

Changing Pillows for a Headache? Financing Participatory Irrigation Management in Sri Lanka

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INTRODUCTION

IN THE FIRST week of May 1994 the Sri Lankan Parliament discussed and passed Amendments to the Irrigation Bill in which farmers' organizations are given the opportunity to operate and maintain irrigation infrastructure below the distributary canal level in exchange for exemption from paying water taxes. The following is an excerpt from the discussion in parliament:

The Minister of Forestry, Irrigation and Mahaweli Development:

'The Amendments to the Irrigation Bill seek to transfer to farmer organisations more powers to see that farmers get a better service. The bill does not intend to levy taxes on the farmers, but farmer organisations will be responsible for the maintenance of irrigation works.'

An opposition MP:

'These amendments could cause burdens on the farmer organisations who will have to undertake the maintenance of the distributary systems which hitherto was done by the Department of Irrigation. If this is the case you must think about allocating a grant for each farmer organisation.'

Another opposition MP:

'You propose (...) farmer organisations to levy a tax for the supply of water (...). You are only using these organisations to collect the money for you and make them bear all the responsibilities for this.'

A Minister:

'The opposition gave a wrong interpretation to this bill. These amendments are geared to bring about more participation by the farmers in conducting their affairs.'

An opposition MP:

'These amendments will not benefit the farmers. It is like changing pillows for a headache. You have empowered farmer organisations to impose levies and supervise the distributary systems. This should be the responsibility of the government.'

The Minister again:

'The bill seeks to get the participation of the Farmers Committees in the management and the maintenance of the irrigation systems. This work is now being done by technical officers. I personally know how inefficient some of them are. (...) farmers themselves would decide whether any taxes are to be levied or not. There is no compulsion on the part of the government. As far as the government is concerned the tax is being abolished.'

(*'The Island,'* May 4 and 5, 1994)

This parliamentary debate not only reflects the political sensitivity of farmers' involvement in operation and maintenance (O&M) activities, but also illustrates how the debate on sharing financial responsibility for O&M by levying water taxes or fees is mystified by opportunistic political statements on farmers' capacities to financially contribute to irrigation management.

In Sri Lanka, the discussion on sharing O&M responsibilities started more than one decade ago when the government introduced various participatory management programs (Raby 1992). Merrey (1994) discusses the necessity of a new set of institutional arrangements that are conducive to achieving and sustaining mechanisms of accountability and high performance in systems that are jointly managed. Repetto (1986) has described the rent-seeking tendency of public irrigation agencies which unofficially attempt to recover costs for services in a context where there is no official accountability for services and payments among the full body of users. Small and Carruthers (1991) have argued that financial autonomy of an irrigation system from central government revenues is an essential pre-condition for accountability between farmers and system managers. Also in Sri Lanka some policy makers try to move ahead with establishing some of these financial and institutional reforms. However, in their attempts to do so, the capacity of agencies and farmer organizations to make jointly managed irrigation systems financially viable is often taken for granted.

This paper addresses the fundamental question "How should the operation and maintenance of a jointly managed irrigation system in Sri Lanka be financially managed by both the agency and farmer organizations involved?". The paper first describes the goals behind the participatory management policy and then evaluates its achievements in one large-scale scheme. It then identifies some of the strategies farmers and officials have developed to make participatory management financially viable, and discusses whether these strategies have proved to be powerful incentives to improving O&M performance at and below the distributary canal level. Finally the paper questions the future role of government agencies and farmer organizations in financing locally managed irrigation.

The paper draws on preliminary findings of a comparative study on participatory management in large scale irrigation systems in Sri Lanka.

THE SETTING: KAUDULLA IRRIGATION SCHEME

Policy and Legal Structure

The government of Sri Lanka established the Participatory Irrigation System Management Policy through a Cabinet paper in December 1988 (IIMI 1993). Although various agencies have been introducing participatory management programs since the mid 1980s, the May 1994 Amendments to the Irrigation Bill now legally provide that in return for taking over financial responsibilities for O&M of distributary and field channels, farmer organizations are to be exempted from payment of any form of service fee or water tax to the government. One of the programs that focusses on the implementation of the participatory management policy is the Integrated Management of Major Irrigation Schemes (INMAS), which was created 1984 to coordinate the services the various government agencies provide to farmers, as well as to promote farmer participation in O&M within 35 major schemes. The most important tools to achieve these are the Distributary Canal Organizations (DCOs) and the Joint Management Committees through which officials and farmers jointly plan and manage irrigation O&M. INMAS is managed by the Irrigation Management Division (IMD).

Kaudulla Irrigation Scheme

With its official registered command area of 5,088 hectares (ha), Kaudulla is one of the largest tank fed schemes that comes under the INMAS program. Although the tank has a storage capacity of about 122 million cubic meters (Mm³), which is a quite generous amount for its command area by Sri Lankan or by international standards (Abernethy 1985), occasionally water shortage occurs in the dry Yala season, primarily owing to the dramatic increase in encroachment¹ and illicit tapping of water to irrigate highlands. The approximate mean annual rainfall is 1,600 mm. Paddy is the main crop in both the wet Maha season and the Yala season. The tank, which occasionally also receives water from the Mahaweli Ganga System, feeds two main canals from which a number of Distributary Canals (DCs) and a small number of Field Channels (FCs) take water by means of fully adjustable disc gates. The scheme is divided into 23 hydrological units ('tracts') that vary greatly in size (80 to 260 ha). Each tract has one or more distributary canals, from which a number of field channels take water to the 10 to 25 field inlets per field channel. A major part of the main system infrastructure, as well as most of the distributary canals and field channels, are unlined.

Kaudulla is located in the dry North Central Province. It is part of a resettlement project that was rehabilitated and expanded in the late 1950s to allot land to resettlers from the wet zone in the south. In the part of the command area this case study reports on, allottees were given 1.2 ha of paddy land and 0.8 ha of highland for homesteads.

