

Some Management Aspects of SCARP-I

By

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INTRODUCTION

Salinity Control and Reclamation Project was initially planned on integrated project approach with special attention on tubewell operation, water distribution; agricultural extension, cooperatives and other institutional support under one Project Director. This approach was later abandoned and the Project was treated like non-SCARPS. Tubewell operation remained the exclusive responsibility of the Project Director. Therefore, the Project did not receive any special institutional support. The question then arises whether to consider tubewell development as a drainage measure to bring the project productivity to the level of non-SCARPS or also as a source of additional irrigation supplies for increasing yield/acre and expanding irrigated area beyond the levels achieved in non-SCARPS. In the first case the Project is to be considered as an improvement project and in the second case as a development project. Development was essential to offset the capital and O&M cost of tubewells.

Be it development or improvement, the ultimate aim is increase in agricultural production, although the level of achievement is different. For improvement the net agricultural income per acre should equal that in the non-SCARP areas, the tubewell cost having been utilised in raising agricultural production from its pre-project level to the present non-SCARPS level. For development the reference is again the level of achievement of non-SCARP areas; the net agricultural income should far exceed the non-SCARP level and the annual cost of tubewells to give quick economic return for replacement of tubewells. It must be noted that once the project is improved, it differs from non-SCARPS only in that it gets additional irrigation water from the public tubewells. This should result in additional agricultural production.

There has been considerable difference in opinion about the economic returns of the project. This seems to have arisen simply because of the confusion on the definition of the project as discussed above. Inflated values of benefits/cost ratio have been obtained by some organizations (3) who determined the net income derived from agriculture and divided it by the annual cost of tubewells. A more rational analysis based on development strategy was made by the Master Planning Division (10) of WAPDA. It came out with the rate of return of 6 percent as against the 24 percent proposed in the Project Reports. This paper discusses the management and organizational problems that led to such a small rate of return.

MANAGEMENT PROBLEMS

The Project can be divided into two distinct phases: the improvement phase; and the development phase. In both phases there have been problems which can be categorised into technical, social and eco-

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nomic. It is the interaction of these problems which gave rise to managerial problems and ultimately affected the performance of the project. These problems may constrain achievement of quantitative targets or prolong the time to reach these. The major emphasis these days is on the identification of causative factors of the first; the latter are generally ignored by attributing them to financial constraints. In this inflationary era both are important and need equal importance in project evaluation. The problems in both cases are same. It is the degree or level of understanding of their interactive effects which finally delay or hamper the attainment of improvement or development objectives.

Technical Problems.

These problems are the outcome of lack of understanding and foresight of the local conditions. The large scale foreign input of expertise at the planning and construction stage led to the application of foreign technology without considering the socio-economic set up of the local rural community.

Vertical drainage by tubewells was the first experiment in the Project. No pre-project research was carried out on design of a tubewell and the gravel pack around it. Neither world experience was available to provide some guidance in design. Because of lack of research and experience, tubewells with mild steel strainers were installed at high cost. They were proved economical by assuming their useful life of 40 years (8). In practice the tubewells deteriorated at a considerably rapid rate because of fault in the design of the gravel pack and encrustation and corrosion of strainers. The useful life was observed to be 10 to 12 years. The economics of these high capacity tubewells, therefore, received a tremendous set back.

No systematic research was carried out to improve the design; instead different types of tubewell strainers were tried one after another without finding any solution to the real problem. The design and specifications were framed in a manner that imported materials for strainers, pumps and motors became essential. The problems arose when some components of the tubewells needed replacements or repairs. Spare parts were not available and had to be imported at great foreign exchange loss. Non-availability of spare parts affected the operational efficiency of tubewell resulting in loss of public confidence in the Project. No mechanism was evolved to manufacture these components locally although the know-how was available. The local industry has been instrumental in the development of a large number of low-capacity private tubewells in the Project as well as outside. These tubewells use local strainers and other components which have been observed to last longer than those in the public tubewells.

In contrast to the constant canal supplies, tubewell supplies had the flexibility to be adjusted according to the demand. However, no operating criteria were evolved whereby the crop water requirements could be determined and tubewell operating schedules fixed to match supply to the demand. This can be linked to the deliberate attempt of putting in the background the benefits of additional supplies. According to the Master Planning Report (10), the objective of the Project was not the optimization of agricultural production. The expected increase in agricultural production from the use of supplementary irrigation supplies was taken into account to the extent it provided the economic justification for this and similar other projects. It appears inconceivable to consider certain aspects in the economic justification of the Project and make no attempt to attain their optimum use during project operation.

