In order for a country to successfully attain the benefits of privatization, it must be aware of the potential obstacles and have a comprehensive plan for addressing them. An appropriate enabling environment, consisting of specific institutional and macroeconomic factors, is necessary to reap these rewards. Legal and regulatory frameworks that encourage competition and free entry into the market place are essential institutional features to allow privatization to succeed. Macroeconomic factors such as a competitive market structure, a well-developed financial sector and capital markets, and a system of property rights, are also key to the privatization process. In addition, a politically acceptable means to retrain and absorb excess labor in newly-privatized firms is needed.

What is it about the private sector that leads to these advantages? Why should the way that production is organized matter so much when similar resources and technology are employed?

In general, the positive features relate to the incentives which operate on a whole range of people involved in the production and consumption of goods and services, including capital owners, managers, sales persons, workers, and consumers. Incentives that operate in a private sector context tend to encourage behavior that leads to these outcomes.

*Capitalists* who risk their own money tend to be hard-nosed in assessing risks and the potential for return for alternative investments. They also have strong incentives to control production costs and market their outputs aggressively. Those who manage capital on behalf of the public, i.e. public managers investing government money, do not experience these incentives since the risks they undertake do not affect them so personally.

*Managers* whose salary and job security depend on enhancing a bottom line, i.e. the profitability of the company that employs them, have much stronger incentives to make hard but necessary decisions than public officials who stand to gain little and lose much from taking risks.

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<sup>1</sup> There are also drawbacks to be considered also, including equity and assurance of services to the poor, externalities including off-site environmental impacts, and asymmetries of information and power between companies and consumers. Thus arises the need for appropriate regulatory frameworks.

*Workers* and sales people whose continued employment depend on meeting managers' expectations work harder and smarter than those who have a lifetime guarantee of wages, as long as they don't rock the boat.

*Consumers* who can influence sales and profits of a company by choosing to purchase (or not) a company's products or services exert a strong controlling influence on the price and quality of those goods and services. Consumers who have only limited choices and who do not support the producer with payments, have no influence over the producer, who, in turn, feels no pressure to improve shoddy and inefficiently produced goods.

Results of efforts to expand private sector participation in economies have varied widely – both among countries and across sectors. Variation among countries depends on a whole host of factors including quantity and quality of human and social capital, natural resources, infrastructure, and levels of corruption in the society. Variation among sectors depends on these overall factors and on the characteristics of the particular sector, including the extent of possible competition. In the remainder of the paper, we examine the case of service provision in large-scale canal irrigation systems. These are often, though not always, created and managed in the public sector. The potential for utilizing private sector organization and incentives in this sector is our topic. Note that the definition of private sector involvement, or private sector participation (PSP) is broader than the traditional notion of a profit-making business venture. Here PSP refers to the reduction in the role of a government body in developing, arranging, and providing (water-related) services, accompanied by a corresponding increase in the role of business and civil society organizations in doing these things.

## **2.2 The Private Sector and Irrigation**

How do the abstract benefits of privatization translate into benefits to the canal irrigation sector?

Firstly, privatization can lower the costs of service provision to the government. By shifting management responsibilities outside the public civil service, payrolls can be cut and government expenditures on other O&M costs eliminated. Of course achieving a net financial gain in this way assumes that these expenditures exceed the cost of the irrigation fees collected from water users, but this is generally a safe assumption. The corollary to this is that the costs of irrigation service to water users may increase. This is not always the case, and depends on the efficiency gains which private sector management may achieve. But where cost recovery by the government was low, the cost to farmers is likely to rise. This has the positive economic effect of shifting the burden to paying for irrigation services to those who utilize the services.

Secondly, the quality of irrigation service can increase. The reasons for this relate to the incentives mentioned above. Where a public bureaucracy will usually have little incentive to make extra efforts to provide high quality (adequate, timely, reliable, responsive) service to farmers and will stand to lose little if they fail to do so, private providers will often have strong incentives to make the extra effort. Improved service quality not only has direct

effects on higher average yields in the command area, but can also have important secondary effects in inducing shifts to higher value crops and increased input use.

Thirdly, under some circumstances, privatization can mobilize private capital to construct, rehabilitate, or modernize irrigation facilities. Willingness of private operators to do this depends of the profit potential of the system, the degree of deterioration, the cost of improvements, and the duration of their franchise or lease. It must be recognized that private investors also look to invest in other sectors and will weigh the degree of risk and financial return among alternative opportunities. Irrigation investments must be competitive in this regard to attract private capital.

### **2.3 Types of Private Sector Involvement**

An obvious difficulty here in seeking to take advantage of private sector incentives is that canal irrigation has the characteristics of a natural monopoly. A natural monopoly is one in which the investment required is so large that it would not be profitable for more than one provider to operate. Another characteristic is that the costs of producing the good or service declines with scale. Thus the bigger the system, the lower the unit costs of provision tend to be. There is and can be only one High Aswan Dam. And the cost of duplicating the existing canal distribution system in the Nile Valley would obviously be prohibitive. Hence a competitive free-market situation, in the traditional sense, where several suppliers vie for customers with each other, like bicycle sellers in the market, is not possible in this case. Does this mean that State management of canal irrigation is the only option? Fortunately, the answer is “no.”

There are a number of possible private sector options for use in improving management of canal irrigation. These include the sale of the infrastructure to a private party, a management contract to operate the infrastructure on behalf of the public sector owner for a specified period of time, a franchise to use the public assets to operate an enterprise, and client operation of the infrastructure to provide services to the client group itself. In addition a variety of private sector options are available for mobilizing private capital and expertise in building plant and infrastructure for providing goods and services in a public sector. These options, e.g. BOOT, BOT, BOO, and so on, have been employed extensively in other sectors but to a very limited degree in water resource development and management. We will discuss some of these options later in the context of power generation, transportation, and other sectors in Egypt, as well as for the so-called mega-projects in the water resource sector.

#### **2.3.1 Sale**

The simplest option, conceptually, is the sale of an irrigation asset to a private party. The private party then operates, maintains, and improves the asset, either for the benefit of the owners themselves, or as a profit making enterprise supplying irrigation services to others. In the latter case, the primary problem becomes that of regulating a monopoly service provider to ensure that service quality is adequate and to prevent price gouging.

An example of a sale of assets is the privatization of tubewells in the Pakistani Punjab. Here state-run wells, constructed primarily for water table control, have been sold to groups of

farmers to operate to supply supplemental water to their farms. Regulation, in this case, is provided by the internal dynamics of the group of farmers operating the well, and by the fact that there are alternative source of water available which compete with the tubewell supply. These alternatives include smaller private tubewells and canal water.

Other examples are found in the Philippines and in the United States. In the Philippines, small pump and gravity facilities constructed by the government have been completely transferred to farmers' associations to operate for the benefit of their members. Repayment in on concessional terms over 40 or 50 years.

In the United States, the Bureau of Reclamation is slowly turning over title of facilities it has constructed to irrigation districts once all construction loans have been paid off.

### **2.3.2 Management contract**

Management contracts are awarded to private firms by the governing body of an irrigation system. Contracts are for a limited period and specify standards of service quality and maintenance which must be achieved. In exchange the organization owning the system pays the firm a predetermined fee. Key features of this type of arrangement are that the governing body must monitor carefully to insure that the terms of service called for in the contract are met, and that the operating firm is contracted for a set fee and does not bear the financial risk involved in system operation and cost recovery.

Management contracts are used extensively in operating municipal water supply systems, but are uncommon in irrigation. Some schemes in France are operated under management contracts, and others under the franchise (affermage) system described below. At times, irrigation is a component of a larger enterprise which is operated under a management contract. The state-owned sugar estates in Guyana are an example. There both cane production, which involves extensive irrigation, and milling are managed for the public company, GUYSUCO, by a British firm, Booker Tate, under a management contract.

### **2.3.4 Franchise**

A franchise is awarded to a private firm giving it the use rights to public irrigation facilities and a water supply. In exchange for a specified payment to the owner of the facilities, the firm provides irrigation service and collects fees from users for the service. Franchises are sometimes awarded competitively and are usually subject to renewal after a specified period, offering an incentive to provide good service. A key difference between a management contract and a franchise is that under the former, risk is born by the owner of the facilities, while a franchisee bears the financial risks of service provision and revenue generation to turn a profit.

A franchise arrangement sometimes has additional conditions attached to it, such as the responsibility to invest in upgrading system facilities. This mechanism for mobilizing private capital for improving urban water supply systems is of growing importance in many countries around the globe, but is as yet little used in irrigation. China is an important exception (Johnson, 2001)

### **2.3.5 Client Provision**

Client provision is where the users of irrigation service group together to manage the provision of that service to themselves. Of the private sector alternatives to state management, this one is presently the most common. Most Irrigation Management Transfer (IMT) programs aim at this type of privatization.

Prime examples of client provision of irrigation services can be found in the United States, where it has been public policy for 100 years, in Australia, Turkey, Mexico, and Nepal. Examples are given in the boxes on Turkey and Mexico. In Nepal, client provision takes two forms. One is an ancient one, in which farmers band together to both construct and operate small irrigation schemes in narrow and remote mountain valleys. In the other, this tradition is being adopted to transfer management of the larger schemes of the country's southern plains to water user associations.

### **2.4 Unbundling Services**

Where a full range of irrigation and drainage services are bound up in a single bureaucratic structure, there may be advantages in unbundling them. Unbundling infrastructure services can improve accountability and foster a more transparent and, in some cases, competitive environment in irrigation and drainage.

By isolating the natural monopoly segments of an industry, unbundling promotes transparency and accountability in segments that are potentially competitive. Failure to unbundled can relegate an entire sector to monopoly provision even when some activities can be undertaken more cost effectively on their own. Plusses of unbundling are that it improves management accountability, makes cross-subsidies between different lines of business more transparent, and identifies more precisely the subsidies needed to deliver services to the poor.

Vertical unbundling separates a chain of services into its individual links, with one organization serving as bulk water supplier and another as a farm service provider. These can be different types of organizations, e.g. a department or authority at the wholesale level with a district or association at the retail level. Another possibility is that a federation of local service providers can act as bulk water supplier to its member districts. This model has been employed in the Philippines, Mexico, and China, and is of growing importance in California and other states in the American West. The steps taken by Pakistan in the process of unbundling the irrigation system in the Indus Basin indicate the magnitude of the undertaking.

Horizontal unbundling separates activities geographically, allowing for better performance comparisons and therefore more efficient regulatory monitoring. In Mexico, for example, there are 82 irrigation districts with separate organization, accounting services and representation of users, while in Victoria, Australia there are 6 irrigation areas with their own administration and Water Service Committees. Another type of unbundling results from outsourcing by an ISP of particular functions to other entities, which may be private firms, NGOs, or government agencies. Functions sometimes outsourced include accounting, fee

collection, specialize maintenance, emergency repairs, design, construction, rehabilitation, and training.

Not subject to contracting out are organizational governance functions. These functions embody control of the ISP and will always be performed by those with the mandate to control. This is why governance functions are the key to organizational classification and should be the primary focus of restructuring efforts. Performance functions are important, but can be handled in a great variety of different ways – always under the control of the governing body. The first step is thus to “get the governance right” and then to design the service delivery mechanism based on principles of comparative advantage and economy.

Unbundling also has drawbacks. Even where available technology permits unbundling, the legacy of history and institutions may limit the possibilities for change. Attempting to force activities that are closely interdependent into distinct boxes can also increase transaction costs, as the coordination once achieved smoothly within a single entity becomes more difficult and costly when handled between entities. The disastrous British Rail experiment demonstrates this. Having many small separate vertically-linked monopolies, each charging a markup over costs, may result in higher charges than with a single, vertically integrated organization. However economies of scale also operate within the divided entities. In Japan, for example, water user associations with irrigation area of more than 1,500 hectares have reported higher efficiencies and lower costs than smaller associations. Similarly, in Mexico WUAs of less than 2,000 hectares have combined to achieve economies of scale with respect to fixed costs.

## **2.5 Enabling Conditions for Private Sector Participation**

In the move from a government monopoly to an unbundled, more transparent system, enforceable contracts are required to balance the interests of various parties and to provide the stability needed for long-term investment. Also required are comprehensive, transparent, and nondiscriminatory rules of the game. Although basic institutions must exist and be enforceable, experience has shown that the move to unbundling need not wait for the rules to be embedded in a fully developed statutory regulatory system.

### **2.5.1 Legal Framework**

Water sector reforms can rely on existing legislation as an enabling basis, as in Turkey (Svendsen and Murray-Rust, 2001), or can be built around new purpose-designed legislation and authority, as in the case of India (Svendsen and Huppert, 2000). Which path is chosen depends on the nature of the existing laws, the flexibility planners are allowed in interpreting existing laws, the difficulty of putting in place new legislation, and the scope of the proposed reforms.

For example, transferring irrigation O&M for the 112,000 hectare Alto Rio Lerma Irrigation District in Mexico to farmer control was embedded in a economic and water reform that involved creation of 11 WUAs with professional irrigation staff, negotiation of a concession agreement between each of the modules and CNA, and provision of extensive training programs on O&M and financial management(Kloezen, et al, 1997). Similarly, in Pakistan, where reform is now under implementation, as long as institutional reform was limited to

formation of WUAs at the level of the watercourse command area served by a single turnout, the Canal Act of 1857 was legally sufficient. However, once institutional reform began to move up the tertiary canal to form Farmer Organizations, Area Water Boards, and Provincial Irrigation and Drainage Authorities and to reorient the national Water and Power Development Authority, numerous institutional changes, including new legal acts, were required (Anonymous, 2000). Successful institutional reform as instituted in China, Mexico, Australia, New Zealand, Chile, India (Andhra Pradesh) Argentina, and Albania have employed new laws to legalize the changes being made. Countries in the former Soviet Union, such as Kazakhstan, Kyrgyzstan, Romania and Bulgaria are all now in the process of drafting new WUA laws, and in some cases national water laws.

An interesting hybrid approach is being followed in Turkey. There a rapid and sweeping IMT program was implemented using existing legal authority beginning in 1994. Several years later, with 70 percent of the State-run irrigation in the country transferred to local control, a process of developing a new irrigation association law was initiated which included the active involvement of the new irrigation associations. The new legislation was designed specifically to remedy deficiencies in existing law which became apparent during implementation. The law is now making its way through the legislative and political systems.

### **2.5.2 Capacity of Supporting Institutions**

Successful institutional reform requires not only changing the system on paper but implementing and enforcing the provisions of new legislation and regulation. This is done through institutions capable of supporting the intended changes (Vermillion and Sagardoy, 1999).

One of the most basic supporting institutions required is respect for property, entitlements, contracts, and agreements. This respect includes such things as water rights, contracts for water service, agreements with suppliers, and leases of equipment. Respect for these arrangements requires a reasonably impartial legal system to adjudicate disputes, mechanisms to enforce settlements, and widespread access to affordable legal representation.

For example, countries are often encouraged to establish a system of water rights to give the users more security. But agricultural water rights are very difficult to specify and allocate and even more difficult to adjudicate and enforce. Countries such as Chile, Mexico, and the Philippines have found it much more difficult than expected to establish functional national registers of water rights. And having established a register, it may be difficult to find a suitable organization for enforcing settlements. Spain has established a special system of water courts for adjudicating water conflicts. Specialized water courts tend to work better than the regular courts, since the former are often clogged with pending cases and unfamiliar with water issues. Moreover, rural water users may have little faith in the formal legal system since it has so often been manipulated against them.