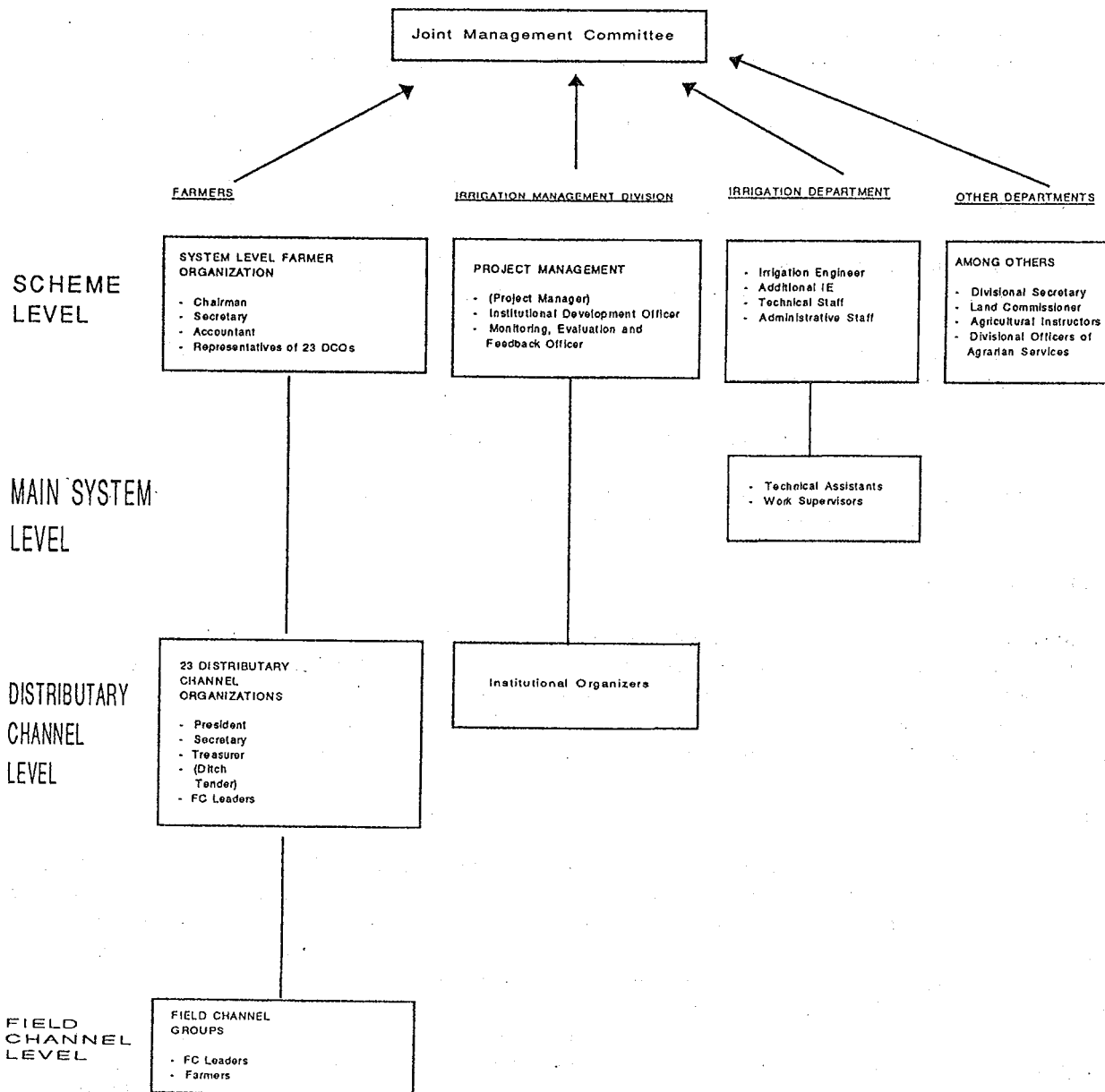
Institutional Structure

One of the main tasks of the INMAS project manager, who was appointed under the INMAS participatory management program, was to establish farmer organizations, the so called Distributary Canal Organizations (DCOs) in each of the 23 tracts. Twenty-six institutional organizers were employed to help to organize the DCOs. The initial idea of creating DCOs was to gradually turnover O&M responsibilities to them. Each DCO has a president, a secretary and a treasurer who are elected in the annual general meeting. The responsibility of these office bearers includes calling monthly DCO meetings, organizing *shramadana* (collective free labor) for cleaning, and maintaining contacts with banks and agencies, particularly with the Irrigation Management Division and the Irrigation Department. Elected FC leaders are responsible for organizing O&M at the field channel level, as well as for reporting problems of water users to the monthly DCO meetings and to the DCO office bearers.

A key element in the INMAS approach is the creation of Joint Management Committees at scheme level. In addition to the project manager (who coordinates the joint activities and presides the monthly meetings) and his staff, the presidents of all 23 DCOs, as well as representatives of the Irrigation Department, the Department of Agriculture, the Department of Agrarian Services and a number of other departments participate in the Committee. Occasionally, representatives of banks, cooperatives or marketing boards are invited to attend a meeting. Figure 1 gives an overview of the institutional setup of the Kaudulla Irrigation Scheme.

¹Some unofficial sources report that the actual irrigated area must be over 7,000 ha.

Figure 1. Institutional setup, Kaudulla Irrigation Scheme, 1994.



Notes:
 * Currently the IDO is the Project Manager in Charge
 ** Not all DCOs have appointed ditch tenders

PARTICIPATORY MANAGEMENT PERFORMANCE ACHIEVEMENTS

In this section the achievements of the participatory management program in Kaudulla are evaluated according to the two official policy goals, which are:

1. Increasing the share of O&M expenditure borne by the farmers by transferring a large portion of the O&M responsibilities to them. This would help relieve pressure on the government budget.
2. Improvement of the productivity of the irrigation schemes through improved farmer ability to manage the system to serve crop needs (IIMI 1993).

Four important general indicators will be used here to evaluate the achievements (cf. Perera 1986):

1. Institutional development as an overall tool, both to coordinate inputs and services and to be able to transfer some of the O&M responsibilities to the farmers.
2. Harmonization of the various inputs and services necessary for increasing agricultural productivity, with special focus on the delivery of irrigation water.
3. Reduction in the Irrigation Department's O&M expenditures.
4. Participation of DCOs in O&M management decisions and activities at and below the distributary canal level, as well as increasing the DCO's degree of management capability.

Institutional Development

Kaudulla farmers and officers have repeatedly reported that the major achievement of the INMAS approach is that it has helped to narrow the communication gap between them. One can observe that project management staff work closely with other agencies as well as farmers. With the termination of funding of the INMAS Program coming up soon the number of Institutional Organizers has dropped from 26 in 1991 to 5 in 1994. The Institutional Development Officer became the Project Manager in charge after the Project Manager himself resigned.

