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PEOPLE'S PARTICIPATION IN THE GAL OYA REHABILITATION PROJECT AS VIEWED BY AGENCY PERSONNEL

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Douglas J Merrey and D Hammond Murray-Rust

International Irrigation Management Institute

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INTRODUCTION

The Gal Oya Rehabilitation Project

The Gal Oya Rehabilitation Project was the first large-scale effort to introduce a participatory approach to irrigation system rehabilitation in Sri Lanka. The 1950s and 1960s had seen a large increase in overall irrigated acreage in the country through the construction of new systems, but by the early 1970s the opportunities for such expansion in irrigated area were rapidly diminishing, and responsibility for almost all new projects was transferred to the Mahaweli Authority. The Irrigation Department therefore became increasingly concerned with rehabilitation of existing systems, and a number of such projects were proposed during the 1970s. These included the Tank Irrigation Modernization Project (TIMP), funded primarily by the World Bank in the North Central part of the country, and the Gal Oya Rehabilitation Project on the east coast, funded by USAID.

The TIMP can, in retrospect, be viewed as a relatively traditional rehabilitation project in that the basic planning, implementation and operation of the project was largely undertaken by agency personnel with little effort to involve farmers in any of these stages (Murray-Rust and Rao, 1987). The initial planning preceded that of Gal Oya, although implementation commenced at much the same time and there was no opportunity for the planners at Gal Oya to learn lessons from the TIMP experience. However, early in the planning stage of the Gal Oya Project, it was proposed to the Government of Sri Lanka and USAID that pilot testing of a participatory approach be adopted to see if experiences from other countries could be transferred to Sri Lanka, making allowances for necessary modifications to suit local circumstances.

This paper examines the Gal Oya Project from the perspective of the Irrigation Department. While there has been considerable analysis of the process of the participatory approach adopted in Gal Oya, and evaluations made of the overall impact of the project, little attention has been paid to the changing roles of agency personnel in such activities, the extent to which it has improved their job conditions and job satisfaction, and the willingness of agency personnel to adopt similar approaches in the future.

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[1]Merrey is a social scientist at the International Irrigation Management Institute's Headquarters in Sri Lanka; Murray-Rust is an engineer at IIMI's branch in Pakistan.

The remainder of this section briefly describes the Gal Oya Irrigation System, the rehabilitation Project, and changes made in the Project during rehabilitation. The next section summarizes the official evaluations of the Project. Following this, the Project is evaluated from the perspectives of key agency personnel who had been intimately involved in Project implementation, including a long term perspective on Peoples' Participation. The Conclusion -- Implications for India -- is left for the participants' discussion.

It should be noted that the authors were intimately involved in the project, especially in its early years. Murray-Rust did research for his PhD dissertation and participated as a consultant in some aspects of Project planning and implementation, beginning in 1979. Merrey was employed from 1980-82 as the "Institutional Advisor" by the engineering consulting firm on the Project.

