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The use of PRA in rehabilitating minor irrigation tanks

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• Introduction

As for much of India, the State of Tamil Nadu is characterised by numerous small irrigation tanks. These tanks, most of them rainfed, often cover a large area of apparent wasteland and generally have the capacity to irrigate 20-40 hectares of farmland. During the dry season it is often difficult to distinguish severely deteriorated tank-bed land from non-tank land. Lack of maintenance, accumulated siltation, and the disappearance of traditional tank management practices (*Kudimaramath*[1]) have resulted in a widespread and significant reduction in tank storage capacities. Consequently agricultural output and employment opportunities have also declined. To combat this the Agricultural Engineering Department (AED) of the Government of Tamil Nadu has undertaken a Standardisation of Minor Irrigation Tanks (SMIT) programme. The programme aims to restore tank capacity and improve overall water management. In this sense, standardisation means rehabilitation, rather than the imposition of a single package of beneficial measures.

This article describes the use of PRA in the rehabilitation of an irrigation tank at Vadapalai village. The specific advantages gained from the use of participatory methodologies in the programme are identified and contrasted with the department's previous approach to tank standardisation.

[1] *Kudimaramath* refers to the traditional system of tank management widely practised before independence. *Kudi* means the villagers, *maramath* means maintenance work. A village elder, assisted by a committee, would coordinate and motivate the local community to maintain the irrigation structures. Villagers provide their labour freely.

• Bridging the knowledge gap

The successful rehabilitation of a minor irrigation tank depends on effective communication between the farmers and SMIT programme personnel. Farmers possess a wealth of knowledge about their local environment and the peculiarities of their irrigation tank. External engineers and specialists would be hard pressed to gain anything like this knowledge without several field trips (spaced over several weeks), clearly neither feasible nor realistic given time and cost restrictions. However, the officials concerned with the standardisation work are trained and expert in macro-level planning issues such as ways of estimating peak flow rates, duty of water, and techniques on standard specifications for restoration works. Knowledge on the latest advances in water management such as the optimum flow concept and rotational water supply can also help to ensure that the maximum benefit is obtained from the project. The expertise of both farmers and engineers are clearly complementary and need to be fully utilised.

• The old approach: participation and participation

The need to consult and actively involve local people in the SMIT programme has always been recognised. However, this involvement was previously limited to individual and group discussions with local farmers before undertaking a formal engineering survey. Such discussions typically generated a considerable amount of information. However, the information obtained was often in a form that could not be marshalled readily or digested easily and so often caused confusion. Failure to obtain certain key facts or to understand the

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local situation fully often necessitated return trips to the village, which caused delays.

Much of the information needed to prepare detailed cost estimates for completing the standardisation work was obtained from a variety of secondary sources. These included maps of the tank and its feeding gullies, location of Ayacut lands, irrigation channels and so on. Information was also collected on survey bench marks, the full tank level as originally designed, maximum water level, top bund levels, bed level of the sluice and size of the sluice barrel. Site surveys were carried out to determine the present level of the various tank structures, thus enabling estimates to be made of the amount of work involved to restore them to their original design levels.

Despite the dialogue with the farmers the approach was not truly participatory as it did not fully involve them and their knowledge in design and planning. In the minds of the farmers, the technical measures appeared to be the sole remit of the government

• The New Approach: the use of PRA in the standardisation of the Vadapalai Tank

In August 1992 the AED and personnel from SPEECH, a local Tamil Nadu based NGO, used PRA for the first time in the SMIT programme. The village of Vadapalai is in the Aruppukottai Taluk of Kamarajar district. There are approximately 850 tanks in Kamarajar district with a total command area approaching 15,000 hectares.

The villagers were informed by SPEECH about the PRA programme some time before the planned visit. On the appointed day officials of the Agricultural Engineering Department and a number of SPEECH volunteers met the villagers in Vadapalai to introduce themselves and explain about the standardisation work and what it would entail.

