

**Evaluation of the Integrated Management of Agricultural
Settlements (INMAS) Program**

FINAL REPORT



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EXECUTIVE SUMMARY

This report presents the results of the evaluation of the Integrated Management of Agricultural Settlements program (INMAS) carried out by the International Water Management Institute (IWMI) at the request of the Irrigation Management Division (IMD) of the Ministry of Irrigation and Water Resources.

The program was launched in 1984 with the aim of strengthening institutional arrangements for irrigation management through farmer participation in the operation and management of irrigation schemes. It was the first official effort at national level of mobilizing farmers for participatory management in major irrigation in the country. Thirty-seven major irrigation schemes in the country have been brought under this program. By 1999, some 1130 farmer organizations had been formed and vested with the responsibility of operation and maintenance of irrigation facilities below the distributary canal head. Over time, the program expanded its scope to include input supply and marketing, agro-processing, enterprise development, coconut development, participatory forestry, and catchment area management. This study, conducted in late 2000, evaluated the INMAS program against its full range of activities with particular emphasis on the central function of irrigation management.

General: The INMAS program focused on management by consultation for improving irrigation system efficiency and increasing farmer income. Several institutional features were introduced to attain these objectives which included the project management system and participatory irrigation management. With the establishment of farmer organizations, Project Managers and project management committee the INMAS program has realized some its major objectives.

Project Manager (PM): The office of the Project Manager is central to the INMAS concept. In the formative years, the PM played a crucial role and succeeded in setting up farmer organizations (FOs), transferring responsibility for operation and management to FOs, and training and guiding FO leaders. PMs do not perceive their current role as challenging and are very willing to take on additional responsibilities.

The farmers reported that most influential person in the scheme to be the Project Manager, followed by other mainly government officials. This suggests that farmers are still dependent on these officials to resolve their problems

The INMAS has only had a limited impact in coordinating the activities of various government agencies. There are no formal powers vested with PMs. Inter-agency coordination has been largely achieved by the persuasive skills of the Project Manager.

The performance of PMs is also constrained by other factors such as the frontier perception of other agencies that view the farming community as open territory accessible for implementing their programs through farmers' organizations.

Recommendation: There is an urgent need to redefine the role of PMs. The INMAS program should gradually work towards weaning FOs away from over-dependency on PMs and other government agencies, and strengthen their capacity to take over the bulk of the coordination, input supply and water management functions.

Farmer organizations (FO): FO are relatively effective in water management including water distribution, maintenance, conflict resolution – and to a lesser extent providing other support services to farmers. Most FO leaders disagreed with the idea that physical rehabilitation is more effective than establishing farmers’ organizations to improve water management.

Majority farmers rated maintenance work by FO either good or very good. Following INMAS, both cash and labor contributions by farmers for O & M showed an upward trend. Although there is a high incidence of conflicts, these have been settled locally by the FO to a great extent. FO are also engaged in cultural activities, perennial crop cultivation, organization of agricultural extension, welfare and credit.

Most farmers’ organizations stressed the need for financial strength to ensure sustainability. The main sources of income are allocations by the Irrigation Department, maintenance fund, and profit from maintenance contracts from the Irrigation Department. A majority FOs surveyed have been given buildings by the government which are used as stores, vehicles tractors and farm implements. All FO maintain records, although documents relating to maintaining accounts can be described as good only in one third of the cases. Only in a few cases could the procedures followed by the FOs be described as transparent to the membership. Although a substantial amount is expended on the preparation and audit of accounts the lack of transparency is a source of friction in a number of organizations.

Recommendation: Undertake rehabilitation and modernization with farmers’ participation. Discontinue with the practice of subcontracting to ID and FO officials. There is a need for intensive training of FO leaders particularly on financial management. Training, especially on financial management, was one of the most frequent demands from farmers when asked what was required from the INMAS program.

Leadership: The most valued qualities for leadership is honesty and integrity, followed by commitment, public confidence, experience and education. Political connections and youth are also considered as desirable qualities for leadership. Some organizations have tail-end farmers in the leadership or in the committee. The membership do move to change the leadership when performance is unacceptable.

Farmers’ organizations are socially recognized and are an established institution though they tend to be inward looking. Their external contacts are mainly government agencies rather than with other actors notably private sector institutions. FO leaders and members value the connection with the government and its supervision as it enhances their social recognition and independence.

FOs tend to keep to the constitution originally given and accommodate all farmers without limiting membership to legal owners often not realizing the constitution provides for this anyway. Membership and attendance at meetings are increasing. The necessity for FOs is widely recognized. There is also some evidence of breakaway farmers’ organizations due to disagreements among groups of farmers and the FOs leaders. In most cases such conflicts have political undertones.

Agricultural Development:

INMAS program has had a mixed impact on agricultural production. About 40% reported an increase in agricultural productivity levels due to INMAS intervention. Crop diversification was minimum in the schemes surveyed. This is attributable to other exogenous factors rather than

INMAS intervention *per se*. Perennial crop cultivation in home-gardens was one of the positive contributions of INMAS.