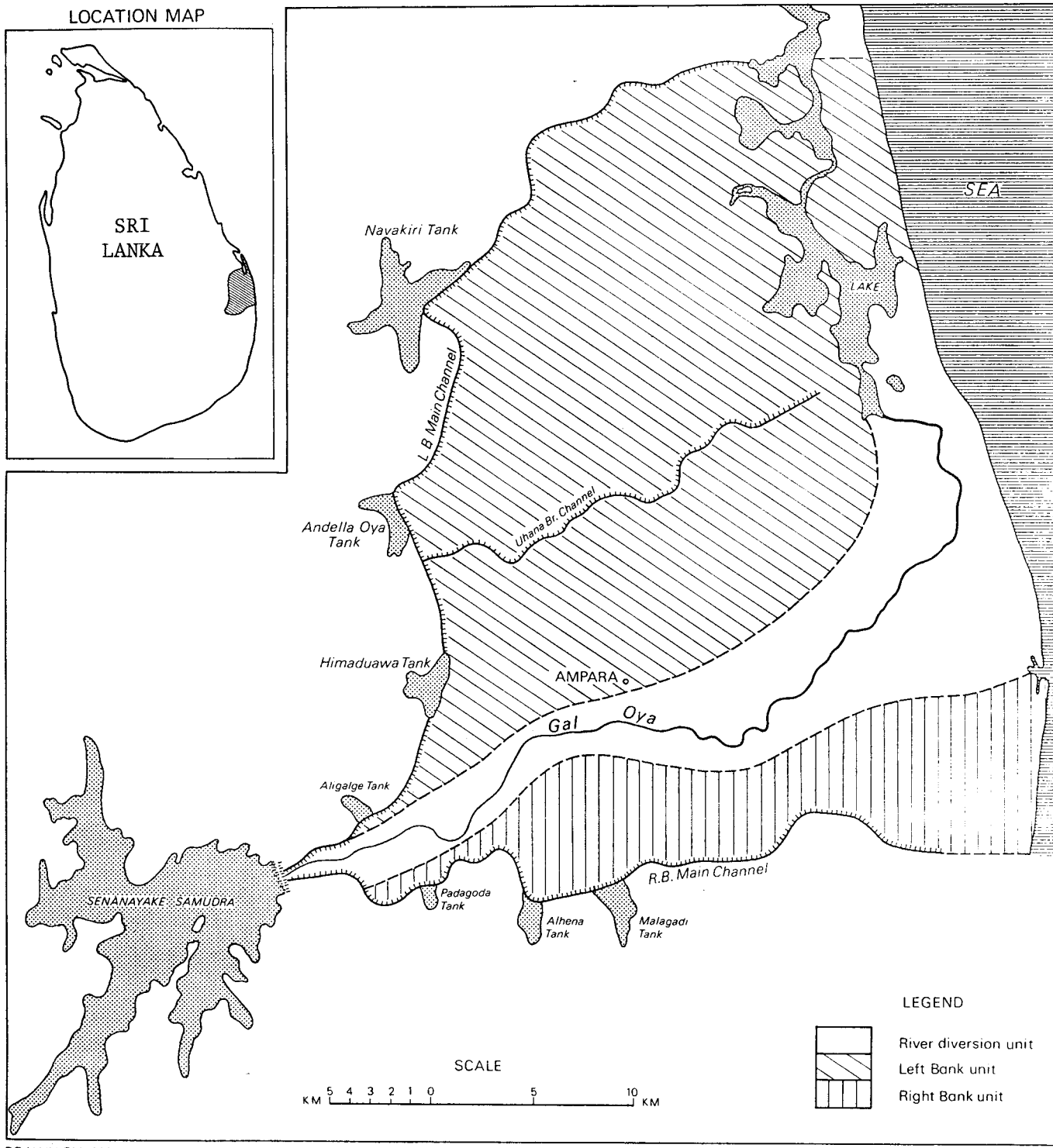
The Gal Oya Irrigation System

The Gal Oya Irrigation System was the first large scale project to be completed following Independence, and has remained the largest contiguous irrigation system in the country. The total commanded area is 48,600 ha divided into three divisions (see map): the Left Bank covering some 24,300 ha, the Right Bank covering 12,150 ha, and the River Division serving 12,150 ha. Each division is largely independent, with separate channels originating immediately downstream of the reservoir, although there are some feeder channels from the Left Bank into the River Division, and several opportunities for reuse of drainage water in the River Division. The Gal Oya Rehabilitation Project focussed exclusively on the Left Bank apart from some overall planning of water releases from the reservoir.

The irrigation system is served by the largest reservoir in Sri Lanka, Senanayake Samudra, with a maximum storage capacity of 950 MCM (770,000 acre-feet). During a typical year inflow only occurs during the northeast monsoon, from November to January. The extent of dry season cultivation is therefore entirely dependent on the water level existing at the end of the wet season crop. Traditional cropping seasons have been from October to March for the wet season (maha) crop and April to September for the dry season (yala) crop. With the exception of about 4,000 ha of sugar cane on the Right Bank, the entire system is devoted to rice cultivation in both seasons.

The system was constructed in three stages. The dam was completed by 1952, thereby providing abundant water during the first stages of irrigation. The Left Bank, started in 1951, was completed by 1960, although some tail end areas originally included in the project design were never completed as it proved impossible to get water there. The Right Bank was constructed between 1957 and 1964. The River Division, which predated the project and relied on diversions from the Gal Oya River, was upgraded but did not require major physical construction of channels or significant land development for irrigation.

MAP OF GAL OYA PROJECT



DRAWN BY Wijesinghe - IIMI

MAY-19

In 1964 responsibility for the system was transferred from the Gal Oya Development Board, a special agency created to handle all construction and development in the Gal Oya area, to the Irrigation Department.

The irrigation infrastructure was designed in accordance with Sri Lankan standards prevailing at Independence. The main channels paralleled the contour as far as possible, and in many cases flowed through small reservoirs (tanks) which had previously been constructed on small rivers flowing into the Gal Oya valley. The branch channels were designed to flow along the top of low ridges in an approximately east-west orientation, with networks of distributary channels (D channels) and field channels (FC) branching off at appropriate locations.

Most D channels and many FCs also follow the contour, making their courses sinuous. There was little effort to standardize the area commanded by either D channels or FCs. Distributary channel lengths range from several kilometers to a hundred meters, and have command areas ranging from 12 ha to 607 ha. Similarly, field channels can serve anything from 2 ha to 80 ha. Larger field channel commands may contain one or more sub-field channels. Some farms receive water directly from D Channels, although the majority are served from field channels or sub-field channels. Design discharge in every channel was therefore different, making it difficult to regulate flows throughout the system.

Because the majority of the area was unpopulated prior to construction, a standard settlement and land allocation procedure was adopted. The area was divided into colonization units, averaging about 200 ha; initially, each colonist was allocated 1.6 ha (4 acres) of irrigated land and 1.2 ha (3 acres) of highland. Later, the allocations were reduced to 1.2 ha of irrigated and 0.8 ha (2 acres) of non-irrigated land. Each irrigated holding had a single pipe outlet. It was, and still is, illegal to sell land or sub-divide it, although this is common practice.

Irrigation Conditions Prior to Rehabilitation

By the mid-1970s the system was badly in need of rehabilitation. The main channels had in many places eroded their banks so that actual widths were up to twice the original design width. The few cross-regulators in main and branch channels were all broken or lacking proper gates. This made it impossible to maintain adequate head throughout the system, and discharges into some D channels were far below design requirements. Structures had badly deteriorated or had been destroyed, so that many D channels and virtually every field channel was lacking the proper gate. It is probably fair to say that the Irrigation Department had completely lost control over water below the D channel outlet, or the 120 ha to 200 ha level. In many instances D channel gates were missing, so that effective control over water was only at branch channel, or 4,000 ha level.

At the same time, overall water supplies were much lower than originally anticipated. The reservoir had only filled twice, in 1957 and 1964, and dry season supplies were always insufficient to irrigate the entire command area given the deteriorated conveyance system. In a typical wet season it proved impossible to deliver water to the tail end parts of the Left and Right Banks, with the result that those areas had reverted essentially to rainfed agriculture, trying to grow a single rice crop during the wet season. In the central parts of both the Right and Left Banks there was adequate irrigation for one crop during the wet season. It was only in the upper portions of the Left Bank that farmers could be assured of two rice crops per year. Because head end areas have generally lighter textured soils, water use rates were higher than anticipated in the project design.

Despite the overall water problems, many areas had experienced encroachments. Wherever water could be used for irrigation of reservations and unalienated land, farmers diverted water to these lands. Head-enders were therefore able to extend their irrigated land at the expense of tail enders. Overuse of water by these head enders permitted reuse of drainage water in the valley bottoms and on lands not scheduled for irrigation.

A succession of dry years in the mid-1970s resulted in poor system performance. In 1977 it was only possible to cultivate some 4,860 ha on the Left Bank during the dry season, or about 20% of the irrigable area. Even in reasonably good years it was difficult to irrigate more than 50% of the Left Bank.