System-Level Farmers' Organization and the Joint Management Committee

Kaudulla is one of the first schemes in which farmers, with a major support from the project manager and his staff, succeeded in federating the DCOs into a system-level farmers' organization. This organization not only serves the DCOs, but is very active in the Joint Management Committee as well. Already, after a few years, this system-level farmers' organization has become so active and effective in coping not only with irrigation related issues, but with marketing and input supply activities, that it has been able to take over the chair of the Joint Management Committee from the IMD Project Management.

Although it is reported that there have always been difficulties in getting all committee members committed to take up joint management activities, the Joint Management Committee in Kaudulla has become well known for its success in bringing the various parties together to discuss issues of mutual interest that go far beyond those related to O&M responsibilities. From previous minutes and from observations of the meetings over the last two seasons (1993-94), it has been observed that at least 15 out of the 23 DCOs send their representatives to the monthly Joint Management Committee meetings.

The Establishment of Distributary Canal Organizations

In Kaudulla, the turnover of O&M to DCOs has been a gradual process comprising the following steps:

- 1985-1989: establishment of DCOs, and giving some DCOs maintenance contracts
- 1989: turnover of DC maintenance responsibilities to 7 DCOs
- 1990: turnover of DC maintenance responsibilities to all DCOs, and giving some DCOs rehabilitation contracts
- 1992-1993: full turnover of DC O&M responsibilities to 6 DCOs
- 1994: full turnover of DC O&M responsibilities to all DCOs, and giving DCOs operation contracts as well
- Future: termination of O&M contracts: DCOs become fully independent financially

Kaudulla is certainly not one of those schemes where 'participatory management' is a mere paper exercise. This is not the place to fully evaluate the performances of the DCOs, but in short, observations and previous DCO minutes indicate that the elected office bearers are committed and try to fulfil their responsibilities to develop the DCOs. Most farmers are DCO members, who are aware of the existence and the objectives of the DCOs, and who have been involved in one or more of the DCOs activities, for instance by attending DCO meetings, electing FC-leaders or by participating in *shramadana* work organized by the DCOs.

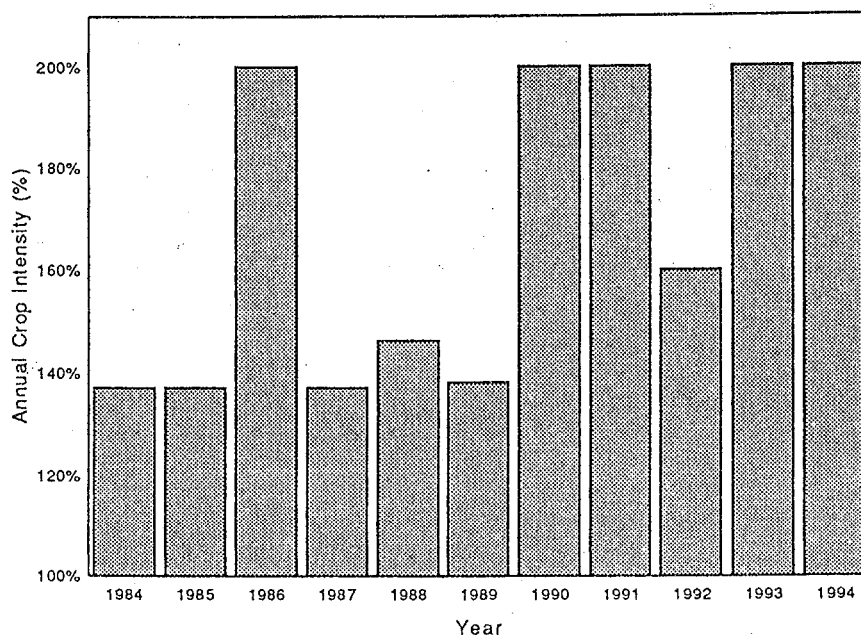
COORDINATION OF WATER DELIVERY, SERVICES AND INPUTS

Water Delivery and Crop Intensity

One of the tasks of the Joint Management Committee is to serve as a host to the Divisional Secretary to chair the Cultivation Meeting in which seasonal planning decisions are to be jointly made by farmers and officers.² The Joint Management Committee plays a very active role in planning the first water delivery to the system. While the irrigation engineer presents relevant hydrological data, the committee decides on when to start the season and what extent of the command area will be irrigated. Saving irrigation water for the next season by proper tank management has become one of the farmers' major concerns in this decision process.

Normally the Irrigation Department recommends that the farmers cultivate only 50% of the command area during the dry Yala season: farmers from head-end areas allow tail-end farmers to cultivate half of their fields so every farmer will be able to grow approximately 0.5 ha of paddy. This is the so called *bethma* share system (Spiertz 1992). One of the first achievements of both the project management and the system-level farmer organization was to encourage the Joint Management Committee to shift away from the *bethma* system, to cultivating the full command area, especially in years when there is relatively abundant water in the tank at the beginning of the Yala season. This has resulted in an increase in annual crop intensity from less than 150% before 1990 (except in 1986) to 200% in 4 out of the 5 years after 1990 (Figure 2). This is a substantial improvement considering the fact that at the same time the total water delivery to the system declined (Figure 3).³

Figure 2. Annual crop intensity, Kaudulla Irrigation Scheme, 1984-1994.