Recommendation: It is not within the scope of the INMAS program to contribute directly with agricultural production activities in the schemes. But, it can play a useful role by effectively coordinating the activities of other line agencies like the Irrigation Department, Agricultural Department, agencies dealing with livestock development and in particular private and public sector marketing channels.

Future Development Strategies: The future program of IMD and INMAS should be formulated in terms of a few key objectives followed by a clear understanding of the issue/s to be dealt with. INMAS should continue to address O & M.

INMAS should pay attention to river basin development and regional planning rather than remaining within the scheme. The IMD and PMs cadre have valuable experience in mobilizing of rural communities. This experience can be utilized to promote wider participation in natural resources management, with a particular focus on water resources management at the basin level that is expected to become a priority in Sri Lanka. IMD is well placed to contribute expertise to the process of formation of river basin organizations in collaboration with the Water Resources Secretariat/Authority and the transformed Mahaweli Authority.

With respect to the continued support to farmer organizations created under the INMAS program a core group of PM should be retained at the IMD office in Colombo, or in two regional centers. This core group should become a training resource able to help train new and existing officers of FOs. A clear program for withdrawal of project level officers should be established and FOs given sufficient notice of the need to adopt full O&M responsibilities. A realistic target would be to withdraw all PMs from field offices in three years.

1. INTRODUCTION

1.1 Background

This report presents the results of the evaluation of the Integrated Management of Agricultural Settlements program (INMAS) carried out by the International Water Management Institute (IWMI) at the request of the Irrigation Management Division (IMD) of the Ministry of Irrigation and Water Resources.

The INMAS program is a major institutional reform program focused on improving management and the performance of major irrigation schemes. The program was launched in 1984. The main aim of INMAS is strengthening the institutional arrangements for irrigation management through farmer participation in the operation and management of irrigation schemes. It is “the first official effort at national level of mobilizing farmers for participatory management in major irrigation in the country” (Ratnayake,1995:81). Thirty-seven major irrigation schemes in the country have been brought under this program. By 1999, some 1130 farmer organizations had been formed and vested with the responsibility of operation and maintenance of irrigation facilities below the distributary canal head. Over time, the program expanded its scope to include input supply and marketing, agro-processing, enterprise development, coconut development, participatory forestry, and catchment area management. This study conducted from late 2000 –2001, evaluates INMAS program against its full range of activities with particular emphasis on the central function of irrigation management.

1.2 Scope and Objectives

The terms of reference (TOR) for the study are given in Annex 1. In accordance with the TOR, the overall objectives of the study are to document the achievements, shortcomings and impacts of the INMAS program with a view to planning future activities, and if necessary, the reorientation of the program to better match current management needs and future trends in irrigated agriculture. The more specific aims are:

- i. To document the evolution of the INMAS program with particular focus on the adjustments that have been made over time and the reasons for them.
- ii. To determine the extent to which the program has matched the expectations of various stakeholders and to identify constraints that hindered the success of interventions.
- iii. To determine whether the institutional arrangements (agency, beneficiary and collaborative) introduced through the INMAS program facilitate improved management of irrigation schemes
- iv. To determine the impact of the INMAS program on the performance of irrigation schemes including its contribution to national economy.
- v. Identify whether, and what, changes are appropriate in the content and approach of INMAS to cater to the changing management demands and policy objectives.
- vi. Identify major constraints to achieving desired objectives and propose remedial actions to address major issues, such as sustainability, weaknesses of institutions, need for reorientation of agencies etc.
- vii. To comment on the existing structure of IMD and make recommendations, if necessary, for reorganization/restructuring.

1.3 Methodology

The evaluation entailed three levels of analysis: a) national level, b) scheme level, c) farm level. At the national level, the focus was on the basics of government policy on participatory irrigation system management, the evolution of the INMAS model of participatory irrigation management and the adjustments made to the model through time. The scheme level analysis focussed on two critical components of the INMAS model: the project manager system and farmer organizations on the basis of information collected from eight schemes where the INMAS program was implemented. The farm level analysis measured the impact of the INMAS program at the farm level. In addition, to compare INMAS program with other institutional interventions in irrigation management, the Mannankattiya scheme under the MANIS program and the Galnewa area of Mahaweli System H were selected and comparative information were collected through the application of rapid rural appraisal technique.

Figure 1 shows the location of the schemes selected for study. Annex 2 gives the major characteristics of schemes selected for study and outlines the methodology for selection farmers for the questionnaire survey.

1.4 Organization of Report

This report is structured as follows. Chapter two provides a description of the institutional framework in INMAS with particular attention to the underlying principles, structure and objectives and the process of development of farmer organizations and the institutional context. Chapter three presents information on the performance of the INMAS program as an institutional intervention, and role of farmer organizations and its contribution to agricultural production and household incomes. Chapter four is an analysis of the INMAS program in terms of achievement of objective . Chapter five gives the summary and recommendations.