A second set of essential institutions are those which provide transparency for public, corporate, and NGO decision making. Corruption, mismanagement, and favoritism all flourish in dark corners away from public scrutiny. Institutions which mandate and enforce

public disclosure of contracting, financial records, hiring and firing, adjudications, and similar practices are essential in facilitating democratic processes, local control, and efficiency. The basis for such institutions are laws which open public records to public examination, expectations on the part of farmers and others of access to such records, a free press at both national and local levels to publish such information, a tradition of investigative journalism to bring excesses to light, and NGOs and other advocates to push for openness and transparency. A third important set of institutions comprises external organizations which support ISPs in a variety of other ways. These include a competitive private sector which can be tapped for engineering services, accounting services, audits, equipment rental, and so on.

### **2.5.3 Rights to Water and Facilities**

Rights to water is emerging as a key issue in the ongoing discussion of restructuring irrigation institutions (Svendsen, Trava, and Johnson, 1997). Historically in most developing countries, water resources have belonged to the State. State agencies such as Ministries of Water Resources and Departments of Irrigation have been assigned responsibility for diverting water from natural sources and delivering it to users such as municipalities, industry, and irrigation systems. Control of water resources is directly in the hands of the government, and regardless of whether there is a formal system of water rights, the State retains the de facto right to abstract and allocate water. Irrigators have no control over the resource until it is delivered to their farm outlet. A similar situation of State ownership exists with respect to infrastructure used to divert water from the source and convey it to users. Formal water rights do not exist in many developing countries, but this is not so important while State agencies are responsible for diverting, managing and delivering water through State-owned infrastructure to end users.

This situation changes significantly once the State begins to assign portions of this responsibility to other organizations. Now there is no longer a single chain of control from source to user, and water may change hands several times in the process. Linking the parties are agreements that specify the water supply obligations of the provider. In addition, new financial responsibilities are being thrust on both the middlemen and on end users to pay for water and often to pay for construction and rehabilitation of water delivery facilities. And a growing involvement of private firms in both constructing and operating irrigation facilities is expected. All of these changes will be difficult to implement without a more formalized system of water rights and institutions to protect those rights. Some changes, such as private sector involvement, will likely prove unworkable in the absence of rights-based guarantees.

Without a firm guarantee of water supply and access to distribution facilities, users will generally be unwilling to invest their own resources of time and money in creating a strong user association. Likewise, without a clear and transparent recognition of ownership, users will be unwilling to invest in maintaining existing infrastructure, much less in upgrading irrigation systems by lining canals or installing new gates (Johnson, et al, 2001).

- Rights to water are actually a bundle of rights (Meinzen-Dick, 2000). These include:
- Rights to use the resource
- Rights to derive income from a resource

- Rights to change a resource
- Rights to transfer the resource to others

Not all of these rights must be involved in a rights allocation and registration scheme. For example, rights to use and to derive income from a resource could be specified initially, while rights to change the resource and to transfer it could be frozen until a later stage, as we presently see in the land market in many of the former Soviet countries. Moreover, it is not necessary to assign water rights to individuals directly. In many countries with well-functioning rights systems, rights are held by an organization, such as a WUA, on behalf of involved individuals. These arrangements have proven successful when agreements provide long-term security (10-20 years) but have failed when they only provide short-term (1-3 years) rights systems.

Experience has shown no particular benefit to a permanent transfer of rights to either water or ownership of facilities. What is important is that there be a clear contractual agreement assigning the appropriate rights to users for an appropriate period of time.

### 3. Private Sector Participation in Egypt

Privatization is a worldwide phenomenon and has become a central feature of economic policy in both developed and developing countries. Over the last decade, many governments have introduced privatization programs designed to reduce the role of the public sector and expand the role of private market-based institutions. During the last 10-15 years, privatization of state owned enterprises (SOEs) has been occurring at an increasing rate, especially in developing countries. Divestiture is at the heart of the adjustment and reform programs being adopted under the supervision of the World Bank and the International Monetary Fund. This shift, according to Martin and Parker (1995), stems from dissatisfaction with the record of state ownership and from a belief that private ownership will bring substantial economic benefits.

#### 3.1 Economic Reform and Structural Adjustment Program

In 1991, the Egyptian government embarked on an Economic Reform and Structural Adjustment Program (ERSAP), designed with the assistance of IMF and the World Bank. The transfer of state owned enterprises (SOEs) to the private sector was perceived as the cornerstone and the most challenging component of the economic reform program (Khattab, 1999).

In 1998, Egyptian President Hosni Mubarak and U.S. Vice President Albert Gore signed a *Partnership for Competitiveness* agreement between the U.S. and Egypt. The primary focus of the agreement was to "...increased privatization of the Egyptian economy, which will lead to increased competitiveness." As noted in the agreement's *Results Package*, "Improvements in the efficiency and competitiveness of domestic enterprises will generate the trade and investment that the economy needs to realize sustainable growth in the long term."

The privatization program in Egypt is twofold. The first of its elements involves divestment of public sector holdings in production and manufacturing. The second consists of encouraging private sector participation and investment in sectors traditionally controlled and operated by the public sector, e.g., electricity, roads, airports, ports, and oil and gas transmission.

Five different methods of privatizing ownership and investment are being employed in the public sector holdings divestment.

- **Initial Public Offering (IPO):** The transfer of ownership and control of state-owned enterprises to the private sector through a partial or full public share flotation on domestic or foreign stock exchanges in the form of Global Depository Receipts (GDR). This method was favored by the government in the early phases of the program. IPOs have proved less costly, swift and less complicated than other methods. Having a direct positive effect on the revival of the capital market, this method was the rational choice of the government.
- **Anchor Investor (AI):** Direct sale of a controlling interest to a domestic and/or foreign strategic investor. The sale to an anchor investor allows the transfer of new technology, and halts the accumulation of unproductive debt and inventory.

Nevertheless, this method has relaxed pressure on the government to address redundant labor and outstanding debt issues.

- **Employee Shareholder Association (ESAs):** Direct sale of a controlling interest to employees, leading to improved labor management, productivity and profitability. Having employees as shareholders affects the company's productivity positively.
- **Liquidation:** Liquidation of non-profitable companies that have no potential for reform or restructuring; halts continued operating losses and accumulation of debt.
- **Project finance contracts** (Build Own Operate and Transfer- BOOT) have been introduced as an alternative method encouraging private sector participation in constructing and renovating large-scale infrastructure projects.

The second thrust of the program involves encouraging PSP in infrastructure and utility services. The GOE started its privatization process in the industrial sector. Other countries have begun the process by concentrating on infrastructure and public utilities as a first priority, attracting large amounts of Foreign Direct Investment (FDI). Egypt has now begun to aggressively encourage PSP in the infrastructure and public service sectors. Two broad approaches are envisioned. Firstly, employing project finance or limited recourse financing as a means of channeling private sector capital and participation into large-scale infrastructure projects. This element is well advanced. Secondly, contracting qualified private sector companies to operate public utilities and other public service monopolies. Outside of BOOT-type projects, this element lags.

## 3.2 Laws and Regulations

### 3.2.1 Public Sector Law (Law 203 of 1991)

*The Public Sector Law* and its *Executive Regulations* represent the first step towards privatization of public sector companies in Egypt. Under the old public sector law (Law 97 of 1983), it was prohibited to sell public sector companies except to other public sector entities. Under the 1991 law, private companies and individuals have the chance to subscribe to or purchase shares in the subsidiary public sector companies. By issuing this law, public sector companies were rendered as independent economic entities, and a framework for their management was established comparable to that of the private sector. Prior to 1991 public companies functioned like governmental authorities and were companies in name only. Since the issuance of Law 203, the Ministry of Public Enterprises (MPE) has had responsibility for overseeing the privatization of the set of state owned enterprises known as "Law 203 companies." The Ministry made a *début* with a portfolio of 314 companies distributed among 17 government Holding Companies (HCs). To expose these companies to free market conditions and to facilitate their privatization, the government abolished credit guarantees from national budget and foreswore additional investment financing. Excluded from Law 203 coverage were public enterprises in the financial sector, public utilities, and transportation sectors. Public corporations and joint ventures in these sectors, to the extent that they are privatized, are to be handled on an *ad hoc* basis, under the authority of the

involved Minister and, generally, with the concurrence of the Prime Minister and the President.

### 3.2.2 Capital Market Law (Law 95 of 1992)

The Capital Market Law was issued to regulate the stock market and introduce a framework for trading. Until the late 1980s, the Egyptian Stock Market was not prepared to execute privatization transactions, which constituted a serious constraint. The law regulates the establishment of and norms for investment funds in Egypt. It also regulates the establishment, operation and monitoring of brokerage firms by the Capital Market Authority, as well as the operation of portfolio management, share promotion, and underwriting firms, among others, which are essential for the success of privatization programs. The law also introduced the idea of Employee Shareholder Associations (ESAs) for public and private enterprises and their establishment as independent entities.

### 3.2.3 Joint Venture Companies (PD 341 of 1996)

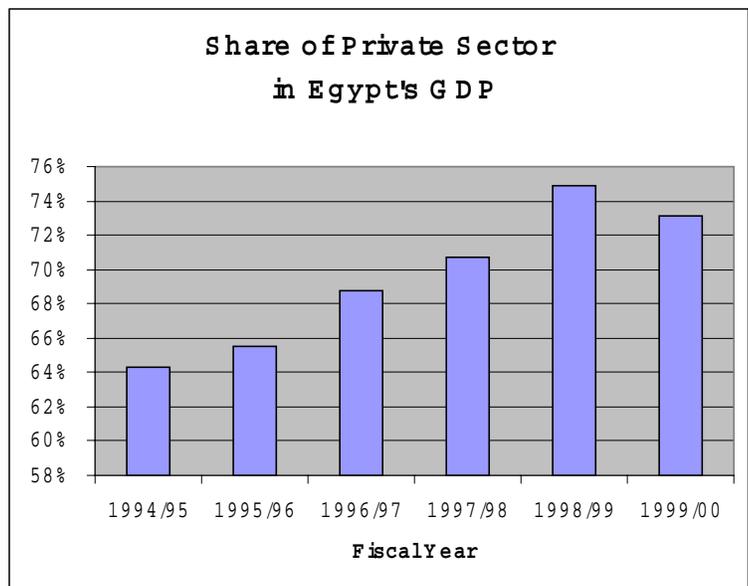
Presidential decree 341 of 1996 directed the reform and reconstruct of Joint Venture Companies (JVCs) through privatization. This decree committed the government to the sale of its outstanding stakes in 640 JVCs, additional to the privatization of the 314 Law 203 companies. In early 2000, the Ministry of Foreign Trade<sup>2</sup> (MOFT) was mandated to manage and coordinate the divestiture activity in the Joint Venture Companies portfolio in coordination with the Ministry of Public Enterprise. During the 3rd Quarter of 2000, MOFT established the procedures necessary to sell the public stake in any JVC. In November 2001, a presidential decree was signed, refocusing the MOFT's portfolio on boosting exports, and transferring the Joint Venture portfolio to the Ministry of Public Enterprise.

### 3.2.4 Law 159

Law 159 of 1981 is the preexisting law governing joint stock companies, partnerships limited by shares, and limited liability companies in Egypt. As companies are privatized, they come under the provisions of Law 159.

### 3.3 Results to Date

Privatization activity under these laws peaked in 1999. The year 2002 was one of the least productive to date with respect to Egypt's privatization program, with only four



<sup>2</sup> Formerly the Ministry of Economy and Foreign Trade (MOEFT)

Law 203 companies privatized and a similar number of JVC transactions. The private sector share of Egypt's GDP grew steadily from 1994/5 through 1998/9 and then showed a slight decline (see Box above).

As of December 2002, 191 or 61% of the 314 Law 203 companies had been privatized (Table 1). The pace and type of privatization are shown in Figures 1 and 2.

The pace of privatization through 1993 was slow, as time was needed to frame and introduce the necessary legislative and regulatory arrangements. Also, the socio-economic culture of the country had not been ready to accept the concept of privatization. Consequently, policy makers were pre-occupied with a number of political and legal constraints to privatization, i.e. executive authorities, public opinion, the press, and People's Assembly members (Khattab, 1999).

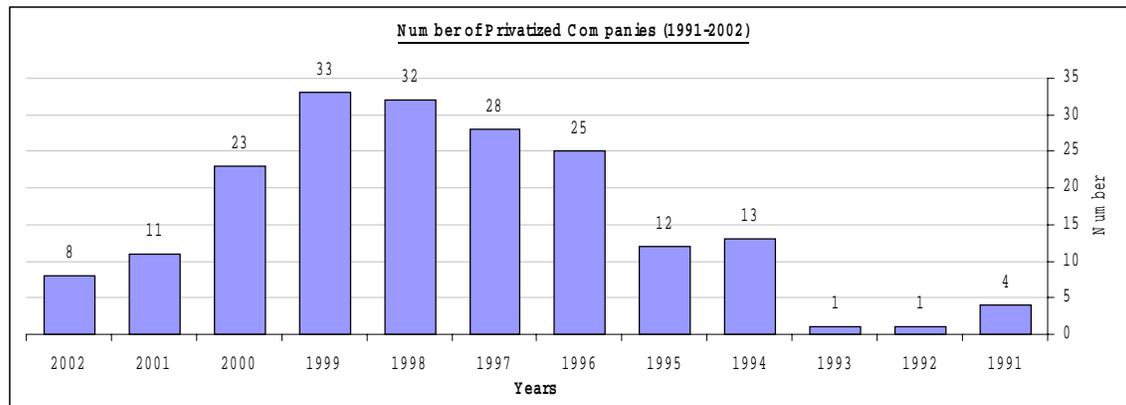
Table 1: Number and Type of Privatizations as of 31 December 2002

YEAR	Majority Privatization (> 51% sold)				Partial Privatization & Leases				TOTAL	
	Anchor Investor	Majority IPO	ESAs	Liquidation	Majority Total	Minority IPO	Asset Sales	Leases		Partial Total
	1991				4	4				
1992				1	1					1
1993				1	1					1
1994	3		7	2	12	1			1	13
1995		1	3	2	6	6			6	12
1996	3	14		1	18	6	1		7	25
1997	3	14	3	3	23	2	1	2	5	28
1998	2	8	12	6	28	1	3		4	32
1999	9		5	7	21		4	8	12	33
2000	5	1		3	9		6	8	14	23
2001	3		2	2	7		3	1	4	11
2002	1		2	1	4		4		4	8
<b>TOTAL</b>	<b>29</b>	<b>38</b>	<b>34</b>	<b>33</b>	<b>134</b>	<b>16</b>	<b>22</b>	<b>19</b>	<b>57</b>	<b>191</b>

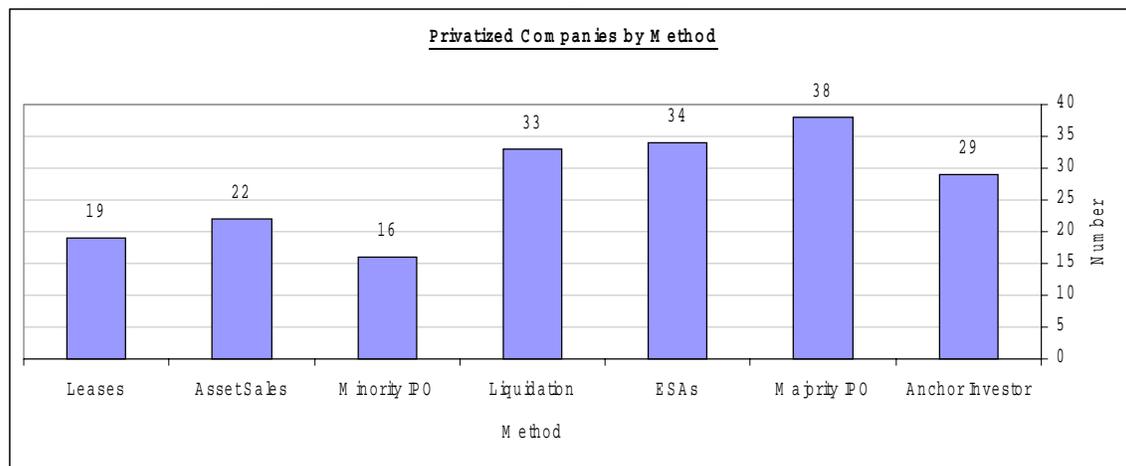
Once the enabling mechanisms were in place, the program gained momentum in the second half of the 1990s, given impetus by a favorable ruling by the constitutional court upholding the government's right to privatize the public sector.