The urgency of the Project due to serious waterlogging and salinity problem set aside water management considerations at the planning stage assuming no anticipated water shortage in the future(11). Consequently no management policy was evolved for the optimum use of additional irrigation water. This flaw in planning became apparent at the operation stage when tubewell discharge started decreasing; some tubewells were abandoned due to saline water; and some had to be stopped due to breakdowns of their components. On the otherhand, the farmers had extended their irrigated areas to the level they could possibly do. This had considerable effect on the quality of soils. To meet increasing shortage of water from public tubewells, the medium and large farmers started installing their private tubewells.

Technico-Social Problems:

The absence of a proper frame work for water management in the planning stage led to numerous social problems. Some of these can be attributed to the siting of tubewells and others to the distribution of tubewell water to more than one water course. These can be summarised as follows:

- a) Disproportionate distribution of water, causing disputes among farmers
- b) Heading-up of water in the watercourses and consequent reduction in canal water discharge from the outlets
- c) Uncontrolled extension of irrigated area and high lands causing ponding of water and consequent reduction in canal water
- d) Farmers getting only tubewell water showed resentment against double water rates.
- e) Farmers entitled to tubewell water only also extended their rights over the canal water.
- f) Frequent breakdowns of tubewells and long administrative procedures to rectify the defects created serious irrigation problems for the farmers
- g) Farmers demanded relocation of water course outlets to irrigate their highlands
- h) Permanent turn (Warabandi) schedule is not fixed on many watercourses by the Irrigation Department

Water Management:

There was downward trend in yields/acre in the early seventies. This could be averted if the farmers were motivated to adopt efficient and effective water management practices. The cooperation and active participation of farmers is an essential condition for the success of water management improvements. This would only come if the farmers are convinced of the benefits of the improvements and have good communication with the government officials. Besides, they must be assured adequate irrigation supplies to show discipline in water use and get convinced of the benefits of their investment in improvement works. This also requires change in the attitudes of the Irrigation and Agriculture Departments. They should associate themselves in these activities as real public service institutions rather than organizations of Masters in disguise.

The common water management problems in the project are; inadequate watercourses and channels to and on the farms, absence of simple structures to regulate and measure the flow; inadequate water distribution, and lack of adequately trained personnel to plan and implement water management programmes. There are also complaints of frequent and uncontrolled water intakes not only from watercourses but also from the distributing canals. These have caused serious conflicts among the larger and stronger landlords. The medium and smaller farmers are the worst sufferers because of their inability to deal with such cases directly or through intervention of the Irrigation Department. The Department considers water management beyond the outlet out of its jurisdiction. Moreover, the Canal Act does not provide severe punishment for illegal intakes. In serious recurrences the cases are referred to civil courts where it takes years to decide a case. This has forced large number of medium and small farmers to take a passive attitude on water management imagining that no body could protect their legitimate water use rights. There is a deliberate resistance from the larger landlords against the formation of Water Users' Association, a forum which the farmers could use for equitable distribution of water and to prepare a joint implementation plan for water management. The farmers are therefore, pessimistic about the formation of Water Users' Association on their own through election.

The conflicting individual interests override the need for such a cooperative institution. The general consensus was to have such an institution under the supervision of the Government to exert a moderating influence on vested interests. This should have a support of proper legal framework. Opinions were also expressed on the abolition of the colonial 'Lambardari System'; especially when there already exists elected institutions of Union Councils. The Union Councils were proposed to have a control over Water Users' Associations.

The rural community is not to be entirely blamed for their faults. There is a need for a complete review of the national development strategy. The experience of the past shows that most projects were executed in haste giving little time to rational and scientific planning. In such cases project planning was piecemeal with emphasis on structural measures to solve specific problems. The last two decades have seen hectic planning activity for the eradication of waterlogging and salinity. When planning on the problem attained a certain degree of soundness and perfection, the emphasis has shifted to on-farm water management with almost the same urgency as on waterlogging and salinity in the past. There is no denying the fact that the two problems are interrelated and planning for one should have taken care of the other.

