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STATE INTERVENTION IN IRRIGATION DEVELOPMENT: THE VILLAGE IRRIGATION REHABILITATION PROGRAMME

by
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Introduction

Self-sufficiency in food has been the focus of Sri Lanka's agricultural policy for the past several decades. Consistent with this goal, a major strategy has been one of trying to expand the acreage under food crops -- primarily paddy -- through the development of major irrigation schemes. Investment in major irrigated agricultural schemes has also allowed for the resettlement of landless and unemployed people from the more congested regions into hitherto sparsely populated areas of the country.

As avenues for expanding paddy acreages meet natural limits, the government turned to a strategy based on the intensification of agricultural production on existing irrigated lands, especially those coming under minor irrigation tanks/anicuts. Within this larger effort, the Village Irrigation Rehabilitation Programme (VIRP) occupies a significant position. It seeks to rehabilitate some 1,200 village tanks and anicuts in 14 districts of the island. Rehabilitation of these small-scale tanks/anicuts it is believed would offer certain advantages: 1) short-gestation periods compared to rehabilitation of large-scale irrigation works, 2) dispersion of government funds to neglected rural areas for the upliftment of the welfare of the poorest sections, and 3) creating conditions for more efficient use and control of water and as a consequence, expansion of the crop acreage as well as cropping intensity.

The potential for the development of minor irrigation has been highlighted in several reports (Gunadasa et al. 1980). It has been estimated that minor irrigation accounts for 45% of the 450,000 acres under irrigation and carries

33% of the paddy extent and contributes 22% of the paddy production.' However only 50% of minor irrigation schemes are considered to be in working condition (at varying degrees of efficiency) while 30% of the irrigable area remain unutilized or underutilized for paddy cultivation. Thus it has been estimated that the potential exists to increase the cultivable area under minor irrigation by about 50,000 to 75,000 hectares (Gunadasa et al. 1980).

This paper describes the VIRP which is a state-assisted programme for the rehabilitation of minor irrigation systems in 14 districts of the island. As such the VSRP is not a case study nor is it a programme aimed at promoting farmer management of village irrigation systems. Rather the VSRP seeks to improve agricultural productivity under village irrigation systems through physical refurbishment of the irrigation works and the introduction of a water management package. For the latter purpose, certain institutional arrangements are advocated. To the extent that these institutional arrangements involve some degree of farmer participation, they constitute the focus of this paper.

Village Irrigation Rehabilitation Programme (VIRP)

Objectives of the VIRP

The VSRP has two main objectives: physical rehabilitation of deteriorated minor irrigation schemes to increase agricultural production and farm incomes,² and the introduction of a systematic water management programme to ensure efficient utilization of stored water once rehabilitation work is completed. The project also aims to strengthen the major government departments involved with minor irrigation, particularly the Department of Agrarian Services (DAS), by providing them with the necessary training, staff, equipment, and transport to ensure proper maintenance of these schemes.

¹Minor irrigation works are **defined as** those that command an irrigated area of 200 acres. In this **paper**, the terms minor irrigation, village irrigation and small-scale irrigation **are** used interchangeably.

²This includes **schemes** currently in use at low levels of efficiency, those abandoned some years previously, and those where no cultivation is done.

Programme Scope

Under the VIRP, the Government of Sri Lanka, with assistance from the World Bank, has embarked on a programme to rehabilitate 1,200 minor irrigation systems. It is expected that the rehabilitation work will minimize uncertainties related to irrigation water on 77,805 acres of land, benefitting 20,000 - 25,000 farm families. The project area is spread over almost the whole of the dry and intermediate zones, and a small part of the wet zone.³ In addition to physical rehabilitation, the DAS has been requested to implement a water management programme for each of the rehabilitate,] systems.

Costs and Benefits

The VIRP is a 5 year (1981-85) project and has a budget of US \$25.9 million or US **\$43.6** million including price contingencies (World Bank 1981).⁴ There are five main budget heads; civil works, equipment, incremental staff costs and other incremental costs and training, evaluation, and assistance.

About 11% of civil works are for downstream works. The training evaluation and technical assistance allocation and the incremental staff cost allocation (except regional office allocations) are mainly for water management, while the other incremental costs and equipment budget is mainly for headworks. Accordingly, the share for water management in the budget (net of price contingencies) is US **\$3.4** million or about **13%**. The project life has been estimated to be 25 years, with the project reaching its full production levels in 1991. It is estimated that with full maturity of the project, cropping intensity would increase 116% and lead to an increase in rice production of 37,800 tons per annum and a **43%** increase in per capita income.

