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Cost Recovery for Irrigated Agriculture: Egyptian Experience

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1. Introduction

This paper attempts to highlight Egypt's experience in dealing with the cost recovery in irrigated agriculture. An overview of the previous studies that were done in this respect will be summarized. The development of the Egyptian experiences in applying the mechanisms and policies that aiming to recover part of the costs of the irrigation system is given. Finally, the paper will outline some recommendations for the future prospective of the cost recovery application in Egypt and how it can be successfully used as a tool to improve water management and make better allocation for the limited available water resources.

1.1 Concepts and Types of Cost Recovery

Irrigation Cost Recovery can be defined as the process of directly or indirectly capturing and directing to public agencies some portion of revenue resulting from government actions to provide irrigation services, regardless of whether or not these funds are used to pay for any construction or operation and maintenance costs. The extent of the recovery is usually referenced to the costs incurred, with both the amount recovered and the costs expressed in present value terms. The objectives being pursued and their relative weights will determine appropriate target levels and modes of recovery. In practice, criteria for successful recovery can vary from small fraction of operation and maintenance costs only, to more than 100% of total costs of construction and O&M.

Cost for services are in principal to be recovered from those who benefit from the provision of those services. The recovery of costs may be directly from beneficiaries or indirectly through sectoral taxation, through diversion of water resources from one use to another or simply reduced production from un-maintained, deteriorated facilities.

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A viable cost recovery policy should have the following:

1- Few or no negative impact in terms of distorting incentives and inequity of impact
2- Be transparent in calculation and application.
3- Be administratively simple
4- Be politically and socially acceptable.

Cost recovery has three distinct objectives that can identified as underlying the purpose of the service charges: the financial objective to recover from beneficiaries the cost of providing water related services; and the two efficiency objectives to encourage efficient use of water resources and to provide the water service at a reasonable cost.

The formulation of a cost recovery program includes the allocation of costs for service provided and selection of charge levels and collection procedures; the economic and financial status of the beneficiaries; the extent to which benefits can be quantified and captured; the cost of imposing the charges and the impact of the charges on aggregate production.

Recovery may be direct or indirect. Direct Cost recovery refers to collections from irrigation fees, betterment levies, the incremental portion of land taxes attributable to irrigation investments, increased crop delivery quotas at controlled prices, or other instruments that increase taxes paid by farmer beneficiaries in the irrigation command area. Indirect cost recovery refers to increases in government revenue attributable to the irrigation project, whose incidence is not borne by farmers in the command area. Some policies, such as an export tax on a cash crop like rice or cotton, may contribute both to direct and indirect cost recovery, affecting both producers and processors of the product. Cost recovery instruments may also be classified as automatic, to the extent that a project may increase government revenue via existing tax instruments, or discretionary, when it pertains to instruments that are explicitly instituted to increase cost recovery.

The recovery of investment costs and the recovery of operating costs are often treated separately. While it may be true that there is no fundamental justification for this separation, there are practical reasons for it, including the fact that foreign and multi-lateral lenders will readily finance the former but seldom the latter. As a practical matter, recurrent cost recovery is often of far greater interest to developing country irrigation system managers, If not to their lenders, than is the recovery of capital costs.

Capital costs are recovered according to a formula, which requires repayment of the full capital cost over a period of ten to twenty years, beginning no more than five years after completion of the works.

Water resources investments on the Nile comprise a multi purpose development serving the needs of power, navigation, municipalities and industries as well as farmers. Some of these demands are competitive (agricultural and industrial) while others are complementary (releases for agriculture ca be passed through turbines to generate power, and used by ships for navigation without detriment to the agricultural users). This makes the design of a cost recovery system more difficult in distinguishing between different uses to reach fair allocation of fees between different users.

1.2 Purposes of Cost Recovery

Cost recovery through any means is not an end by itself but a way of achieving specific efficiency and equity ends within the national economy. A charging system will have appropriate impacts if:

1- it results in improved irrigation performance through:

- More efficient operation and maintenance of irrigation facilities
- More efficient use of water by farmers.

2- it promotes other objectives of the government by:

- Leading to better irrigation investment decisions
- Easing the government's financial burden
- Resulting inn a more equitable distribution of income.