Since 2000, progress has slowed for a number of reasons, among them the downturn in national and world economies, the poor performance of the Egyptian stock market, and the less attractive investment opportunities offered by the remaining companies in the Law 203 portfolio. Many of the remaining companies have declining revenues, high debts and bank overdrafts, excess labor, and valuation problems. The massive resources required to keep these companies afloat could easily erase the gains from previous privatizations, and completing this portion of the program will require some difficult and painful decisions.

**Figure 1. Number of privatized Law 203 companies, by year**



**Figure 2. Number of privatized Law 203 companies, by method**



### 3.3.1 Banks

In the financial sector reforms have proceeded, but have stopped short of privatizing the “big four” state-owned banks. A number of joint venture banks have been completely privatized and banking and credit laws amended allowing majority foreign ownership in joint venture and private banks. New regulations allowing Egyptian banks to freely set charges and fees for banking services and interest rates have rendered the Egyptian banking industry more efficient, with more profitability options.

### 3.3.2 Utilities and Infrastructure

The GOE started the privatization process with the industrial sector and has only recently shifted attention to infrastructure and utilities. Egypt has begun employing BOOT mechanisms to attract private sector participation in projects directed by the Ministry of Transportation; the Ministry of Electricity & Energy; the Ministry of Housing, Utilities & New Urban Communities; and the Ministry of Civil Aviation. An advantage of this

mechanism, from the government's point of view, is that it allows private sector investment to be mobilized into sectors that remain in public hands for political reasons. They are implemented as discrete projects and therefore do not threaten the overall ownership structure of SOEs.

BOOT involves the private sector financing, building and operating a public infrastructure facility for a concessionary period. That period may last up to 99 years (Levy, 1996), but more usually is between 10 to 30 years, depending on micro-economic factors. During the concession period, the project company is allowed to charge users a fee or sell its products and services at a rate high enough to repay debt within maturity periods of 10 to 15 years and to generate a profit at Internal Rates of Return (IRR) of 15% or more. At the end of the concession period, the facility is transferred to government ownership at no cost to the government. Many other variants such as Build-Transfer-Operate (BTO) and Rehabilitate-Operate-Transfer (ROT) exist and are essentially similar in nature to the BOOT approach which is discussed here. Certain countries and international institutions such as the World Bank have preferred the term Build-Operate-Transfer (BOT) as a politically more palatable alternative to the term BOOT which explicitly indicates a property rights relation. However, in a legal sense there is no difference since BOT schemes also confer the right of asset transfer to the private developer and investor (Wyatt, nd).

#### **Sidi Krir BOOT Power Project**

The Sidi Krir Generating Company (SKGC) is Egypt's first BOOT power generating company. Owned by InterGen (Shell and Bechtel) and Italy's Edison, the Sidi Krir Project consists of two natural-gas fired steam-generating units and is located on the Mediterranean 30 km west of Alexandria. It started construction in mid-1999 and became operational in January 2002. At 685 megawatts, it is one of the largest private power generating stations in the Middle East.

The total investment of \$482 million was raised with owner's equity and from loans from local and international banks. Foreign investment of \$269 includes owner's equity and international bank loans. There is no direct investment by the GOE. The contract calls for SKGC to build the facility and operate it for 20 years. Prior to turnover to EEHC, SKGC will refurbish the facility to extend its useful operating life for a minimum of an additional 13 years.

The project is recognized as the 1999 "Middle East Deal of the Year" by *Euromoney Institutional Investor's Project Finance* magazine and is held up as an example of how a complex BOOT project can be successfully executed by the private sector in cooperation with the GOE.

The transportation sector is well along this path. Since the mid-90's, the government has been encouraging private sector participation in the transportation sector through BOOT projects. Current status of BOOT projects that fall under the Ministry of Transportation are shown in Annex 1<sup>3</sup>.

Since November 1997, the government has implemented a series of measures to open up the aviation sector to private sector participation in order to increase competition, improve public transportation, and support export industries. The measures include allowing the private sector to establish and operate airlines, removal of the 10% tax on aircraft and spare parts purchases, allowing the private sector to operate airport ground services, and reducing the 45% tax on refrigerated airfreight shipments. Reforms stop short of privatizing the national carrier. Concurrently, the GOE has converted the Civil Aviation Authority into the Ministry

<sup>3</sup> CARANA April-June 2002

of Civil Aviation through a presidential decree issued in early 2002. Current BOT projects in the aviation sector are shown in Annex 2.

The energy sector has also moved rapidly to mobilize private investment through BOOT mechanisms (see Box). A total of 15 BOOT power projects are planned for offer to the private sector in the coming two decades, intended to meet an annual 7-8% increase in demand for electricity. Electricity distribution companies under the Electricity Holding Company will be offering their shares for sale once market conditions improve. Recent developments in the BOOT sector include the following.

- A Japanese Consortium will design, supply, and install gas turbines for the North Cairo Power Plant under an agreement with the Egyptian Electricity HC
- Three new electricity stations will be established under the BOT system at a total cost of LE 4.5 billion
- The 12 high dam generators will be modernized under a contract with a German company
- Kuwaiti development fund will finance the new Nobariya generating station

In the urban water sector, the minister of Housing, Utilities, and New Urban Communities (MHUUC) has indicated that while the supply of urban water will not be privatized, private sector participation is possible. The Prime Minister has indicated the same thing. The MHUUC minister has also issued a decree relating to tariff restructuring in the domestic water sector.

The Government has planned to spend about LE 16-17 billion on water and waste-water projects over the next 10 years. Projects include water treatment plants in 10th of Ramadan City, a pipeline to the new Suez Gulf Industrial Zone similar to the scheme for East Port Said Industrial Zone, and water facilities for 6th October City.

### **3.4 Privatization in MWRI**

#### **3.4.1 Law 203 Privatizations**

When the privatization program in Egypt was launched in the early 1990s, a portfolio of 314 public sector enterprises, distributed under 27 Holding Company (HCs), was initially targeted under Law 203. One of these HCs was the Agriculture & Irrigation HC which, in 1993, merged with the Land Reclamation HC to become the Public Works & Land Reclamation HC (PWL RHC). Holding Companies are owned by GOE and governed by a board consisting of public officials.

The PWLRHC controlled 13 affiliated companies:

1. Consulting Office for Irrigation
2. Kom Ombo Valley

3. General for Land Reclamation
4. Egyptian Real Estate
5. General Mechanical Excavation
6. Egyptian Dredging
7. Upper Egypt Dredging
8. General Company for Research and Underground Water (REGWA)
9. Arabia for Land Reclamation
10. El Beheira Joint Stock Co.
11. The Egyptian Irrigation & Drainage Co.
12. The High Dam for Civil Works Co.
13. Arab Bureau for Design & Technical Consultations

In 1994 and 1995 the PWLRHC concluded contracts to privatize 95% of the shares of 10 of these companies through majority sale to company Employee Shareholder Associations (ESAs). Through ESAs, workers in public enterprise can buy shares in their companies that are sold to strategic investors or the stock market. Their share is taken before prorating the offered shares with a discount of 20 percent on the selling price. ESAs are also granted credit for the purchased stake with a payoff period of 8 to 10 years in annual installments, enabling them to repay out of their dividend yield.

Companies were sold at reasonable prices (normally book value) with repayment over 8 to 10 years. The HC, which retains a small ownership share, provides technical and financial support in the form of soft loans bearing just 5% simple interest, to enable the companies to grow to preserve their operations and employees (Mokhtar, 1999).

The ten PWLRHC companies included three companies in land reclamation, two in dredging, and four large public works companies. These ten initial transactions provided considerable momentum to the privatization program at a time when it was under international criticism for moving slowly. These privatizations represented the beginning of the ESA experiment, which, by January 1999 includes 28 companies in all. The PWLRHC companies remain the most successful of the majority-ESA privatizations to date (Table 2).

These companies specialize in two activities central to the growth of Egyptian agriculture, irrigation and land reclamation, the latter being the process of “reclaiming” desert land for agriculture. Over the past few years, the companies have focused on the major land reclamation projects being implemented by the government, including Toshka, the El Salaam canal, and the East Oweinat Project. Specific activities include the following.

- Irrigation projects (canal excavation and dredging, dam construction, lining canals with concrete, the installation of pumping stations and floating pump stations, etc.)
- Land reclamation (construction of irrigation systems, land preparation, canal construction, construction of aqueducts, etc.)
- Dredging of rivers and canals
- Well drilling

- Road construction
- Manufacturing of irrigation hardware and products, including irrigation and canal systems and subsystems;
- Installations of pump stations
- Marine construction (sea walls and breakwaters)
- Architecture and Design (in the case of Arab Bureau for Design)

The Arab Bureau for Design is a special case. It was minority privatized in 1994 and 55% of the shares are held by the state. The High Dam Civil Works company was liquidated in 1996. Two remaining ESA transactions (San el Hagar and Egypt for Irrigation) were carried out in 1999.

**Table 2. Public Works/ Land Reclamation Privatization Transactions**

Name of Company	Date of Contract	Private Sector	ESA	Remaining HC Share	Total Sale Value (LE Millions)	Entered under Law 159
Consulting Office for Irrigation (EDIPCO)	June 25, 1994	4.00%	95%	1.00%	1.3	April 27, 1994
Kom Ombo Valley	Sept. 15, 1994	4.73%	95%	0.27%	70.1	April 27, 1994
General for Land Reclamation	Oct. 11, 1994	4.86%	95%	0.14%	60.0	April 27, 1994
Egyptian Real Estate	Nov. 16, 1994	4.70%	95%	0.30%	45.7	April 27, 1994
General Mechanical Excavation	Nov. 16, 1994	4.76%	95%	0.24%	23.4	April 27, 1994
Egyptian Dredging	June 12, 1994	4.17%	95%	0.83%	18.5	April 27, 1994
Upper Egypt Dredging	July 12, 1994	4.80%	95%	0.20%	8.0	April 27, 1994
General Co. For Research and Underground Water (REGWA)	March 1, 1995	4.77%	95%	0.23%	28.3	April 27, 1994
Arabia for Land Reclamation	July 1, 1995	4.77%	95%	0.23%	61.2	April 27, 1994
El Beheira Company	Feb. 16, 1995	3.20%	95%	1.80%	49.0	April 27, 1994
San El Hagar Agricultural	March, 1999	0%	95%	5%	18.0	March, 1999
Egyptian for Irrigation	Jan. 1, 1999	60.00%	30%	10.00%	5.2	March 14, 1999

Name of Company	Date of Contract	Private Sector	ESA	Remaining HC Share	Total Sale Value (LE Millions)
Arab Bureau for Design	July 24, 1994	5.00%	40%	55.00%	4.0

Name of Company	Date	Liquidator
High Dam Civil Works	March 18, 1996	Moustafa Nour
Source: MWRI		

### 3.4.2 Results of Law 203 Privatizations

Table 3 shows some summary financial indicators for the privatized MWRI companies for 1995, immediately after privatization, and for 2000, after 5 years of independent operation. From this table we can observe the following.

- Sales increased rapidly, growing by an annual average 12.4% between 1995 and 2000, though company financial data indicate that revenue growth slowed in the late 1990s as the companies were affected by the slowdown in government spending on large public works projects.
- Profitability has fallen somewhat since privatization. Average gross profit margin for the sector fell from 27.5% to 17.1%, and net profits fell from 8.6% to 6.8%. Profit margins fell for almost all companies. One possible explanation for this fall in profitability is that the government is benefiting from increased competition in public works tenders, at the expense of the profitability of the privatized companies. Alternatively, the companies may not be growing in an efficient manner, and may be paying too much in salaries to new employee owners.
- Receivables have decreased, as the companies appear to be doing better job of managing their collections. However, a high level of non-payment continues to impose a large burden on balance sheets.

Table 4 shows data on labor productivity for the privatized MWRI companies. It appears that almost all of the public works and land reclamation sector companies have grown considerably since privatization. The companies, though generally regarded as overstaffed at privatization, have failed to shed excess workers. Some companies have added employees to accommodate their growth, but most have held employment largely constant. However, in combination with the 80% growth in revenue<sup>4</sup>, labor productivity has increased. While they have restructured and changed at a slower pace than expected, as a group the ESA-owned companies appear to be making slow steady progress away from a public sector orientation.

While the public works companies have performed capably, it is difficult to generalize their experience or relate it directly to ESA governance. Performance of the country-wide group

<sup>4</sup> Note that revenues are expressed in current terms and thus include the effects of inflation over the 5 year period. However inflation averaged just 5.6% per annum over this period, so real growth in revenue was present.

of ESA companies is decidedly mixed. The successes and failures of these companies are, to a great extent, related to their sector and a variety of specific factors.

### **3.4.3 Remaining Privatizable Assets**

The ministry has a number of remaining units which could and probably should be privatized. A full picture would require a careful review of ministry units and operations. A few possibilities that emerge quickly include (a) factories of EPADP which produce plastic drainage pipe for tile drainage programs, (b) the lightly used and expensive ministry training center, and (c) a variety of underutilized mechanical and electrical workshops. Pipe manufacture for the largest agricultural drainage program in the world is clearly an activity most appropriately lodged in the private sector, with competition providing incentives to improve quality and update technology, and hold prices down. The value of outdated factory equipment should be aggressively depreciated and the factories offered for sale. The training center and a number of ministry workshops, by many accounts, are unused or lightly used, while services they theoretically could provide are obtained from the more capable and responsive (and cheaper) private sector. There would seem to be little reason to continue to support them with ministry funds.

To the extent that privatizing these and similar assets will threaten jobs of current employees, the ministry must complement the divestiture by providing workers with opportunities for retraining, and with assistance in finding new employment. These options for dealing with surplus labor issues should be less expensive, in the long run, than continuing to employ workers indefinitely in unproductive underutilized enterprises.

