

PERFORMANCE OF IRRIGATED AGRICULTURE IN SRI LANKA

by

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1.0 History

The ancient civilization of our country had been based on irrigated agriculture. Combined with the religion, it has survived over several centuries until modern market economies intruded into it. Even among those societies, especially in the northern dry zone of the country, smaller communities that depended on small village tanks with little farm lands had better resistance to social change than larger schemes with diversion facilities etc. The existence of several such schemes, scattered all over the dry zone itself is a good proof of this fact. Those societies, even today, are relatively independent. They operate and manage their irrigation system by themselves, produce most of their other requirements by themselves and hence can continue to survive.

In any irrigation system, whether large or small, planning, operation and maintenance are the three key elements that go on as long as the system exists. Before the beginning of a cropping season, having observed the available storage of the irrigation tank, planning decisions such as crop types and extents of cultivation, starting dates and duration of water issues etc. are taken with the knowledge through past experience of the probabilistic nature of the weather. As for operations, releases from the tank as well as from the control structures in the distribution system are carried out during the cropping period according to the plan that has already been made. The maintenance work, that needs to be carried out in order to keep the tank and the distribution system in good shape, is also arranged and carried out without interrupting the operations.

In small irrigation schemes (or systems), the above three aspects are under the control of the farmers themselves. Planning is done mostly on the basis of past experience. Here, the involvement of risk in operational planning due to uncertainties of weather also is well accounted by the farmers before making decisions. Naturally, it has led to a sort of optimization in planning where risks and benefits are reasonably compared before making planning decisions such as crop types and

extents of cultivation. The process also proves the fact that 'the direct beneficiaries of an economic return resulting from a certain process always take decisions with respect to that process, so that the net return would be optimum'.

However, the larger irrigation schemes coupled with diversions etc. could not behave similarly and have fallen victims to the changing society. Some large systems of earlier days have already fallen apart and even the few existing ones are no more independent. In such large schemes, at present, the state involvement in operational planning and maintenance is high while that of the farmers themselves is low. Hasalaka Scheme in Minipe and Parakrama Samudra Scheme in Polonnaruwa are two such large irrigation schemes, that have become state dependent.

The main reason for this change could be the complexity of operation of a large system and the large number of farmers involved. Unlike in smaller tank irrigation systems, a complex system of canal network connecting a number of regulating tanks and few diversions from nearby watersheds make these systems too complex for laymen farmers to understand and evaluate for planning and operational purposes. The large number of farmers involved and their living close to their own farmlands scattered over a large area also pose problems to form a single group that can effectively manage their own businesses like in small tank irrigation schemes.

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These large irrigation systems also show the negative benefits of the increase of distance of farmers from the decision making process with respect to operational planning by the involvement of state through its bureaucracy. While farmers are not always happy about the decisions taken by the bureaucracy on their behalf, the state also carries the additional financial burden of O&M expenses. Unseen losses are also incurred due to operational decisions taken by the bureaucracy without consulting the real beneficiaries.

2.0 Position of irrigation schemes in multi-purpose projects

Senanayake Samudra and Udawalawe are the first two large irrigation schemes that have been built recently with power generation facilities incorporated. Though the energy generated at these plants is fed into the national grid (power system), their contributions are very small compared to the rest of the generating system. Moreover, the irrigation benefits too are in excess when compared to power benefits. Therefore, both these multi-purpose projects have been operated to satisfy their irrigation needs and hence to optimize irrigation benefits, leaving energy benefits to be secondary. However, both these projects too, also have the same shortcomings that were discussed earlier with respect to large irrigation schemes.

With the introduction of the new multi-purpose project, Mahaweli Development Programme, even the above concepts no longer hold true in irrigation schemes benefited by it. Primarily, the energy aspect of the project is not secondary to irrigation. In fact, economics alone would favour the energy component over irrigation and it is to be more so in the future. Even among irrigation schemes themselves, the economic return of an unit of water diverted from the Mahaweli System varies. In other words, when the availability of water for diversion is limited or when the diversion requirements exceed the availability, the allocation pattern will greatly influence the overall economic return of the project. Both these factors, namely the economics of energy generation against irrigation and the competition for water between irrigation schemes themselves, have developed the present situation where farmers of irrigation schemes benefited by Mahaweli Program are kept further away from the decision making process with respect to operational planning. In short, the decisions of priorities between energy generation versus irrigation and allocations among irrigation schemes do not reflect farmers views sufficiently.