Cost Recovery should relief the pressure on the use of the limited water and land resources and improves the utilization of such resources. At the same time, cost recovery will require a more solid policy approach associated with policies on subsidies and taxes. Thus, the action-oriented part of a cost recovery system can and should be seen as one of the major potentials in improving the performance of the irrigation sector and how it is managed. Cost recovery can and will exert great pressure on the service agency to improve its performance.

2. Egypt Experience in Cost Recovery

Growing recurrent costs for O&M of irrigation services and facilities are creating huge budgetary demands in Egypt. In addition, public irrigation is heavily subsidized and has become an enoffilous fiscal drain. In 1995, the public subsidy to irrigation services was almost LE 670 Million.

Greater emphasis is now put on cost recovery mechanisms whereby the resources for O&M, minimally, must come from the direct beneficiaries, the water users.

Series of workshops were held during the past ten years to establish guidelines for recovery of all mesqa and farm improvement costs, and establishes a procedure and necessary document to legalize the Water Users Associations (WUAs). In addition to that, several studies were made to discuss the design and implementation of successful cost recovery policies for irrigation services in Egypt and the major impacts of such policies on water management and on the social and economical conditions of the users.

This chapter will provide a general review for the most important cost recovery studies that were made during the past 20 years. It will also provide an overview for the Egyptian experiences in applying cost recovery mechanisms through the implementation of two major national projects, the Irrigation Improvement Project (IIP) and the Tile Drainage Project.

Previous Studies

Cost of irrigation water is an important issue in water resources planning and management. It plays a major rule in examining the feasibility of agricultural investments, allocation of irrigation water among various agricultural areas, and in establishing a pricing policy (water management policy) for irrigation water. Although much work has been done on water pricing, little rigorous work have been made on the cost of irrigation water delivery and collection.

The "Economic and Social Commission for Asia and the Pacific- United Nations" published the proceedings of the expert group meeting on water pricing held in Bangkok, Thailand, May 1980. In the report, current policies in the pricing of irrigation water were presented for Bangladesh, India, Indonesia, Philippines, and Thailand. Costs of delivery of irrigation water were also discussed. Costs were estimated at the farm level in various pumping operating systems plus very few government-operated large structures.

The "Master Plan for Water Resources Development and use in Egypt", 1981, in its report on irrigation and drainage systems in Egypt, has tackled the problem of irrigation water cost. Average cost of irrigation water was estimated as 1.92 L.E. per 1000 m3. It is worth mentioning that this figure is averaged over the whole nation. In the computations of the average cost

of irrigation delivery, the replacement cost of most irrigation infrastructures was neglected. It was assumed that costs occurring after the year 2000 should not be taken into account. Also, this average cost of water included the full cost of multi-purpose structures operated and supervised by MWRI but serve other purposes (navigation, hydro-power, flood control, etc.) rather than irrigation.

In 1983, the Supreme council of Universities published a report about "Pricing of Irrigation Water". The report presents a methodology for estimating irrigation water cost at various locations of a river basin. The methodology is applied to Upper Egypt. Two cost models were used. The first model is to determine cost of irrigation water if controlled, operated, and/or stored with multi-purpose structure. It is to allocate total cost of the structure among the various services. The model is applied to the High Aswan Dam. The second model is to allocate the cost (irrigation cost) of an irrigation (multi-purpose) structure among the cultivated areas served with this structure.

Estimates of the irrigation cost at the various regions of Upper Egypt are obtained under different configurations to the functions of main irrigation controlling structures. The results are presented and a discussion was made in the above-mentioned report.

The model developed by B. Attia, 1985, is used to establish a price scheme for irrigation water by conducting several policy planning experiments. Water pricing is used as policy instrument. These pricing reflect the policy planner viewpoints in distributing different taxes and/or subsidies concerning the agriculture.

In January 1993, Irrigation Support Project for Asia and Near East (ISPAN) published a report under title " Irrigation Water Cost Recovery in Egypt: Determination of Irrigation Water Cost". The overall objective of the report is to determine the net O&M costs of the main irrigation and water supply system in Egypt, as it is currently supported, and what those costs might be under an enhanced or acceptable budget allocation. The analysis is limited to OM&R costs of the main system, defined as the Nile River structures and the main and secondary canals, and exclude the on-farm portion "mesqa and below". The first scenario reflects the recent and current budget allocations for OM&R in Egypt. Scenario 2 considers the costs of the system if improved to an adequate degree. The third and fourth scenarios incorporate planned reclamation of not yet developed "new new lands" into each of the first two scenarios.