Implementing Agencies

The Irrigation Department (ID) is responsible for the civil works component of the project.⁶ Physical rehabilitation includes improvement of tank bunds and spillways; replacement of **all** sluices; improvement of main channels;

³The tanks predominate in the dry zone and anicuts fall into the intermediate and wet zone areas.

⁴Planned now to extend until 1981.

⁵For a district-wise breakdown of expenditure and physical progress rehabilitation from 1981 to 1985.

alignment of main channels and field channels; and provision of appropriate drainage systems, control structures, turnout structures, and measuring devices.

Once rehabilitated, the ID hands over the irrigation system to the DAS which is then responsible for planning and implementing a water management programme to ensure optimum utilization of the available water. Specific water management programmes are to be drawn up for individual tanks in consultation with farmers.⁶ Operation and maintenance functions become the responsibility of the farmers with DAS support. However the ID is responsible for ensuring satisfactory functioning of the headworks and structures rehabilitated under the project, for a period of 2 years thereafter.

Criteria for Selection of Tanks/ Anicuts for Rehabilitation

The project specifies that highest priority should be given to those irrigation systems that would yield maximum returns with minimal investment. Lowest priority is to be accorded to those minor works that have been abandoned long ago and would need almost complete reconstruction. The following specific criteria are used in the selection process (World Bank 1981):

1. The command area under a tank should not be less than **20** acres except if a tank is one in a cascade and requires improvements to provide safety for the tanks downstream.
2. Tanks in inhabited areas with easy access should be given priority.
3. The useful storage of the tank should not be less than **3** acre feet per acre, **2.5** acre feet per acre, and **1.5** acre feet per acre of command area in the dry, intermediate, and wet zones respectively.
4. The useful tank storage should not exceed 70% of the yield potential computed from sio-yield curves of the Irrigation Department.
5. The tank should benefit at least 10 families
6. The incremental area brought under direct maha irrigation should be at least 10 times privately irrigated lands submerged or three times other cultivated lands submerged.

⁶See Annex IV for a list, by district, of the irrigation systems where there is a DAS water management programme.

7. The soils of the catchment area, reservoir, and the command area should be suitable for their respective purpose.
8. The cost for a project including all civil works and physical contingencies valued at mid-1980 prices, but excluding price contingencies, engineering and administration, should not exceed Rs. 5,000 per acre for the existing area plus Rs. 10,000 per acre for the incremental area.

Strategy for Promoting Participation/Organisation of Farmers

Subsequent to rehabilitation, operation and maintenance activities become the responsibility of the farmers with the support and sponsorship of the (DAS).

Agricultural Planning Team

The DAS does this through the Agricultural Planning Team (APT) which is constituted for each district. The APT is in effect an appendage of the DAS and consists of three government officers: the Technical Assistant (TA), the Agricultural Instructor (AI) and the Divisional Officer (DO).⁷ While the AI is a divisional officer of the Department of Agriculture, the TA and the DO are employees of the DAS.

The principal function of the APT is to formulate and thereafter implement a water management programme for each rehabilitated tank/anicut, in consultation with the farmers. Each APT is responsible for all the tanks/anicuts under VIRP for a district, and the APT is supposed to visit each refurbished system at regular intervals. A tank supervisor, a salaried official, is appointed to supervise 10-15 tanks and is meant to assist the TA of the APT.

As such, the APT is supposed to spend approximately 2 weeks in each locality, and become acquainted with the specific requirements of each tank anicut. Local feedback is to be provided by the Cultivation Officer, the Tank Supervisor, the KVS and the Vel Vidane, while farmer concurrence is to be obtained for the different components of the water management package. The APT members are taught in their training that these programmes should be

⁷The DO was a recent addition to the APT, upon recognition of the importance of paying attention to the social and community aspects of village irrigation.

developed on the basis of rainfall," soil type, and hydrological data and a proper understanding of existing agricultural practices for each area; and that due consideration should be given to production constraints and risks under which the cultivators operate.

After the APT has finalized the water management plan and it has been approved by the Deputy Commissioner (Water Management) in Colombo, the Tank Supervisor sees that the command area is divided into areas of about **4 acres** each around a field canal and consisting of 6-10 farmers. These groups in turn each select a farmer representative (FR), all of whom are represented in the Tank Committee.