Figure 1. Location of Schemes Selected for Study

2. INSTITUTIONAL FRAMEWORK

2.1 Principles of INMAS approach

Several important management principles were adopted in designing the INMAS management system. Foremost among them is the integrated approach to management that sought to harmonize the various input supplies and services necessary to improve agricultural productivity levels in the major schemes by a *decentralization of decision making or delegation of authority and responsibility* to appropriate levels. Second is Farmer participation in irrigation management. At least two levels of hydrological based farmer organizations exist in INMAS schemes: field channel groups and distributary canal organizations. Third, *flexibility* in management. Fourth the *insulation from political interference*. Fifth, the spirit of *teamwork*. The appointment of Project Manager, who are assisted by Institutional Development Officers, are specifically charged with the establishment and strengthening of farmer organizations. Finally, the *sunset* principle where in the course of time when the objectives are achieved and the integrated management and farmers' participation is socially institutionalized, it would be time for a new era when arrangements will be put in place to suit the new requirements.¹

2.2 Structure of INMAS

The INMAS program adopted a cascading management system from the national level down to the field level with various functions and responsibilities assigned to organizations/ individuals at the respective levels. At the national level, the Irrigation Management Division (IMD) is the principal agency administering INMAS. The IMD receives policy guidelines and directions from the Central Coordinating Committee on Irrigation Management (CCCIM) and the Secretary of the Ministry of Irrigation. The Chairman of the CCCIM is the Secretary of the Ministry of Lands and Land Development. Other members include the Secretary of Ministry of Agricultural Development and Research, the Chairman of Agricultural development Authority, the Director of Irrigation, the Director of Agriculture, the Land Commissioner, the Commissioner of Agrarian Services, and the Representatives of State Banks. The Director of IMD functions as the Secretary of the CCCIM.

The IMD reports directly to the Ministry of Irrigation. It has officials with expertise in irrigation, agriculture, institutional development and management for the purposes of coordination, training, progress monitoring and evaluation of the program.

At the project level the IMD executes the program through its Resident Project Manager (RPM). The RPM is answerable to the DAC Sub-committee on Agricultural Development that implements and monitors the program at the district level. The Government Agent is the Chairman of the Sub-Committee. Other members of the Sub-Committee include the Additional Government Agent (Lands) and the district heads of the Departments of Irrigation, Agriculture, Agrarian Services, Cooperative Development, the Agricultural Development Authority, the Agricultural Insurance Board, the Paddy Marketing Board, and the State Banks in addition to the RPM. The RPM is acts as the coordinator and facilitator who is expected to harmonize the various inputs from respective line agencies, promote a dialogue between farmers and officers for agricultural and social development whilst encouraging farmer participation in project activities. He is also expected to arrange for prosecution of offenders under Irrigation Ordinance, and pursue action with relevant authorities in case of animal trespass and damage.

The main decision making body at the project level for implementation of the program is the Project Management Committee (PMC). It is comprised of the relevant line department field staff attached to the

¹ Abeywickrama, N. "Evolution of and future challenges for the Program for Integrated Management of Major Irrigation Schemes" Presentation delivered at the Workshop for the Resident project Managers on INMAS Evaluation held at IWMI on October 27, 2000.

Project and over whom the RPM has a degree of administrative control, and the representatives of distributory canal farmer organizations. The line department officers, as members of the Project Committee, are responsible to the Project Manager for work performed in relation to the agreed program. The main objective of the RPM system is to achieve more co-ordination than when these activities are implemented by line agencies in isolation (Abeywickrama, 1984:iv-v).

Farmer organizations constitute the other key component in the INMAS model. They are responsible for the distribution of irrigation water, maintenance of irrigation canals and structures, and the resolution of irrigation related conflicts at the distributory canal level. In addition, they have the mandate to arrange input supply, marketing of farm produce and any other activities in the interest of their membership.

2.3 Objectives of program

The INMAS program sought to harmonize the various input supply and services necessary, for increasing agricultural productivity with special focus on irrigation water and to involve farmers in management decisions affecting them (IMD, 1984:1). In the short run, the INMAS program sought to improve the physical system and water management, obtain farmer inputs to the decision taking process, organize services for farming, increase production and organize sale of produce. Initially the following aspects were emphasized:

- Identify major systems needing urgent rehabilitation
- Maintenance of irrigation systems at optimum levels of performance
- Organize and develop farmer institutions to facilitate their participation in management
- Recovery of O & M costs from beneficiaries in major irrigation schemes
- Adequate and equitable distribution of irrigation water to farmers
- Farmer education
- Increasing agricultural production per unit of irrigation water
- Increasing agricultural production per unit of land
- Arrange for timely supply of agricultural inputs and sale of produce

The long-term objectives were commercialization of farms, crop diversification, marketing, social and economic development, and turning over the management from the government to FOs. They were stated as follows:

- Integrated development of the farm lot to a commercial holding
- Crop diversification and rotation
- Social and economic development of the farming community
- Marketing of agricultural produce and by-products locally
- Handing over to farmer organizations some of the management and operational functions

With time INMAS program broadened its scope of activities to include:

- Increase in profitability of paddy farming
- Introduction of perennials
- Enhance farm credit availability
- Development of entrepreneur skills
- Timely availability of inputs in a sustainable manner
- Stabilization of paddy prices
- Integrate agriculture with livestock and fisheries
- Improve savings habits
- Coconut, home garden crops, forestry
- Resource mobilization

2.4 Development of Farmer Organizations

2.4.1 Principles of formation of FO

The fundamental idea on which Farmer Organizations (FO) were founded by INMAS program relates to their utility as a forum for dialogue and interaction among farmers and between farmers and officers working in the Project. It sought to set up these organizations within an identified framework *to satisfy the irrigation and allied needs* of farmers in these projects (IMD 1984:12).