In 1995, the "International Irrigation Management Institute (IIMI), in collaboration with MWRI has addressed the topic of water services charges for agriculture in Egypt. During the course of IIMI's collaboration program of work, several reports about cost recovery have been produced. In May 1995, IIMI published a technical paper, in which a brief background to cost recovery in the Egyptian agricultural sector was presented. The paper summarized the procedures for the allocation of basic costs of operation and maintenance and capital costs as have been firstly presented by ISPAN in their report. The paper also discussed the implications of various mechanisms for cost recovery on the agricultural sector indicating the particular advantages and disadvantages of each.

In May 1995, Jan L.M.H. Gerards, from Gaia International Management Inc. made a rapid appraisal on structuring cost recovery in Egypt with an emphases on the mesqa as the service delivery point for introduction off a mesqa operational fee as the WUA contribution to main system O&M costs. The results of this study were demonstrated in a technical paper under subtitle "The role of a nationwide and institutionally integrated IIP and IAS in creating the Federated WUAs and the single point mesqa's". This paper identified 6 main components that any irrigation management program should contain and the possible suggestions for meeting improvements in these components. The paper attempted to integrate the experience of cost recovery introduction in Indonesia to the situation and circumstances of the irrigation sector in Egypt. It also addresses the advantages of creating the single point mesqa in water management and the function of the mesqa in cost recovery. A model for cost recovery of the mesqa operational fees was introduced with identification of the institutional and administrative changes that need to be done.

3. Application of Cost Recovery in Egypt

Government revenues from agriculture up to the late 1980s were derived through implicit taxes on agricultural production: prices of farm products were low; marketing was controlled; cropping patterns were set to meet government's priorities; and GOE captured substantial profits from sales of commodities (especially cotton) on world markets. The result of these policies, combined with increasing domestic demands, was a rapid deterioration in the agricultural trade balance. To restore farmers' incentives, a radical program of reforms to agricultural policy was initiated in 1986. Much closer correspondence between international and domestic prices for the major crops was allowed, and controls on cropping patterns were gradually eliminated. The response to this policy change has

been dramatic: yields and production of major crops have increased sharply, and farm incomes have increased (after allowing for the increased cost of inputs) by some 40% in real terms.

This period of rapid adjustment, during which government's revenues from the sector fell sharply, also provided the opportunity to adjust other prices to more appropriate levels. To some extent this was done, as subsidies for farm inputs were reduced. Charges for water services (to agriculture or to other users) were not introduced, however. The GOE initiated several programs to implement cost recovery mechanisms for irrigation services. The following is a brief description of the main programs that were initiated by MWRI.

3.1 Irrigation Improvement Cost Recovery

The Irrigation Improvement Project

A package of demand-oriented measures have been prepared and applied to the Egyptian agricultural sector under the Irrigation Improvement Project (IIP). The Irrigation Improvement Project (IIP) comprises improving control structures, using modem methods in land levelling/tillage, on- farm development, rehabilitation of main and branch canals and most of all mesqas, promoting equity of water distribution, and attaining a form of cooperation between the irrigation directorate and farmers, by forming water users associations.

Water users' associations that were established under the irrigation improvement project serve as an excellent example of the effect of user involvement and cooperation on the system management. Although all the users here are farmers who belong to the same economical sector, it is the concept of stakeholder involvement in decision making during the various stages of planning and implementation, which is emphasized. When the user is involved from an early stage, it is evident that he will accept the proposed improvements and will be able to operate and maintain them easily afterwards. Moreover, they resolve conflicts between themselves automatically as they have to share a common resource.

In order to achieve the user involvement objective, a department for water advisory service was established under the irrigation improvement sector. One of the main functions of this department is to help in the transfer of the management of the mesqa to farmers and help them resolve conflicts and problems.

The success of the IIP project in forming water users' associations forced the parliament to issue a legislation of such associations in which it was defined as private organizations owned and operated by its members of the water users of the water course for their own benefit, and work in the field of water use and distribution and all the related organizational activities for the purpose of raising the agricultural productivity.

Repayment of the full capital cost of improved mesqa, excluding interest, over a period not more than twenty years and establish a special fund within the MWRI to finance future mesqa improvement beside recoveries from farmers, the fund would be financed from budgetary transfers and foreign grants and loans.