**Table 3. Summary Financial Indicators for privatized MWRI companies [LE 000's unless otherwise stated]**

	Months of Receivables			Debt/Equity Ratio			Return on Equity		
Company	Revenues			Gross Profit			After tax Income		
	1995	2000	Annual Average Growth (AAG)	1995	2000	Annual Average Growth (AAG)	1995	2000	(AAG)
Arabia for Land Reclamation	93,201	151,064	10.1%	39,923	40,934	0.5%	9,249	16,898	12.8%
El Beheira Company	279,385	553,128	14.6%	75,235	43,709	-10.3%	16,435	22,183	6.2%
General for Land Reclamation	179,748	321,619	12.3%	51,685	66,865	5.3%	9,245	21,883	18.8%
Kom Ombo Valley	87,352	123,907	7.2%	26,465	37,205	7.0%	15,760	15,869	0.1%
Egyptian Real Estate	162,345	235,659	7.7%	29,182	44,264	8.7%	10,554	10,298	-0.5%
REGWA	66,060	124,096	13.4%	22,461	30,827	6.5%	9,645	14,386	8.3%
Egyptian Dredging	61,217	143,190	18.5%	17,668	19,614	2.1%	10,574	12,028	2.6%
General Mechanical Excavation	48,746	100,174	12.8%	8,859	17,125	14.1%	3,629	5,405	8.3%
Upper Egypt Dredging	13,634	26,273	12.8%	787	3,033	31.0%	0	1,200	
EDIPCO	1,500	3,911	21.1%	583	1,038	12.2%	245	497	15.2%
<b>TOTAL</b>	<b>993,188</b>	<b>1,783,021</b>	<b>12.4%</b>	<b>272,85</b>	<b>304,614</b>	<b>2.2%</b>	<b>85,336</b>	<b>120,647</b>	<b>7.2%</b>

Note: Figures expressed in current values (unadjusted for inflation)

	1995	2000	1995	2000	1995	2000
Arabia for Land Reclamation	18.5	15.7	112.2%	29.3%	23.3%	21.4%
El Beheira Company	17.4	12.7	228.8%	31.2%	24.2%	19.4%
General for Land Reclamation	22.9	14.5	95.1%	58.8%	18.3%	21.8%
Kom Ombo Valley	20.2	20.7	106.8%	46.6%	30.4%	24.3%
Egyptian Real Estate	16.3	28.1	186.9%	116.6%	31.4%	16.9%
REGWA	27.8	19.0	40.9%	206.5%	42.1%	27.1%
Egyptian Dredging	26.4	10.4	71.3%	35.5%	16.4%	14.2%
General Mechanical Excavation	91.1	65.6	47.8%	102.9%	9.1%	17.7%
Upper Egypt Dredging	27.2	13.5	64.9%	26.7%	0.0%	10.4%
EDIPCO	2.0	3.6	0.0%	0.0%	21.8%	29.5%
<b>TOTAL</b>	<b>19.8</b>	<b>15.9</b>	<b>117.0%</b>	<b>65.4%</b>	<b>22.3%</b>	<b>20.1%</b>

Source:

**Table 4. Labor productivity of privatized MWRI companies (1995-2000)**

	1995	1996	1997	1998	1999	2000
<b>Revenues (LE Millions)</b>						
Arab Land Reclamation Co.	93.2	94.7	101.0	117.5	133.3	151.1
Beheira Joint Stock Co.	279.4	242.5	422.8	735.9	701.1	553.1
General Land Reclamation	179.7	176.3	200.4	267.8	308.3	321.6
Kom Ombo Valley	87.8	86.7	108.1	127.6	128.3	123.9
Egyptian Real Estate	162.3	166.8	188.3	213.9	238.6	235.7
REGWA	66.1	71.6	86.8	105.2	136.5	124.1
Egyptian Dredging	61.2	60.2	75.4	129.7	173.1	143.2
Irrigation for Public Works	48.7	55.4	59.8	69.8	76.8	100.2
Upper Egypt Dredging	13.6	19.1	20.5	20.2	27.7	26.3
EDIPCO	1.5	1.6	1.9	2.8	3.0	3.9
<b>Total</b>	<b>993.5</b>	<b>974.9</b>	<b>1,265.0</b>	<b>1790.4</b>	<b>1926.7</b>	<b>1783.1</b>
<b>Number of Workers</b>						
Arab Land Reclamation Co.	1,400	1,100	1,400	1,580	1,580	1,580
Beheira Joint Stock Co.	4,549	4,391	4,336	4,815	4,810	4,810
General Land Reclamation	2,995	2,897	2,688	2,424	2,160	2,160
Kom Ombo Valley	1,386	1,378	1,381	1,358	1,281	1,281
Egyptian Real Estate	2,520	2,432	2,614	2,826	2,780	2,780
REGWA	1,420	1,599	1,638	1,742	1,742	1,742
Egyptian Dredging	3,019	3,312	3,216	3,333	3,475	3,475
Irrigation for Public Works	2,840	2,950	3,300	3,247	3,150	3,150
Upper Egypt Dredging	1,050	970	980	853	843	843
EDIPCO	96	91	105	113	120	120
<b>Total</b>	<b>21,275</b>	<b>21,120</b>	<b>21,658</b>	<b>22,291</b>	<b>21,941</b>	<b>21,941</b>
<b>Revenue per Worker (LE Thousands)</b>						
Arab Land Reclamation Co.	66.6	86.1	72.2	74.3	84.4	95.6
Beheira Joint Stock Co.	61.4	55.2	97.5	152.8	145.8	115.0
General Land Reclamation	60.0	60.8	74.5	110.5	142.7	148.9
Kom Ombo Valley	63.4	62.9	78.3	94.0	100.1	96.7
Egyptian Real Estate	64.4	68.6	72.0	75.7	85.8	84.8
REGWA	46.5	44.8	53.0	60.4	78.4	71.2
Egyptian Dredging	20.3	18.2	23.4	38.9	49.8	41.2
Irrigation for Public Works	17.2	18.8	18.1	21.5	24.4	31.8
Upper Egypt Dredging	13.0	19.7	21.0	23.7	32.9	31.2
EDIPCO	15.6	17.5	17.6	24.6	24.9	32.6
<b>Average</b>	<b>46.8</b>	<b>46.3</b>	<b>58.5</b>	<b>80.4</b>	<b>87.9</b>	<b>81.4</b>
Note: Figures expressed in current values (unadjusted for inflation)						

### 3.4.4 Mega-Projects

Egypt has ambitious plans to develop 3.4 million acres of new irrigated land by 2017. Much of this land is contained in five “mega projects” located in largely unpopulated areas around the country. All include important PSP elements

The largest is Toshka, located in the Toshka depression in Upper Egypt west of Lake Nasser. Work on Toshka began in January 1997 and the project will use 5 BCM of water annually (about 9% of Egypt’s Nile allotment) lifted from the lake to irrigate 540,000 feddans<sup>5</sup> of land in its initial phase. An Egyptian-British-Japanese consortium is building the \$440 M pumping station for the government. The government will also construct the main canal required to carry water the 52 kilometers from Lake Nasser and 4 branch canals, each about 40 km long. However in the project plan, private partners are expected to develop the agricultural operations needed to make the project functional. To date, Saudi Prince Alwaleed Bin Talal’s Kadco is the primary private developer, with \$500 M committed. Together with an American firm, Sun World International<sup>6</sup>, a subsidiary of the Cadiz Corporation which is investing \$50 M, Kadco aims to develop and operate 100,000 feddans of the project area to grow table grapes, citrus, and vegetables, and, in the longer term, cotton and other row crops, mostly for export (*RCC News*, 2000). The remaining 320,000 feddans that have been distributed have gone almost entirely to two state-dominated ventures (*Business*, 2003).

The cost of land to the developers is LE 50/feddan (US\$21/hectare) and water is to be supplied by the GOE for just under 1US cent/m<sup>3</sup>. Infrastructure development costs are estimated to be LE 12 to 15 thousand per feddan (\$ 5,200 to US\$ 6,500/hectare).

Terms of the agreements between the developers and the government include an extensive range of subsidies and conditions designed to shelter the investors against the considerable risks involved in initiating large irrigated agriculture investments in a harsh virgin environment. The contract between GOE and Kadco contains the following features.

- A priority water right to Kadco estimated at 7,000 m<sup>3</sup>/feddan but to be specified by Kadco, with an absolute minimum allocation of 6,000 m<sup>3</sup>/feddan when Lake Nasser levels are reduced.
- 100,000 feddans of the area sold on a freehold basis at LE 50/feddan (~ \$ 23/hectare), with rights to resell, subdivide or reallocate the land retained by Kadco, but with GOE to approve any transfer of property to non-Egyptian entities.
- The land is not “subject to any duties, fees, charges or taxes of any kind whatsoever now or in the future...” nor is it subject to any zoning regulations now or in the future. All other corporate taxes and fees are exempted for a period of twenty years following initiation of irrigated farming.

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<sup>5</sup> 1 feddan equals 1.04 acres or 0.42 hectares

<sup>6</sup> Sun World filed for Chapter 11 bankruptcy protection in the United States on 30 January 2003.

- GOE to deliver water to the full length of the branch, bearing any involved pumping costs.
- GOE to operate and maintain main and branch canal number 1 (the one supplying Kadco land) and pumping stations. The O&M of the sub-branch off-takes and subsidiary channels are the responsibility of Kadco.
- GOE is responsible for detailed design of all sub-system channels; Cadco to construct sub-system canals and infrastructure.
- All aspects of branch canal number 1 design and construction to be reviewed and approved by Kadco.
- Additional water for agricultural processing will be supplied by GOE to Kadco at no charge and in amounts to be negotiated, but without limit.
- Kadco has cost-free and unimpeded access to any surface and groundwater that becomes available on the purchased land.
- Kadco may establish and operate any industrial or processing facilities on the land.
- Kadco must be “committed” to application of “modern methods” of irrigation (as defined by Kadco).
- GOE will construct and maintain a heavy-duty two-lane road along the entire length of the branch canal alignment.
- Kadco can discharge all drainage water into natural depressions in the area, without cost or liability.
- Kadco can select crops and genotypes to be grown without any restrictions or GOE approvals. Kadco has the right to use any means of cargo transport for import or export purposes, including air and land, and associated infrastructure, without restriction. GOE to provide, at no cost to Kadco, a customs representative to complete on-site customs formalities efficiently.
- GOE, in consultation with Kadco, to provide all social service infrastructure, including health, education, recreation, religious, etc. facilities, to support the population residing at the site.
- GOE to provide three-phase electricity along the entire length of the branch canal; KADCO will construct electrical lines within the sub-system, and will pay GOE for the electricity at lowest established public rate.

The GOE justifies the favorable terms and subsidies provided to the agricultural developers in Toshka by the resettlement objectives of the project, which aim to relocate 2 M people to the Toshka project area. A private investor would never take on such a project if required to bear all of the costs and risks of establishment.

In addition to Toshka, the East Oweinat Project in the southwestern desert aims to reclaim 200,000 feddans and the North Sinai Development Project another 400,000 feddans. East Oweinat is a self-contained fossil groundwater area in southwestern Egypt. The Northern Sinai project is a model likely to be applied to similar reclaimed land projects in the future, assuming water availability. Growing conditions in Northern Sinai are marked by a favorable inland coastal Mediterranean climate and access to year-round paved roads connecting with the Suez Canal and port cities of El Arish and Port Said. Basic services and infrastructure are already established in the area, and plans are underway by the GOE to extend and expand these services and facilities in order to address projected population growth. On each branch canal, a water user association is to be established to coordinate O&M and intra-branch water allocation and delivery.

The North Sinai development specifies private sector development, operation and maintenance of sub-system water infrastructure for large and medium sized holdings (more than 10 feddans). Holdings are to be awarded in a sealed bid public auction. Smaller holdings are to be allocated on the basis of a public lottery and provided with all irrigation facilities by GOE. This model involves lower levels of private investment and more modest public subsidies in comparison with Toshka.

New land development projects are limited in extent by the available water supply, which is nearly fully allocated in Egypt. This leads to the question of whether private investors could be expected to invest in irrigation system rehabilitation or modernization. Returns to present private investors come from agricultural operations, and not from sale of irrigation service. Private investment in rehabilitation would need to produce returns either from irrigation service revenues themselves, or from incremental agricultural production on affected lands. Exercise of the first option awaits the acceptance and introduction of a full-cost cost recovery system for irrigation services, which does not appear imminent. The second option would involve investment by current landowners in system rehabilitation. This too would require the general acceptance of user responsibility for irrigation system capital costs and a significant boost in quality of irrigation service (and production) as a result of the rehabilitation. It thus seems unlikely that it will be possible to mobilize significant private capital for irrigation system rehabilitation in the short to medium-term future without significant changes to the system of cost recovery from water users.

## **4. Water Management in Egypt**

### **4.1 MWRI Organizational Structure**

A single unified ministry manages both water resources and irrigation in Egypt. There is a close correspondence between the two, with the 8 M feddan (3.2 M hectares) of irrigated land being the primary user of Nile water. There are other important users of water, however, including urban domestic users, industries, and the environment. The ministry also handles both development and management tasks, with 3.4 M feddan (1.4 M hectares) of new irrigation development envisioned. Its mandate covers both ground and surface water.

#### **4.1.1 Primary Structure**

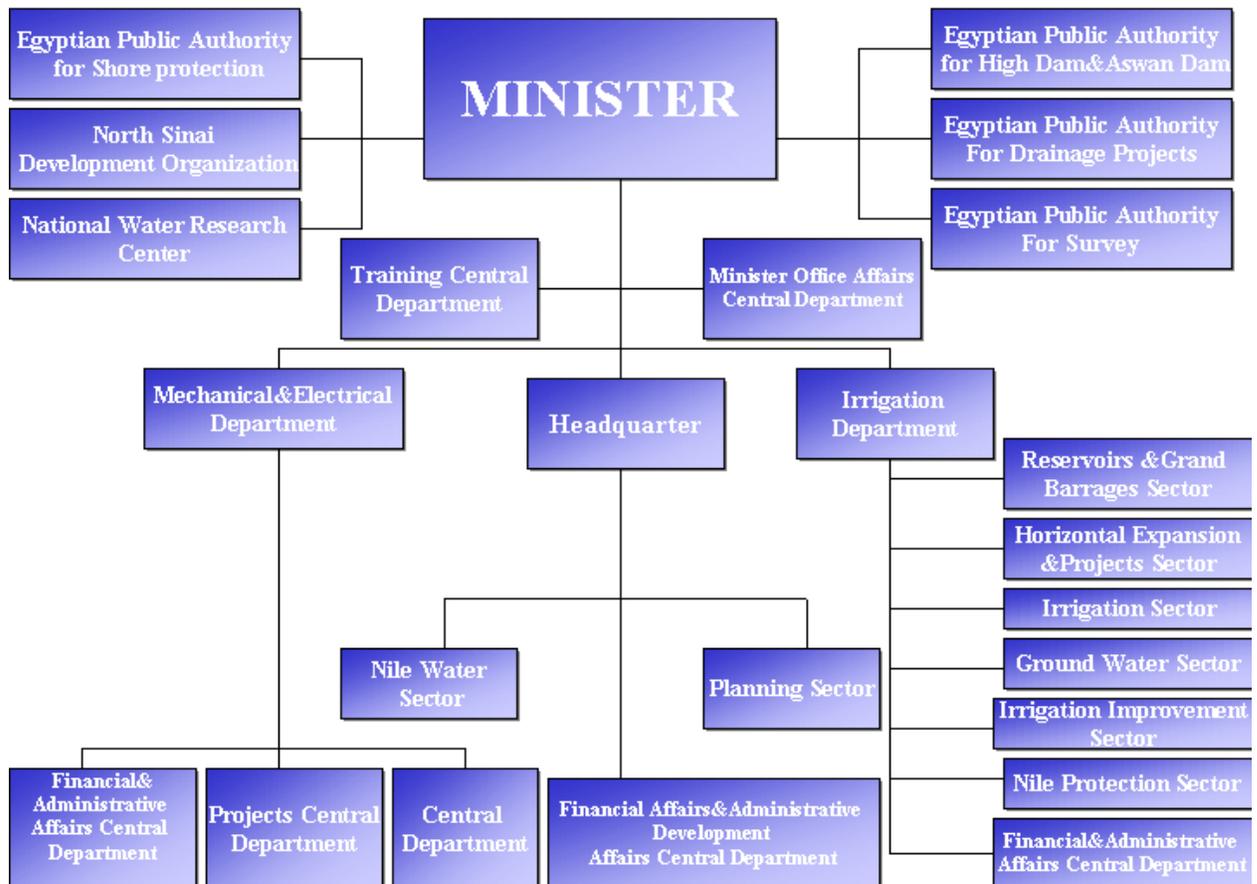
The Ministry of Water Resources and Irrigation (MWRI) was formed in 1998 by splitting off water resource functions from the former Ministry of Public Works and Water Resources. The MWRI comprises more than a dozen basic units as shown in Figure 3. The three primary operating units are Irrigation, Drainage, and Mechanical and Electrical. Functions of some of these units are described below.