The program planners recognized the presence of specific needs of the individual projects that the FO would have to cater to, and allowed the size, type and level of representation of FO to be determined according to the particular situation of the project. Instead of a blueprint of FO, INMAS provided guidelines so there would be some conformity and consistency in the organizational and structural arrangements. These guidelines are as follows:

- FO at all levels should represent a distinct hydrological area
- Members of FO should be bona-fide cultivators within the area it represents
- FO should represent all cultivators within the area
- Government officers participate at FO meetings as observers or in advisory capacity. In case of DC level FO or Sub Project Committee an officer could function as its Secretary.

2.4.2 Structure and Roles of FO

A three-tier system of organization depending on the circumstances and the size of the project was recommended to make farmer participation and representation practicable.

- (1) Primary Level Organization: Most schemes consists of Turn-out or Field Channel Groups (FCG) of about 15-25 farmers. Each group nominates a farmer to represent the group in the Distributary Canal Organization .
- (2) Distributary Canal Level Organization (DCO): DCOs are the formal Farmer Organizations. They are formed on the basis of one or more distributary canal command areas. These were also identified as Sub-Project Committees.
- (3) Project Management Committees: Each scheme has a Project Management Committee that made of official from relevant agencies and representatives of farmer organizations. Larger schemes also have Sub-Project Committees to deal with irrigation and others matters at smaller units within the scheme.

2.4.3 Objectives of FO

IMD listed the main responsibilities of FO as:

- Identify the critical areas of the irrigation system needing attention and indicate priority areas for rehabilitation or repair.
- Maintain and clean channels with the assistance of farmers
- Organize shramadana for work under supervision of Irrigation authorities
- Water distribution and rotational water issues within the field canal
- Participate in decision making in matters connected with agriculture and irrigation through its representatives
- Motivate and encourage farmers for on-farm water management
- Inform authorities of offences relating to the irrigation systems and assist in checking of such offences.
- Submit proposals in respect of irrigation and agricultural programs to the Project Committee

- Liaise with the Project Committee and connected agencies in obtaining inputs and facilitating the sale of produce
- Motivate farmers to pay irrigation rates (O & M costs).
- Inform the necessary authorities and assist them in cases of pest or disease outbreak or damage to crops by animals
- Handle maintenance work on contract under supervision of Irrigation authorities.

The functions of the FR are:

- Represent the group at all levels of the organizational hierarchy.
- Represent the area in case he is the representative of the Distributory or Sub-Project Committee.
- Water distribution at the turn-out or field canal level.
- Take up with Project Committee issues regarding agriculture and assist the Project Committee in matters under its purview.
- Especially assist the authorities in collection of O & M costs, in instances of animal damage and trespass and irrigation offences.
- Ensure Kanna meeting decisions are adhered to and motivate farmers to keep to the calendar of operations.
- Arrange for cleaning of field canals either on pangu basis or shramadana.
- Identify with the farmers the structures and other items in the canal network that need attention on a priority basis and submit the list to the Project Committee.
- Help the authorities in gathering agricultural statistics.
- Perform duties required if appointed as Vel Vidane or Yaya Palaka under Agrarian Services Act.

2.5 Institutional Context of INMAS Program

There are four important legislative enactments provide the institutional framework for the INMAS program.

- Agrarian Services Act No. 58 of 1979
- Amended Agrarian Services Act No. 4 of 1991
- Irrigation Ordinance Chap. 453 of 1968
- Amended Irrigation Ordinance No. 23 of 1983 and No. 13 of 1994

In addition, there are various other circulars issued by the Irrigation Management Division that deal with more procedural matters.

Agrarian Services Act and the Amendments

The Agrarian Services Act of 1979 is one a series of Acts relating to institutional support systems for the small farm sector, particularly on matters relating to land tenure systems in the paddy sector. The Paddy Lands Act of 1958, the Agricultural Productivity Law of 1972 and the Agricultural Lands Law of 1973 preceded the Agrarian Services Act. This Act was amended in 1991 to provide for the establishment of Farmer Organizations and to grant them authority over cultivation and other matters. These Acts enabled the transfer of f irrigation management functions from government to the farmers organizations and provided for the legal recognition of FOs.

Irrigation Ordinance and the Amendments

The Irrigation Ordinance was first enacted in 1856 by the British colonial government to legalize customary irrigation practices and bring about discipline in paddy cultivation. Since then this Ordinance had been amended from time to time to keep pace with the socio-economic changes in the country.

With the implementation of the Paddy Lands Act in 1958 the Vel Vidane System was abolished and replaced by cultivation committees comprising of farmer representatives. The Irrigation Ordinance was amended in 1968 to accommodate the cultivation committees. In 1994 the act was amended again to keep pace with the new concepts in participatory management. The term "Cultivation Committee" in the 1968 amendment was substituted with "Farmer Organization" and powers vested with cultivation committees were transferred to Farmer Organizations registered under the Agrarian Services Act.