System operations reflected difficulties in conveying water. Although there had been enough water initially to operate the system on continuous flow, by 1973 it became necessary to introduce rotations at high levels in the system. For some years thereafter it became standard practice to rotate between branch channels, in an effort both to conserve water in the reservoir and maintain adequate head when water was delivered. The nominal issue schedule was for five days of water followed by five days without water. In practice, although the rotation was implemented, the duration of both issue and non-issue periods was erratic. It was impossible to assess with any certainty when, and for how long, water would be delivered. This tended to force farmers to grab water whenever it came, use more than required by building up water levels in paddies, and then allow the excess to flow to drains if issues lasted longer than six or seven days. No response to rainfall was possible under such operating conditions.

From the perspective of the Irrigation Department staff, Gal Oya was considered to be one of the least popular field postings in the country. In addition to the difficulties in operating a system with deficient water, relationships between agency staff and farmers were at a low ebb. Senior officers were reluctant to go to the field due to abuse or criticism from farmers; communication to farmers of changes in water supply were essentially non-existent; the seasonal planning meetings were contentious and frequently failed to resolve disagreements betweens agency staff and farmers; and politicians were involved in all manner of petty disputes, and

became involved in opening and closing gates without the knowledge of the Department. Most engineers viewed the farmers as being largely uncooperative, frequently interfering with system operation, stealing water, and making complaints. Irrigation Department offices were always crowded with farmers trying to lobby for more water or repair of structures. Most senior officers avoided regular attendance at the office, and were forced to take routine work to their quarters so that necessary paperwork could be completed. Overall it was considered a hardship posting.

The Rehabilitation Project

The Gal Oya Rehabilitation Project was designed during 1978. It was initially conceived as a largely physical problem: if the conveyance infrastructure were restored and control regained over the D channel and FC gates, then it should be possible to significantly improve performance. The primary components of the Project were:

- restoration of main, branch and D channels to their original design condition, with installation of additional cross-regulators as needed;

- redesign of D channel control structures to deliver appropriate discharges;

- redesign of all FC command areas to standardize the command area to approximately 12.1 ha (30 acres), and redesign of structures to standardize FC flows to 28 liters per second (1 cusec);

- elimination of all farm outlets from D channels, and construction, where needed, of new FCs parallel to D channels to serve farms originally irrigated from the distributary;

- introduction of continuous water deliveries to the head of every FC and implementation of rotation between pairs of farmers along each FC;

- creation of farmer organizations to assist in reconstruction of the FCs, take responsibility for distribution of water and FC maintenance, and facilitate extension services.

Implementation of the Project was undertaken by the Irrigation Department, with assistance from a US consulting firm. All construction was to be done under force account, with USAID agreeing to reimburse actual expenses as each part of the work was completed and checked by the consultants.

The Agrarian Research and Training Institute (ARTI) was to provide socio-economic evaluation of the project, in terms of baseline studies, periodic monitoring and post-project evaluation. Their mandate was later extended to include the training of organizers whose task was to foster the

creation of farmer organizations. They were assisted in these tasks by consultants from Cornell University under an additional component of the project.

Changes During Project Implementation

The project commenced in 1979, with the first baseline study undertaken by ARTI. Consultants arrived in 1980, and assisted the Irrigation Department in initial surveys and design. Actual reconstruction started in 1981. A number of factors soon led to significant changes in project activities.

The lack of original project design drawings, which were to have formed the basis of the redesign, forced the engineers to start a resurvey of the entire project. The lack of proper maps and little available information regarding actually irrigated areas and soil types made it difficult to estimate required discharge. It became clear that collection of all data using standard procedures would greatly extend the life of the project, and significantly increase costs. It was also recognized that it would be impossible to restore channels to their originally designed cross-sections because of the volume of earthwork required, the lack of suitable fill materials and financial limitations.

It also became apparent that there had been a serious underestimate of the length of D channels and FCs that required rehabilitation. The original design had included estimates that referred only to those portions of the system that the Irrigation Department had maintenance responsibility for before the project. The length of FCs had been estimated at about 80 km, but in reality was nearly 1,000 km. The time needed to survey all channels became far too great for project timetables and budgets.

At this stage ARTI and its own consultants from Cornell University proposed that the project focus be shifted from a largely civil engineering one to a more pragmatic approach that would utilize as far as possible the capabilities of farmers. Because most farmers had over 20 years of experience in irrigation from the system, and could identify local irrigation problems more quickly than engineering surveys, it was agreed to introduce a set of design meetings where the farmers could make inputs, approve work to be done and arrange for operation and maintenance (O&M) of FCs following reconstruction. While mobilization of labor for construction was always envisaged as part of the project, less concern had been paid to the post-project requirements for O&M.

To facilitate the input from farmers, ARTI embarked on a program to train organizers who would then be assigned to a group of FCs and establish farmer organizations. The first task of these organizations was to assist in the design process, then to arrange for labor contributions during construction, and eventually to extend their activities to O&M.

After about two years of these activities it was recognized that there was a need for a more hierarchical organization of farmers, so that FC groups had a mechanism to discuss common problems at D channel level, and for D

channel groups to provide representatives to Area Committees for seasonal planning activities.

At all levels in the system a policy of "Pragmatic Rehabilitation" was adopted. Rather than reconstruct the entire channel, repairs and redesign were only undertaken where required to maintain proper system operation. Channel banks were strengthened and heightened where weak, banks were protected from further erosion, sediment removed where excessive, broken structures replaced where needed but functional structures left alone.

This practice had many advantages. It required only reconnaissance survey initially to identify critical deficiencies, followed where necessary by more detailed survey, cost estimates and redesign. The rate of work speeded up dramatically, thereby permitting the project to recover from a slow and unproductive start. The cost of reconstruction also fell greatly because unnecessary work was eliminated.