- The Irrigation Department is generally responsible for controlling, distributing and allocating waters for agriculture and modernizing the irrigation system to satisfy the demand management programs.
- The Egyptian Public Authority for Drainage Projects, together with the Drainage Research Institute of the National Water Research Center (NWRC), provides subsurface drainage to agricultural land to control salinity and waterlogging. It also undertakes studies and research in the field of drainage water reuse for irrigation purposes.
- The Mechanical and Electrical Department establishes, operates, and maintains irrigation and drainage pump stations.
- The Egyptian General Survey Authority carries out both land and aerial surveys and uses satellite imagery to prepare maps at various scales. The mandate of the authority also includes the estimation of the country's agricultural area and the determination of city and village borders.
- The High Aswan Dam (HAD) Authority operates and maintains the High Dam and old Aswan Reservoir.
- The NWRC with its twelve specialized research institutes and two supporting units conducts applied research aimed at solving practical field problems facing the Ministry.
- The Nile Water Sector is mainly responsible for cooperation with Upper Nile countries in managing the river system. It represents the Egyptian Government in discussions with other riparian countries regarding the Nile.

- The Planning Sector is responsible for formulating and evaluating long and short term plans that match supply and demand using available planning tools and mathematical models.
- The Egyptian Coast Protection Authority is responsible for providing northern and eastern coasts with protection against erosion and surge flow.

The ministry employs a staff of nearly 100,000, broken out as shown in Table 5. This staff is still growing. For a privatization program to be effective, it must, among other things, reduce the recurrent cost burden of irrigation management on the government. This is generally not possible without significantly reducing staff contingents.

**Figure 3. Organizational structure of the Ministry of Water Resources and Irrigation**



**Table 5. MWRI staff levels, 2003**

Unit	Engineering Staff	Professional Staff	Non-professional Staff	Non-prof. to Eng. & Prof. ratio	Total Staff
Ministry HQ	182	187	680	1.84	1,049
Irrigation Department	2,015	1,025	35,801	11.78	38,841
Public Drainage Authority	890	3,521	14,156	3.21	18,567
Mechanical & Electrical Dept	947	253	15,458	12.88	16,658
Survey Authority*	421	879	13,586	10.45	14,886
High Dam Authority	59	201	3,269	12.57	3,529
National Water Res Center	404	598	1,993	1.99	2,995
North Sinai Organization	139	253	339	0.86	731
Coast Protection Authority	77	115	162	0.84	354
<b>Total</b>	<b>5,134</b>	<b>7,032</b>	<b>85,444</b>	<b>7.02</b>	<b>97,610</b>

Source: MWRI

Note: Survey Authority figures for 1995, others for 2003

#### 4.1.1 An Overview of Field Level Organization

Irrigation Districts are fundamental units of the MWRI, since the field offices maintain and operate the irrigation system and provide water to farmers. Districts serve, on average, an agricultural area of about 43 thousand feddans (17 thousand hectares). The district office is a governmental office similar to other offices that exist in an administrative district, called a *markaz*.

Districts are grouped into Directorates, which in turn are aggregated under General Departments. General Departments are accountable to 2 ministry Undersecretaries, one for Upper Egypt and one for Lower Egypt. Lower Egypt, essentially the Nile Delta, covers about 5.8 M feddans of irrigated area, or about two-thirds of the total, while Upper Egypt accounts for the remaining 2.8 M feddans. Table 6 shows the numbers of the various units and sub-units and their average area of coverage.

The boundaries of MWRI districts, however, are usually different than those of the *markaz* since MWRI districts are determined by the hydraulic characteristics of the irrigation and drainage network. A MWRI district may therefore overlap more than one administrative district.

Units	Number	Average Area [feddans]	Average Area [hectares]
Undersecretaries	2	4,274,104	1,730,406
General Departments	23	371,661	150,470
Directorates	53	161,287	65,298
Districts	198	43,173	17,479

The MWRI carries out a number activities at the district level – irrigation, drainage, groundwater activities, and others. Currently, each of these activities is directed by a separate entity. Usually there are two MWRI districts – an irrigation district and a drainage district. However in some areas, a groundwater district and a mechanical and electrical district also exist to take care of groundwater utilization and operation and maintenance of pump stations, respectively. Although all these districts are all MWRI units, they themselves have different boundaries and operate independently of each other. Each has its own administrative staff, legal offices, contractors, bookkeepers, gatekeepers, maintenance personnel, telephone operators and so on. There is limited coordination or communication in the planning and delivery of services and supplies, and little consolidation and sharing of resources at these levels. As a result, the district engineer focuses solely on irrigation issues, and has little or no authority to integrate the other aspects of water management and use, such as drainage and groundwater management and use.

#### 4.1.2 IWMDs

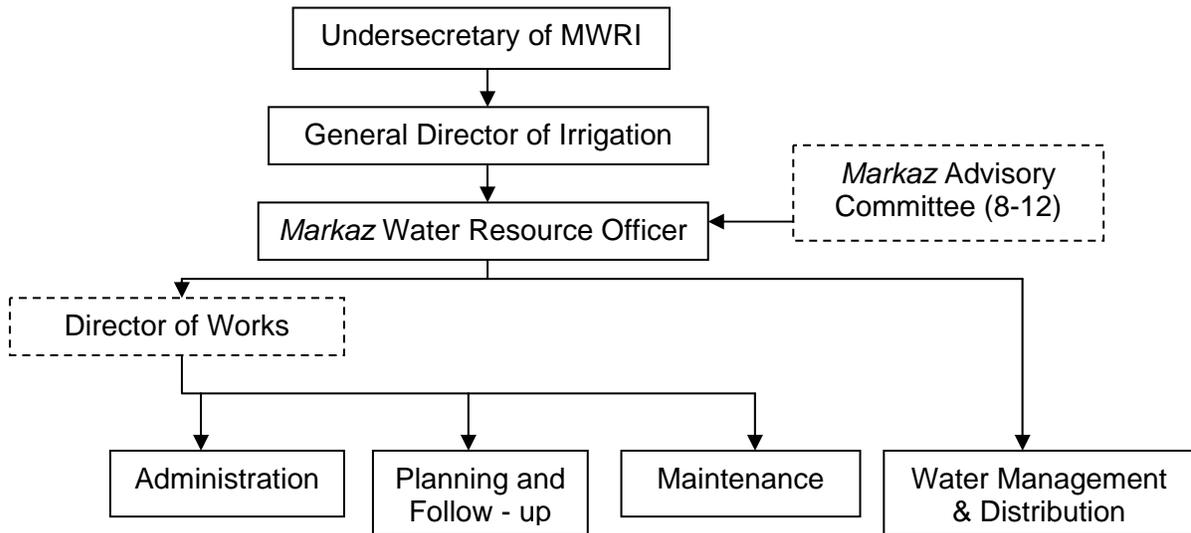
The proposed establishment of Integrated Water Management Districts (IWMDs) is intended to overcome these deficiencies. Since the primary responsibility of the integrated district is to deliver water to users, all units of the IWMD will support the water distribution process to ensure that water is delivered adequately, reliably, and equitably. A ministerial decree (No 506) issued in December 2001 directs that the different MWRI water management entities currently existing at the district level should be merged to constitute one entity defined as an IWMD. Two pilot areas have been selected for an initial trial of the new concept<sup>7</sup>.

Under the new integrated district management scheme, a district will be headed by the *markaz* officer. Under him would be four sections, (1) the water management and distribution section, (2) the maintenance section, (3) the planning and follow-up section, and (4) an administrative section. The *markaz* officer would be supervised by the general director of the irrigation directorate (Figure 4). This means that the *markaz* officer will not report to an irrigation inspector as the irrigation district engineer currently does. Upon full implementation, the irrigation inspectorate can be removed from the hierarchy, flattening the overall organizational structure. The IWMD will become equivalent in authority and responsibility to the present inspectorate. The span of control for a general director will still be only 3 to 5 units, which could be seen as more reasonable and efficient than the current narrower span.

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<sup>7</sup> South Zifta in the Menoufia Irrigation Directorate, and Ibrahimia in the West Sharkia Directorate.

**Figure 4. Proposed organizational chart for an IWMD**



After the concept has been tested in pilot districts and proven successful, it is envisioned that a *markaz* advisory committee consisting of 8 to 12 persons would be added to the organizational structure to work with *markaz* officer. The committee would be made up not of MWRI personnel but rather would represent local water users. Another possibility would be for the District-level Water Boards being developed with Dutch and German assistance to play this advisory role to the IWMD.

#### 4.1.3 Civil society participation in MWRI decision making

Public participation is an essential element of public policy decision making, and H.E. the Minister, MWRI, has initiated a program to enhance public participation in MWRI decision making. Key thrusts of the program include encouraging stakeholder participation in MWRI program implementation and creating broader public awareness of issues and policies related to water resource management.

The Irrigation Advisory Service is the only MWRI unit that currently has proactive, two-way stakeholder involvement in its program. The primary vehicle for this interaction is the establishment of WUAs utilizing a trained cadre of field teams experienced in communications and PRA techniques. Other MWRI units such as EPADP could also benefit from such interaction.

A Water Communication Unit (WCU) was established by a previous USAID-supported program for the purpose of conducting water-related public awareness activities. The primary mission of the WCU has been to develop materials for public consumption and education with regard to Egypt's water resources and to coordinate communications training for MWRI field staff and engineers. It has been assigned extensive human and physical resources for providing that service. However, even though public awareness is a necessary component of any comprehensive public participation program, it does not provide the two-way proactive stakeholder involvement required for public participation in decision-making.

The ministry is expected shortly to designate a permanent entity to assume responsibility for public participation in MWRI affairs. This is a useful step. However, effective two-way communication and interaction between stakeholders and ministry decision makers cannot be conducted effectively by a single centralized ministry unit. Principles and practices of public participation need to permeate the main operational units of the ministry. Thus a primary responsibility of the new unit must be to work extensively within the ministry, under a strong mandate from H.E. the Minister, to help individual departments and sectors develop the attitudes and techniques of public consultation. If restricted to the work of a single centralized department, public participation is likely to become isolated and formalized, adding bureaucratic mass but having little or no effective impact on ministry policy making and operations. Decision makers must recognize and ask for public input on important decisions, for the system to be useful and effective. In other words, demand for public input and the recognition that public opinion is useful in making sound decisions must be created along with its supply for the system to work.

## **4.2 Management Functions**

Three primary sets of water resource management functions must be performed in a basin by the various actors involved. They are (1) resource development and management, (2) service delivery, (3) and regulation. Both public and private organizations are typically involved in performing these functions, and the assignments of particular functions often change as a basin water system matures. In addition, the importance of particular functions changes as the larger economy and the level of development and utilization of the river system change. Some of these shifts are outlined below.

### **4.2.1 Resource Development and Management**

Resource development is dominant in the early stages of the development of a river basin. In Egypt, this stage lasted for thousands of years and culminated with the construction of the Aswan High Dam on the Nile in the 1950s. Subsequently, while construction and, especially, rehabilitation activities continue, increasingly attention shifts to managing the developed waters within the basin. Egypt is now moving into this stage, as the new mega projects utilize fully the available waters of the Nile. As stress on the resource builds, the need for quantification, quick access to information, and more precise control increase. The resource management function can involve elements of both public and private sectors, and often a combination is the strongest configuration. The involvement in decisionmaking of the various water using sectors – agriculture, cities, industries, and the environment – are critical in achieving rational water allocation and control of water quality. This shift requires changes in government agency priorities, structure, skills, and attitudes and is a difficult transition to make. Experienced employees find the delegation of old responsibilities to others and the assumption of new ones difficult. The need to reduce the accumulated bureaucratic mass is usually acute but the process is often traumatic, and significant changes to long established structures and routines, whether or not they still work effectively, is seen as politically risky by agency heads. Vision and top level support are needed to make this transition.

## **4.2.2 Service delivery**

Service provision, which involves the delivery of appropriate quantities of water of suitable quality at appropriate times in response to client requirements, typically devolves increasingly to private sector providers as basins mature. This devolution takes place because locally-based organizations are generally better able to manage local service provision effectively and efficiently than are large and cumbersome centralized bureaucracies. Devolution usually means a transition from government provision to private provision and requires major changes in policies and laws and administrative procedures. It also requires efforts to develop capacity of local institutions to manage and programs to retrain public sector employees for other employment. In addition, “terms of service” provision become more explicit, as they must often now be written into agreements and monitored. Things like quantity, quality, and timing of water to be provided, rules for dealing with drought-related shortages, costs of service provision, and acceptable condition of facilities must be specified, documented, and agreed to in writing between the parties involved. With time, service delivery becomes a private function at increasingly higher levels of the distribution hierarchy, and the government’s role becomes increasingly one of regulation, standard setting, and overall water resource management.

## **4.2.3 Regulation**

Regulation involves setting and monitoring standards for service provision performance, water quality, ecosystem sustenance, financial probity in involved companies and organizations, openness in governance processes, and the like. This is necessarily a public sector function, though their may be supporting roles for private companies – in auditing contractor accounts, for example. At the same time, one virtue of client-based service providers such as WUAs is that they tend to be self-regulating through democratic governance processes. Properly constituted client-based governing boards represent client (farmer) interests and correct themselves through feedback and regular elections. Nevertheless, regulation is required, particularly with respect to water quality and environmental issues. This, along with basin level water resource management, becomes an increasingly important role for the public water agency. There may be more than one government agency involved in the regulatory processes to deal, for example, with environmental issues, financial audits, and resource allocation and management.