Tank Committee

The Tank Committee is regarded as the primary vehicle to enlist farmer participation in operation and maintenance activities. The Tank Committee is without legal status and is meant to be a relatively informal organisation that is formed with the impetus provided by the APT.⁹ The Tank Committee consists of the Vel Vidane (as Chairman)," the FRs and the relevant government offices including the Cultivation Officer and KVS.¹¹ It is thus composed of government officials and FRs. The responsibility for organising agricultural inputs and for providing extension advice falls on the officers in the committee while the distribution of water and the resolution of conflicts are the responsibility of the Vel Vidane and the FRs. Hence there is a division of responsibilities; those irrigation-cum-agricultural tasks that require extra-community activity and by definition warrant a certain amount of governmental intervention are performed by the government's representatives in the Tank Committee, while matters that strictly concern the community are left to the latter's representatives for mediation through the Vel Vidane. However the Tank Supervisor remains in overall charge of the water management programme.

The **'Sank** Committee, the concept of which is introduced from without, but whose evolution is considered to be from within the "hydraulic community,"

⁸The APT members are given a 3-week intensive training, followed annually by a two-week refresher course.

⁹This is in conformity with the proposed amendments to the Agrarian Services Act of 1979.

¹⁰Elected under the Agrarian Services Act No. 58 of 1975.

¹¹KVS is the Lowest level Extension Officer.

with the impetus being given by the APT is thus the local organisation that is promoted under the VIRP. The scope of activities of this organisation is confined to ~~irrigation-cum-agricultural~~ matters and it derives its authority mainly from the state, and to a lesser degree, from an interest group constituency (those dependent on the irrigation water). Its membership likewise consists of the lowest level of the government administrative structure as it relates to irrigation and crop production matters, and FRs who are responsible to the members in the paddy tract.¹² Hence the government officials are accountable "upwards" so to speak to the state, whilst the FRs are responsible "downwards" to those who own irrigable paddy land under the particular water source. Likewise the state officers are responsible for activities that are dependent on interaction with the wider society--e.g., ensuring timely delivery of inputs--while the FRs are responsible for matters that concern the community, and can be mediated within it. However in reality, many of these latter decisions are also made by the officers, because only they have the necessary legal backing for remedial action (i.e., for prosecution at the Magistrate's court).

Hence the Tank Committee is strictly speaking not a farmer organisation; rather it provides a convenient meeting place or nexus between the state as it reaches down to provide benefits such as extension advice or production inputs, and the community, through its representatives, reaches up to receive them.

The Tank Committee moreover is a standardized blueprint that is introduced as a vehicle for resource management and mobilization purposes under the VIRP. It is the recommended arrangement for all refurbished tanks/anicuts, irrespective of existing arrangements for irrigation water management. The only proviso is the number of farmers. If a particular irrigation system has more than 15 farmers, farmer grouping is recommended.¹³

The Tank Committees together are not federated up to a higher level. In a sense this, plus the pronounced government presence in the composition of the Tank Committee, show that the basis for organisation is not to empower the farmers to be the key figures in irrigation management decisions or enable them to collectively bargain for their rights as a hydraulic community. Rather farmers are encouraged to come together primarily for purposes of undertaking agricultural and irrigation related tasks as set out by the water management programme, which in turn is mainly an artifact of the APT, though of course having farmer consensus. And to do this, the Tank Committee is constituted so as to have the correct mix of local-level participation and state intervention. In the

****Though it is considered preferable that those elected own land in the command area, there is no means to ensure this.**

¹³ Manual on village irrigation. Department of Agrarian Services April. 1984.

final analysis the latter superseded the former as a state official--the tank supervisor--was ultimately responsible for the implementation of the water management programme.¹⁴ Hence the APTs and the Tank Committees can be seen as state sponsored vehicles for implementing a prescribed water management programme rather than as mechanisms to encourage farmer involvement in system rehabilitation, management, and operation.

.Attempted Solutions and Results

During the course of implementation, certain defects in approach were recognized and remedial action taken to improve them. At least five of these factors bear mentioning. One of the most important changes was to bring in the APTs at the time an irrigation system is identified for rehabilitation so that it could have some input from the early stages of the rehabilitation process. In addition, the constitution of the APT was changed to include a DO who would pay attention to the social and community aspects of village irrigation.

Along with these changes it was decided that the Tank Supervisor was in a superfluous position and that in many ways he performed the activities that could have been done by the Vel Vidane. Hence about 2 years ago this position was abolished, so that once the APT moved out, no government official remained in a supervisory position over the water management package.