The legislative provisions under the Agrarian Services Act and the 1994 amendment to the Irrigation Ordinance provide the FO's the legal authority to intervene in all irrigation and cultivation matters. The powers vested with FOs include, responsibility for the operation and maintenance (O&M) of distributory canals, levy a fee from farmers to cover the cost of O&M of the distributory canal or any other work that is beneficial to farmers cultivating land in the distributory canal command. Under the provisions of the Irrigation Ordinance the FOs had the power to make rules for promoting paddy cultivation in its area of authority including the rules for *bethma* cultivation, maintain and protect irrigation facilities and to impose penalties on those violating rules and customs (Weerawardena, 2000).

The 1994 amendment to the Irrigation Ordinance provided for the establishment of the Project Management Committees and Sub-Project Management Committees to effectively implement participatory irrigation management. The PMC do not have juridical roles but are essentially advisory bodies. In addition to legislation, FOs and the Government entered into a memorandum of understanding (MOU) that specified the respective functions of the government agency and FOs. The provisions include the seasonal planning to be done in a participatory mode by government agencies and FOs, O&M of headworks and main and branch canal to be done by government agency, O&M distributory canals to be done by FOs and FOs were given authority to intervene in conflict resolution.

3. PERFORMANCE OF INMAS PROGRAM

3.1 Institutional Performance

The key components of the INMAS program are the Resident Project Manager, Farmer Organizations and the Project Management Committee.

3.1.1 What has been done

(a) Appointment of Project Managers

Project Managers were recruited to play a catalytic role in organizing and developing farmer organizations and to facilitate farmer participation in management. All Project Managers (PM) who were interviewed had previously worked as 'Institutional Officers' and 'Institutional Development Officers' of pilot projects on farmer participation, or as Extension Officers of the Department of Agriculture. Most of the PMs are graduates or Diploma holders in Agriculture. They had considerable experience in interacting with farmers and other major stakeholders in irrigation schemes.

The IMD opted to use the terms *Vyapara Adhikari* (i.e. *Project Director*), *Vyapara Adhikari Karyalaya* (i.e. *Project Director's Office*) to refer to Project Manager and Project Manager's Office respectively. By contrast the Mahaweli Authority uses the term *Kottasha Kalamanakaru* (Block Manager). These terms have important symbolic meanings for the role assumption and performance as well as for the social perception of the role. The former term signifies authority extending over a physical area, in this case the irrigation scheme, whereas the latter denotes more of a coordinating and motivating function related to a project. Although the adopted Sinhala terms seem contradictory to the notion of participatory management, the nevertheless, is adaptive in the Sri Lankan context characterized by a social value for acceptance of authority – legitimate or otherwise.

The Project Managers are aware of the social perception of the role denoted by the designation. The term Project Manager is so widely used that it is generally understood as denoting a designation of authority and responsibility to achieve a stated mission within a given time frame and in terms of a set of activities interconnected, time bound and quantifiable in financial terms and work targets.

The IMD eventually made PMs permanent employees, although it originally these positions were to be transient to catalyze the establishment of FO and strengthen the capacity of FOs in water management.

(b) Formation and establishment of farmer organizations

Field investigations revealed that PMs have played a significant role to accomplish the task of setting up and establishment of FO. All INMAS schemes have established FO both at the DC level and at the scheme level. Out of 100 sample FO some 78 were set up more than 10 years ago and 20 over five years ago (Table 1). Some 60% of FO reported were registered under 56A, and half this number under 56B of the Agrarian Services (Amendment) Act No. 4 of 1991. Minneriya, Kaudulla and Tabbowa are conspicuous in having a larger proportion of FOs registered under 56B (Table 2).

The FO survey revealed an increase in membership over time and the high proportion of active members relative to non-active members (Table 3). Community interest in FO is discernible from the participation of non- members as observers. The farm household survey indicated over 90% of the farmers were members of their respective FO, and over 75% paid their membership or admission fee. Non members were mostly encroachers who were not allowed for membership.

Farmers have periodically changed their leadership and the committee indicating the community's increased assertiveness, self-confidence and desire for the FO to be successful. Most FO have reduced the

number of the committee to what is considered to be a more manageable level. For example, 91% of FO have changed the committee of office bearers (Table 4). This was mostly due to loss of public confidence. That a significant number has voluntarily resigned may be partly due to their awareness of the public knowledge of loss of individual credibility and the avoidance of the probable outcome of a vote at the general meeting. In fact, the FO members attributed the success of FO to the dedication of the leaders and the cooperation from farmers.

The survey revealed that the farmers think of viability or the sustainability issue in terms of financial strength of the organization and have adopted such strategies as taking contracts, work for free and accruing the income thereby saved to build up a capital fund for the respective organizations. The maintenance fund thus created is regarded increasingly important. In Minneriya for example it accounted for 57% of all income. Farmers believe that the government has no money for O & M and even expressed the fear that the government may eventually withdraw its perceived responsibility. Nevertheless, the importance placed on creating maintenance fund suggests increased self-reliance and thus sustainability.