Mesqa improving costs consists of three components:

1- Investment costs for the mesqa pumps, the repayment over a period not exceeding 5 years.

2- Investment costs for civil works including mesqa remodelling, PVC pipes, lining, etc., these costs would be repaid by beneficiaries not later than the end of the first year following completion of mesqa improvement. The investment costs would be paid to the government over a period not more than twenty years without interest based on farmer's capacity to pay.

3- In the case of O&M costs, farmers would pay these costs directly to the WUA's. The WUA's would determine the mode of recovery of O&M costs of the mesqa from their members, they would be encouraged to base recovery on a proxy for the volume of water (e.g. according to the time of pumping) rather than on a per feddan basis since this would provide incentives for improved water use efficiency.

The payment for mesqa investment expressed as a proportion of incremental income attributed to irrigation improvements varies between 15-25%. This shows the ability of beneficiaries to pay, it also shows there is strong incentive for farmers to participate in the irrigation improvement program.

The Water Boards Project

At the branch canal level, under the Dutch government aided program to Egypt, the water boards project has been formulated to develop an approach, which has a general validity to the diverse irrigation and drainage system in Egypt. The Fayoum Water Management Project's initiative to establish experimental "local Water Boards" at the Secondary Canal was quite successful and between 1995 and 1998 a total of 10 "local

Water Boards" were established. Eight of these follow a "joint management" model, whereby users and Ministry staff (District Engineer) form the Board. These are established by Decree of the Under-Secretary of State for Fayoum of the MWRI. For the two remaining, the Board consists of users only and is formed under law 32/1964 on Private Organizations and Unions.

The positive outcome of this experiment first lead to the formulation of a project to expand the experiment beyond the Fayoum (the Water Boards Project) and secondly in expansion of the experiment to the level above the Secondary Canal during the third phase of the Fayoum Water Management Project.

The Water Boards Project was formulated to develop a viable national policy and legal framework for Water Board development. This is a clear indication that the Government of Egypt has decided that for the future the users need to be formally involved in water management. The limited impact of earlier experiments due to the absence of a legal framework for user organizations at secondary level and above has been duly recognized and this was included in the Terms of Reference of the Water Boards Project.

The Water Boards Project will base its recommendations for a national policy for participatory water management at the secondary level on existing experience and the establishment of 8 (eight) additional experimental "Water Boards" spread over the country. This combined experience will form the basis for the formulation recommendations for a national policy and a legal framework for user participation in water management at the secondary level.

In this context the Agricultural Policy Reform Program (APRP) has formulated two important benchmarks for the Ministry of Water Resources and Irrigation. One is the Benchmark No.5: Revision of Law 12/1984 on Irrigation and Drainage", and the other one is Benchmark No.4 "Irrigation Management Transfer". These Benchmarks are implemented in the MWRI with the assistance of the Environmental Policy and Institutional Strengthening Indefinite Quantity Contract (EPIC). Benchmark No.5 would result in a law that recognizes Branch Canal Water User Associations and Water Boards as user organizations for water management at the Secondary Canal level and above. Benchmark No.4 is an experiment to expand the concepts of participation and privatisation in the water sector even further.

Parallel to this the Irrigation Improvement Project has embarked on the

formation of "Branch Canal Water Users Associations", which are fashioned after the three experimental BCWUAs established under the EPIQ program in 1999. The BCWUAs are established in IIP areas where WUAs have been established and are basically Federations of Water Users Associations.

3.2 Subsurface Drainage Cost Recovery

Irrigated agriculture represents 98% of the EGYPTIAN agriculture. Typical adverse impacts of perennial irrigation are soil salinity and water logging.

EGYPT in 1970 launched a large scale drainage program. The program was planned to cover the entire old agricultural land in the Nile delta and valley. After finishing the installation of the national drainage system EPADP will continue to operate and maintain it in addition to rehabilitation and replacement of the old drainage systems.

Egypt's drainage program is considered to be one of the largest, if not the largest drainage program in the world. It has been extremely successful preserving Egypt's soil and allowing for high crop production. An increase in crop yield by more than 20% due to installation of the drainage system has encouraged farmers to participate in the program and pay for it.

A similar approach of recovery the investment costs for mesqa is followed in the case of subsurface drainage investments, which have been made over more than five million feddans during the last 30 years.