Another significant innovation was the introduction of ratification meetings which are held after the plans and estimates for rehabilitation are ready, and intended primarily as a mechanism to explain proposals for rehabilitation to the farmers and to obtain their approval.

The problems inherent in the handing over exercise have been somewhat ameliorated by the introduction of a method of joint inspection by the ID and the DAS, which allows the two departments to come to an agreement on whether rehabilitation is completed or, in the event that some feature is not satisfactory, for provision to be made to the DAS for completing the particular item. An important feature is that a time limit of one has been set before which the DAS must inform the ID of any defects in design or construction. This holds both departments accountable in having the job completed speedily.

The APTs coming to the picture early in the rehabilitation exercise has helped the construction agency in designing and planning the rehabilitation programme, and in tying the proposed water management programme to the physical improvements/modifications to the system. This was important as until then

¹⁴The tank supervisor position has however been abolished recently.

there was little discourse between the ID and the APT/DAS, such that after physical rehabilitation, the APT/DAS had little basis upon which to devise a water management programme appropriate to the physical improvements/modifications. The introduction of the DO into the APT has also meant more weight being given to social and community considerations in village irrigation systems.

The other important innovation, in the latter part of 1984, has been the Sub-Committee on Village Irrigation, which under the chairmanship of the GA provides coordination of the rehabilitation process at the district level. This appears to have had some major salutary effects especially for the process of "handing over." While the District Agricultural Committee (DAC) has several officers (approximately 15-20) who must meet to make policy decisions, the Sub-Steering Committee has only 4-5 key members who meet quarterly and who, under the chairmanship of the GA can take quick decisions.¹⁵

Key Problems Faced by Activity

There are several problems in the strategy of rehabilitation and the strategy of organizing farmers for irrigation water management activities. Whilst these are interrelated, they will be presented here separately for ease of discussion. The discussion is based in large part on the study conducted by the ARTI in 1984 in six village irrigation systems in Moneragala district, four of which came under the VIRP (Abeyratne and Perera 1986). Hence the information presented here mainly reflects these data and should not be considered conclusive of the whole programme.

The Rehabilitation Process

The rehabilitation process under VIRP can be divided into four major stages, namely the preliminary investigation stage, the design stage, and the construction stage. The fourth stage is that of "handing over" the system of DAS after physical rehabilitation is over. The major problems that surface at each of these stages will be discussed briefly.

Preliminary investigation stage. As mentioned earlier, certain criteria have been laid out for the selection of tanks/anicuts for rehabilitation. These criteria, whilst being important, still overlook certain other important considerations. Among these:

¹⁵The range ID/DDs, ASC/DAS and in the event that land has to be alienated an officer from the Land Commissioner's Department.

1. The importance of sources of income outside of irrigated agriculture in the project area, particularly for the more impoverished farmers.
2. The likelihood that input and product prices will justify increased attention to irrigated agriculture on the part of the water-users.
3. That there exists local capacity for system management given existing household production strategies.
4. That the local social structure is conducive to a rehabilitation exercise.
5. Community articulation of the desire for rehabilitation of irrigation works by the government. As noted by Coward (1984), communities that are able to come together and agree to request assistance will display the social capacity required for successful future irrigation development.
6. More stringent criteria for selecting the most needy plus those with an agricultural background in the event that an abandoned tank (olagama) is selected for rehabilitation. Otherwise the inherent social welfare aspects of the programme will not be met.

Design stage. Typically--and the VIRP case is no exception--the technical irrigation agency is given the responsibility for establishing design criteria and thereafter in applying these to construction. When responsibility is bestowed almost entirely on the ID and the latter is consequently held accountable for any future defects in design and construction, it is almost inevitable that the local community is not consulted nor involved in the design process.

This omission of local knowledge and experience from the design process was a serious drawback especially for the first few years of the VIRP. Unfortunately as pointed out in the ARTI study at locations that had or were undergoing rehabilitation, less than 1% of the farmers said that they were consulted or even kept informed of the design plans. When asked if they would have been able to provide useful information if actually consulted, most farmers said that they could have. Sixty-six percent of the farmer, who said that there were problems in the physical works after the rehabilitation programme, attributed these problems to the fact that the ID did not consult the local residents. In one of the study anicuts for example, the farmers complained that the ID undertook rehabilitation of the anicut--viz. raising and strengthening the dam--without realising that what was needed was a feeder canal from the adjacent stream to augment the water supply, a fact that they could have pointed out. Medagama (1982) also cites an illustrative example of a tank that was rehabilitated at the

cost of Rs. 25,000/- only to be abandoned, as it only irrigated 2 hectares on completion. At the same time farmers in the area said that what was really required was a way to divert a stream in the catchment area rather than to improve the headworks.