Over the course of the day the villagers prepared a resource map and model of the tank. A detailed seasonal calendar provided a wealth of information on labour availability, water flow, rainfall, rainfall intensity, frequency of storms and so on. The transect walks provided a good opportunity for the villagers and AED staff to get to know each other. Three transect walks were made, each by a group of 15 or so farmers, three AED staff and one or two SPEECH personnel. The transects covered the feeding channels, waterspread area, and the tank bund and command areas.

The knowledge shared by the farmers through the use of PRA revealed the following:

- The farmers were able to mark and locate the feeding channel requiring repairs; specific spots requiring stone revetments; the exact location in the irrigation channel where division boxes needed to be constructed and the boundaries of unauthorised irrigated land. The maps produced by the farmers were later found to be extremely accurate and realistic when compared to survey maps.
- Rehabilitation of the tank would enable all 20 hectares of the command area to raise a paddy crop of 110 days duration.
- The farmers were able to pinpoint exactly what repairs and alterations were needed to the infrastructure of the tank.
- There is frequently a lot of siltation in the water spread area, especially the northern side, causing substantial loss of live storage.
- The 20 hectares of registered command area were divided into 80 parcels of land owned by about 65 farmers. However, the tank was also being used to irrigate a further 13 acres of unauthorised command land. This clearly placed a considerable strain on limited water reserves and frequently resulted in water shortages and crop failure. The farmers had no idea how this problem of unauthorised irrigation could be resolved.
- The water drawn through the sluices is divided into small streams of about 0. 10 to 0. 20 cusecs and used for irrigation by 8 or so farmers at a time. It would take 15-24 hours to irrigate one acre (0. 4 ha). Farmers would compete with each other to irrigate their fields as often as possible, unaware that less frequent irrigation and use of water would actually increase yields. The farmers were also unaware that the irrigation time of 15-24 hours/acre could be reduced to 2-3 hours/acre if the flow was not split and a

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rotational watering programme was adopted.

The complementarity of the outsiders' and farmers' knowledge is further illustrated by a specific problem the farmers were experiencing but were unable to explain. When full, land bordering the tank was becoming waterlogged and unmanageable due to excessive water seepage through the tank bund. Not only did this represent a waste of stored water but it also created a minor health hazard. Following completion of the engineering survey it was established that the bund was not wide enough at the base, causing water to seep through. This was a problem that the standardisation work was subsequently able to resolve.

• The advantages of a participatory approach the SMIT programme

The use of participatory methodologies based on open attitudes and behaviour was found to be more effective than the conventional approach based on the collection of statistics collection and the soliciting of farmers' participation. Under the conventional approach, despite the farmer discussions, participation of the local community had still been limited to the extraction of information, for subsequent analysis away from the village.

The new approach enabled the farmers and the AED personnel to develop an effective working partnership. Everyone involved was more aware of what was required and the value of each other's contribution to the process. Collection of data was more rapid and the information obtained was more concise, targeted and relevant to the project. Consequently, AED personnel were not required to make repeated trips to the village to collect further information.

The resource maps and models provided an excellent visual record of the tank and current state of its structures. The maps also provided a good basis for planning the subsequent engineering survey, which saved time and money. By enabling farmers effectively and clearly to communicate their detailed knowledge about the local environment and condition of the tank, the use of PRA undoubtedly reduced the overall time from inception to project completion. The farmers clearly derived a lot of satisfaction from being involved in the planning and decision-making process for the rehabilitation of their tank, as demonstrated by their greater enthusiasm for taking part in the actual restoration work.

The use of PRA was also helpful in exposing the areas which were too technical for the farmers. This included the water seepage through the tank bund, sub-optimal flow resulting from the division of the sluice flow, and the excessive irrigation. By bringing these issues into the open they could be discussed and resolved. Similarly, the farmers were unaware that an existing informal organisation in the village was capable of dealing with the unauthorised irrigation.

• Conclusion

The use of PRA in the SMIT programme provides a good example of the effectiveness and potential of adopting a more participatory approach in the execution of Government development projects. By establishing a more equal partnership between the Agricultural Engineering Department and villagers, resources were more effectively targeted and the completion time of the project reduced. This maximises the benefits of Government investment and helps to bring about more long term and sustainable benefits to the village community.

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