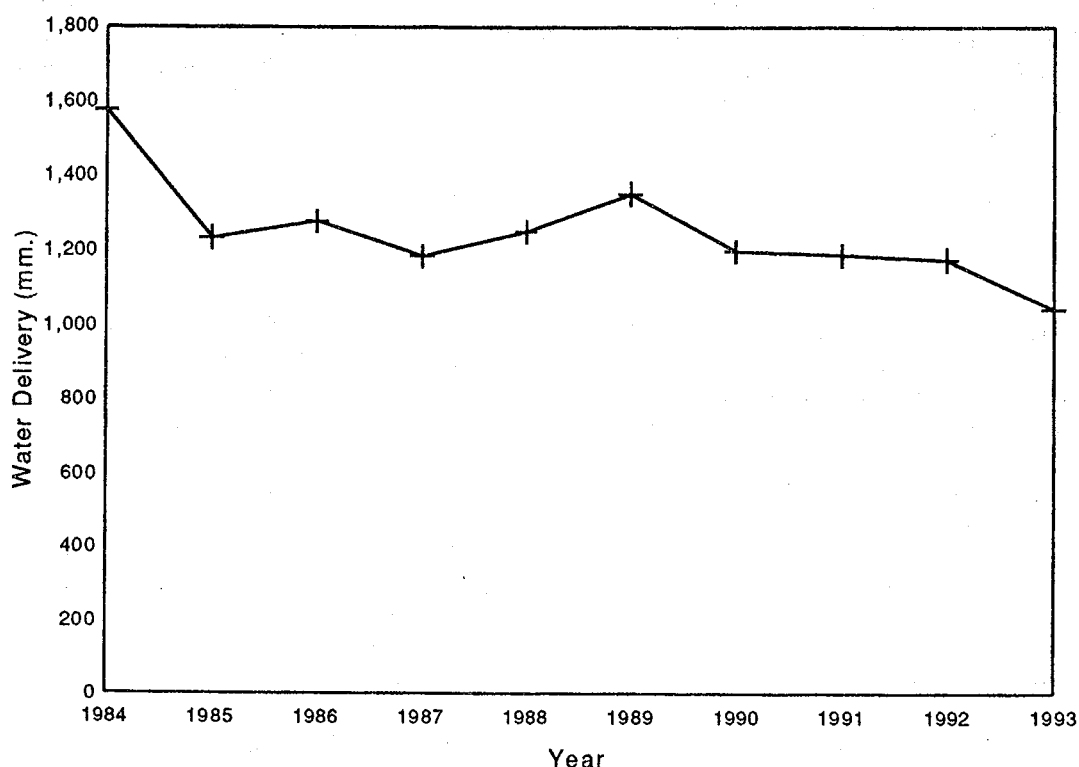


Source: Office of the Irrigation Engineer.

²The new amendments transfer the power to make these decisions to the Joint Management Committee.

³Here the official cultivated area (excluding encroached area) is used to calculate the water delivery to the system (in mm per ha per year). Not only is the actual water delivery per hectare less, but also the decline over the last few years is more dramatic than is indicated here owing to the increase in encroached area over the last few years.

Figure 3. Seasonal water supply (average of Maha and Yala seasons) Kaudulla Irrigation Scheme, 1984-1993.



Source: Office of the Irrigation Engineer.

The following example illustrates that the system-level farmer organization has become a strong institution that is able to enforce the decision to grow the full command area during Yala. As 1993 was a dry year the irrigation engineer had advised the seasonal planning meeting to follow the *bethma* system. However, the system-level farmer organization disregarded this advice and argued that they should try to get additional water from the Mahaweli Ganga System in order to cultivate the full command area. The system-level farmer organization was prepared to take full responsibility for any crop failure that might occur. Through the help of both the district organizer of the ruling party and a local Member of Parliament, the system-level farmer organization approached the Director of the Water Panel in Colombo and even the President of Sri Lanka. The President ordered by facsimile to allocate an extra 12 Mm³ from the Mahaweli Ganga System to Kaudulla tank. Owing to severe drought only 3.7 Mm³ could be allocated, but as in previous years farmers again succeeded in cultivating the full command area during Yala season and achieved a 200% crop intensity in 1993.

Agricultural Input Supply

The official idea behind the Joint Management Committees was to coordinate inputs and services that are provided by the various departments. One of the major complaints by both farmers and the project management is the low participation of some of the key departments that deal with the supply of important agricultural, legal and administrative services. Despite this the Joint Management Committee helped the system-level farmer organization as well as some DCOs get access to government services, such as for instance the Department of Agrarian Services which provides subsidized two-wheel tractors and seed paddy). In order to compensate the agencies' relatively small role in the supply of agricultural services, as well as to compete actively with local private traders, the organization made the supply of cheap services to improve the farmers' living conditions as their main objective, for which they developed an number of service oriented activities.

One of the organization's key activities is to supply fertilizers, agro-chemicals and seed paddy at discounted bulk rates, which was started in 1991. Profits from these activities are used to invest in further expanding the services to the farmers. Although data on sales are available only from 1992 onwards, Table 1 suggests that there has been a considerable increase in the amount of sales of these inputs by the system-level farmer organization.⁴ The

⁴These are the official figures of the farmer organization. It is likely that they are somewhat underestimated.

organization sells fertilizers at prices that are at least 5% below the local market prices. They see this as their major service towards the farmers, regardless of threats the office bearers get from local traders. Owing to severe floods during the Maha 1993-94 season the fertilizer sales dropped. The figures show that profit is mainly made on agro-chemicals and seed-paddy. The profit on fertilizers is low owing to the high transport cost involved in hiring a lorry. Other costs include the maintenance of a shop and an office, an accountant and a small salary for the chairman. In spite of the organization's ability to keep a steady positive balance of more than Rs 100,000 (US\$ 2,100) over the last two years, access to capital is seen as the most important constraint to further expansion of the sales.

Table 1. Sales and profits of the Kaudulla System-level farmers' organization, 1992-1994 (in nominal rupees).

	1992-1993 Maha	1993 Yala	1993-1994 Maha
Fertilizer Sales	1,908,060	2,879,289	1,299,971
Profit	11,233 (0.5%)	32,324 (1%)	13,043 (1%)
Agro-Chemical Sales	292,841	675,700	425,964
Profit	17,821 (6%)	23,967 (4%)	18,966 (4%)
Seed Paddy Sales	184,057	Included in 1993/94 Maha figures	837,535
Profit	9,438 (5%)		64,453 (8%)
Total Sales	2,384,958	3,554,989	2,563,470
Total Profit	38,492	56,291	96,462

Note: Numbers in parentheses are profit as percentage of sales.

Source: System-level farmers' organization, Kaudulla.

Reducing the Agency's O&M Expenditure

By turning over some O&M responsibilities to DCOs the agency should be able to reduce its own financial contribution to O&M. The reduction in O&M costs can be evaluated by analyzing both the changes in annual O&M expenditures and O&M staff salaries. Figure 4 shows that although the annual O&M expenditures, in 1993 prices, have decreased since the start of the INMAS program in 1984, this reduction is not considerable: from 3.4 million rupees (US\$ 70,212) in 1984 to 2.9 million rupees (US\$ 60,402) in 1993.⁵ These expenditures include regular O&M, as well as priority maintenance and casual maintenance laborers. The expenditure for regular O&M dropped especially from 1985 to 1989. The sudden increase in total O&M expenditures in 1990-1991 is mainly due to charging deferred maintenance of the main system to a so called priority maintenance budget, which contributes about 30% to 50% of the total O&M budget (Table 2). While the expenditure for regular O&M remains at more or less the same level, the budget for priority maintenance has declined, which explains the slight reduction in O&M expenses since 1991.