Money allocated by the ID is the largest sources of income of FOs. Other major sources are farmer contributions to the maintenance fund established by FOs, and profit from contractual work (Table 5). In previous financial year 11% of FO earned Rs. 60,000 or more and some 55% of them earned less than Rs. 20,000 (Table 6).

In 1999, Galnewa FOs earned a sum of Rs. 271,480. This comprised of profit from maintenance contract(87%) farmers' contributions to the maintenance fund (14%), membership fees(1%), other income (1%). About 29% of FO received over Rs. 60,000, 14% between Rs. 40,000 – 49,000, 29% between Rs. 20,000 – 29,000,29% less than Rs. 19,0000. According to the socio-economic survey conducted by Mahaweli Reconstruction and Rehabilitation Project in System H in November 1999, some 85 percent of farmers are willing to organize maintenance fund and accept responsibility for maintenance of roads.

(c) *Monitoring and evaluation*

PMs having completed the task of establishing FO, and are now on a rather a motionless, desk-bound job of sending reports to the head office and a coordinating role that is increasingly going in the direction of back seat guidance. Officers from the Colombo office also visit the projects.

In all schemes studied PMs have developed a system of monitoring and evaluation. The relevant charts are displayed in public at the project office, and they are easily comprehensible. The FO are being evaluated and graded periodically by the PMs. This way the PMs make sure the FO officials attend project management meetings regularly. Normal monitoring of FO activities is done at the monthly review meeting held at the PM's office under his chairmanship.

(d) *Supply of inputs and services*

The PMs were expected to develop closer personal connections with the line agency officials in the course of their official work to coordinate the delivery of inputs and services for agricultural production. Most PMs interviewed pointed out that they have developed personal links with the line agency officials and it is only due to that they respond positively to the INMAS initiatives such as attending meetings and responding to other requests made by them. However, the PMs described the line agency officials as being less supportive of the INMAS program as they are committed to their own programs (in some cases with their own FO), and used such the expressions as “doing the job single handed” “towing-on” and “own-effort” to describe their experience. According to the PMs, the INMAS model did not achieve the objective of coordination of line agencies as envisaged.

Mahaweli system has succeeded in achieving line agency cooperation due to its centralized system and hierarchical order. The Block Manager has and does exercise powers to command and direct officers of other line departments who are administratively attached to the Mahaweli System and whose offices are in the same premises.

(e) *Project Management Committee*

Project Management Committees were created at the system level and vested with the responsibility of coordination, planning and allocation of resources, and review of progress of work undertaken in the respective schemes. It meets monthly under the chairmanship of the Project Manager usually at the PMs office. According to Project Managers, the attendance at meetings by government officers is unsatisfactory though the FO leaders attend the PMC meetings regularly. The poor showing of officers is because many of them perceive INMAS as an 'outside' program because they receive no financial incentive.

The majority of the FO (94%) considered their relationships with the PMC as being satisfactory or moderately satisfactory. Three FOs from Kirindi Oya and Muruthawela reported that they had no relationships with the PMCs. Most FO leaders expressed their disappointment about the lack of enthusiasm of government officials to assume responsibility and implement decisions taken at the PMC. Certain grass roots level officers like the govi-niyamakas of the Ministry of Agriculture do not participate in the PMC preferring "to work independently".

3.1.2 Impact

The impact of the performance of INMAS program is positive in terms of implementation of participatory irrigation management through the PMC and FOs. However, the program's objectives of commercialization, farm credit, savings, price stabilization, industrialization, marketing involves issues that are complex and not amenable to effective solution by INMAS type interventions. These areas come under the purview of various other government agencies over which the authorities involved with INMAS do not have much control. Any interventions by IMD and PMs in these areas has to be through goodwill and persuasion rather than through formal lines of authority. The emphasis on 'program' and 'moving goals' suggest continuity in contrast to 'project' that has a definite time frame. They also contradict the 'sun-set principle' while partly contributing to identity formation attached to permanent status.

Although participatory irrigation management was initiated on experimental scale since the early 1980s, widespread adoption of participatory management did not occur until much later on a ministerial directive. This is not matched by the 'flexibility' principle and the recognition on variation of ground situation written into the design of the program.

The Sinhala terms used by the IMD such as *Vyapara Adhikari* projects an image more of authority than a coordinating and motivating function that is ostensibly counter to the fundamental values upon which participatory management is based and the present role of back seat guidance.

The concept of catalytic role assumed by the PMs in the formative years of FO has been transformed into an identity attached to a permanent status in the process of implementing the INMAS program, resulting in adjustment problems for the PMs after completion of their main task. The present function of back seat guidance does not require full time involvement of project manager who remains under-employed. Personally, they prefer to be more actively engaged; yet, they are not sure of the specific areas of potential activity. Further, the perceived lack of promotion prospects and uncertainty about the INMAS program has contributed to frustration and a general lack of motivation to complete the transfer task.

3.2 Performance of FO

Responsibilities of FO set up under INMAS were largely connected with operation and maintenance of the physical system. Other responsibilities were to motivate farmers for water management, participate in the decision taking, and obtaining inputs and services. These responsibilities may be grouped in terms of the categorization of INMAS objectives as follows for convenience in examining performance.