## 5. Recent Experience with Privatizing Water Management

In 1981, the MWRI initiated the Irrigation Management Systems (IMS) Project with USAID funding. The IMS Project was amended in 1984 to incorporate the seven-year (1977-84) Egypt Water Use and Management Project (EWUP), an interdisciplinary project implemented by the MWRI. The recommendations of that project related to farmer participation in irrigation management were the following.

- Farmers should be involved in improvements to the water delivery system
- Farmers must play a role in ensuring more efficient operations, improved maintenance, and protection of physical works
- Farmers should become involved in management of water
- There is a need for a special trained cadre of professionals (IAS) to support and strengthen new farmer responsibilities related to water delivery, water use, and farmer organization
- Continued farmer involvement is essential for improved operations, water scheduling, *mesqa* improvements and renovation of branch canals

The successor project to EWUP, the Irrigation Improvement Project (IIP), was added as a component of IMS in 1987. IIP has since evolved organizationally to sector status within MWRI, and now includes a number of irrigation improvement projects assisted by various donors and international lenders. Participatory irrigation management began in a formal way under the IIP. A successor phase of the IIP, funded with assistance from KfW and the World Bank, is currently about to launch its second phase of implementation.

Under the USAID-assisted APRP program, additional policy reforms were undertaken during the 1997-2002 period that expanded user participation to the secondary level of the irrigation/drainage system. As a part of these reforms, MWRI introduced a policy allowing the formation of secondary-level Branch Canal Water User Associations (BCWUAs), which were pilot-tested in a number of branch canals by transferring selected water management and operational functions to newly-formed associations.

During the same period a Dutch-supported program in Fayyum introduced the concept of joint Water Boards borrowed from the Netherlands, also at the branch canal level. Unlike earlier irrigation improvement efforts in Egypt (i.e. EWUP, ISM, and IIP), which can be classified as “farmer participation in irrigation improvement”, the IMT and Water Board models allow private entities to participate at higher levels in the irrigation system and to take on considerable managerial and financial responsibility for system operation and maintenance. This is intended to lead to reduced government expenditures on O&M, freeing funds for neglected tasks the private sector is unable to effectively undertake. Through these policy initiatives, MWRI has set in motion a long-term evolutionary process that could allow the GOE to significantly reduce its costs, improve the quality of irrigation service, and increase farmer satisfaction while continuing to expand coverage and services in other areas.

## 5.1 Drainage Development

Because of the intensive irrigation and low physical relief in the Nile Delta, the area is prone to waterlogging, with negative effects on agricultural yields. As a consequence, Egypt has had a tile drainage installation program in the Delta since the early 1970s. As of April 2003, the EPADP has implemented tile drainage installation programs covering 5.2 million feddans, out of a total national target of 6.4 million feddans.

Drainage areas are organized into Drainage Collector User Associations (DCUAs), based on the area served by one collector drain. This area is generally 50 to 60 feddans in extent, but can be as large as 500 feddans (200 ha). These associations have a limited supervisory and monitoring role, as mandated by Law 213, similar to that of WUAs during IIP construction. The DCUAs are not considered for direct contracting, nor do they take part in the actual contracting process for the civil work.

Unlike *mesqa* improvement activities, where criteria such as location of farm gates and field size determine the final plan configuration, the tile drainage program is implemented according to strict technical criteria regarding size, depth, and spacing of drain lines which are functions of soil type (affecting rate of filtration) and cropping pattern (affecting root zone depth). While forming *mesqa*-level WUAs involves considerable lead-time and numerous meetings, the DCUAs are formed through a simplified process of identifying key farmers sharing a common drain and registering them as a DCUA. The registration is carried out through the local agricultural cooperatives with assistance from the drainage extension unit. Following registration, EPADP provides training for members in preventive maintenance and drainage system management.

The program calls for beneficiaries of drain installation to bear a portion of the costs of installation. These costs are calculated from contractors' billings and include costs of pipe, transportation and installation, administration, and compensation for damage to standing crops during installation. Total costs per feddan range from LE 800 to 1,000 (\$360 to \$450/ha).

The program specifies that costs are to be recovered over 20 years with no interest after a one year grace period. Thus a landowner's annual payment is determined by dividing the total costs over the collector area by the number of feddans served and that divided by 20 years to obtain the annual assessment per feddan. This amount will typically range between LE 40 and 50 per feddan per year (\$18 to \$22/ha).

Actual rates are determined by a committee representing a variety of related agencies, including the Drainage Authority, the local farmers cooperative, the Survey Authority, and the Irrigation District. After rates are determined, a list of farmers' names, together with the annual amount they are liable for, is posted in front of relevant cooperatives and at the police station. Each farmer has the right to contest the amount of his financial liability within 30 days of the posting.

These amounts are collected by the Authority for the Taxation of Properties which is an agency of the Ministry of Finance. This unit collects a variety of taxes and charges all across

the country. Collectors generally approach farmers twice a year, after each harvest, and receive 2.5% of their collections as a performance incentive. Figures for collection rates are not easy to obtain, but some data for the period 1993 to 2002 are shown in Table 7. Collection rates, as a percent of collectibles by governorate, ranged from 17% to 92% averaged over the ten-year period. The highest rate of collection was in Qena governorate and the lowest was in Sharqiaya. Aggregate collection rates for Upper and Lower Egypt were also calculated and come to 74.6% and 67.1% respectively. The average rate of collection for all Egypt is calculated to be 69.1%.

Failure to recover the full amount of drainage capital costs assessed to beneficiaries, in general, appears to relate more to weaknesses in the collection system than to landowners' reluctance or inability to pay. By all accounts, investments in tile drainage result in handsome returns. Typically, improvements in crop yields more than cover the total investment in just a few years. Farmers are aware of such a strong effect and are quite ready and able to pay for it. On the other hand, the collection system is affected by the following difficulties.

- Farmers generally have cash available twice a year – after each harvest. Collectors may not approach farmers at these times and are thus unsuccessful in making collections.
- Money is collected from farmers as a lump sum. The collector later may divide this amount by type (land tax, drainage payment, etc) according to his own perception. Thus if a partial payment is made, the farmer does not have control over how this amount is allocated.
- Land records are outdated, meaning that not all benefiting landowners are billed.

There is no follow up from the drainage authority with the collector. Recently, however, a committee with the same composition as that which fixes the assessment has been established to review collection performance.

**Table 7. Drainage capital cost recovery rates**

Governorate	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total	Total Collectible	Collection Rate
Kaluobia	408	247	292	389	306	340	460	453	477	468	3841		
Menoufia	389	245	248	392	964	257	323	385	306	776	4285		
Gharpia	195	1825	1815	1933	1372	2084	1973	2137	2368	2544	20003		
Dakahlya	2660	3264	3727	3698	4088	3628	5439	5072	7010	9028	47615		
Sharqaiya	899	1066	660	821	800	923	746	1040	821	923	8697	52483	16.6
Behear	956	898	853	1257	1585	1937	1816	2462	2169	2575	16499		
Kafr El-Sheik	1205	1279	1415	1676	1598	1754	2261	2238	2351	2666	18842		
Demmiate	-		-	-	50	50	251	609	685	757	2403		
Total (Lower Egypt)											122185	182042	67.1
Giza	59	45	183	57	54	52	38	54	61	62	664		
Fauom	105	135	159	164	263	300	394	443	581	796	3341		
Bani suef	741	731	1244	1212	1215	1284	1149	1093	1069	1697	11435		
Menia	153	253	280	407	444	681	637	629	1053	1257	5977		
Assouit	551	506	572	601	1052	599	1205	1011	1071	1064	8324		
Sohag	219	356	470	833	1265	582	462	371	398	383	5339		
Qena	419	494	964	1392	1257	1119	993	1010	1210	1417	10347	11260	91.9
Aswan	219	203	211	178	233	258	265	304	277	234	2381		
Total (Upper Egypt)											47808	64113	74.6
Total (Egypt)											169993	246155	69.1

## 5.2 IIP/IIS

The Irrigation Improvement Sector reflects a significant embrace by the GOE of the principles of participatory irrigation management. Initially a USAID funded project (1988-96), IIP was later regularized as a permanent sectoral arm of the Irrigation Department and now serves as the focal point for various GOE and donor assisted projects using the IIP model of user organization and physical improvement at the *mesqa* level<sup>8</sup>. The IIP model is marked by the following features and aims.

- Retention of all *mesqa* O&M responsibilities to water users.
- Improvement in irrigation efficiencies (the ratio of water beneficially used to the water delivered), primarily through reduction of delivery system operational losses. These efficiency improvements translate to water savings (in a global sense) that can be transferred or reallocated to other uses where irrigation losses and return flows are to salt or pollution sinks.
- Equity of water distribution is improved. Evidence shows substantial head-end/tail-end inequities are relieved and tail-end farmers previously reliant on pumping of drain water to augment their short water supplies no longer need to perform this activity. Land values at the tail ends of canals and *mesqas* have increased as a result. Positive environmental and health impacts result since farmers no longer need to pump polluted and/or saline drain water.
- Fresh water losses by direct flows from canals and *mesqas* to drains are eliminated, thereby preserving fresh water quality and reducing or eliminating the degradation of these waters which occurs when they enter polluted drains.
- Farmers are organized in private, legally recognized WUAs using a tested and monitored seven-phase process, supported by the fully institutionalized MWRI Irrigation Advisory Service. There are many examples of functional WUAs actively operating and maintaining their improved *mesqas*.
- Many farmers report high degrees of satisfaction with their improved *mesqas*.
- Farmer's aggregated irrigation costs (labor, pumping and *mesqa* maintenance) are substantially reduced.
- Farmers report water supply (adequacy, reliability, timeliness) is much improved. Farmers and district engineers report fewer conflicts over water and increased and more substantial communications among users and between users and irrigation officials.

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<sup>8</sup> In 2002, coinciding with the preparatory work for the second phase of the World Bank/KfW support to IIP, the project name was changed to *Integrate Improved Irrigation Management Project (IIIMP)*, and will cover an estimated 450,000 feddans.

- Increased crop productivity are reported by farmers, though it is unclear if the combination of productivity impacts, irrigation cost savings, positive equity impacts, positive environmental and health impacts, and positive social impacts result in economically feasible rates of return on improvement investments. It is difficult to assign an economic value to the positive equity, environmental, health, and social impacts of IIP.
- Farmer willingness and ability to pay for improvements were studied extensively in support of the *mesqa* improvement cost recovery legislation (Law 213). However, if actual economic benefits over an extended period are less than estimated, willingness and ability to pay need to be re-evaluated.

In many ways the IIP is a new form of the ancient indigenous system of organization for water management which was used in operation multi-farmer sakias (see box at right).

Sakia Organization

Sakia are ancient Egyptian water lifting devices. Traditionally they were powered by cows or buffalos. Today, some have been adapted to use a tractor or other mechanical means as a power source. Quite a few remain in operation today.

The capacity of a sakia is measured by the diameter of lifting wheel, the number of *kadous* or chambers attached to the wheel, and the width of the chambers. Smaller devices serve about 10 feddans and about 10 to 15 farmers. Larger ones serve perhaps 20 feddans and 20 to 30 farmers.

Leaders of sakia groups are generally elders who own or cultivate larger areas and who are well off and regarded as honest. The leader is responsible for managing the irrigation schedule, collecting necessary funds, resolving conflicts, and maintaining the sakia and the mesqas. For the larger sakia, or where mechanical power sources are involved, an experienced operator may be hired to operate and maintain the sakia.

Sakia groups are self-funding. Members are the actual operators of the land (rather than the land owners) and each has a share (*qirat*).

Several factors have constrained the IIP program and reduced its effectiveness. These must be addressed and resolved before any widespread national irrigation improvement effort is implemented.

The rate of implementation has been slower than expected. IIP is an innovative and unique program and it has required considerable effort and time to develop institutional capacity within the Ministry to implement it. It is now recognition within MWRI that adequate lead-time is required to organize strong water user associations. Developing trust and understanding by farmers in IIP areas regarding the program and its costs and benefits is a time-consuming process that cannot be circumvented. Additionally, poor contractor performance has often not only caused project delays but has seriously undermined farmer confidence in the IIP.

The costs of physical improvement are relatively high. This is partially attributable to a lack of construction contractor expertise for the program's physical improvements, to poor construction contracting and monitoring, and to significant time overruns. One would expect unit costs to decline as contractor capability to design and construct improvements improves

and competition for services increases. However, recent figures show that the IIP package now costs LE 3,200 per feddan (\$1,440/ha) to implement.<sup>9</sup> It is hoped that costs will decline as promising developments using locally-manufactured and locally-adapted construction materials are employed. Better contracting and supervision procedures may also be required, however.

WUAs and BCWUAs will require water management technical and organizational assistance long after IIP staff have moved on to new areas, since IIP design and construction oversight requires only a temporary presence in the improvement area. The effectiveness of IIP is dependent on farmer organizations and the quality of immediate and ongoing socio-technical assistance provided to the new organizations. Some progress with agricultural extension service providers has been achieved under the EPIQ program, but the technical service shortfall has contributed, in part, to lower than expected crop productivity benefits. The IIP package of interventions and improvements has not been fully completed in most of the pilot sites. This has also contributed, in part, to less than the full range of expected benefits being realized.

Monitoring and evaluation of IIP interventions to provide lessons for improving implementation processes, and to provide data to justify continuing investments in IIP has been incomplete. Documented agricultural productivity benefits are positive, but at rates less than estimated in feasibility studies. Substantial labor and energy cost reductions have resulted from IIP. The net effect of these results is an unclear picture regarding the economic and financial feasibility of the improvements. Studies carried out under USAID and World Bank/KfW funding have repeatedly suggested that an independent Monitoring and Evaluation Unit within the MWRI is needed for implementing a comprehensive evaluation program and for analyzing data needed to support subsequent policy decisions. The recently established Institutional Reform Unit (IRU) within MWRI is intended to coordinate this function, though it is not yet clear how monitoring and evaluation functions will be structured. Such capability should be a required component of any program the Ministry undertakes in which economic efficiency, equity, and environmental impacts must be known before decisions regarding additional resource allocations can be made.

Many improved *mesqas* in pilot command areas were completed before main system improvements were completed and continuous flow implemented. As a result farmers and WUAs became somewhat disenchanted with the program. Continuous flow availability in the branch and distributary canals is a key premise for IIP. This must occur prior to improved *mesqas* coming on line. This can be accomplished in a phased participatory approach in which BCWUAs are developed as the first step in the improvement process. The BCWUA then works cooperatively with the IAS, IIP engineers and the irrigation district engineer to plan, design, and implement branch and distributary canal improvements to allow continuous flow implementation. These improvements would include control gates on low level unimproved *mesqas*. Branch canal water user organizations would help manage the control gates.

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<sup>9</sup> Communication from IAS Central Directorate Undersecretary, April 2003.