Towards the end of the project it became possible to introduce operational innovations. There had been sufficient improvement to the main and branch channels to enable continuous flow to be reestablished, although this was also greatly facilitated by complete filling of the reservoir in 1984 for the first time in 20 years. The greater discharge possible and the maintenance of more constant head in the channel system enabled the Department to issue water throughout the entire Left Bank system for the first time in at least 20 years. The smooth introduction of continuous flow eliminated the previously constant stream of complaints about water problems.

A computer model was designed that assisted agency staff in the smooth implementation of continuous flow. The model was designed to undertake two primary tasks: the maintenance of records that indicate the volume of water delivered to every D channel in the system, and the prediction of future demand based on assumptions of soil water requirements, rainfall and other factors.

The Irrigation Department has shown itself to be able to adapt readily to the new technology, and it has clearly encouraged engineers to feel that there can be significant improvements in facilities made available to them. Prior to rehabilitation all record keeping was done in old ledgers and was seen as a rather fruitless task.

OFFICIAL EVALUATIONS OF THE PROJECT

The Official Evaluation

The official USAID evaluation of the project was carried out in November-December, 1985, by a six person multi-disciplinary team of specialists (ISTI, 1985).

Overall, the evaluators declared the project a "definite success." They noted that the physical rehabilitation, though only 86% complete, had been done in a cost-effective way, and the system had been made operational. The important structures had been completed, measuring devices had been installed, and the quality of the construction was "satisfactory." An appropriate rehabilitation strategy, termed "Pragmatic Rehabilitation," had been evolved that would be useful on future projects. They noted that a number of management innovations had been introduced, most notably the use of the computer model for estimating water delivery requirements and its accompanying delivery monitoring system.

The area irrigated had been increased by about 4,450 ha due to the rehabilitation, and there had been improvements in agronomic practices and in yields and cropping intensity, although these may be in part a result of factors other than the project, such as increased rainfall, in recent years. The official evaluation claims an Internal Rate of Return (IRR) of a whopping 47.4%.

The evaluators rated as "one of the most important outcomes" the change in attitudes, communications, and behavior among farmers and government personnel. The violence over water which had previously been characteristic of relations among farmers is "gone" (other forms continue). Complaints to the MP and the Government Agent had become "minimal." There was increased dialogue among farmers and between farmers and officials.

The factors identified as contributing to this dramatic improvement were:

the improved reliability of water deliveries due to the rehabilitation;

the Institutional Organizer (IO) program and the Farmer Organizations;

the leadership of the Project Director; and

the training program.

The evaluators noted that IOs had worked to organize farmer organizations in a 10,250 ha area, where about 350 field channel level organizations had been formed. Above these, and building on them, 27 Channel Organizations, 6 Area Councils, and a Project Committee had been formed and

were functioning. Farmer representatives were given seats on the District Agricultural Coordination Committee, which meets monthly to coordinate activities of all Ministries and Departments involved in agricultural matters. There were about 420 Farmer Representatives chosen by the farmers themselves, and this group as a whole appeared to the evaluators to be responsive to the farmers' needs and less politicized than most traditional farmer leaders. They estimated that 60 to 80% of the farmers in the organized area participate directly or indirectly in the farmer organizations.

Although most FCs had not been fully rehabilitated, the evaluators noted that there were numerous examples of farmer organizations contributing their own time and funds to system O&M. Overall, the evaluators concluded that the IO program had been critical to the establishment of the farmer organizations, and the intensive effort had been justified by the results.

The ARTI Assessment

ARTI had been responsible for carrying out various socio-economic studies as part of the project, and for implementing the IO program for organizing farmers. ARTI researchers carried out their own assessment of the project, based on detailed socio-economic surveys and other materials (ARTI and Cornell University, 1986; see also J Perera, 1986). These data were not available in complete form to the official evaluation team.

Perhaps not surprisingly, ARTI also concluded the project had been a success. The pragmatic rehabilitation strategy that had been developed proved appropriate, and had resulted in restoration of the conveyance and control capacity of the system. It noted that although yield data are suspect, there were definite improvements, and these were greater at the tail of the system than the head--evidence that disparities in water deliveries had been reduced. ARTI's economist was less enthusiastic than the official evaluation team's--he rated the IRR at 17%, close to what the Project planners had hoped for. Overall, surveys of farmers showed a perception that incomes and quality of life had improved (not necessarily all due to the project), and this perception was more pronounced at the tail than the head of the system.

ARTI carried out a survey of 250 farmers, 29 government officers, and 165 farmer representatives. Based primarily on these data, and earlier surveys that served as a baseline on some parameters, ARTI evaluated the farmer organization program. It claims 380 farmer organizations formed at FC level, 29 D channel organizations (out of 42 projected), and 6 Area (including sub-area) Councils.

Farmers are reported to have expressed a high degree of satisfaction with the organizations, and particularly with their Farmer Representatives. They rated the D channel organizations as effective forums for dealing with complaints and grievances and planning for the seasonal cultivation meetings. ARTI reports a dramatic improvement in farmers' attitudes toward the irrigation system and the Irrigation Department; a dramatic decline in damages to the system as reported by farmers; and a dramatic decline in

reported conflict over water. Farmers also perceived an improvement in FC cleaning. Sixty-nine percent of the respondents attributed these improvements to the changed attitudes of farmers brought about by the farmer organizations.

ARTI claims that the IO program had led to the emergence of service-oriented leaders who are not particularly wealthy, and have no prior political base; 90% own less than 1.6 ha. The farmer organizations had been kept separate from politics--a separation that had been a conscious goal of the program.

Farmers perceived an improvement in the number of officers having good attitudes towards farmers, although there was an undercurrent of frustration that farmers were not listened to as much as they should be, for example during design meetings. On the officers' side, all the Irrigation Engineers and Technical Assistants felt that the design meetings with farmers had been useful, and they had received useful information. A high percentage of officers said that farmer organizations had led to better relationships with farmers (73%), and better communications (63%). ARTI attributes the re-oriented attitudes of both the Irrigation Department and farmers to a large extent to the design meetings.