Perhaps the assumed abundance of irrigation supplies provided by public tubewells swayed the planners from the fact that the process of planning and decision-making does involve not only technological and financial challenges, but also social, managerial and environmental constraints. Conventional planning methodologies cannot cater for the present multi-dimensional and multi-disciplinary challenges, constraints and uncertainties. Therefore, there is a need for a complete reappraisal of strategies and methodologies for project planning and execution giving due emphasis to management aspects. This would require an intensive training of planners and project managers not only in multi-objective and multi-purpose project planning but also on project operation under very strong forces the ignorance of which could fail an otherwise successful project.

Land Management:

At the time of the inception of the project, 0.425 million acres were affected by waterlogging and salinity. The project receives usable, marginal and hazardous tubewell water according to the well-established water quality criteria. It has been observed (1) that 42.1 percent of the project wells discharge groundwater of usable quality; 35.7 percent marginal; and 22.2 percent hazardous. Many of the wells in the last category have been abandoned. The marginal and hazardous waters are to be mixed with canal water in the ratio 1:1 and 1:2.5. The actual mixing has been reported in the range 1:0.4 to 1:2.4. In 75 percent of the cases it is less than one. This shows the magnitude of the problem of under-mixing and its consequent effect on soil quality. Proper mixing is not being done in a larger number of marginal wells.

The Central Monitoring Organization, and before that the Water and Soil Investigation Division of WAPDA carried out surface salinity studies in the beginning. The results of these studies showed reclamation (2) of 44 percent of the affected area in the first nine years of operation of the project. Thereafter the reclamation progress declined resulting thereby resalinisation of some area. This trend coincided with the decline of tubewell pumpage and decrease in crop yields. This also gives an impression that, although reclamation was the most important objective, it was assumed to be achieved automatically as a result of increased water supplies provided by tubewells in the same way as the increased agricultural production. No concerted scientific effort, beyond some random soil sampling for monitoring purposes, was made in project reclamation. Perhaps too much reliance was placed on additional water without taking steps to maintain it. As soon as the additional tubewell supplies started to decline, land improvement by reclamation also showed downward trend. The only public sector effort, other than tubewells, was of giving additional canal supplies for reclamation in yearly rotations to different watercourses. Subsequently, due to shortage of water, this was also stopped.

There has been no endeavour even to maintain a consistent record on reclamation achievements. This was partly due to re-organizations of the monitoring division of WAPDA from WASID to the Central Monitoring Organization. But it can mainly be attributed to absence of proper framework in the Project Report for continuous evaluation of the project to achieve the proposed objectives. As a result much was left to the adhoc decisions of the operational and monitoring agencies. These decisions were based on the quality and quantity of the available staff and on the amount of funds provided from year to year. The broad functions, such as groundwater monitoring and tubewell performance evaluation, agricultural economics, soil monitoring and land use studies were well understood. The guidelines to carry out these functions were lacking. Out of these functions, soil monitoring was perhaps the most neglected one. Expansion of area of jurisdiction of CMO due to the development of subsequent SCARPS also aggravated the problem by placing greater work load on the small staff and also on the available funds.

Reclamation of irrigated land depends not only on the quantity of water, but also on its quality, cropping pattern, drainage, cultural practices and proper use of chemical amendments. The problem is so complex that it cannot be left to the farmers alone. There is an imperative need for Irrigation and Reclamation Extension Service in the Project to provide the farmers the necessary technical guidance on reclamation measures. There is also a need to establish an optimum value of yield / acre and classify land productivity in relation to the optimum watertable level, soil quality and crop. The present criterion of lowering of watertable (below 10ft), cannot be considered reliable for land reclamation.

Management Parameters:

The subject of salinity and reclamation is only a part of a much larger concern; the effective management of the project with its social, economic and production aspects intertwined in an almost incredible complexity with the organizational structure. The subject is bounded not only by the parameters of new drainage, reclamation and cropping technologies but also by the political and social forces within and outside the management organizations. The latter include low morale and tension in the organizations with very little team work; political and professional tension; jealousies between organizations; lack of communication between organizations and between organizations and farmers; and the structural changes in the involved organizations during the process of implementation of a programme.