The above data on O&M and system expenditures do not include salaries of regular system staff. Although data on staff changes and salaries have not yet been collected, there are no indications that there has been a dramatic reduction in the number of staff at the system office of the Irrigation Department after turnover. As is shown in Table

⁵ 1 US\$ equals Rs. 48 (1993 average rate).

2 the total O&M expenses include casual maintenance laborers, the cost of which has also remained at the same level.

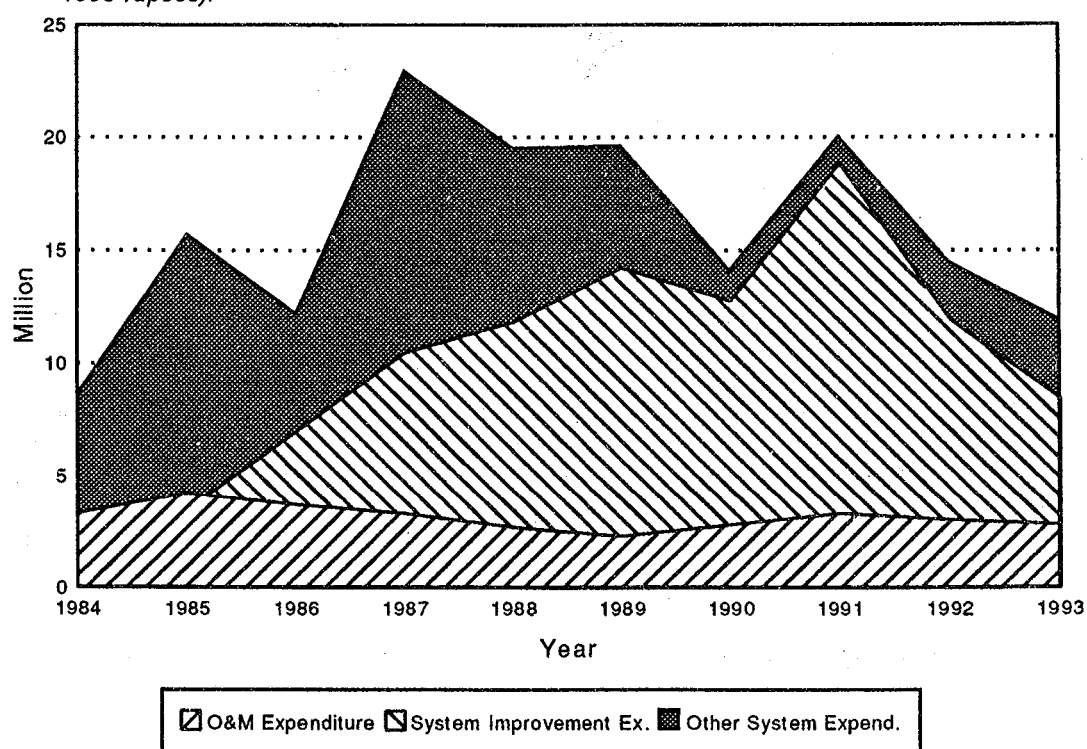
Table 2. Breakdown of O&M expenses, Kaudulla Irrigation Scheme, 1990-1994 (in constant 1993 rupees).

Year	Regular Operation	Regular Maintenance	Priority Maintenance	Maintenance Labourers	Total O&M
1990	284,939 (10.1)	691,902 (24.6)	1,385,298 (49.1)	455,067 (16.2)	2,817,206 (100)
1991	488,382 (14.4)	909,140 (26.7)	1,453,219 (42.8)	545,366 (16.1)	3,396,107 (100)
1992	470,784 (15.3)	963,224 (31.3)	1,100,885 (35.7)	546,239 (17.7)	3,081,132 (100)
1993	432,877 (14.9)	1,059,501 (36.5)	966,955 (33.4)	439,997 (15.2)	2,899,330 (100)
1994 (Allocated)	400,000	900,000	Unknown	612,000	Unknown

Note: Number in parentheses are percentage of total O&M.

Source: Office of the Irrigation Engineer, Kaudulla.

Figure 4. O&M, system improvement and other expenditure of Kaudulla Irrigation Scheme, 1983-1993 (in constant 1993 rupees).



Note: Other system expenditure includes flood damage and emergency repairs, surveys, etc.,
Other system expenditure in 1985 includes Rs. 6.5 m for a major bund repair.

Source: Office of the Irrigation Engineer, Kaudulla.

Although officially the DCOs have taken over O&M responsibilities at and below the distributory canal level, this has had little implications for the actual O&M expenditures at the system level (reasons for which are explained below). It is difficult to assess to what extent this is due to under allocation of the O&M budget. The irrigation engineer claims that he still faces an under-allocation for total O&M.⁶ Furthermore, throughout the year it remains uncertain what the eventual O&M budget will be. The 1994 budget has already been changed twice and in June 1994 the engineer was told to further cut his budget with another 20%. This example not only suggests that the actual O&M expenditure is determined by an allocation from above rather than by real O&M requirements, it also shows that irrigation system managers are not financially independent from their headquarters, which makes local O&M decision making very difficult. The engineer uses two strategies to cope with this under-allocation and uncertainty. Some of the regular O&M work to be done is covered by funds under a rehabilitation program that started in 1986-87 (Figure 4). The other strategy is to reduce the quality of the work to be done, for instance by desilting the main canal only once instead of twice a year.

Comparing Kaudulla with other schemes might give us an indication of the actual level of O&M expenditure in Kaudulla. Fernando (1993) reports on 4 different studies in which attempts have been made to quantify irrigation O&M target and actual expenditures in Sri Lanka. One study concludes that a typical O&M allocation for a major irrigation scheme is about Rs. 380 (US\$ 7.9), whereas the actual O&M requirement was found to be between Rs. 1,325 (US\$ 27.6) and Rs. 1,800 (US\$ 37.5) per ha as an average for both the main system and the lower system levels (all in 1993 prices). Based on a study in 12 DCOs, the actual O&M cost of the DCO area was found to be about Rs. 212 (US\$ 4.4) per ha. In Kaudulla the regular O&M expenditure per hectare in 1993 was Rs. 293 (US\$ 6.1), which is lower than the average found by Fernando, assuming that his data only include regular O&M. The total O&M expenditure (without regular staff salary) is Rs. 570 (US\$ 11.9) per hectare if one includes priority maintenance and casual maintenance laborers. This is higher than the Rs. 380 found by Fernando, but still lower than his estimated requirement.

