

IRRIGATION COST RECOVERY IN DEVELOPING COUNTRIES

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In the last few years in Egypt there has been great interest in the issue of water pricing as a means for irrigation water management, and for saving a portion of the investments required for modernization of irrigation systems at the farm level. In spite of the fact that there are difficult technical and economic considerations concerning the subject of water pricing, the issue is still considered highly important in the political and social areas.

However, in view of the difficulty of separating the technical/economical considerations on one hand from the political/social ones on the other, it is necessary to provide political decision-makers with a sound technical basis for their decision. This is the main purpose of this paper.

The most obvious reasons that make irrigation water pricing an issue of such importance, is that many of the countries and international agencies have focused upon this subject in their conferences and seminars, and have come to some conclusions, eg: 1) Increasing the efficiency of the already existing irrigation projects by modernization and /or improved development has become a higher priority from an economical viewpoint than initiating new projects. Undoubtedly, any improvement or modernization of the existing projects must include the need for additional investments, a large portion of which must cover the on-farm irrigation network which is the farmer's domain.

2) Frequently international donor agencies may offer grants or loans for agricultural sector development under conditions that the government establish a cost recovery system.

3) In most cases, modernization of the irrigation network necessitates increasing the allocation of operation and maintenance funds in such a way that these funds are guaranteed to be available and therefore ensures the efficient performance of the network.

4) Numerous professionals have emphasized the importance of on-farm water management in the existing projects with the aim of increasing their productivity and saving the extra water. One opinion indicates that water pricing automatically leads to improved water management. However, there is evidence to the contrary also.

The complexity of the problem is further increased by the fact that some farmers, es-

Abstract

The cost of delivering irrigation water to agricultural producers in a marketing economy is customarily accomplished by private irrigation companies or districts that operate on a non-profit basis for the purpose of providing the service and the commodity at cost. In developing countries where the economy is usually subsidized recovering the cost of water delivery is much more complicated and difficult. A key policy for cost recovery for an irrigation system should be based upon a sense of equity among the beneficiaries. Because costs for maintenance and operation lag seriously over years of operation, water is not usually delivered effectively and therefore produces inequities. Methods of assessment and collection of fees must be considered in light of country's economic and technical environment. This and other issues are discussed to assist decision/policy makers concerned with cost recovery.

Résumé

Le coût pour délivrer l'eau d'irrigation aux producteurs agricoles dans une économie de marché est d'habitude soutenu par des sociétés privées ou par des districts opérant sans but lucratif pour fournir un service et un bien.

Dans les pays en voie de développement où l'économie est souvent subventionnée, il est plus difficile de récupérer le coût de la livraison de l'eau. Une politique clé pour la récupération du coût pour un réseau d'irrigation devrait se baser sur un sens d'équité entre bénéficiaires. Les méthodes d'évaluation et de récolte des tarifs doivent être considérées à la lumière du milieu économique et technique du pays. Ce sujet et d'autres encore font l'objet des discussions visant à aider les politiciens concernés avec la récupération des coûts.

pecially in the new lands, bear the total expense of water delivery to their fields from the main canals or from conveyance and operational wells (Which is considered a part of the suggested water pricing fees), while on the other hand farmers on the old lands bear no expense for delivery.

Water pricing concepts

There have been different opinions and understandings concerning the terminology and concept of the Water pricing. Some suggested that the pricing should be considered as additional tax or a fee that covers part of the expenses of modernization, operation and maintenance of the irrigation network. Another concept is that the price should be based upon some value of the irrigation water per unit area, per crop or per cubic meter.

It should be noted that one or the other of these two concepts is used by many of the developing and developed countries for water pricing.

Irrespective of the value set for the irrigation water fee, it is very important to establish a procedure that governs the farmer-government interrelationship in terms of estimating and collecting the fees and ensure that they are directed toward the improvement and maintenance of the irrigation system.

Specialists have handled this matter controversially based upon the different economic policies and concepts used in each

individual study case. Nevertheless, in order to put into motion any drastic changes or the establishment of any fee for irrigation water, there should be a strong political subsidy, particularly in countries like Egypt where irrigated agriculture is an important economic sector.

It is also essential to have the same governing principles of irrigation water pricing for both old and new lands. It should be made clearly evident to the farmers that these water fees are not an additional tax or scheme for charging them more money; but rather, a service charge for improving the irrigation network and increasing its efficiency, which will lead toward increased agricultural productivity, a benefit primarily for the farmer and of course to the national economy in the long term.