Private Sector Participation in water management has focused strongly on the IIP. Although there are questions concerning its economic efficiency, *mesqa* improvement is nevertheless a major and recognized component of MWRI policy over the next several decades. The current strategy is ambitious and proposes to improve irrigation systems serving 3.5 million feddans by the year 2017, about 45% of the total irrigated land in Egypt. Achieving this will require improving *mesqas* serving more than 200 thousand feddans each year for the next 14 years, a pace far exceeding that which has been achieved to date. This will require a significant ramping up of implementation capacity, simplifying the process, reducing the target, or a combination of the three. Once capital cost recovery procedures are in place, it would be sensible to make the process more demand driven, and to rely more heavily on direct connections between WUAs and private financiers and contractors, thus moving the MWRI further to the background of the process. This would have the effect of allowing farmer groups to make financially-based decisions on whether or not to go for an improved *mesqa* and manage more of the process itself, streamlining the process and reducing the potential target area of coverage by concentrating on motivated WUAs. The goal is for *mesqa* improvement to become a private sector activity, driven by farmer demands, with IIP/IAS oversight and guidance.

Prioritization criteria are proposed for selecting future improvement areas, with higher priority placed on those command areas in the northern Delta at the tail end of the Nile Irrigation System, where irrigation losses and return flows are to salt and/or pollution sinks (e.g., Mediterranean Sea, northern lakes, polluted collector and main drains). Highest priority should be assigned to areas having irrigation return flows to drains from which the drain water is pumped to the Sea in order to reduce both the water losses and pumping costs. High priority should also be placed on improving areas where water shortages have been documented and where there is strong water user support for the improvement process at the branch canal level.

### 5.3 IMT

The initial process of irrigation management transfer (IMT) began many years ago at the *mesqa* level in Egypt, when responsibility for tertiary-level O&M was handed to farmers. Farmers were not organized into formal user groups until the advent of the Irrigation Improvement Project in the 1980's. However for centuries prior to that they have grouped themselves into well-functioning informal groups for operating *sakias* to lift water into their fields. This long history of self organization and the successes of the IIP demonstrated that farmers have the capability and desire to develop functional self-sustaining user groups capable of managing and regulating water delivery and maintaining facilities.

In 2000 the concept was applied to secondary level branch canals on a pilot basis under a MWRI program termed Irrigation Management Transfer (IMT). Under the program branch canal water user associations (BCWUAs) would assume primary responsibility for scheduling distribution among *mesqas* and supervising and monitoring water distribution below the branch canal intake. The concept is predicated on BCWUAs having legal authority commensurate with this mandate. BCWUAs' executive councils have a minimum of 5 and a maximum of 15 members and are based on representation for each 500-750

feddans (200-300 hectares), with an equal distribution of members from head, middle and tail reaches of each branch canal.

BCWUAs are intended to be the primary conduit between farmers on a branch canal and all relevant government agencies in matters related to irrigated agriculture (Irrigation, Drainage, Ministry of Agriculture and Land Reform (MALR), and Agricultural Development Bank, etc.). BCWUAs are mandated to safeguard water and soil quality and resolve disputes related to water delivery and allocation. Officers receive training in organizational management, financial management, and record keeping, and are assisted in their work by the office of the district engineer.

The primary BCWUA functions and responsibilities under the IMT concept are to 1) monitor irrigation and drainage performance and requirements in the area served by the branch canal, 2) manage scheduling and water deliveries among *mesqas*, 3) execute and oversee branch canal maintenance work for pitching and weeding of embankments, maintaining gates, and leveling and compacting embankment pads, 4) establish and strengthen *mesqa*-level WUAs, 5) interface with public sector authorities, e.g. Irrigation Department, MALR, Drainage Authority, District Council, regarding problems that arise on the branch canal, and 6) prepare seasonal cropping plans and review them with Irrigation Department and MALR. The BCWUA is the contracting entity for the BC and will direct and oversee work. Farmers do not enter into contracts individually but collectively through the BCWUA. Terms of the agreement between the BCWUA and the MWRI are individually negotiated and formalized in a memorandum of understanding.

An O&M cost-sharing formula that uses a *five-year base value* was adopted to determine the annual level and ceiling of O&M costs. It reflects the estimated annual cost of operating the branch canal, including overhead costs associated with public agency administration and salaries. The cost-sharing program employs a phased, three-year plan that can be redesigned and renewed at the end of the three-year period. Each phase of the plan increases the share of the branch canal operating cost falling to the BCWUA and includes the development of managerial, fiscal, record-keeping and dispute resolution skills.

Thus far, MOUs have been negotiated and formalized with five pilot BCWUAs. The renewable three-year plan also phases in a *mesqa* improvement package in some areas. The program does not depend entirely on the availability of physical improvements, but a *mesqa* improvement package will most likely move the farming community more quickly in the direction of BCWUA development, if it is well designed. When available, *mesqa* improvement is also an important additional economic incentive to the cost-sharing objectives of the IMT program.

Farmers presently do not contribute to branch canal O&M, either through an assessment or through voluntary labor mobilization. The anticipated reform to the irrigation law will allow BCWUAs to enter into contracts with the government to operate and maintain the branch canals, rather than using private contractors do maintenance work. The BCWUAs will likely have subcontracting arrangements with private suppliers.

The program assumes that the work done under BCWUA supervision will be of higher quality than that performed solely by private contractors and supervised by MWRI. If this assumption is borne out, it will allow the government to stretch existing funds further and reduce the rate of canal systems deterioration. Social benefits that cannot easily be measured in economic terms are also presumed. Among these are greater local control, improved water delivery performance, and fewer water disputes.

Responsibility for implementing IMT has been assigned to the *Irrigation Advisory Service* directorate of the Irrigation Department. To date, the activities of the pilot BCWUAs have been limited to system rehabilitation (in collaboration with the Irrigation and Mechanical & Electrical Departments) developing consolidated BC cropping plans, assessing BC water allocation requirements to *mesqas*, and, in non-IIP program areas, organizing *mesqa*-level WUAs. Few financial incentives are being provided to the BCWUAs, although in each case a phased turnover process is negotiated and formalized into the MOU. In the pilot schemes, phasing out of direct government responsibility for O&M is planned to last from 9 months to a maximum of 3 years. During this “joint management” phase, BCWUAs are expected to take on increasing responsibilities leading to system management turnover.

BCWUAs heretofore have been operating on the basis of a ministerial decree. Complete legal authority will be granted to BCWUAs with the adoption of the revised GOE Law on Water Resources. The goal of substantial cost sharing, however, is unlikely to be achieved as long as farmers in non-BCWUA areas pay no fees. The additional cost burden attendant on BCWUA formation and maturation amounts to a strong disincentive to create and sustain such organizations. To make the cost sharing element, and indeed the BCWUA program itself, effective, the GOE needs to announce its intention to move to an across the board fee-for-service policy for irrigation, thus offering the BCWUAs an opportunity to reduce that burden through careful management.

#### **5.4 Water Boards**

The concept of Branch Canal Water Boards (BCWBs) was first implemented in a Dutch-assisted project in Fayyum and later expanded, with Dutch and German support, in a broader pilot program in several other systems in the Nile delta and valley. Under this expanded pilot program, 9 BCWBs were created in the delta and upper Egypt covering about 33 thousand feddans (13,200 ha). The intention of the program was to introduce a coordinated participatory approach to planning and executing irrigation and drainage management on a branch canal. Organization is based on the command area of a branch irrigation canal and is intended to deal with both irrigation and drainage issues. Boards are ultimately responsible to a *general assembly* made up of three interest categories – agricultural, residential, and industrial/enterprise. The general assembly selects a *representative assembly* (40 to 75 members) through a weighting mechanism that insures the participation of all three interest categories, as well as the participation of women in all decision making and executive bodies of the BCWBs. The representative assembly then selects a 5 to 11 person *water board committee* which undertakes the day to day functions of the BCWB. All committee positions are voluntary and non-salaried, and members must not be public employees of local government, MWRI, or MALR and must live in the BCWB command area.

Many of the organizational precepts underlying the BCWB formation process are admirable – including the three stage governance process, the inclusion of women, and the integration of irrigation and drainage functions. In the latter, it links well, conceptually, with the IWMD concept being tested by the ministry.

Up to now, however, BCWBs lack legal sanction for their roles and have had few real responsibilities to implement. Their role has been limited to that of an advisory body to MWRI and other government agencies. It is not clear how the BCWBs would fund themselves once cut loose from a pilot program and concerns have been expressed by project evaluators over the distorting effect of “excessive financial incentives” provided during the pilot stage. More fundamentally, there is a question of whether the three interest groups involved have sufficient common interests to hold them together, and whether they would have sufficient clout to deal with such resource quality problems as the solid waste disposal problems affecting canals in populated areas. Another important issue is whether such a multi-faceted group should, in fact, be empowered to make irrigation management decisions which affect primarily cultivators.

More recently Water Board Project (WBP) team members have opined that water boards at the branch canal level are not viable, and that future efforts should focus on water boards at the district level<sup>10</sup>. The logic offered for this is that Regional Management Committees (RMC) have been formed at the district level under the chairmanship of the MWRI governorate Under-Secretary, and with regular participation of the Inspectorate and District Engineer staff. This is the primary policy and decision-making body for Water Boards. For the present Water Board pilot project in 9 branch canals, the RMC convenes a monthly meeting to review progress and guide implementing staff. The implications of this level of management oversight are obvious and considerable: assuming an average of 40 to 60 branch canals in each irrigation district, to continue to provide the same level of support, the RMC would be engaged in 40-60 meetings per month. This is clearly not a practical or sustainable option. There is also the concern that the RMC, as the management focal point, will become an additional tier of government bureaucracy, at a time when MWRI has expressed the need to streamline official procedures and reduce burden on the existing bureaucracy.

There are a number of similarities between the Water Board model that grew out of the Fayyum Water Management Project and the Branch Canal Water User Association model that resulted from collaboration between the MWRI and the USAID APRP/EPIQ project. However, MWRI officials are clear to point out their view that the BCWB model is one of joint user/government management, with largely advisory powers coupled with limited financial resources, while the BCWUA is seen as an operating agency. One possibility is to meld the district WB idea with the IWMD concept to allow the WB to serve as the advisory body to the integrated district. The BCWUA model seems more generally and directly applicable to the problem of managing irrigation water at the branch canal level and in moving management at that level into the private realm.

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<sup>10</sup> Communication from WBP Director, Eng. Y. A. Aziz, March 2003

## 5.5 Lessons to Build On

Some lessons emerge from a review of recent experience with increasing PSP in water management in Egypt.

- Farmers readily accept, and pay for, high pay-off improvements such as tile drainage installation
- The 30% shortfall in drainage improvement collections is probably more a function of weaknesses in the collection system than of farmers' unwillingness or inability to pay
- Farmers can organize themselves, with assistance, into functional and viable water management organizations
- Institutional structures are in place within MWRI (notably the IAS) to implement future PSP programs involving user control of canal management (though their capacity is inadequate to achieve current target levels of farmer organization).
- The branch canal level is a high priority target for enhancing PSP in irrigation system management
- Experience with farmer-based organizations at the branch canal level is available from both the IMT and BCWB programs, but needs to be captured, organized, and interpreted
- Scope exists for expanding PSP in existing *mesqa* improvement and tile drainage programs through changes in those programs
- The broader goal of enhancing civil society participation in MWRI decision making cannot be accomplished by a single central office working alone, but must be infused throughout all operational arms of the ministry

## 6. Looking Forward

Increasing PSP involves reducing the role of the government in making and implementing decisions and increasing the role of non-governmental organizations in these processes. Above, we have reviewed briefly the experience of Egypt in general and the water resource sector in particular with respect to current policies and recent experience with increasing PSP. Below, we examine the possibilities in four different areas for enhancing PSP in the water resource sector. The first three are dealt with rather briefly. More attention is devoted to the final area – irrigation service provision.

## **6.1 Expanding Roles for Non-government Entities**

### **6.1.1 Commercial Enterprise Operation**

A number of public companies previously owned by the ministry were sold to employee stockholder associations in the mid 1990s. However a government-controlled holding company retain a small share of the stock in all of these companies. Having enjoyed access to cheap credit afforded by the holding company for 8 years, it would seem to be time to complete the privatization by selling the remaining public stake and closing the holding company. This would both save the cost of operating the holding company and level the playing field among all fully private and formerly government-owned companies.

It is difficult to argue rationally that in an economy as large, diverse, skilled and sophisticated as is Egypt's, an article like slotted plastic drainage pipe, unarguably a private good, should continue to be produced in a government-owned factory. Yet this is the case. Counterarguments involve claims that heavy investments in equipment, much of which is now outdated, could not be recovered in a sale. This is both bad logic and bad economics. Equipment should have been depreciated as it aged, and in any event, it is a sunk cost now with respect to future planning and should not be a factor in a decision regarding privatization. Factories such as this still belonging to the ministry should be put up for sale and competition in provision of such commodities encouraged. This will reduce the true cost of the pipe (regardless on any subsidies now being provided) and promote the introduction of improved manufacturing technology. Some of the employees displaced will likely shift over to the private firms which replace the government enterprise and others can be offered retraining assistance.

MWRI apparently also still retains a number of service providing entities which are costly and underutilized. These include a training center and equipment repair and maintenance shops. The ministry should conduct a comprehensive review of all such service providers within MWRI and prepare a plan for privatizing or closing them and outsourcing the services they are intended to provide. The ministry could pre-qualify potential contractors and then make contract awards to qualifying private providers.

### **6.1.2 Financing**

Partial private sector financing of some of the new mega-projects such as Toshka is taking place. This financing piggybacks onto major public financing of infrastructure, however, and the opportunities for more projects of this type is virtually nil, without drying up existing irrigation. Likewise, BOOT-type rehabilitations of existing schemes lack the revenue generating potential to make them attractive to investors. Even if cost recovery systems for irrigation service were rationalized and reformed, they probably would not generate sufficient revenue to support a BOOT system rehabilitation and operation process. Some smaller more localized improvement programs, however, do have the potential to mobilize and employ private capital.

Current MWRI initiatives, such as IIP *mesqa* improvement and tile drain installation, are publicly funded, sometimes with support by international financing. Some programs, such as tile drainage, attempt to recover a portion of capital costs from users, while others, such as

IIP, have not<sup>11</sup>. Employing PSP type incentives to improve efficiency, benefit targeting, and effectiveness requires changes in these practices.

Where public financing is employed, it should be provided through a revolving fund, with repayments returned specifically to this fund. Because of interest rate subsidies<sup>12</sup>, the fund will still have to be topped up, but individual programs should be partially self-financing on this basis. Collection of payments through the government revenue systems, while convenient, has a number of problems as outlined earlier. Better recordkeeping and computerization of records is an obvious solution. Computerization of financial records would have a great number of other benefits related to transparency and reduction of leakages as well, but is obviously a much broader issue than the one we are dealing with here. Farmers could, however, be allowed to earmark partial payments to the collection agent for particular obligations, such as drainage repayment. This would help to close the accountability loop and give the farmer a better sense of actually making a payment for a particular purpose. Payments thus fed into the public revenue system should then be earmarked to replenish the appropriate revolving fund. A joint MWRI/Finance Ministry task force should monitor this process, using repayment rates in particular governates and districts as performance criteria for staff.

Where possible, programs should be shifted over to private sources of finance. This would involve establishing a direct link between a user association (UA) and a bank or other private finance institution. The UA would work directly with the bank and a private contractor engaged for improvement work. MWRI would provide technical assistance and advice where necessary, but transactions would be private and direct. Banks could link failure of a particular group to fully pay their obligations to the group's credit rating, affecting their ability to get other loans in the future. The group payment record could also be linked to access to production credit by individual members of the group as an incentive to pay. The tile drainage program, with its high rates of return and relatively low cost, would be a likely initial candidate for such an arrangement.