Thus, in the Mahaweli Programme too, the farmers part of decision making has been taken over by the state

bureaucracy, violating yet the same fact, that only the direct beneficiaries would make decisions that yield optimum returns. In the present system, bureaucrats make plans and decide water allocations amongst irrigation schemes and for energy generation on behalf of the farmers. However, when the farmers feel strongly that they are denied optimum economic returns due to certain operational decisions taken by the bureaucracy, their views are transmitted to the bureaucrats through the local political system, which in turn has some control over bureaucratic decision making. This process, however is time consuming and therefore, does not bring results efficiently.

Even within a single irrigation scheme of the Mahaweli Development Programme, the irrigated extent of land and hence the number of farmers involved are so large that farmer participation in decision making within the scheme itself is rather impracticable and the involvement of bureaucracy is unavoidable. Therefore, the unhealthy situation of insufficient farmer involvement in operational decision making exists even with in these new schemes similar to that of large irrigation schemes of ancient times.

The bureaucracy too, however much they try, cannot improve the decision making process with respect to operational planning; any further, proving still the same fact, that only the direct beneficiaries of an economic return resulting from a certain process would take decisions that would maximize the return. On the other hand, the Ceylon Electricity Board (CEB) is the sole beneficiary of energy generated from the Mahaweli System. It creates the unique situation where, as far as the direct economic beneficiaries are concerned, the direct participation in decision making with respect to operational planning is 100% in the case of energy while it is almost nil in the case of irrigation. On the whole, it could be deduced that in

- irrigation schemes, farmers have been left out of the operational decision making process while they remain the economic beneficiaries affected by such decisions.
- energy generation, CEB is directly involved in the operational decision making process.

It is now clear that insufficient farmer participation in the decision making process of operational planning in large irrigation schemes is detrimental not only to the farmers by way of depriving them of the optimum return, but also to the country as a whole. It also creates an additional burden on the state through the involvement of bureaucracy for operation and maintenance. In the Mahaweli Development Programme, there is an additional loss due to non-optimization of combined

benefits of irrigation and hydro-power. The basic attempt of this article is to highlight these shortcomings and to search for a remedy.

3.0 Philosophy of Insurance

In market economies, a system called insurance has been in existence over a long period of time. The primary idea is to have or get involved a third party to look after the risk factor of an investment of the client over a specified period of time. In other words, the insurer will take care of the specified risks of the insured over a specified time for an agreed fee. As the insurer has to bear the cost of damage, if it has been specified as a risk in the agreement with the insured, he takes precautions to minimize the occurrence of such damages. On the other hand, as one could expect, both with the rising risk and cost of damage, the fee of insurance goes up. Thus, the basis of insurance could be effectively used to solve the problem that we discussed with respect to management of irrigation schemes.

4.0 The History of Agricultural Insurance

Citing these important aspects of agriculture affecting both the national economy and the farmer population individually, the State has initiated an insurance scheme called 'The Crop Insurance Act No. 27 of 1961'. Later in 1973, a more comprehensive scheme was introduced through a superseding act called 'Agricultural Insurance Law No. 27 of 1973'. 'The Agricultural Insurance Board' was formed under this act to operate a comprehensive agricultural insurance scheme in order to provide a stabilizing effect on farm income and to promote agricultural production. In the process, it is also expected to undertake research necessary for the promotion and development of agricultural insurance. The insurance scheme itself is not anticipated to be operated on a commercial basis and thus an 'Agricultural Insurance Fund' was formed under the control of the board with an initial capital grant from the government. Since then, the government has contributed to the fund on several occasions to raise the capital as well as to meet operational costs.