Impact of the Project on Government Policy

Even before the end of the Gal Oya Project, discussions were initiated within the Ministry of Lands and Land Development, and the Irrigation Department itself, on how best to promote more participatory management of irrigation systems. In 1984, the Irrigation Management Division (IMD) was created, parallel to the Irrigation Department, with two objectives:

> to improve the level of coordination among key agencies on selected irrigation schemes in order to raise production; and
>
> to promote a more formal structure through which farmers could participate actively in system management decisions.

The IMD's "Hand Book on Farmer Organizations in Major Irrigation Schemes" (IMD, 1985) specifically states that the framework for farmer organizations is based on lessons from Gal Oya and one other project. The IMD is active in 35 medium and large schemes, promoting a three-tier structure of farmer organizations at the FC level, the D channel level, and the Project Committee level. IMD is in the process of recruiting some former IOs to act as "Institutional Development Officers" in other irrigation systems.

In regard to rehabilitation projects, the next major project funded by USAID envisions continuing the use of IOs to organize farmers and to involve them in the planning, design, and construction processes, as well as in system O&M over the long run. Thus, it is fair to conclude that despite the lack of a clear legal mechanism to support the development of participatory

management of irrigation schemes, the GSL has committed itself to continued experimenting to develop effective means for farmer participation (see Abeywickrema, 1986).

The Department has also drawn up plans to extend the computer based water monitoring program to other systems. It is expected that this will lead to more effective monitoring of water deliveries and better estimation, on a system by system basis, of actual water delivery requirements.

EVALUATION OF THE PROJECT: PERSPECTIVES OF AGENCY PERSONNEL

Introduction

We have noted above that according to ARTI's survey, the officers' perceptions of the impact of the farmer organizations were quite positive. However, this survey was done toward the end of the project period. It therefore does not address the question of the long term sustainability of the organizational and attitudinal changes, which would in turn be the key to sustaining the benefits from improved rehabilitation, and building on these to bring about continued improvement.

More than a year has passed since the Project ended, sufficient time to get some idea of the trends since that time, though not sufficient to come to a conclusive judgement regarding the long term project impact. It would be preferable to carry out a survey of a cross-section of people in the project area to obtain a picture of the impact of peoples' participation to date. However, both the security situation in the project area, and the lack of time and resources, preclude carrying out such a survey at this time.

Instead, we have done separate in-depth interviews with two key Irrigation Department officials involved in the Project on their perceptions of the costs and benefits, impact, and likely future of peoples' participation in the Gal Oya Project.[2] This section is based on those interviews, supplemented with the authors' own experience and knowledge of the Project. It synthesizes, integrates, and interprets the data obtained through those interviews, but it should be clear to the reader that what is presented here is the authors' own interpretation of the interview data. The

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[2]The two officials are Eng. S Senthinathan, Deputy Director Amparai Range, and Project Director, Gal Oya Rehabilitation and Water Management Project, 1981 to the present; and Eng. Godaliyadde, former Irrigation Engineer, Amparai, 1984 to 1986. The authors are extremely grateful to these two officials for giving up considerable time on a weekend to sit through lengthy interviews, and patiently providing very detailed and frank information.

authors, and not the two officials interviewed, are responsible for any errors or misinterpretations that might be contained here.

Interestingly enough, both officials interviewed were associated with another, non-participatory, rehabilitation project (TIMP) before coming to Gal Oya. One of them has recently been transferred from Gal Oya to work in the follow-on to TIMP, called MIRP.[3]

The remainder of this section very briefly discusses the present status of the Gal Oya Project, then discusses the role, contributions, and limitations of peoples' participation in the rehabilitation process itself; it then discusses the benefits to farmers, and impact on the Irrigation Department and its officers of the farmers organizations in O&M since rehabilitation, and finally discusses the longer term implications and prognosis.

Present Status of the System: Rehabilitation and O&M

As discussed above, the Project evaluations had noted the rehabilitation works were about 86% completed by the end of the Project. Most of the remaining work was at the FC and, to a lesser extent, at the D channel level. During the period from January 1986 to the present, the Irrigation Department has continued to carry out rehabilitation work using its maintenance budget, augmented by some special grants and O&M fee collections from farmers. This has consisted not only of completing work not done, but addressing problems that have come to light since the completion of the rehabilitation.

After the rehabilitation, two major operational innovations have been introduced. First, as noted, the system is now operated as a continuous flow system at the main canal level, with rotations within D channels in some cases, and within FCs, as needed. The second is the computer model, discussed above.

The introduction of the computer provided considerable professional job satisfaction. In contrast to many projects where there was an element of overseas training that proved largely irrelevant to the tasks faced on return to the country, the overseas training could be effectively used on a system that had been custom made for Gal Oya. While evaluation of water consumption in the past had been based on gross tank releases, and undertaken in a framework of merely trying to reduce system-wide water consumption, the introduction of the computer system gave a chance to more closely match deliveries to requirements at much lower levels in the system. Being associated with this innovation was perceived by the engineers as being highly desirable professionally as well as relevant to the needs of system management.

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[3]TIMP was the Tank Improvement and Modernization Project, implemented with World Bank funding on five tanks in 1977-83; MIRP is the Major Irrigation Rehabilitation Project, implemented with World Bank funds on seven tanks, 1985-90.

It is difficult to assess the impact of the Project on system performance because while the baseline period was a time of lower than average rainfall, and consequent severe water shortages, the last few years, until the 1986/87 maha (wet season), were years of above average rainfall, and plenty of water in the reservoir. Particularly during yala (dry season), it was unusual to have sufficient water to cultivate the whole area on the Left Bank. However, 100% of the Left Bank has been cultivated during the last three yala seasons. It is reported that tank level water issues were 0.7 ha m/ha (2.3 acre feet/acre) for maha 1985/86 on the rehabilitated Left Bank, and 1.55 ha m/ha (5.1 acre feet/acre) during yala 86, which is regarded as excellent performance for this system. Despite lower than average rainfall in the catchment area for maha 1986/87 (some parts of the country have suffered drought and crop failure this maha), there is sufficient water in the reservoir for a full yala in 1987.