Maintenance of irrigation facilities

- Identification and prioritization of areas for rehabilitation
- Canal maintenance with farmer assistance
- Organize *shramadana* for work under ID supervision
- Contractual work under ID supervision

Irrigation Management

- Water distribution and rotational water issues within field canals
- Motivate & encourage farmers for on farm water management
- Inform and check irrigation offences
- Participate in decision taking on agriculture and irrigation
- Submit proposals on irrigation and agriculture to PMC

Support Services

- Obtain inputs through PMC participant agencies
- Inform authorities the problems of pests and diseases
- Organize sale of produce through authorities
- & M Cost recovery
- Inform authorities regarding crop damages

3.2.1 *What has been done*

Maintenance of Irrigation Facilities

FOs identify the critical areas of the irrigation system and indicate priority areas for rehabilitation and repair. They also maintain and clean channels with the assistance of farmers in addition to organizing *shramadana*. The maintenance of irrigation channels and drainage channels is by the individual farmers or performed collectively by farmers. FOs also handle maintenance work on contract under supervision of the Irrigation Department either directly or by sub-contracting with other individuals charging a commission of 5% of the value of the estimated cost of the construction. A majority FO officials interviewed claimed that government expenditure for operation and maintenance has progressively decreased after handing over the responsibility to FOs.

Table 7 gives farmers' assessment of maintenance activities performed by FOs. A majority (80%) of the farmers claimed that maintenance field and distributary canal maintenance was very good or good. Repair of irrigation structures was considered to be unsatisfactory by over 30% of the farmers, while 44% said it was good and 20% thought it to be very good. Road maintenance was considered unsatisfactory by more than 50% of the farmers and this was confirmed by our observations in the field. The main reason appears to be the lack of authority over the roads. Some roads owned by the Irrigation Department were badly neglected due to lack of funds.

Irrigation Management Functions

(a) Water distribution and rotational water issues within field canals

Water distribution within the distributory canal is done by FO. Majority (58%) of the FOs surveyed claimed that they attend to the opening and closing the main gate of the distributory canal whereas in 42% of the cases the irrigator of the department of irrigation does it. FO has appointed farmers to do this job who are, in many cases, field channel representatives (Table 8).

(b) Motivating farmers

FOs have encouraged and motivated farmers for improving on-farm water management. Head reach farmers appreciate the water scarcity problems faced by the tail end farmers. They have elected tail end farmers to the FO leadership. Water problems are amicably settled at the local level. Farmers consider characteristics as honesty and integrity, commitment, public confidence as vital for FOs leaders (Table 8). Experience in being a farmer leader (good leaders are re-elected) and holding leadership in other community organizations are also taken into consideration selecting FO leaders. Political connections are preferred for FO leadership positions. Several FO (including Mahaweli H) have leaders from either the two main political parties. Minneriya and Kaudulla are conspicuous in having some tail-end farmers in their leadership. In the Southern schemes, FOs recognized educational qualifications as part of resourcefulness (Table 9).

In terms of leadership qualities are concerned, the Mahaweli farmers also think in similar lines as INMAS farmers. The most valued quality is honesty and integrity followed by other qualities as commitment, experience in leadership role, sociability / popularity, public confidence and education. At least in some cases, being a tail end farmer is also an important factor to qualify for leadership in farmers' organizations. Success in farming, forging connections with government offices or being a youth are not among the valued leadership qualities in the perception of Galnewa farmers.

Many PMs noted that politicization of FO is widespread. A majority of farmers described the politicians' influence as negative. However, the FO observed the positive aspect of maintaining a line of communication with the politicians to 'move' the administration. The government officers are faulted for not implementing the PMC decisions and this affects the social standing of FO. In the sample, there were seven members of local bodies who stated that the political power enhances meeting FO responsibilities.

Communication is an important aspect of motivation. FO employs several methods to disseminate each type of information (Table 10). The mostly frequently used means includes posters, farmer representative, and meetings. Other methods used are loudspeakers and informal methods such as informing a few people who would gather at the boutiques or happen to meet on the way. On occasions, meetings convened by other organizations and institutions are used to convey FO messages. For example, "Funeral Aid Societies", "Temple Societies", and "Prayer Meetings at Mosque" are used to announce FO matters. This is largely an expression of leadership in various organizations at grass roots level being concentrated on a few individuals. A few FOs communicates with members formally by mail and hand-delivered letters.

In Galnewa the representative of the field channel group is the main channel for disseminating all types of information. Next in importance is FO and kanna meetings. Decisions on agriculture and water management taken at these meetings are conveyed to the farmers through the field channel representative.

(c) *Conflict Resolution*

Although farmers claimed that the incidence of various conflicts have increased, there has been a decline in irrigation related disputes since the introduction of the INMAS program. Conflicts relating to water distribution are resolved amicably by the FO at the local level. FOs have also resolved land tenure disputes and conflicts over the boundary of the fields. Overall, FOs have settled 78% of the conflicts referred to them by the farmers (Table 11).