Establishing Distributory Canal Organizations and Improving O&M

Although the collection of quantitative data to assess O&M performance has not yet been completed in this study, qualitative documentation of O&M activities suggests that the aimed improvement of O&M at the distributory canal level has not yet been fully achieved. The following examples, which are derived from one DCO in the middle reach of the system, support this observation.

Before official turnover of maintenance farmers used to clean the distributory canal and field channels. Cleaning of both the distributory canal and the field channels through *shramadana* has only slightly improved in terms of number of labor days. Farmers are generally not willing to voluntarily contribute labor for maintenance work that goes beyond regular cleaning, such as earth work to repair a bund.

Before turnover water distribution was organized by the *Vel Vidana*, a traditional local irrigation officer who was generally accountable to the water users. Now water distribution is the responsibility of the DCO at the distributory canal level and the FC-leaders at the FC-level. Although some DCOs have appointed a *Yala Palaka* (a ditch tender), other DCOs do not want to invest in such a person but rather try to operate the distributory canal with the help of the DC and the FC leaders. In the DCO monitored for this study this has resulted in an ad hoc operation of the FC-gates, because these leaders are generally not able to implement a set rotation schedule. At the field channel level farmers report that there has been no change in the way water is distributed before and after turnover. This indicates that most farmers still try to take water whenever they feel they need it.

Almost all FC-leaders complain that they get little participation from the water users along their field channels. It is hard to motivate farmers to contribute to *shramadana*, and the leaders lack the authority and legal support to have farmers follow the rotation schedule they have agreed upon. Some farmers are suggesting there should be a return to the *Vel Vidanes* who, unlike the present FC-leaders, were paid a share of the harvest. This was an incentive for them to be accountable for the way they operated the system below the distributory canal level.

In summary, the participatory management program implemented in Kaudulla irrigation scheme has not yet fully realized its official objectives. However, other unanticipated positive results have occurred, particularly through the system-level farmer organization. The system-level farmer organization has been effective in developing agricultural input services to the farmers, as well as in making decisions on seasonal water allocation at the system level. On the other hand, the turnover of O&M responsibilities to DCOs until now has had only a marginal effect on the reduction of the irrigation agency's O&M expenditures and the number of irrigation staff. Although most farmers are enthusiastic about the DCOs, as well as the system-level farmer organization, there has not yet been a strong incentive for farmers to take over O&M. Consequently significant improvements in O&M performance at and below

⁶The estimated 1994 O&M budget submitted by the Irrigation Engineer is 2.15 times higher than the actual allocated budget.

the distributary canal level have not yet occurred. In the section below we assess to what extent the DCOs succeeded in taking over the financial responsibility for O&M.

FINANCIAL ARRANGEMENTS AT THE DISTRIBUTARY CANAL LEVEL

A key issue for turnover is the way in which farmer organizations try to become financially viable. The financial viability of DCOs in Kaudulla Irrigation System is greatly determined by the way these organizations are financially related to both the system-level farmer organization and the irrigation agency. It is argued herein that these financial relationships do not provide sufficient incentives to DCOs to actually become financially responsible for O&M at the distributary canal level.

DCOs' Income-Generating Activities

As with the system-level farmer organization, provision of agricultural services to farmers is the main priority of the DCOs. Although farmers know that improvement of O&M is one of the official goals of the turnover policy, interviews with DCO-leaders and water users indicate that only few of them see better water distribution and *shramadana* for canal cleaning as priorities. DCOs in Kaudulla have developed the following services to their members:

- * hiring out two wheel tractors to farmers at prices below the market price. These tractors could be bought at subsidized prices against favorable interest rates and instalment arrangements;
- * bulk purchase of fertilizers, agro-chemicals and seed paddy below market prices. The DCOs buy these inputs either through the system-level farmer organization, or directly from wholesalers and cooperatives;
- * bulk storing and marketing of paddy at prices that are higher than those paid by local traders and middlemen. This marketing takes place either through the government Paddy Marketing Board, or directly to traders;
- * taking over system rehabilitation contracts from the Irrigation Department for essential structural improvement. 5% of the contract value must be deposited in the DCO fund;
- * in addition to the above activities, DCO-leaders negotiate favorable conditions for DCO loans with banks and some agencies.

Taking over rehabilitation contracts used to be the main source of income for DCOs in the early 1990s. At present DCOs make most profit from hiring out tractors and paddy marketing. For example, in May 1994 a DCO with 300 members purchased 300,000 kg of paddy from the farmers, which they sold to the government Paddy Marketing Board. From this the DCO made a net profit of Rs. 13,000 (US\$ 270). The lack of paddy storing capacity prevents the DCO from earning a higher income from paddy marketing. Farmers strongly support these activities, because they personally benefit from the better prices and they acknowledge the importance of these activities for making the DCO financially sound. These "sideline" sources of income are not used for O&M.

Relationship between the DCOs and the System-Level Farmers' Organization

There is a close financial relationship between the DCOs and the system-level farmer organization. In order to be able to build up sufficient funds to purchase agricultural inputs, the system-level farmer organization requests DCOs to deposit an average amount of Rs. 10,000 (US\$ 208) per DCO, to be repaid with 5% interest. So a considerable part of the profits made by DCOs is invested in the system-level farmer organization which not involved in O&M below the distributary canal. However, this relationship has already created several problems that might endanger the financial sustainability of the system-level farmer organization. As the DCO is investing this amount in the system-level farmer organization they expect a real improvement in the provision and cost of inputs. Owing to transport problems and lack of capital the system-level farmer organizations have always had difficulties in distributing inputs on time. This has caused some DCOs to develop their own channels for providing inputs, or in some cases to return to the local traders. As a consequence such DCOs have lost the incentive to further invest in the system-level farmer organization and have terminated their financial contribution to the system-level farmer

organization. This has jeopardized the existence of the system-level farmer organization since it depends on the financial support of the DCOs.⁷

DCOs and System Rehabilitation Contracts

A USAID-funded Irrigation System Management Project was started in Kaudulla in 1986. It included rehabilitation and the improvement of irrigation structures in distributary and field channels. The annual budgets for these works in Kaudulla differ per year, but range from Rs. 5.6 M (US\$ 117,000) in 1993 to Rs. 15.5 M (US\$ 322,000) in 1991 (in 1993 prices, see Figure 4). In this project DCOs were given priority to undertake contracts for rehabilitation work in their respective distributary areas at estimated rates. An advance of 20% of the value of the contract is paid to the DCO prior to the work (Fernando 1993). Each DCO is allowed to take over contracts up to an amount of Rs. 750,000 (US\$ 15,625). In Kaudulla DCOs have agreed to deposit 5 percent of the value of the contract into DCOs fund to help them to build up their financial capacity.