Subsequent to the ARTI research study, the idea of farmer meetings at the initial investigation stage was introduced.¹⁶ This was a great improvement as pointed out by ID personnel who said that these meetings eased their work and considerably improved relations between the farmers and ID, especially as the former were now kept informed of the rehabilitation plans of the latter. However the process is still one of informing farmers rather than eliciting their participation in decision-making or employing them in the construction process (other than the mandatory requirement to have farmers do earth-work on the field canals).

The Construction Stage

From the large number of tanks/anicuts earmarked for investigation in each district, selected works are chosen for rehabilitation in a particular year. After an estimation of costs undertaken by the ID, the latter calls for tenders. Usually the contractors selected, supposedly the lowest bidders, are not from the local area and consequently they prefer to import their labour from outside. Supervision of construction is done by the technical staff of the ID. Hence there is little local involvement in the construction stage.

The delay in obtaining confirmation by the District Agricultural Committee (DAC) and the contractor's interests elsewhere result in the delay of the construction programme." This has serious consequences for the farmers as no cultivation is allowed until physical refurbishment is completed, sometimes extending to four or more consecutive seasons. Since they are not employed in construction, they have no other sources of income or means of subsistence. They also felt that actual construction involved poor quality work since there was little ID supervision, and because they had no authority to check on the type nor the quantity of materials used.

¹⁶According to the former VIRP Project Director/ID these farmer meetings are held in approximately 80% of the cases.

¹⁷In fact the ID is now considering introducing a clause when calling for tenders that requires contractors to take an only one scheme at a time.

Handing Over. After physical rehabilitation, the refurbished irrigation system is supposed to be "handed over" to the DAS. "Handing over" implies several things. First, the fact that one department is responsible for rehabilitation and another for operation and maintenance creates problems, primarily an ambiguity in responsibility for the refurbished systems. This situation has since been improved by introducing the method of joint inspection.

The second factor implied in the term "handing over" is of course that process involving a give and take exercise that is confined to two government departments. This reflects what appears to be the generalized perception that these rehabilitated schemes belong to the state and not to the community and that by definition those living and cultivating under these systems are merely recipients of government services.

The third factor implied in this "handing over" exercise is that the technical agency, the ID, can undertake the rehabilitation exercise without supporting a participatory approach and simply leave it to the DAS to be committed to the latter after "taking over." And attempts to mobilise farmers after "handing over" thus become undermined. As documented by others (Mayson 1984), the advantages of farmer participation in the different stages of rehabilitation is the increased likelihood that the physical improvements in the system are less likely to result in management problems in the future. Additionally, farmers will gain useful practical knowledge and appreciate the components of the irrigation system that require the most care and maintenance (Korten 1982). Unfortunately, these advantages may not materialize under the VIRP given the current approach to the rehabilitation process.

The Water Management Programme

All irrigation schemes that are rehabilitated are in principle considered for inclusion in the water management programme. The water management programmes are to be adapted to the requirements of each system but they share the twin goals of making efficient use of rainfall and tank-stored water by (a) improvements in the dependability of the water supply, and (b) a more equitable sharing of water among farmers in the command area.

The responsibility for implementing the water management programme lies with the Water Management Division of the DAS which delegates to its district level appendage, the APT, the responsibility to visit each tank/anicut proposed for rehabilitation, to prepare an appropriate water management programme, and to supervise its implementation.

Most components of the water management programme were deemed successful by the farmers. In the ARTI study for example, 73% of the farmers

commented positively on the distribution of water under the rotational schedule drawn up under the programme. Nearly 60% of the farmers said that their own water supply had improved subsequent to rehabilitation and introduction of the recommended water management practices.

Hence, the extension component ensuring adherence to certain agronomic and water distribution practices seems to be working well, though cultivation risks under minor irrigation systems (given the precarious water supply) prevent farmers from adopting certain recommended practices such as growing subsidiary food crops in Yala.¹⁸ The problem appears to be that the officials who are responsible for the above extension-type activity, the APT, are also responsible for organisational activity. As Coward (1984) notes, the problem here is that "extension agents are formally trained to disseminate information rather than to organize farmers groups." What is argued here is that if the APT plays primarily an extension-oriented role (for which incidentally it is trained) it cannot also be expected to play a successful catalytic role (for which it is not trained).