3.3 Cost Recovery in the New Lands

In the new lands, farmers are also responsible for investment costs for all infrastructures including and downstream of the booster pumps that draw from distributary canals, serving areas in the order of 100-200 feddans. Such investment may either be undertaken independently at farmers expense or by government with cost recovery according to the rules set out above.

Thus the policy of the government with respect to capital cost recovery is to recover no charges above the delivery point (mesqa head in the old land, booster pump in the new land) and a proportion of the investment costs below the delivery point (mesqa head in the old land, booster pump in the new land) and proportion of the investment costs below delivery point. Thus, the subsidy on capital investments is in the order of 80 to 90%. The existing policy for capital cost recovery should be reviewed in the light of the very high subsidy resulting from present procedures.

3.4 Cost Recovery for Operation and Maintenance

Operation and maintenance costs are the responsibility of farmers below the delivery point. Failure to fulfil this obligation results in the work being undertaken by the MWRI and charged to the farmers on average general, farmers pay L.E. 18 per feddan per year for mesqa maintenance in the old lands, either to the government or as a contribution of labour cost recovery for O&M above the mesqa from farmers has been through land tax.

Farmers in EGYPT today pay very little in taxes relative to their incomes. Under the present system, as agricultural incomes rise in response to liberalized market conditions, tax revenues do not automatically follow. Farmers with 3 feddans or less of land and who have no other source of income are exempt from land tax and additional taxes attached to agricultural land tax. In all cases, these exemptions do not applied if taxpayer has other sources of family income. However to obtain an exemption, farmers must apply to their local authorities each year and go through an enormous bureaucratic process, as a result most farmers seem to pay their land tax whatever the size of their holding.

Settlers on new lands, be they graduates or farmer landless peasants or investors are given a grace period of ten years before they are subject to any taxes. Total land tax collections for year 2000 came to LE 133 million at an average of 20 LE/feddan/year. In addition most farmers pay an additional 15 % of the land tax to their local administrative authorities. Other taxes paid by farmers in addition to land tax for other local services, fees, stamp duties, etc. The average payment is about 15 LE/feddan/year.

Most farmers pay land tax based on a valuation done in the late 1980,s. this tax ranges from less than 10 L.E/feddan to no more than 35 LE/ feddan in no case does it seems an excessive burden on the farmers. The government has frozen the land tax for five years at its current rates as a measure to palliate the impact of the implementation of the of the new land law which takes effect on 1 October 1997. Farmers are aware of this and appreciate it.

3.5 Cost Recovery on Mega Projects

The Egyptian government has started the development of three mega projects (North Sinai, Toshka and North-west Delta). These projects will mostly attract investors although some parts are set-aside for graduates. Privatization is introduced from the start and thus already included in the planning process of these projects. The GOE sets up holding companies to

invest in the main system to provide water to the main gate of a lower level on the basis of cost recovery.

The GOE has set a maximum level of cost recovery. This concept is already issued by presidential decree. From the main gate onwards, private parties take over the development and O&M including investments in the water system infrastructure. In areas with relatively small landowners, water boards are set up at branch and district level.

4. Proposed Amendments to Law 12/1984 Concerning Water Resources

The current applicable law No. 12/1984 and its supplementary law No. 213/1994 define the use and management of public and private sector irrigation and drainage system including main canals, feeders and drains. They also provide legal directions for operation and maintenance of public and private waterways and specify arrangements for cost recovery in irrigation and drainage works.

In light of prevailing and projected water supplies, demographic and ecological conditions in Egypt, the laws are in serious need of reconsideration. Law 12 and its executive regulation have been revised to take into account current government of Egypt policies on liberalized crop, decentralization, and privatization and cost recovery for irrigation systems.

For this purpose, a modified law was enacted to reflect the latest developments, concepts, visions and inputs related to water use management. The modified law was intended to achieve the following objectives:

- Highlight the concept of integrated water management for different sources, types and uses considering the social and economic aspects.
- Develop new water resources.
- Define the responsibilities and authorities of governmental and non-governmental bodies at all central, regional and local levels.
- Encourage water users to participate in water resource management under the supervision of the MWRI. Private companies should be encouraged to assume this function, passing associated costs and expenses on the end users.
- Complete the tile drainage networks so they can reach all the existing farmlands and replace the old ones.
- Expand the use of drainage water for irrigation purposes.