The organizational set up and the services rendered by the Project management were of considerable interest for Planners and Decision-makers, because the quality of its performance was to determine the development of subsequent such projects. The lessons of experience were needed to guide the design and operation of other salinity control and reclamation projects. It was thought that the research and experimental insight into farmers participation gained in the project would provide persuasive support for other similar projects. However, project management underwent organizational changes so rapidly during the last two decades that it failed to provide the planned guidance for other projects. These changes also considerably lowered the project management efficiency in so far as communication between farmers and project managers was concerned.

Change in Project Management:

The Project management passed from a state of disintegrated activities to that of complete integration and back to disintegration. It started as a component of the Provincial Irrigation Department vested with the responsibility of developing and operating a battery of tubewells and construction of related works contingent upon reclamation requirements. The Soil Reclamation Board of the Irrigation Department provided the necessary guidance to the farmers for carrying out the reclamation operations and selection of appropriate cropping pattern. The original planning for the twelve schemes, which were later merged into this project, was carried out by the Board. On the establishment of the Water and Power Development Authority in 1958, Planning, investigation and development work was transferred to this organization.

In 1964 the 'Project Approach' was adopted on the recommendation of the U.S. Panel of Experts (3). Under this new organizational structure the Soil Reclamation Board was replaced by the Land and Water Development Board with wider scope of responsibilities which included agricultural extension; the supply and distribution of inputs, the credit control operation and maintenance of tubewells, and distribution of canal supplies. This was an attempt to bring traditional functions under one organization. The original recommendations on the 'Project Approach' also assigned to the Project organization the functions of reclamation and water management, technical aids to the farmers, research and experimentation and record keeping and reporting. No significant public sector effort was made on the first two; the latter two functions were transferred to the Water and Soil Investigation Division (WASID) of WAPDA. This was reorganised later into the Central Monitoring Organization.

The Project staff was taken from the Provincial Irrigation, Agriculture and Cooperative Departments under the control of a Project Director. The staff of the project was administratively controlled by their respective Departments. This created problems of discipline and good conduct which greatly affected the project efficiency. Transfer of development responsibilities to WAPDA enormously lowered the morale of the Irrigation Department and acted as an impediment to efficient project management.

In 1970 the 'Project Approach' was abandoned (5) on the assumption that it was needed to initiate the use of modern inputs during the initial stages of the project operation. With the passage of time the problem was assumed to be more of the availability of these inputs rather than their utilization by the farmers. It was thought that top heavy administration was not necessary to ensure and sponsor coordinated use of these inputs. Therefore, responsibilities of agriculture extension, cooperatives and irrigation were transferred to their respective Departments. The Project organization was left only with the tubewell operation and maintenance and water distribution and assessment. In 1977 the Canal Distribution was handed over to the respective Canal Divisions of the Irrigation Department (4). The Project Directorate was responsible only for tubewell operation and maintenance. There are two Tubewell Divisions and a Workshop at Sheikhpura. There is no decentralization of powers with the result that long administrative procedures are followed to repair tubewells. The tubewell operators remain absent. Therefore, the farmers have to travel long distances to report tubewell breakdowns and get them repaired. They have to contact WAPDA for defects in transformers and the Tubewell Operation Divisions for defects in tubewells. In fact, the organizations are so many that the farmers have to spend a large part of their farming time in contacting one agency or another for the solution of their day-to-day problems.

Effect of changes in Project Management:

Survey shows complete mistrust on public organizations. There is hardly any contact between the farmers and the field staff, except of course, of Patwaris at the time of assessment of 'Abiana' in each season. There is much more that could be added about mismanagement, administrative high handedness and ineptness on the part of the various organizations which are supposed to help the farming community in their effort of increasing agricultural production.

In this era of specialization there is an increasing emphasis on interdisciplinary cooperation and homogeneous development of waterlogging and salinity control projects. This can be achieved when the responsibility for surveys, investigations, planning, design, execution, operation and management of these projects is concentrated in one authority. It is thus inconceivable to dispense with the 'Project Approach' which was planned to facilitate all essential services to the farmers. Bottlenecks in the way of these services could be removed by some adjustment in the organizational structure instead of conducting a complete surgery leading to amputation of its important components.