This existing scheme can be classified into two groups. The first group deals exclusively with paddy while the second group deals with the rest of the agricultural sector including livestock. In the case of paddy, the process has been fairly well established including the development of policies with standard coverage/premium ratios for varying risk levels. Furthermore, this crop insurance has been tied to agricultural loans obtainable from approved credit institutions by making

the insurance a pre-requisite. Although a vast spectrum of causes are covered under these policies, the scheme still remains subsidized by the government. Being a government sponsored programme, the value of insurance, the terms of cover, the causes of loss and the premia have all been fixed, though the actual costs and extents of these items vary continuously. Under these circumstances, the premia cannot be varied to suit actual risk levels and therefore, a variety of cases having varying risk levels cannot be accommodated. Even the number insured under the present scheme do not reflect its extent of success as the insurance has been made essential to obtain credit facilities. Thus, the effect of the scheme has become marginal while the government's contribution keeps rising.

The insurance of other crops and animal husbandry has always been the secondary aspect of this scheme. Policies and coverages have not been standardized as in the case of paddy and hence individual agreements are signed for each case. However here too, the insured could not cover the entire cost in many cases due to the financial constraints of the insurer and hence the expected goals have not been reached. Furthermore, the value of insurance offered by the board is unrealistically low for the present day costs and they also do not undertake to cover the loss of expected revenue, which is directly related to the extent of farmer inputs.

5.0 An Alternative Scheme of Insurance

When an investment is to be made on an agricultural crop, apart from the risk of availability of irrigation water at the right time in correct quantity, there is a whole array of other factors posing different levels of risks. For the crop of paddy, the existing insurance scheme identifies the following causes as insurable;

1. drought
2. less water
3. flood
4. more water
5. pest attacks
6. diseases
7. losses from wild animals and birds

Though the responsibility of minimizing the damage falls on the insurer after a crop is insured under the above standardized policy, the attention paid to minimize such damages has been rather low when compared to the process of estimation that takes place. It is not very strange in a subsidized scheme, but it is the complete opposite in a commercially operated scheme. In a commercially operated scheme, the ratio of pre-

mium to coverage is basically dependent on the expected value of damage. In the environment of competition, insurers will try to lower the expected value of damage by reducing the causes of them as far as their economies justify, so that they could offer attractive low ratios of premium to coverage. Furthermore, irrigation being the primary cause of uncertainty, insured will be benefited additionally if the aspect of irrigation is isolated as a specific risk. Therefore, if a crop is insured by a commercial insurer, only covering irrigation as a specific risk, then in the process of trying to minimize the damage, the insurer will become the insured's representative in matters dealing with irrigation. As the number insured increases, with a heavy total coverage at stake, the insurer will naturally go into finer details of planning and operation of the irrigation system in trying to minimize damages. In such situations, farmers' representation in those matters will automatically increase through the insurer. This is an important advantage, which the individual farmers can never think of without being involved in such an insurance scheme.

6.0 Conclusion

With a well established commercial insurance scheme covering irrigation as a specific risk, the added advantages over the present system can be listed as below.

- instead of themselves, farmers have a financially responsible representative
- insurers will absorb the irrigation risks that otherwise would be a burden on the farmers
- farmers financial interests with respect to irrigation water availability is well represented at operational decision making levels through the participation of insurer

- the ratio of premium to coverage is a good indicator that can be used to judge;

- the level of irrigation management
- the variation of irrigation management that exists within an irrigation scheme
- the variation of irrigation management that exists between different irrigation schemes
- the financially infeasible areas for improvement or abandonment

- involvement of several insurers with similar policies would give the financial advantage of free competition to the insured

- removal of risk of irrigation water shortages would increase the farmer confidence and thereby increased inputs by the farmer would increase the net agricultural output

- the net total of insurance cover of a particular irrigation system would indicate the net worthiness of irrigation in that system which could be used in justifying diversions from the Mahaweli

- the net totals of insurance covers of different irrigation systems could be used to determine the overall diversion pattern of the Mahaweli System that gives the optimum economic return

- bureaucracy involved in operational planning and management of irrigation schemes would be kept under constant surveillance by the insurers for better performance on their part

- less problems for the State in managing irrigation schemes due to increase in efficiency of management

- evolution of economically affluent farmer communities will reduce social problems.