Although they agree that higher rainfall and increased reservoir storage have had an important impact, both officials also attributed the good yields and area irrigated to the effects of the rehabilitation and improved management: even with the same rainfall and reservoir levels, they assert they could not have delivered water to the whole system, and done it reliably and efficiently, before the Project.

Farmers' Participation during the Rehabilitation

The strategies and processes by which farmers' organizations were built up and expanded during the rehabilitation project period, and the role they played in the rehabilitation, has been described in detail in several other places (see Uphoff, 1985; J. Perera, 1986). This will not be repeated here. Rather, this section looks retrospectively at the contributions and limitations of farmers' participation in the rehabilitation process itself.

The Irrigation Department had not initially envisioned a participatory approach towards the rehabilitation of the Gal Oya system, despite the donor's insistence on organizing farmers' organizations. It is clear that even the donor initially thought of farmers' organizations as a source of free labor. However, as ARTI's Institutional Organizers developed the FC groups, pressure increased to involve farmers in the design process.

After several different experiments, a process was evolved whereby the design engineer walked the FC with the farmers, discussing the proposed plans for the channel, and seeking farmers' input as to what problems they faced with the present channel. The engineer was to incorporate these suggestions into the design wherever possible, or explain why they could not be incorporated when this was the case. It became, thus, a negotiation process, in which both the Department and the farmers also made commitments about what work each party would do. At a later stage in the Project, as D channel organizations were formed by federating FC groups, these were also consulted on at least some D channel designs, and there was also some consultation on placement of bridges and other facilities even on the main canals.

Initially it is fair to state that engineers felt rather uncomfortable about this process. Going out to the field to discuss issues with farmers was an experience alien to their previous experience, and because of previous bad relationships with farmers it was not always perceived that the meeting would be useful. However, it rapidly became clear that, apart from a few isolated instances, there was complete amicability during these design meetings, and engineers soon became quite experienced in eliciting problems from farmers.

At the same time engineers realized that their own commitment had to be maintained. On a couple of occasions engineers failed to arrive for meetings previously scheduled, and this raised some doubts in farmers' minds as to the depth of commitment. The improved communication procedures, however, overcame these initial difficulties. Several engineers expressed their surprise at the overall knowledge of farmers, and admitted that they had learned a considerable amount about the type of problems farmers were actually experiencing. This was particularly true for younger engineers who had limited exposure to operation of irrigation systems.

By the end of the Project the farmer meetings for purposes of design had become quite routine and there were no longer any questions as to their general utility.

The engineers agree strongly that farmers were able to make very useful contributions to solving FC problems. Many problems could be pinpointed precisely that are missed in 100 m interval surveys, or are not observed when the system is not actually in operation. Also, farmers could inform the design engineers about social factors, such as land boundaries, that affect the placement of outlets. In those cases where the engineers felt changes or alternative solutions to problems would be useful, the design meetings gave them an opportunity to explain these to farmers. These were usually understood and accepted by the farmers, and therefore greatly reduced the incidence of misunderstandings.

Both engineers contrasted the benefits derived from the participatory approach at Gal Oya with the limited participation of farmers in TIMP and MIRP. As one said, "In TIMP we tried to replace farmer management by physical infrastructure." That is, under TIMP, there was no consultation with farmers on the FC designs. Further, rather than address existing problems, the Department attempted to impose rather drastic redesigns, particularly by dividing large FCs into smaller parallel ones, replacing direct outlets from D channels with parallel field channels, and replacing all farm pipe outlets with new (larger) ones. Further, scheduling of construction work in TIMP was arbitrary, and farmers were involved in construction only on payment.

On the other hand, in Gal Oya, when farmers were offered a choice, in all but two cases they rejected parallel field channels to replace long ones and direct D channel outlets. Existing farm outlets were replaced only where necessary, and the same size was kept. Scheduling of work on FCs was done in consultation with farmers, and farmers have contributed free labor for FC

construction (though not as much as originally hoped). On long channels, often two or more FC groups were organized but these in turn must cooperate to share water; when they do not, water distribution problems arise. Farmers with adjacent direct outlets from D channels have been organized or incorporated into adjacent FC groups. The engineers professed satisfaction with the decision not to attempt to impose drastic redesigns: in most cases the farmer organizations are making up for what might be regarded as design deficiencies, and the two parallel channels that were built are not used as such. Thus, there has been a significant saving of funds and time as a result of the Gal Oya approach, with no apparent sacrifice in performance.

It is noteworthy that as a result of the contrasting experiences of the Gal Oya Project and TIMP, MIRP includes a more participatory approach than TIMP, though not to the degree of Gal Oya; and farmers are given some choices, at least, in regard to alternative designs, such as parallel field channels to replace very long ones. Part of the mandate of the official recently transferred from Gal Oya to MIRP is to try to promote greater farmer participation on newly rehabilitated systems.

At the level of distributary and main channels, the engineers agreed that farmers generally had very little to offer in the actual channel design; indeed they had little interest in this. However, they did have a strong interest in the quality of bund roads and in the location of bridges and other amenities. Two examples regarding bridge location were cited. In one case, a bridge was moved to a different place because of political pressures, despite the wishes of the farmers' organization and the Irrigation Department. Today people are not using the bridge, and cross the channel where the organization wanted it. In another case, there was a dispute between an influential person and the farmers' organization over the location of a bridge, but a compromise was reached and this one is used.

To conclude this section, both the officials we interviewed, and those previously interviewed by ARTI, were unanimous on the usefulness of consultations with farmers' groups on the design of the FCs. These consultations led to improved and more appropriate designs, and thus presumably better performance. The associated "pragmatic approach," in which only those physical changes required to make the system work better, and accepted by the farmers, were made, has led to a large savings in cost, with no apparent sacrifice of technical performance. Although farmers' labor contributions were less than hoped for, they have still been substantial and very valuable, leading to a large (but difficult to quantify) net savings, and higher quality work than that done through contractors. Engineers sometimes assert that consulting farmers causes delays in completion of the work. However, given that FCs were not totally re-designed and reconstructed, in contrast with TIMP for example, the consultative process and pragmatic rehabilitation has not been costly in terms of time required for consultations.