Farmers Involvement:

It has been generally argued that the project has passed its development period. As such it does not require heavy organizational infrastructure. This is an attempt to ignore the fact that greater attention is

required to be paid to the operation, administration, management and maintenance of a project after its completion. The farmers should be involved in the operation and management of the project to the maximum possible extent. The degree of their development, however, depends on their education, their understanding of the problem involved; proper leadership, and on incentives for the farmers to form and associate with their local institutions. Farmers institutions must be established with well-defined responsibilities and authority which must be based on sound land and water legislation. The Soil Reclamation Act is inoperative and the Canal Act does not fulfill requirements of modern water management needs beyond the water course outlet.

Farmers' motivation to undertake agricultural and water use improvement work will not be effective unless measures are taken to reduce the number of farmers on a watercourse to minimise divergence of views and existing conflicts. The average area under each water course is 766 acres, and the average number of farmers sharing water is 150. This pattern exists ever since the canal system was introduced one hundred years ago. At that time the number of settlers was small. The irrigated area matched the canal supplies. The number has increased with the increase in population and division of land to legal heirs. Tubewells development brought more area under cultivation and further increased the number of farmers sharing water from the same watercourse. There is therefore, an imperative need to reduce the water course command to a manageable size of 200 acres involving no more than thirty farmers in the maintenance of a watercourse.

It is realised that the above suggestion will not be workable with the existing location of public tubewells. Increasing the number of water courses or extending distributaries will need relocation of these wells at high cost or increase in the number of water courses to be served by each well. This is likely to result in more conflicts among farmers. These suggestions, however, can be better appreciated in the light of the presently well known policy of shifting groundwater development in sweet water zones from the public sector to the private sector. Increase in the number of watercourses and reduction in the command area will provide an impetus to fractional tubewells already being developed by farmers. This will help the Government to gradually stop replacing the existing large capacity tubewells. It may be emphasised here that the existing water distribution system does not favour the proposed shift. The survey results have clearly indicated that farmers are reluctant to take operational and maintenance responsibility of the existing large capacity public tubewells because they are aware of their frequent breakdown and high cost involved in maintaining them.

Revival of Public Confidence:

In the face of the existing atmosphere of mistrust between public agencies and the farmers, greater effort will be required to clear this hazy atmosphere and to regain farmers confidence. This would be possible by testing the proposed 'SCARP Transition Programme' at pilot project level. However, prior to such a study a comprehensive investigation should be carried out by a multi-disciplinary team of experts to analyse and identify technical, social and economic constraints within the project to formulate a workable blueprint for the pilot project study. These investigations should explore the desirable changes the farmers will adopt readily and those they will resist. The factors influencing farmers readiness and their resistance must be identified. Several identified alternatives can then be tested on the pilot project level for preparing an implementation programme on a large scale.

Concluding Remarks:

The project has passed its improvement phase. It has reached the stage where further increase in yields/acre can be brought about by sound management backed up by well established institutional facilities and research and training at all levels.

There is substantial non-uniformity in the staff assigned to assessing and collection of water revenue and those providing institutional services. There is one Extension Worker for 1000 farm holdings and an

irrigation Sub-engineer for about 20,000 acres of irrigated area as compared to one Patwari for 6000 acres. A Sub-engineer controls about 1,000 farm holdings and a Patwari about 300. This system has been inherited from the colonial period when law and order and the collection of revenue were the most important functions of the Government. The Sub-engineer was (and even now is) responsible for the maintenance of canals and distribution of canal water. His responsibilities, as the lowest tier of the irrigation management structure, ends at the watercourse outlet. The present scarcity of water resources and the challenge posed by the water management needs place greater responsibilities on him. He has not to sit at the outlet and see the toiling farmers in a state of helplessness, but to move down and share his knowledge and experience on water use in their strive for increasing agricultural production.

Unfortunately, the Irrigation Department with all its paraphernalia is so entrenched into its traditional functions of canal operation and maintenance that it did not bother to peep out and prepare itself for new challenges and responsibility beyond the watercourse outlet. Consequently the Provincial Agriculture Department took the responsibility of on-farm water management in addition to their usual function of agricultural extension. The project has been deprived of the research and expert advisory facilities available in the Directorate of Land Reclamation and the Irrigation Research Institute of the Irrigation Department. The former was established for waterlogging and salinity control and the latter for research on the design of irrigation structures. The resource distribution and management now vests with two different organizations. The result is obvious in the light of the past experience of the project discussed earlier.

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