Also a sample DCO took over many contracts and was able to make money out of this as well. However, in terms of financial management and incentives many problems have occurred (in addition to some problems with the quality of the work done, which is not elaborated on here). In some cases there is a broad gap between the time the technical assistant made the estimate and the moment the final payment was made. With rapid inflation of wages and costs for materials DCOs have found it difficult to complete the work within estimated costs. It has also been reported that some DCOs could not repay the contract advances after eventually deciding to not to take the contract. Except for farmers hired as laborers, farmers are not involved in contributing or supervising the work. Only in a few cases were farmers prepared to fulfil the agreement between the Irrigation Department and the DCO to contribute voluntary labor to do the necessary earthwork for rehabilitation works in the FC. DCO-leaders and FC-leaders repeatedly stated that the only reason to take a contract is to be able to earn an additional income, rather than being interested in improving the system. Taking over contracts has helped some DCOs to increase their income, but it has not been an incentive to farmers to increase their commitment to future maintenance and repairs. Rather than using the income for O&M, the DCO uses the money to develop other agricultural support services.

DCOs and O&M Contracts

In addition to the rehabilitation contracts described above the Irrigation Department pays the DCO a small sum apportioned for maintenance of the distributary canal, and since the official turnover of operation in 1994, for operation activities as well. In 1992 and 1993, 20% and 33% respectively of the system's regular maintenance budgets were allocated to DCOs for maintenance contracts. In 1994 about 30% of both the regular maintenance and the regular operation budget is allocated to DCOs. This amount averages Rs. 80 (US\$ 1.7) per hectare. The idea behind handing over O&M contracts to DCOs is to motivate farmers to carry out the work. It is hoped that DCOs will carry out weeding, cleaning and desilting through voluntary labor and that the contract funds will be used to provide tea to the farmers who do the work, and if necessary to buy some materials. From 1994 onwards the funds can also be used to appoint a ditch tender. The Irrigation Departments regards these payments as incentives for DCOs to get them more actively involved in O&M. This is why they only pay Rs. 80 per hectare, which is approximately one third of the estimated required amount for O&M of the distributary. However, as described in the previous section of this paper, this has not proved to be an adequate incentive to invest in improving O&M. In a sample DCO farmers reported that they have not been participating for distributary canal cleaning for two years because they assume that the O&M funds paid to the DCO is sufficient to hire contract laborers. However, most DCOs do not use the money for canal maintenance. In most cases it has been observed that the funds are used for other DCO activities. In one case, DCO leaders intend to use the operation allocation to hire a bus for a religious tour around the island.

Water Tax and Membership Fees

Officially farmers are required to pay water taxes. However, in the Sri Lankan context paying water taxes has always been subject to political discussion and propaganda, with the result that very few farmers pay these taxes. The highest recorded amount of water taxes paid in Kaudulla was in 1987 when a little over Rs. 260,000 (Rs. 53 per hectare, or Rs. 64 per farmer) was collected. Since then the payment has declined dramatically to almost nil after 1991.

⁷The system level farmer organization is not officially registered under section 56A of the Agrarian Service Act, No. 4 of 1991, which makes it very difficult for them get access to bank loans.

The May 1994 Amendments to the Irrigation Bill now legally exempt farmers from paying water taxes to the government if they take over O&M responsibilities. They give DCOs the right to collect fees from the water users. However, DCOs have been collecting these fees already for a number of years. DCOs in Kaudulla expect each member to pay Rs. 100 per successful crop. A survey done in one DCO founds that after the inception of the DCO, members paid these fees for only 2 to 3 seasons. Over the last few seasons the DCO collected fees from only a few farmers. DCO leaders reported that they do not have the authority or power to enforce members to pay. Water users complain that paying DCO fees has not resulted in an improvement in water delivery by the DCO. Some farmers reported that they think that paying fees to the DCO would exempt them from contributing to *shramadana* for canal maintenance. Unlike the profits from marketing activities, which directly benefit the farmer, farmers have no idea what is done with the fees, nor do they see how to make DCO leaders accountable for using this money in a way that improves water delivery to their fields.

DISCUSSION AND CONCLUSIONS

By helping farmers to get better organized, the participatory management approach in Kaudulla has made a modest improvement in the profitability of irrigated agriculture for farmers. Through farmer organizations farmers have improved their access to better and cheaper services, especially in terms of water supply at the system level and provision of agricultural inputs. And with the help of the project management and other agencies farmers have learned to expand these services and build up financially sound farmer organizations. As far as these achievements are concerned, pillows have been changed for a part of farmers' headaches. However, the question here is "Why participatory management could not change the irrigation agency's headache for a pillow?" O&M expenditures have not declined, improvement of O&M at the secondary level and an increase in farmers' O&M management capacities have not occurred. Evaluation of the financial arrangements created at the level of the distributaries by both the irrigation agency and farmers' organizations themselves show that these arrangements have failed to become powerful incentives for reducing O&M costs and improving O&M.

Many policy makers regard Kaudulla scheme as a try out of the participatory management approach in Sri Lanka. Some of these policy makers like to highlight the moderate successes of the system-level farmer organization and, under pressure of donors, push to get the approach copied not only to other schemes that come under the Irrigation Department, but to Mahaweli Systems as well. The danger here is that mistakes made with for instance the rehabilitation and maintenance contracts are going to be repeated. Others, however are concerned about the physical deterioration of the distributary canals and see the lack of farmers' willingness to really take over O&M as the evidence to their believe that "turnover and participatory management are useless exercises anyway" and that the Irrigation Department should again take the full responsibility for O&M above the field channel. This would throw the baby out with the bath water and it would certainly jeopardize any future program in which farmers are to supposed to get involved in. What is necessary instead is that the current policies, as well as the roles that are played by the agencies and farmer organizations that implement participatory management policies ought to be redefined. In this paper we argue that a possible way out of the impasse created by a partial turnover can be found by examining the basis for financial responsibility and accountability for O&M activities. This discussion can be framed around the following four questions:

1. Who is Financially Responsible?

Participatory management cannot simply be achieved by handing over O&M responsibilities to well-established water users' organizations. Participatory management programs focus too much on sharing *activities*, without making clear who is financially responsible for these activities and who can be made financially accountable if these activities do not take place. Also the INMAS Program is not clear in this respect. Project managers and engineers receive instructions from their headquarters to stop handing over O&M contracts to a DCOs, but still the payments continue. Farmers are not interested in investing their DCO income in O&M activities because experience has shown them that the agency continues to provide O&M contracts to DCOs.