The policy of consulting with farmers on the design of FCs is probably here to stay as a Department policy, though this is not official as yet. The

extent to which farmers should be consulted on D channel designs is being debated within the Department. Farmers had little to contribute to the hydraulic design of D channels, but did have much to contribute in deciding on the location of bridges, washing stations, etc.

There is one other, intangible, rationale for consultations with farmers at all levels of the system: it seems likely that to the extent that farmers are consulted, and involved in the rehabilitation process, and especially to the extent that they actually invest their own time and effort, if not funds, they are likely to have a greater civic sense, i.e. a feeling that the system is theirs, and not just the government's, and therefore are more likely to take greater interest in its proper maintenance and use. A necessary condition for this to be translated into concrete action, is for farmers to be organized into effective, responsible groups able to mobilize members.

Post-Rehabilitation: Operations and Maintenance

During the early years of the Project, Irrigation Department personnel were at best skeptics of the usefulness of farmer organizations and peoples' participation. They felt that the Irrigation Department should simply be allowed to do its job, and there should be stronger laws to deter farmers' "malpractices." Today, there has been a substantial shift in the perceptions and attitudes of those Department officials who have been involved in the Project, and to a considerable degree of the Department itself. Both of the officials interviewed, as well as those interviewed by ARTI near the end of the Project period expressed very positive views of the impact of the farmer organizations.

The perceived benefits can be summed up with two words, discipline, and communications. There has been a substantial improvement in discipline both among farmers and at the agency level, and in communication between the Department and farmers, and among farmers. Discipline refers to the degree to which people adhere to a set of rules and orderly procedures for system O&M. Communication refers to the passing of information in both directions between farmers and the agency and among farmers such that there is greater mutual understanding, agreement, and cooperation. From the point of view of the engineers, this improvement in discipline and communication has led to improvements in system performance and in their own level of job satisfaction.

As evidence for their perceptions, the officials point to contrasts between the situation in those parts of the system in which farmers have not been organized (for various reasons not relevant here), and those where farmers are organized. First of all, the rehabilitation has been more difficult to complete in the unorganized areas, largely though not entirely because of the lack of farmer organizations and legitimate leaders with which the Department can deal.

Second, before the Project, there was a very high level of farmer complaints against the Irrigation Department. These complaints came from

farmers through higher officials, through political authorities who put pressure on the Department to satisfy particular demands, through very contentious public meetings such as the pre-season cultivation meetings (see Murray-Rust and Moore, 1984), and in written petitions. Department officials used to complain bitterly about "political interference," and about the "lack of discipline" among farmers. Farmers used to complain equally bitterly about unreliable and inequitable water supplies, and lack of responsiveness by the Irrigation Department. Only those farmers and areas able to make their influence felt got a response to their complaints.

Today, officials assert that while they continue to receive complaints from the unorganized areas, there are virtually no complaints coming to them from the organized (and rehabilitated) areas, and interference from politicians and higher district level officials has completely stopped. Local politicians have also noted the reduction of farmers' complaints.

Department officials attribute this change to the mechanisms that have been set up for channeling discussion of problems through legitimate group spokesmen at regular consultative meetings at lower levels of the system, and regular contacts between farmer representatives and Department officials at all levels. These contacts have led to greater mutual understanding between farmers and the Department officials. Farmers are less critical of the Department, and the criticism that comes is more focused on legitimate problems. On their side, the officials are better able to respond to legitimate problems, and these are usually solved at the appropriate level. Only serious problems come to the top level for solution.

A third change is that there has been a marked decrease in farmers damaging and unilaterally manipulating gates, both of which were very common before the Project. In 1986, only two cases of gate damage were reported. For both, farmers agreed the Department could use their O&M fees for repair, and promised to take measures to see that such damage is not repeated. Officials attribute this decrease in farmer interference and destructiveness to several factors. First, as a result of both the farmer organizations and better system performance, there is far less conflict among farmers which had been a key factor in cases of interference. Second, with improved communications, the Department is more responsive to farmers' problems, so that farmers do not feel compelled to take unilateral action. Not only is delivery of water better than before, but adjustments are made as needed in response to farmers' requests. A third factor is that farmers clearly feel a greater sense of ownership and responsibility for "their" system, and are willing to take measures to protect the system. This reduction of farmer interference has resulted in more efficiency in system operations.

These changes have in turn had a marked impact on the Irrigation Department and its officials. The Department in one sense has less latitude than it had previously, and cannot dictate its wishes in the way it tried to do before (with mixed results). Officials must consult with farmers, and come to a mutual understanding. On the other hand, there has apparently been

a marked change in the public image of the Department. Farmers no longer are so critical of the Department, and indeed have focused more criticism on other Departments recently. They have even requested that the Irrigation Department take on added responsibilities, such as enforcing rules against cattle roaming in paddy fields.

With this improved public image, there has been an improvement in the job satisfaction of the Irrigation Department officials, especially but not only at the higher levels. One official stated he used to hate farmers, and Irrigation Department officials were generally defensive and felt no one understood or appreciated them. Now, many of them enjoy their work, and their contacts with their clients, the farmers, and get great satisfaction from being of service, and being appreciated. Engineers' own attitudes toward farmers have thus also changed. In addition, both officials emphasized that with the reduction of petty complaints, and political intervention, they have much more time for doing more productive work, both administrative and engineering. This improvement in job satisfaction, and the resulting improvement in productivity and job performance, seems to be particularly important to the officials we interviewed.