- Expand the use of ground water stock for drinking and irrigation purposes.
- Improve and integrate surface irrigation systems modernizing them on the old lands.
- Continue to conserve the use of irrigation water and apply modern irrigation systems.
- Replace or renovate irrigation and drainage pumps at the end of their life span.

Main features of the revised law 12/1984 on cost recovery

- According to the law, the responsibility to dredge and maintain the private mesqas and drains and preserve their embankment in good conditions lie with the landlords.

  If the landlords fail to carry out this function, the competent manager may instruct to do so. Failing this the competent administrative department may implement such works and collect the actual costs by administrative ways from landlords in proportion to the land area each of them owns including the damages for each land occupied because of such works.
- The MWRI regulates the method of participation by the farmers and water users and makes available the necessary private and government funding for irrigation and drainage-related construction, replacement, rehabilitation, operation and maintenance works.

  The MWRI regulates in particular, the formation of corporate water user associations in the old and new lands in respect of private or public irrigation methods. It also regulates the formation of corporate water boards in certain lands of specific geographical borders and public water sources.
- The MWRI may entrust to a specialized company or certain water user association or water board the responsibility of constructing, managing, operating and maintaining at the water users cost-parts of the irrigation and drainage networks, groundwater wells, joint reservoirs and dams or systems of improved irrigation and tile drainage.
- The costs of improving the private mesqas and their contents in the old lands are collected after the MWRI determines the costs of their construction in accordance with the rules described under article (64) of the draft law.
- The article (64) of the draft law stated that the MWRI should make a statement of the costs of erection of the tile field drains or improved

mesqas. An amount equivalent to 10% of the erection costs is added as an administrative fee. The statement indicates the part of the cost of each feddan of the land included in the irrigation or drainage unit. The costs of the field drain or field irrigation networks are born by the landlords.

A landlord may pay the amounts referred to under the previous paragraph either at one time or in annual instalments provided that all costs must be paid within a period of no more than twenty years and that the amount of each instalment must not be less than twenty pounds. The payments are collected starting from the first year following the implementation.

- No land may be allotted for horizontal agriculture expansion without the approval of the MWRI to make sure that a water source is available for the irrigation as may be determined by the ministry.

  -The minister of water resources and irrigation shall determine by decision:

  -The terms and conditions for licensing the irrigation of new lands.

  -The costs and charges for water supply and distribution; and

- Establishing c-om the MWRI in accordance with such conditions as may be determined by the ministry.

  The minister of water resources and irrigation shall define be decision the wells and mesqas for which charges are collected for their erection, management and maintenance.

- The minister of water resources and irrigation shall by decision determine the charges to be paid for irrigating and draining water by the state's pumps and machines unless the land tax is estimated on the basis of the free charge use of irrigation and drainage facilities.

- A person licensed to use or exploit the water of the Nile, canals, groundwater, wells, reservoirs or flowing springs for purposes other than agricultural purposes whether for transportation or navigation or industrial activity or generating electricity or drinking or any other purposes shall pay a fee for maintaining, operating and managing the utility in accordance with such rules and rates as may determined by the minister of water resources and irrigation. A person licensed to drain water resulting from an activity other than the agricultural shall pay such charges as may be determined in accordance with rules and rates laid down by decision of the minister of water resources and irrigation.

5. Conclusions and Recommendations

Some conclusions and several recommendations can be drawn from the above discussions in the previous sections of this paper. They can be itemized in the following

- Growing recurrent costs for O&M of irrigation services and facilities are creating huge budgetary demands in Egypt. In addition, public irrigation is heavily subsidized and has become an enoffilous fiscal drain. The implementation of cost recovery is crucial for IIP's successful implementation and has been made a requirement of the World Bank project.
- It has been determined that farmers should gradually participate more fully in the operation and maintenance of their branch canal. This is needed in order to improve overall irrigation system management in Egypt. It is to be accomplished through the development of branch canal water users 'associations (BCWUAs) and / or Water Boards (WBs),
- The legal framework for the WUA formation and cost recovery of mesqa construction cost was fully established by Law Amendment and its By-laws in 1995. It authorizes the WUAs and permits the recovery of mesqa construction cost.
- The capital costs for mesqa improvements under IIP are to be recovered on annual instalments over not more than 20 years, while the costs of pumping units as well as the cost for land leveling are to be repaid over three years in equal annual installments.
- At present, non-agricultural users pay no fees to the government. Within agriculture in general, in the non- improved mesqa ' s there are no procedures for cost recovery/sharing of capital or O&M costs for water services at the level of the main and delivery system. At the mesqa level farmers are responsible for O&M of their "private" mesqa's.
- Water service fees like volumetric water charging (water pricing) would not be economically, socially or politically feasible. A key lesson learnt, notably from Indonesia, is the crucial importance of linking cost recovery to accountability for the services provided.
- The basis for irrigation service charges should be crop-based and reflect crop water consumption (phasing to start with flat rate). The Ministry of Finance will collect irrigation service charges, advised by MWRI. These charges should be deposited in a special revolving fund to be used to provide water delivery services.
- The implementation of irrigation service charges should follow three