Apart from the orientation of the APT, another key problem is its constitution. A major drawback is the lack of a FR or the APT who would provide local feedback. As the project progressed it was anticipated that the DO would fill this vacuum. But the DO, despite his orientation, remains a government officer and is therefore always external to the village environment. Including an FR (in this case the Vel Vidane) on the District APT would ensure consideration of community interests.

The second drawback in the constitution of the APT, granted its "official flavour," is that it has no ID representative. The result is that the APT too becomes external to the physical rehabilitation exercise, which remains strictly the ID's domain.

A third drawback, which was subsequently corrected, was that under the VIRP it was expected that the Tank Supervisor would be ultimately responsible for the implementation of the water management programme in about 10-15 tanks/anicut. Hence he was seen as the key figure to take over from where the APT left off, in consolidating the farmer organisations and assisting the group leaders. He also was to supervise the laying out of the internal field channels and drainage systems; in assisting farmers in constructing and replacing prefabricated farm gates, establishing rain gauges and time schedule boards; and in installing measuring devices, which he thereafter used on a regular basis to keep track of tank water levels.

¹⁸"Crowing subsidiary food crops in Yala has often proved to be difficult encourage, given the tasks.

Hence the Tank Supervisor was interjected into the hierarchy, almost as an intermediary between the APTs and the Tank Committees, but in practice as an agent of the former, to oversee the operation and maintenance of the system. This in effect emasculated any self-reliance on the part of the farmers in operating the irrigation system. The tendency therefore, even in the smallest dispute, **was** for farmers to go to the Tank Supervisor to mediate, rather than attempt to resolve it among themselves.

Under the VIRP, the Vel Vidane is supposed to play a vital role in the operation and maintenance of the irrigation system and in the implementation of the water management programme.” The Vel Vidane is supposed to operate the sluice, supervise water deliveries based on a predetermined rotation to the groups, collect daily rainfall data, and function as the Chairman of the Tank Committee. But, while given important tasks to perform by the Tank Committee, under VIRP the Vel Vidane position becomes undermined because of the other positions introduced into the hierarchy. Ultimately it is the Cultivation Officer who has the necessary legal backing to prosecute those who violate irrigation rules.

The Tank Committee and the Community

Within the institutional framework set out under the VIRP, the only forum for any farmer participation in decision-making is at the Tank Committee level. Here the FRs (note, not the farmers) come together with the state’s representatives--the KVS, CO, TS, GA, AI, TA--under the Chairmanship of the Vel Vidane, to decide on the operation of the system for the particular season. At the Tank Committee meeting, decisions are made such as the dates to do maintenance works, clear scrub on the tank bund, desilt field channels, and determine procedures for bethma cultivation. The Tank Committee hence becomes no more than the kanna meeting, and rarely meets more than once a season. Conflict resolution and other tasks that need to be performed on a continuing basis during the season are dealt with by the officers concerned, since only they have the necessary legal and administrative authority.

¹⁹The *Vel Vidane* is appointed under the Agrarian Services Act and his redesignation in the Act is that of Farmer Representative (FR). But as they are so-called Farmer Representatives elected on the basis of a field channel under VIRP, the old designation of *Vel Vidane* is attached to the person who is elected under the Agrarian Services Act. The latter is elected for a period of 3 years and cannot be removed by the farmer. If the latter wishes they can pay him a *ruwandiram* but evidently this rarely happens, perhaps reflecting the fact that the *Vel Vidane* is perceived by the farmer as being really accountable to the state, through the Cultivation Officer.

In the course of the ARTI study we discovered at least four sets of problems confronting the concept of a Tank Committee. The first is the "community" that the Tank Committee represents. The focus around the water supply--the tank--is one that harks back to the part where the water source was the epicenter of community life, economically and socially. In the past, "the one-tank, one-village" concept was in fact all pervasive (at least in the dry zone) and elaborate rules and regulations were established to keep this hydraulic community intact (Leach 1961). However a process of state penetration of the rural areas, which has accelerated since the 1950s, coupled with natural demographic changes within village communities, have contributed today to making the notion of community around the irrigation water source extremely fuzzy. A market in land has brought outsiders into what were relatively socially homogeneous communities and these outsiders have managed to buy land even in the traditional *purana wela* sections thus making it harder for the original cultivators to maintain exclusive rights to land and water on the basis of prior appropriation. Population pressure and resultant land fragmentation have resulted in irrigated paddy land decreasing in importance for the community; village boundaries have been extended to cover further acreage beyond what was watered by the tank such that these paddy lands become rainfed and are not dependent on the irrigation water source.