The Water Research Center of Egypt has recently conducted two valuable studies in water pricing in cooperation with Cairo University. The first of these studies was aimed at determining the costs of irrigation water conveyance from the High Aswan Dam to the different delivery application sites, taking into consideration the expenses due to transfer, distribution, operation and maintenance of irrigation network. The second study focused on an assessment of the agricultural return (benefit) from 1000 m³ of water when used in irrigating different crops in various areas.

The results at this stage have general implications, however, a considerable amount of additional data is still required if precise values are to be used in establishing a water

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pricing policy. Yet, no matter what the values might be—which exceeds the scope of this paper it is only one fact of the numerous criteria that should be considered before affixing any new policy on cost recovery or water pricing.

It should be pointed out that irrigation water pricing may have a very harmful impact on farmers under poor economic conditions. It may lead to total abandonment of their incentive for high productivity or to a tendency to cultivate only for subsistence. Therefore, a proper balance between the advantages and disadvantages is of utmost necessity before decisions are made.

Investments required for irrigation improvement projects

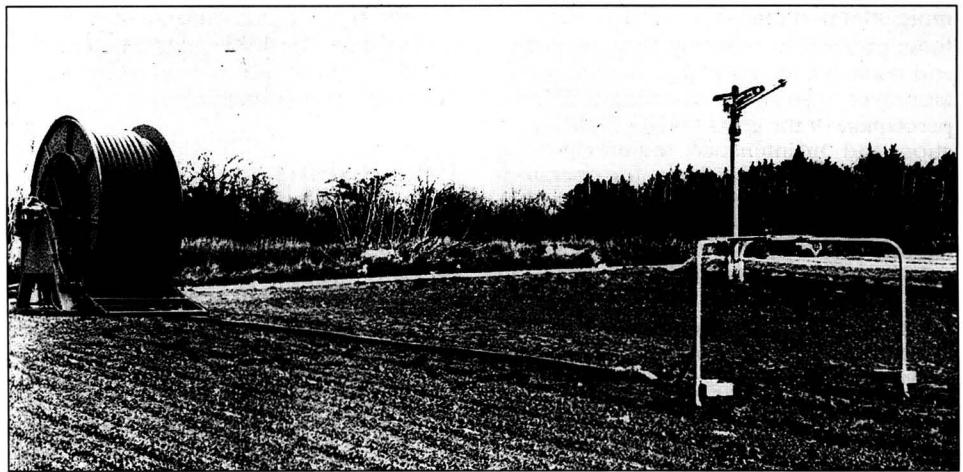
The Government of Egypt is presently implementing a National Irrigation Improvement Program in various regions with a total area of about half a million Acre. The required costs for development were estimated on the average to be \$ 300/Acre, of which \$ 100 were allocated for private irrigation networks.

At present time even though some of those projects are partly funded, it is usually difficult to justify them economically, at least according to the conventional economic criteria. In such cases, governments tend to subsidize the projects for several reasons; i.e., decreasing population growth in critical areas, increasing the population in certain sensitive geographical regions, or saving water. It is noteworthy that the subsidy may occur as a transfer of resources from one group of society to another to improve a certain imbalance. Such subsidies should be avoided whenever possible.

On the other hand, it is difficult to determine all beneficiaries that gain from irrigation modernization projects even if the improvements are restricted to the on-farm improvements. Consequently, part of the costs should be recovered from the most direct beneficiaries, and the balance should be recovered as a general water fee.

Another reason that governments may justify a subsidy, especially in the initial stage of project execution for national irrigation improvement projects, is that in most cases these projects are typically designed in a highly complex and very expensive manner. It may take considerable time before they finally become cost-effective. In addition, delays in scheduling of project execution may lead to additional unnecessary costs, and it would be unreasonable to charge farmers for such delay for additional projects costs.

Many specialists believe that, if irrigation water requirements and quotes were determined, all irrigation problems would be solved, and any modification in the irrigation rates should be preceded by a detailed analysis of the problem that affect irrigation efficiencies, the solution of which should



be given priority consideration. It is certain that the sound management of the irrigation system as a whole requires additional financial resources.

Water pricing versus irrigation efficiencies

The relationship between the cost of goods and its market value is well known in economics. Water is no exception to this law, and yet it may become invalid under two conditions: If the price of water becomes too high or if water is sold on a unit quantity basis. However, those two conditions are the exception rather than the rule. In most cases irrigation rates do not generally have any impact on irrigation efficiencies. Thus, if the farmer suffers from water shortage, he will try to use whatever quantity he can obtain by any means available to him. Consequently, it does not seem reasonable to set a pricing policy for water by attempting to force him to use it efficiently. However, water pricing in this particular case may actually lead to the use of less water. But if that is socially acceptable, then the question arises concerning how to beneficially use the water.