### **6.1.3 Design and Construction**

Similarly in contracting for improvement work, the goal should be to pull MWRI back from direct involvement and encourage direct contracting relationships between WUAs and contractors. MWRI could provide training to contractors in techniques of drain installation or *mesqa* improvement, and prequalify contractors to be eligible for the program. The ministry could also provide training to WUAs and DCUAs in contracting and supervision. This may work better at the branch canal level, where the BCWUA would generally have qualified technical personnel on its staff who could supervise the contract, than at the *mesqa* level where such technical expertise might not be available within the WUA. The benefit would be closer supervision of the contractor by the WUA, a stronger concern with cost control (assuming repayment by WUA members) and access to the extensive and detailed knowledge of local hydrology held by local farmers and WUA staff.

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<sup>11</sup> Efforts are just getting underway to recover *mesqa* improvement costs.

<sup>12</sup> Funds are provided at zero interest, thus inflation will erode the value of the revolving fund, even at 100% collection efficiency.

#### 6.1.4 Service Delivery

Channel operation and management, whether a *mesqa*, a BC or a distributary or higher level canal, is ultimately the most important aspect of managing Egyptian irrigation systems. What benefits can PSP then bring to this set of tasks?

First, expanding the IIP program to a wider number of *mesqas*, or even to the entire country, does nothing to enhance PSP. This is because *mesqa* operation is already acknowledged to be completely within the private sector and the responsibility of the farmers and landowners served by the *mesqa*. While *mesqa* improvement under IIP may have important impacts on equity, economy, or efficiency of water use, it does nothing to improve the incentive climate by increasing PSP in *mesqa* operations.

That leaves the branch canal as the preferred target for reforms which would increase PSP in system operations, enhancing incentives to manage effectively and conveying the resulting benefits related to costs and quality of service. There are two broad ways to approach this – contracting with a private BC manager, or delegating authority to manage to a farmer-based organization.

**Contract Management**—Under the first approach, the district office (or IWMD) would contract with a private firm to manage one or more BCs within the district. Contracts would be let competitively and could follow either of two forms. The first would be a **management contract** for a fixed fee. The contract would specify standards of service to be achieved, condition in which facilities must be maintained, and the terms of payment. The second form would be a **franchise** or **concession** which authorized the private firm to utilize government facilities, i.e. the branch canal with a specified bulk water supply, to generate income. The firm would provide irrigation service to farmers and would collect fees from them in return. The level of profit (or loss) earned would depend on the efficiency with which they operated the system and collected fees for service. The contract between the franchisee and the district office would need to balance farmer protection with attractive incentives to the franchisee to bid for the contract and to perform well.

**WUA Management**—The second option is for the ministry to delegate long-term management authority to a WUA at the branch canal level. The WUA, in turn, could hire its own staff and operate and maintain directly, or it could engage a firm to provide these services, or a combination of the two. It would generally not make sense for the WUA to try to assemble a full complement of staff and equipment to conduct operation and maintenance activities entirely itself. Both staff and equipment would be idle much of the time and operations would be inefficient. Certain canal operations tasks on the other hand, could probably be undertaken efficiently by directly-hired staff. Each WUA would thus have to analyze its situation and decide on the approach to management it wished to take. The option of the WUA contracting with a firm for all services should not be rejected out of hand. Although there few firms at present which could take on this responsibility, there are a large number of trained engineers and other technical people in the country (including a significant

number of retired MWRI engineers). If WUAs were seeking to outsource BC management thus creating a demand, such firms would surely come into existence.

Any outsourcing of services by the WUA should be managed directly by them, and for this purpose, they would require a small hired technical and financial capability. They would also need to acquire the legal status that would enable them to act in this role. The overarching advantage of this type of management set up is the incentive climate that would result. Farmers are the ones that stand to gain and lose the most from the good or poor performance of the BC. As such, they have the strongest incentive to insure that the BC performs well. Likewise, if they are paying for the irrigation service, they have a powerful incentive to minimize the costs of providing the service. These incentives will generally be much stronger than those affecting salaried government employees who stand to gain or lose little as a result of superior or inferior canal performance.

However, a caveat for most of the management set-ups outlined above is that farmers bear a significant share of the costs involved in providing the service. This is not currently the case, and without fundamental changes in the charging system for irrigation service, PSP will probably make few inroads into the BC management picture. With a rationalization of the charging system, however, a number of possibilities open up.

Another option would be a BC-based non-profit company, owned and capitalized by command area farmers and/or landowners, and authorized by WMRI to operate and maintain the Branch Canal. Funding and operating options would be similar to those for a BCWUA, however the organizational form would be different.

***Contract Maintenance***—Although encompassed under the two sub-headings above, BC maintenance deserves a separate note. Branch canals are currently maintained under contracts let by the General Directorate for large numbers of canals. This attracts large contractors who, in turn, usually sublet the work to smaller local contractors. Monitoring the work of these contractors is a nearly impossible task for District Engineers as it occurs in many places at once. A long term solution to this problem is to devolve responsibility for branch canal maintenance to BCWUAs, which would engage the smaller local contractors directly. As the group with the strongest direct interest in well performing BCs, the WUAs could be expected to exercise due diligence in contracting for and supervising maintenance work. The District Office (or the IWMD office) would then maintain higher level structures and channels and perform inspections on the quality of BC maintenance organized by the BCWUAs.

## **6.2 Achieving Public Sector Efficiency Gains**

A variety of reasons underlie any program to increase PSP in the provision of a particular service. These include the following.

- Improving quality of service delivery to clients
- Improving responsiveness of service delivery to clients needs and wishes
- Increasing client satisfaction and control

- Lowering the overall cost of service delivery
- Mobilizing private capital for delivery system improvements
- Shifting the burden of paying for services from society at large to direct beneficiaries
- Reducing size and cost of government agencies, freeing funds for other public activities

Achieving any of these objectives depends on careful design and execution of the PSP program. The last item, however, is special in that an otherwise successful PSP program will not achieve this objective without extra efforts designed specifically to eliminate redundancy and reduce staff levels in the sponsoring government ministry or agency.

Bureaucracies have an inherent tendency to sustain and expand themselves whenever possible. In Egypt this tendency is reinforced by a strong public policy priority on employment creation in the economy as a whole. This is a positive thing when it emphasizes stimulation of employment generation in the private sector by encouraging economic growth and development. It turns perverse when it take the form of expanding public employment rolls with underutilized laborers, in which case it constitutes a drag on the economy and absorbs scarce public funds for salary and benefit payments that could have been used to create more productive jobs in the private sector.

The bottom line for MWRI is that, to achieve the goal of reducing the size and cost of its “establishment”, units and staff made redundant by expanded PSP must be removed from the ministry and excess staff employed elsewhere where their labor will be more productive. This requires top level guidance and leadership, as well as retraining programs for redundant workers, incentive payments for early retirement programs, and assistance to redundant workers in finding new jobs. In the absence of such programs and a strong top level mandate, it is unlikely that the ministry staff and structure will be “right sized” and the imagined cost savings from enhanced PSP will be illusory.

## 7. Conclusions and Recommendations

Egypt initiated a structural adjustment program more than ten years ago to reduce the direct role of the state in economic activities and expand PSP. The first thrust of this effort involved privatizing SOEs. This led to the transfer to employee ownership of 12 firms formerly under MWRI. These firms have continued to operate successfully. The government maintains a small stake in these companies and provides them with cheap credit. The time is ripe to complete the divestiture by selling off this final share and winding up the government holding company which holds it.

Other enterprises and units remain within the ministry that either are better suited to operate as private enterprises or duplicate functions also provided by private sector firms. Often the ministry uses the private firms in preference to its own units because costs are lower or services more responsive. These units include plastic pipe factories, a training center, and workshops. The ministry should review its operations thoroughly and either divest or close units which would operate more efficiently in the private sector.

The second thrust of the structural adjustment program aims to involve private capital and expertise in developing productive infrastructure in the country. MWRI has long used private contractors for design and construction of new facilities, but financing has always come from public or multi-lateral sources. Other sectors, such as power and roads, have mobilized private capital and management expertise through BOOT type projects. MWRI is bringing in private capital to develop and operate secondary and tertiary works in some of the mega-projects such as Toshka. In this case, however, the private investment is facilitated by major public investments which are not directly recovered. Moreover private investors will recoup their investments not by selling irrigation service, but by operating irrigated agricultural enterprises with cheap water. The scope for widespread private financing of new development or rehabilitation of existing irrigation systems is very limited, constrained by high costs and the modest resulting revenue stream.

Over the past few years, MWRI has also experimented with PSP in irrigation management. The long-standing IIP program, strictly speaking, does not enhance PSP since *mesqas* are private parts of the Nile irrigation system anyway, and collectivizing pumping does not alter the private/public balance in any way. From the late 1990s, however, MWRI has experimented with two different types of collective groups at the branch canal level which, if empowered, would increase PSP in irrigation management. Established and empowered, BCWUAs would serve as the decision making and contracting entity for BC maintenance work and operations, and could play an important advisory role in BC rehabilitation. DCUAs, if empowered, could contract directly with private contractors and financiers to install tile drainage. Likewise, *mesqa* WUAs could contract directly with contractors for *mesqa* improvement work.

BCWUAs should generally be formed directly from the farmers within a BC command. They play an important role in improving management of BCs whether or not *mesqas* have been raised in the command. A BC organization of farmers could also be established as a

non-profit corporation. Legal issues and local preferences would suggest the appropriate model. The model envisioned here would not involve joint management of BCs with the government, but rather would assign the management role to the WUA and the regulatory role to MWRI. BCWUAs would require a broad legal mandate to take on a legal personality and perform these functions. The ministry would establish standards for system maintenance and performance and would have to give some assurance of the volume and schedule of water deliveries the BCWUA could expect. This provides a link with the system of allocative water entitlements proposed by the third component of this study.

The BCWUA would perform its management responsibilities with a small permanent staff with technical and financial management capabilities and would contract with private firms for maintenance and other services. This may lead to the emergence of a new set of small firms with specialized expertise in carrying out outsourced management functions. Competition among these firms would then help to hold down costs.

Although there are interim ways for user associations of various types to utilizing public funds for system improvement and O&M, in the longer run enhanced PSP depends of passing a major share of both capital improvement and operating costs to the direct beneficiaries. The resulting financial accountability is a key governance mechanism for controlling costs and improving quality of services provided. In the absence of this payment mechanism, control becomes much more difficult and many of the PSP mechanisms considered here will be hobbled.

One important purpose underlying PSP programs is to reduce the cost of ministry operations, freeing funds for other high priority activities. Unfortunately, this will not happen automatically as a result of a successful PSP program. Bureaucracies tend to expand, not to contract, and shedding unproductive personnel and redundant units will only happen as a result of a concerted program with a top-level mandate and support. Such a right-sizing program requires a comprehensive review of ministry operations and private sector capacities, payments for early retirement and voluntary termination, and retraining and reemployment assistance for redundant staff. Even then, such a move will be difficult to implement. However, in its absence, cost savings and gains in public efficiency are very unlikely to be realized.

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## Annex 1

### A) Status of Road BOOT Projects

Road Project Name	Length (km)	Investment Cost (LE million)	Project Stage	Contractors
Cairo – Ein Sokhna + Exits	175	600-800	Just started	Ministry of Defense
Cairo – Kureimat + Exits	125			
Alexandria – Fayoum + Exits	199	700	Under negotiations with Council of Ministers	-
Development of Cairo – Alexandria – Matrouh	520	900	Under study for offer	-
Development of Cairo – Ismailia – Port Said	180	500	"	-
Sohag – Hurghada	250	500	"	Studies are being prepared by GARBLT
Luxor – Hurghada Desert Road	220	450	"	"
Fayoum – Assiut	260	500	"	"
Dayrout – Farafrah	263	500	"	"
Cairo – Center of Alexandria	180	400	"	"
Ein Sokhna – Marsa Allam	630	1200	"	"
Cairo – Aswan (West of Nile)	800	1500	"	"

*Source: GARBLT- CARANA*

### B) Status of Maritime BOT Projects

Authority	Project Name	Period (Years)	Investment Cost (\$ million)	Project Status	Completion Date	Name of Contractor
Old Alexandria Port/ (Dekheila)	Petroleum Quay in Alexandria (Dekheila)	30	45	Signed end of 1998	Inaugurated July 2001	MEDTAB (to build quay pipes) MIDOR refines raw petroleum
East Port Said Port Authority	East Port Said Port	30	480.8	Signed August 1999	Early 2004	JV-European Container Terminal, Maersk (Danish), Ibrahim Kamel, National Bank of Egypt
Read Sea Port Authority	North Sokhna Port	25	176	Signed May 1999	Early 2002	JV-ABL (American), Sawiris, SSA (American), Tantawy(Egyptian)
Damietta Port Authority	Damietta for Liquid Gas Export	25	1.6 billion	February 2001	2003	Sea Gas-JV Spanish Venus & Egyptian Company

*Source: Maritime Transportation Sector*

### C) Status of Railway BOOT Projects

Railway Project Name	Length	Investment Cost	Project Stage	Name of Contractor
Ein Shams – Tenth of Ramadan	40 km	LE1.7 billion	Study underway	-
Ismailia – Rafah	225 km	\$268 m	Offered	-
Giza – Sidi Gaber	-	-	Announced	-
Marsa Matrouh – El Saloum	260 km	LE50 m	Bidding underway	-
Alexandria – Marsa Matrouh	300 km	N/A	Bidding underway	-
Sidi Gaber – Borg El Arab	60 km	\$150 m	Study underway	-
Alexandria – Aswan (Super Train)	-	LE10 billion (estimate)	Feasibility Study to be conducted	Spanish Railway Authority
Cairo – Tebbeen	225 km	\$75 m	Offered	-
Sinai – Saloum	-	\$230 m	Offered	-
Dayrout – Rafah	165 miles	\$400 m	Offered	-
Saloum – Natrun	315 miles	\$520 m	Offered	-
Saloum – Morocco	-	LE780 m	Under study	-
Borg El Arab – Alexandria	-	LE850 m	-	Supervised by International British Company

*Source: PCSU compilation*

## Annex 2

### Status of Airport BOT Projects

Airport Project Name	Concession Period	Investment Cost	Project Stage	Name of Contractor
Marsa Allam	40	\$40 m	Inaugurated November 2001	EMAC (El Khorafi Group)
Hurghada Terminal	10	\$15 m	Completed 1999	JV Artoc Suisse for Airport Services Investment & GOE
Sharm El Sheikh (expansion)	25	\$170 m	Under negotiations	ABB Equity Swiss-SESAM (Swedish.Scansca-Vancouver/ Canadian-Samcrete/ Sami Saad)
Luxor Airport	25	Approx. \$70 m	Under negotiations	JV Aeroport de Paris/ Vinci
Al Alamein	50	LE200 m	Under construction – expected opening Q4, 2002	International Company for Airports (Ibrahim Kamel)
Bahareya & Farafrah Oasis Airport (2 Airports)	50	DM200 m (each Airport)	Cancelled	ABB – Manheim Germany
Assiut Airport			Bidding underway	
East Oweinat			To be announced	
Sohag			To be announced	
Borg El Arab			Stage of assessment of offers	
<i>Source: Civil Aviation HC – CARANA [April-June 2002]</i>				