stages: Political commitment to the introduction of service charges, passing of commitments through People's Assembles, design collection procedures and introduction of service charges

- Clearly, there are many social benefits to participation that cannot be easily measured in economic terms, However, it is always important to acknowledge that participation imposes costs on farmers in the form of time and other resources spent in these activities. Participation can be said to have a known opportunity, cost to farmers.
- The Water Boards must be transparent in its management. It must develop managerial, fiscal and record keeping procedures that are open and detailed enough to ensure success in the cost sharing program. It should also be fair and reasonable in its decisions and administration of resources.
- The implementation of cost sharing programs will greatly minimize up front opportunity costs, giving farmers time to adjust to the new regime and to assess its benefits. Re-direction of GOE funds from private contractors to BCWUAs/WBs for branch canal O&M work will be the basic economic incentive, as well as governmental policy change needed. Training and workshops for the farmers will be needed to implement the cost sharing program.
- The formulation of a cost recovery program includes the allocation of costs for services provided, and selection of charge levels and collection procedures. The process depends on a number of factors: the nature of the investment; the economic and financial status of the beneficiaries; the extent to which benefits can be quantified and captured; the cost of imposing the charges; and the impact of the charges on aggregate production.
- Since crop charges (based on the crop grown and area cultivated) give an indication of the benefit received, it is also recommended that the basis for setting service charges to beneficiaries should be crop-related, and reflect water consumption of the crop. Beneficiaries should also have the right to claim if remission of rates in case of crop failure.
- An additional recommendation is that MWRI should introduce the proposed financial accounting system so that there is transparency in the costs allocated to agriculture and other users. Further decisions should be taken concerning three main issues. The first will be cross-subsidization between sectors, the second will be the agricultural water service charges be the same in all regions, and the third will be the service charges be levied on the owner of the land, or the farmer.

On the first issue, two points are important: first, given that the higher priority generally given to non-agricultural users, and the considerably higher benefit derived in such uses, it might be appropriate to charge premium rates (consistent with the principles of the Use of Facilities approach). However, the very large proportion of water consumed in agriculture means that such an approach would have limited impact on water service fees for agriculture.

The second issue is essentially political. The considerably higher cost of delivering to parts of Upper Egypt would result in charges of about 8% of farm incomes, and would have a limited impact on water use. It would therefore be preferable to have higher rates in pump-lift areas.

The third issue is both political and economic: a charge levied on tenant farmers correctly links the benefit to the service, and will induce more efficient crop selection, if charges are crop-specific. On the other hand, farm incomes for tenants are lower by 30-50% and charges would in consequence be a higher proportion of income for this group. The likely affect of charging tenant farmers will be a small fall in rental charges (which could explicitly be recognized by reducing the multiple of land tax chargeable as rent from 22 to 20). It is recommended that service charges be levied on farmers and tenant farmers directly, and that the officially allowed rental rates be reduced in parallel.

- The definition of the framework for setting service charges also depends upon how water services are ultimately defined. At present, farmers receive as much, or nearly as much water as they need, and the service is provided by the MWRI from Aswan to the mesqa. A benefit of service charges is to make both the service provider and the service receiver conscious of costs incurred, but this is not feasible at the aggregate level of the country. To achieve this linkage, service should be disaggregated to units where the link is more transparent. The can be achieved through supplying water at a common rate to all Directorates, and setting charges within the Directorate to meet costs incurred at that level.
- The introduction of service charges will take time, both because of the significant policy change required, and because a number of related decisions and actions are needed. Most importantly, the introduction of full cost accounting is needed to indicate accurately and transparently what the cost of providing the service is. Decisions are also required on whether the nature of the irrigation service should change, defining the service delivery point as the Directorate or Federation of Water User Associations.

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