Hence today the village tank does not enjoy the primacy it had in the past and land holdings under the village tank are extremely fragmented and do not meet subsistence requirements.²⁰ As a result many villagers depend on other crops (such as *chena*) and other activities to bring in a larger proportion of the income.

In some of the irrigation systems selected for the ARTI study this was clear; the village tank was not the main contributor of income nor of social identity for the community, and often it was of little consequence to all but those cultivating a limited acreage immediately adjacent to it. In such a situation it becomes difficult to elicit even the limited farmer participation envisaged for the Tank Committees. In this respect the modicum of farmer participation expected for the Tank Committee might be realistic. The problem arises when more community-wide participation is expected, especially for system maintenance in the future.

The second problem that plagued some localities was that the community of water users was not coterminous with those represented on the Tank Committee. The latter is defined only with reference to irrigation water users but there were cases where other populations were drawing water from the same source.

²⁰In the ARTI study (op cit) it was found that 70% of all holdings are less than one acre

For example in Kehellanda, in one of the ARTI study localities, a "show piece" for the water management programme in Moneragala, there was a sizeable community immediately next to the tank whose subsistence depended on fishing in the tank. However this community was not represented in the Tank Committee. As a result there was a series of conflicts over water levels and the rights each group had over the tank and its water. From this it is evident that if farmer participation is to be encouraged, it is important to delineate irrigation and water-user community boundaries more realistically, and not expect commitment to a Tank Committee simply because one owns land under its command, similarly excluding others because they do not use the tank water for irrigation purposes should be avoided.

The third aspect that emerged in the ARTI study with respect to participation in the Tank Committee was the critical question of who owned the irrigation water source. In earlier times, the water source (the tank or anicut) contributed to the definition of community and consequently spelled out a clear set of privileges and obligations for those who lived and cultivated relying on it. Today on the contrary there seems to be some ambiguity as to who owns the irrigation works. In those irrigation systems that had undergone rehabilitation, the majority of farmers (67% in the ARTI study) said that the state had ownership and clearly therefore the state had responsibility for operation and maintenance. However in those systems that had not undergone rehabilitation, the village community felt that they themselves owned the irrigation system. The pervasive belief that, subsequent to state embarked rehabilitation, the community no longer owns the irrigation water source, has several implications for farmer participation. At the least it cannot be assumed that the community will have the incentives to participate in system management or maintenance.

In the ARTI study, the question of who should do maintenance and who actually does maintenance work was addressed. While farmers in the pre-rehabilitation tanks and anicuts felt that it was the community's responsibility, those who had state involvement in the form of rehabilitation, stated that it was clearly the government's responsibility. However, because they were compelled to do maintenance work under the water management programme, they did in fact undertake it. The farmers were emphatic in pointing out that though this was called *shramaduna* by the project authorities, it was actually done only under compulsory fiat. Thus the pertinent question that remains is what will be the incentive/compulsion for farmers to undertake maintenance work in the future?

The fourth aspect that concerns the introduction of the Tank Committee concerns the fate of irrigation water management if anything happens to existing institutional arrangements. While in principle it is accepted that existing arrangements are allowed to continue, it is hard for the APTs to do all the required

tasks in the short-time available to them and also determine the extent and strength of existing local capacity for irrigation water management and thereafter devise strategies that serve to utilize the latter. From the limited data available for Moneragala, it appears that the APF gets over this problem simply by advocating the introduction of a Tank Committee disregarding existing institutional arrangements.

Implications for Future Policies

Cross-cultural studies demonstrate the advantages inherent in small-scale irrigation systems for eliciting farmer participation in investment, design, and construction, and operation and maintenance activities (Lynch 1985). Because small-scale irrigation projects are of a manageable size and have more accessible technology, and because the communities surrounding them tend to be relatively homogeneous, it is typically believed that opportunities for community involvement tend to be enhanced and that in turn the success of these projects depends on eliciting community involvement.

From the government's point of view, there are several advantages in promoting community involvement from the inception of a rehabilitation exercise. Typically, small-scale irrigation projects tend to be widely scattered and thus costly for government to invest in feasibility studies prior to investment. It can instead rely on the community to provide information on factors such as micro-variations in soil, climate and crop water needs, quite apart from valuable socio-economic information such as legal and customary property rights in the water source, and ownership rights of land or labour availability on a seasonal and permanent basis. The community can also provide human resources for construction or system repair, thus reducing the costs to government. And of course if management and administration of the systems after construction remain with the community, the expense to the government will be reduced.