2. Are Politicians and Agency Staff Willing to Turnover Financial Responsibility to Farmers?

Without having examined the positive and negative effects of fee payment on O&M improvements, politicians have made the farmers' inability to financially contribute to O&M an important issue in political campaigning. The agency's intention to motivate farmers to do O&M by involving them in contracts has proven to be counterproductive. Handing over the rehabilitation contracts apparently has not sufficiently

motivated farmers to take over full management of O&M. Although the Irrigation Department has officially turned over O&M to the farmers, the agency continues paying for O&M through O&M contracts. These 'incentives' preserve the existing relationships between farmers and the agency, in which the former are financially dependent on the latter. However, without giving farmers proper tools to make both agencies and farmer organizations more accountable for their O&M responsibilities. Moreover, these kind of incentives cast doubts on the political willingness of politicians and agency staff to really handover responsibilities to farmers.

3. **Can Farmers Take Over Financial Responsibility?**

The current policy assumes that turning over financial responsibility to farmers will increase financial accountability for O&M and consequently improves O&M. But the question whether farmers can carry the financial burden remains. Our first observations from a household survey done during the maha 1993-94 season indicate that farmers hardly make a profit from rice cultivation; many farmers even had negative incomes.⁸ However, the popular notion by politicians and government staff that farmers are *individually* unable to pay for the cost of O&M should be shifted to the question whether *farmers' organizations* can be held financially responsible for O&M. And if so, how can this responsibility be used to make both DCOs and the agency accountable for their share in O&M? At present, because of the reasons explained above, farmer organizations feel no incentive to invest in O&M (except by contributing some labor). They use money that has been allocated for O&M for other purposes.

4. **What Role Should Be Played by Farmers' Organizations and Who Should Support Them?**

The fact that farmers use their organizations for purposes other than improving O&M brings us to the question on the definition of farmer organization in participatory management. The Kaudulla case shows that farmer define the role of their organizations more (and predominantly) in terms of providing agricultural services to their members than in terms of O&M improvement. Policy makers and agency still see farmer organizations merely as a tool to improve O&M, regardless whether these organizations are at all interested in contributing to such improvements. The observation that farmer use their organizations for other activities than O&M should have implications for participatory management policies in general and for the role the various supporting agencies play in particular. The question is arising as to whether the approach of the participatory management programs to concentrate on farmers' organizations taking over O&M responsibilities is the right one. If farmers are mainly interested in developing capacities that go beyond O&M, then why should the Irrigation Department need to provide financial support to farmers? And should not the government support the tendency of the farmer organizations to develop multiple functions? The Kaudulla case suggests that multi-functional organizations has greater potential to provide more incentives to farmers to work together and make their organizations financially viable. The next step then would be to see whether these financially sound organizations can provide an important contribution to O&M improvement.

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⁸This is partly because of the low yields owing to flooding.

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Institutional Design Principles for Accountability on Large Irrigation Systems

Douglas J. Merrey

INTRODUCTION

THIS PAPER ADDRESSES an issue that is fundamental to the future productivity and sustainability of irrigated agriculture in many developing countries. This issue can be framed as a question: What institutional conditions and principles are most conducive to achieving and sustaining high performance on those gravity irrigation systems currently owned and managed by government agencies?

There is a substantial literature on indigenous "farmer-managed irrigation systems" (FMIS). Researchers have generally emphasized the strengths of FMIS, identified underlying principles believed to be the foundation of their success, and proposed ways governments can support their continuation and improvement. But a very large proportion of the total irrigated area in developing countries receives its water through systems constructed, owned, and administered by government agencies. Most of these systems are relatively large compared to the farmer-managed sector in a given country. Researchers have documented the experiences with "water users associations" (WUA) at the tertiary and secondary levels of government-managed systems, focusing on methods for organizing WUAs and the potential roles, benefits and advantages (rarely disadvantages and costs) of WUAs. Some of this work notes that government agencies change themselves much to enable them to support WUAs.

However, this literature makes a crucial assumption: that the government agency will continue to retain primary responsibility for overall system management on the larger systems, and will share some of these responsibilities with farmer organizations. Although there are variations in what tasks and responsibilities are shared, turned over to farmers, or retained by the government, the most frequent pattern in Asia is one in which the government retains control over the water resource, reservoirs, and main canals, and overall ownership and financial responsibility for the system. Maintenance and (perhaps) operation of lower level canals are turned over to WUAs. Representatives of farmers may or may not be consulted on policy issues affecting the larger system.

The fundamental problem is that while public organizations, under various forms of pressure, have agreed to "share" with farmer organizations many of the responsibilities -- especially the expenses and hard work -- of system management, there is no significant change in the power relations between the farmers and officials. Mutual accountability is absent. Officials have no incentives to foster independent WUAs. Farmer organizations remain dependent on the public organization legally, financially, and psychologically. "Joint management" as currently practiced is often business as usual with cosmetic changes.

This paper selectively synthesizes recent research and introduces a framework for classifying systems based on hypotheses on the institutional determinants of performance. It then discusses the implications of these hypotheses for shared or joint management of government irrigation systems. This is a simplified and selective version of a larger and more academic paper which contains more details and a full set of references (Merrey 1994).

INSTITUTIONAL PRINCIPLES FOR IRRIGATION MANAGEMENT

Self-Governing and Government-Managed Irrigation Systems

We can distinguish between systems owned, controlled, and managed by users organized into local organizations; and systems owned and to varying degrees managed by government agencies. The former includes both indigenous systems which often have long histories, and systems that have been turned over by the government to user groups for management. Both types are widespread throughout the world, in both developing and industrialized countries. Terms for this class include "irrigation communities," "communal irrigation," and "farmer-managed irrigation systems" (FMIS). There is considerable though not unlimited variety in the size, technology and organization of FMIS.

The other class of systems -- those constructed, owned and controlled by government agencies -- also includes both ancient and modern systems. There is a variety of types of government agencies, including civil engineering departments, area or river basin development authorities, and agricultural agencies; the dependence of these agencies on political authorities' control, their financial dependence or autonomy, and the extent to which government control extends to the farmgate or is "shared" with local user groups at lower levels also vary.