Concerning the measurement of water quantity as a basis for pricing, it has been found that the cost of installation, operation and maintenance of the measuring devices themselves (counters or other) are rather high, which in turn increases the price of water.

In most cases, the cost of water represent 10-20% of the production costs for the majority of crops. As for the vegetable crops, they may be as low as 5%. Thus, one might expect that water pricing would have a great effect on the farmer's preference for certain crops over others. In order that such costs would have a tangible impact on the production, they should be increased (double or more); a trend which is now favored in most countries. In such a case, the farmer will find ways to avoid cultivating the high water-consuming crops. It is certain that the production costs have doubled within the last ten years, whereas the increase

in productivity has not kept pace, a fact which should not be overlooked if a satisfactory income is to be obtained by the farmer.

And since irrigation water pricing is the basis for ensuring proper operation and maintenance, it is necessary to review and adjust all operation and maintenance practices before considering a policy. This should take place in the framework of acceptable management concepts, which is different from one country to another according to their different social and economic conditions. Other alternatives for lowering the operation and maintenance costs are to transfer some of the responsibilities to the water users themselves, or to design and operate the networks in such a way as to ensure their high efficiency and cost-effectiveness. All this should take place within the environment of a very efficient management system.

In the case of assigning the management of part of the irrigation network to the farmers, the costs of operation and maintenance may probably be greatly reduced and particularly cases of unlined canals or water-courses (mesqas). An additional advantage is the farmers' feeling of commitment due to their participation in operation and maintenance.

The farmers' responsibility of managing part of the network necessitates the precise determination of their duties and rights. A worth while consideration is to have them participate in decision-making, valuation and collection of fees, and scheduling the required training and organizational assistance for their service. Official instructions and procedures may be necessary to regulate such matters.

In the design of different irrigation projects, it has been observed that the improvement and modernization process of irrigation networks have noticeably increased within the last twenty years without consideration of the factors that reduce operation and maintenance costs. Consequently, many projects now represent a heavy financial burden on both the governments and farmers without finding practical solutions for this situation. Therefore, it is utmost importance to give

more attention during the design stages of these projects to reducing their operation and maintenance costs to a minimum. Moreover, instead of allocating a definite percentage of the gross budget to the operation and maintenance requirements, a detailed budget breakdown for operation and maintenance should be developed in harmony with available actual social, physical and organizational conditions. This step will encourage the use of local materials and will help obtain data from responsible authorities concerning operation and maintenance during the design stage.

Water pricing

In case of establishing these fees, they should be estimated as a percentage of the «Traditional user's capability for payment» derived from irrigation (i.e. the net increase in his income as a result of irrigation), in order that the user might have a reasonable motivation for continuing irrigation and cultivation. As for the new projects, extraordinarily high fees should be avoided in the project developmental stages, where the payment capability is much less at the beginning than at the end of those stages. Thus, changes in the production rates and farmer's income in those regions should be closely observed.

In recent studies, specialists, have recom-

mended that water pricing occur on a compound basis: The first is a unit area fee (constant fee) and the second is an additional fee per water unit (variable fee).

Conclusions

Developing countries are found to have over 75% of the World's irrigated lands. In order to meet the growing food demands in these countries, agricultural output must be expanded. It is apparent that irrigation efficiency of irrigated agricultural lands must be improved if future world food needs are to be met. Improved irrigation efficiency means more water for horizontal expansion of agricultural lands, since under most agricultural systems, water is the limiting factor and not land. A crucial issue in improving irrigation system efficiency is the equitable distribution of the irrigation water among users.

A better equitable distribution and increased efficiency in conveyance of irrigation water and on-farm irrigation is costly. These costs compete with other budgetary needs in the public sector and they increase the pressure for recovering some or all of these costs from the beneficiaries.

In many instances, multilateral and bilateral donors assisting in rehabilitating and improving the efficiency of irrigation systems have brought pressure to bear upon host

governments to discontinue the subsidy of operation and maintenance of the system and have encouraged the government to focus more upon farmers as a source of revenue or cost sharing in the operation and maintenance. They have pressed also for more farmer involvement in management and planning.

Local government decision makers are under pressure to implement cost sharing schemes for irrigation expansion. This paper cautions decision makers in making decisions without extensive study and background information. Conflicts already exists between government and the private sector in agriculture. Decisions based upon insufficient information and background may produce a negative impact, the opposite to that desired of increased productivity. Policy/decision making must better understand the characteristics and motivation of the human components of the irrigation system.

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