However the ability and willingness of the community to take on project responsibility, especially the kinds of tasks that follow rehabilitation, depend on at least four factors: a high level of community participation from the inception right through the different phases of project development; the existence of (or potential for) local organisational capacity capable of decision-making in relation to system management and resource mobilization for irrigation-related tasks; economic and social incentives for participation that would include agricultural prices to encourage farmers to contribute towards the system; and clear-cut property rights in land, water, and the irrigation works that bind the community together and provide a reason to come together for group decision-making and other irrigation-related tasks.

It can be argued that in Sri Lanka, where state intervention has been extensive since the 1930s, and strong links have been forged with the state apparatus and the market, village communities can no longer be expected to have local organisations that are autonomous and totally community-based. In that sense, it is only realistic to expect some degree of state involvement in small-scale irrigation systems. State recognition may be a pre-requisite to formalizing local organisations so that they may for example, be able to obtain credit or be involved in construction, and state financing may be the expedient route to physical rehabilitation of the system. The question then is, to what extent is farmer participation warranted and expected and is the structure under VIRP an effective mechanism for eliciting the anticipated degree of farmer participation.

The VIRP does expect farmer participation in irrigation-related tasks subsequent to rehabilitation. It expects this participation to be one of undertaking tasks related to system operation and maintenance and for enforcement of rules with regard to it. It expects to enlist this participation through a semi-farmer organisation--the Tank Committee--which consists of farmer representation and state representation.

It appears that the problem for VIRP arises because it expects the kind of farmer involvement or participation (after the state-sponsored rehabilitation exercise), that can emerge only if certain prior conditions conducive to farmer/community participation are met. But in a situation where local organisational capacity is hardly involved in the different phases of system rehabilitation and development, and thereafter called upon only for undertaking irrigation-related tasks with little concomitant decision-making responsibility, it is difficult to expect effective farmer participation that is at the same time self-reliant and self-sustaining and willing to take on future responsibility for system operation and maintenance.

Additionally, the APT which is no more than a bureaucratic appendage of the DAS (perhaps only more mobile) has been called upon to perform what is in a sense a catalytic role, and to promote farmers to organize themselves in hydrological groups and thereafter into a Tank Committee. A team that is composed of three government officers selected for their technical skills and whose task is primarily to formulate an appropriate water management programme is unlikely to have the resources or the skills required for organisational activity.

Where the VIRP could have profited was to have paid more attention to the local community structure, including existing institutional arrangements and appropriate types of leadership that could have been mobilized for irrigation water management, to have considered alternative investment approaches for rehabilitation, and to have involved farmers more in the rehabilitation process. But as it chose to use the APT as the basic mechanism for ensuring post-

rehabilitation system operation and maintenance and the Tank Committee, which is weighted by government presence and functions only as a kanna meeting, it is clear that the main thrust of the VIRP is not to promote participatory farmer management of the irrigation system, in any sustained way. Rather the whole rehabilitation-cum-water management programme under VIRP has served to consolidate the government's role in irrigation water management under village irrigation systems. In doing so, the state has once and for all established its lead role in providing services to the rural areas. Given the continuing theme of welfarism that pervades government policy, this is perhaps consistent. What is problematic is if the state thereafter anticipates that future irrigation responsibilities will be assumed by the local community.

To summarize, village irrigation systems in Sri Lanka have become increasingly integrated into the national economy and society. The VIRP is an example of deliberate and focused State intervention into village irrigation systems through a process of physical rehabilitation, coupled with a water management/institutional component. The VIRP, by physically rehabilitating village irrigation systems, by providing advice on appropriate operation and maintenance activities and on new agricultural practice!;, and thereafter by introducing an institutional arrangement to implement the latter, is concentrating and consolidating the State's role in village irrigation systems. In doing so it gets the job done: physical rehabilitation of the system is accomplished, maintenance work is done, water management is successful. Indeed, all this matches the people's perception that because the State owns the irrigation system, it is also responsible for ensuring the performance of system operations and maintenance tasks. The problem however arises when the state deems it fit--not the least because it cannot shoulder all the administrative, financial, and logistical burdens of irrigation management--to hand over some of these activities to the community. Chances of motivating the farmers to participate in sustained local group action at this stage become problematic.