When both of the engineers interviewed left the Project area for assignment to other areas, the farmer organizations paid for and hosted a farewell party for each of them. These were unprecedented events. Both engineers expressed that they found it almost impossible to believe that having come into a system with considerable misgivings, well aware of the conflicts that existed between farmers and the Department, they would be reluctant to leave because of the close and highly amicable relationships that had developed. They also expressed some difficulty in convincing colleagues that the role they had played in Gal Oya was a legitimate one for a professional Irrigation Engineer. But neither expressed regrets at having been associated with the project, and, quite independently, stated that it had been the happiest posting they had both had.

Long Term Perspective on Peoples' Participation

The officials we interviewed are convinced that peoples' participation through farmers' organization in system management is, and should be, here to stay. This view is confirmed by many public and private statements of high level officials, including the Director of Irrigation (for example K.D.P. Perera, 1986). Even though the Government of Sri Lanka has not committed itself to any particular form of farmer organizations, and indeed has not to date introduced a legal framework for such organizations (Abeywickrema, 1986), it has continued to encourage and support experiments, and is presently introducing forms of farmer organization which are partly based on the Gal Oya experience. Within the Irrigation Department, there seems to be broad support for the concept, especially among field personnel.

However, both officials touched on two issues that will affect the future of farmers' organizations for irrigation management: the sustainability of the organizations, and internal Irrigation Department changes to enhance the effectiveness of farmers' participation.

For the long term sustainability of effective farmers' organizations, continued positive support from the highest levels is absolutely necessary--support that to date has been critical to the success of the program. In addition, a continuous government effort to assist and motivate farmers' organizations is necessary to insure their continued effectiveness. They agree that assisting and nurturing farmers' organizations is a legitimate function of the government, and one that the government can do well.

On this issue, however, there seems to be some reservations regarding the present approach being implemented in Gal Oya in the post-Project period and on many other Irrigation Department schemes. Under this approach, a separate but parallel division of the Ministry, the Irrigation Management Division (IMD), is primarily responsible for promoting and supporting the various farmers' organizations. Questions about the need for a separate IMD are often raised by some middle level Irrigation Department officials, but that is not the question raised here; it seemed to us that there was acceptance that the Irrigation Department itself may not be the best equipped for promoting farmers' organizations, though it is the Department that must work with them.

The question raised was regarding the methodology: there seems to be considerable support for the "Institutional Organizer" approach used initially with such success in the Gal Oya Project. IOs are specially trained for this work, and work best if they are given a fair degree of independence, rather than being subject to close bureaucratic control. Organizations formed recently using regular government employees working with traditional leaders has apparently tended to produce less effective leaders, and weaker groups, than has been the case with those promoted by IOs. This support for the use of "catalysts" to promote farmer organizations was also a key recommendation of a workshop held at IIMI in 1986, in which the participants were primarily officials involved in participatory management of irrigation schemes (IIMI, 1986).

There also seems to be recognition that further internal changes in the Irrigation Department are needed as it shifts to a management approach that emphasizes collaboration with farmers' organizations. A key example raised by both officials has to do with contracting procedures: the Department recognizes that for many kinds of maintenance and rehabilitation work, the farmer organizations may be more effective than private contractors. The Gal Oya officials, and Department officials on other systems, have therefore strived to give contracts to farmer groups that meet the rather minimal requirements of the Department (they must get registered, and have a bank account with a balance of Rs. 2,000, about US$70). This has been done in consultation with farmers, and at their request. Only D channel groups have gotten such contracts so far.

However, the rules state that only contracts up to Rs. 5,000 may be given, and only three contracts per group per year. Payments often have to be made in several installments, given the low capital available to the groups. The paperwork involved in giving such relatively small contracts is rather onerous, and could tend to discourage them.

Nevertheless, over the last year or so, over 30 contracts have been given to D channel groups for maintenance work. The work has been done successfully. But simplified procedures are needed if contracting with such farmer groups is going to become an effective policy. It would also be useful if the Department adopted a policy that encouraged such contracting where it is appropriate.

There is also some evidence that the growth of farmer organizations' capabilities exceeded the rate of change within the Department itself. In 1984 the Government introduced, for the first time, an irrigation service fee of Rs. 100 per 0.4 ha (acre). The intention was to use these funds for O&M expenses, although initially it was not clear whether these would accrue to the Department as a whole, or be reserved for the systems in which the funds were collected.

Gal Oya Left Bank had the highest collection rate of any system in Sri Lanka, estimated to be 70% of what was actually due, in the first year. In contrast, the national average was well below 50%. There is no doubt that commitment to their organization was instrumental in motivating farmers to pay. However, because funds were not spent by the Government, largely remaining in the bank because of bureaucratic delays, collections the next year fell dramatically throughout the country, including Gal Oya, because farmers saw that their contributions were not being used.

This leads to the other set of internal changes that would increase the effectiveness of the Irrigation Department in its new management mode. The Irrigation Department is presently in a transitional stage, having changed considerably its philosophy, policy, and strategies over the last decade. It may be time for the Department to consider making its present informal policies regarding working with farmers' organizations explicit and clear. This includes articulating a philosophy or rationale for its policies, strong incentives to encourage its officials to implement the policy, and training programs to increase the officials' understanding and effectiveness in working with farmers for improving irrigation systems, and for managing systems more responsively and efficiently. This would appear to be the next challenge for the Sri Lanka Irrigation Department.

CONCLUSION: IMPLICATIONS FOR INDIA

The extent to which the lessons of Gal Oya can be transferred out of Sri Lanka depends on a wide range of factors. These include differences in organizational arrangements among farmers, the institutional setting of the irrigation agency, the nature of the irrigation problems being faced, and the willingness of individuals to commit themselves to the goal of involving farmers in various aspects of irrigation planning, operation and maintenance. Any effort to introduce such innovations depends on making the necessary

adjustments to suit local conditions, rather than adopting a prescriptive approach that specifies the program in detail at the outset.

It has to be left to individual participants to decide whether the lessons of Gal Oya are appropriate to their particular situation, and make the required adjustments to ensure the approach will be successful within their own irrigation management environment.

(To be completed by participants in group discussion.)

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