FOs do not impose fines except for crop damage by stray cattle. FOs complain about not having real powers for enforcement. However, despite the provisions allowed in the law, FO leaders have not found it necessary to pass their own rules and regulations. They are not sure if the by-laws passed by FO are binding on the farmer. They also do not have the resources to retain lawyers for law suits. In such circumstances, FOs solicit the intervention of PMs for conflict resolution.

(d) *Relationship between FOs and PMs*

Tables 12 and 13 gives FOs assessment about their relationship with Project Management Committee and with other government and non-governmental organizations. Over 94% of FO described the relationship with the project management as satisfactory or moderately satisfactory. About 80% FO described their relationship with government institutions as being moderately good or satisfactory. FO officials also indicated that they maintain good relationship with fellow farmers and other FO (Table 14).

The majority of farmers including some non-members particularly in the south, attend the office bearer election meetings and other general meetings. Participation is higher at the general meetings convened to elect office bearers (Table 15). The office bearer election meetings are held annually. General meetings are held pre-seasonally or when required. The committee meets monthly or whenever necessary.

Service objectives

Irrigation management is main function of FOs. Other services organized by the FOs include arranging credit facilities, marketing, perennial crop development including organizing cultural events. Table 15 gives assessment of the made by the FO leaders of the services rendered by their respective organizations. Activities relating to irrigation management were discharged satisfactorily. Most of the FOs were not involved in input supply and the provision of other services as identified in Table 16.

In Galnawa some, 71% of FOs supply seed paddy, and 43% FO supply perennial crops seedlings, fertilizers, credit and credit coordination. The majority of FOs organize welfare services, community development and cultural activities. They do not supply chemicals, tractors, other machinery and implements, or services like marketing of produce.

3.2.2. Impact

Self-assessment of the overall performance of farmer organizations by their leadership indicate that in their perception farmer organizations have made significant contributions in many areas (Table 17). Most of them (91%) were of the opinion that farmer organizations are an essential institution for effective management of irrigation systems. They also felt that the establishment of farmer organizations had improved the relationship between the farming community and government agencies and are also capable of resolving local conflicts and uniting farmers. A majority of the FO leaders felt that the FOs are socially recognized.

An important indicator of success of the INMAS program is how farmers perceive the performance of Farmer Organizations. During the field survey farmers were requested to assess the overall performance of their FO's in terms of financial matters, maintenance of DC's, distribution of water, land and water

conflicts and communication. Farmers' response are shown in Table 18. Around 80% of the farmers consider the performance of FO's as very good or good in terms financial, maintenance of irrigation canals, water distribution and resolving land and water disputes. Their best performance was in regard communication and information dissemination with about 90% of farmers' judging their performance good and very good.

A further analysis was undertaken to determine whether there were variations in farmer perceptions of the performance of FOs between schemes with different resource endowments and management intensity. The results are given in Table 19. The analysis showed that with respect to most functions, there were no difference in the assessments of FO functions between resource rich and resource poor schemes. Similarly, there were no differences in farmer perceptions in the performance of FOs in respect of most functions in the high and low intervention schemes (see Annex 2 for the definition and categorization of schemes by resource endowments and level of intervention). The only difference in farmer perceptions were with respect to financial management and land conflict resolution between resource rich and resource poor schemes, and in communication between the high and low intervention schemes

Table 20 gives farmers' assessment of the irrigation management by FOs. The majority of the farmers indicated that with the establishment of FOs the adequacy, reliability, and allocation of water had improved. However, nearly 40% of the farmers interviewed believed that the irrigation structure and conditions of the canals had worsened after their maintenance had been handed over to farmer organizations. These findings uphold the results of a study carried out in 1996-97 in 50 selected schemes which showed that there were serious under-investment in maintenance in the transferred schemes. This poses major concerns about the long term sustainability of the irrigation system.

Categorical analysis was done to determine whether farmers' assessment of irrigation management functions of FOs varied with schemes with different resource endowments. The results are presented in Table 21. The analysis showed that there is a statistically significant difference between resource rich and resource poor schemes of farmers' assessment of the adequacy and reliability of water supply under FO management. Results also showed that there was a greater improvement in adequacy and reliability of water supply in the resource poor schemes than in resource rich schemes. This suggests that water management may have improved in the resource poor schemes as a result of INMAS intervention and the establishment of FOs. Farmers' assessment of the FOs handling of water allocation, conflict resolution, maintenance of irrigation facilities were higher in the high intervention than in the low intervention schemes. This suggests interventions such as physical rehabilitation followed by close involvement of PM and staff is influential in improving irrigation management.

The conclusion that emerges is that farmers' are satisfied with the way FOs functions irrespective of whether the scheme is well-endowed or not, or the level of intervention. A greater proportion of farmers were unsatisfied with financial management and land conflicts in resource rich schemes than in resource poor schemes. Similarly, communication was assessed to be very good in low intervention as compared to high intervention schemes. It is possible that in resource rich schemes there are greater financial inflows leading to more problems in finances. Land problems may be aggravated because of competition for land, which would have premium value in resource rich schemes with greater water availability.

3.3 Impact on agricultural production, enterprise development, household income

3.3.1 Agricultural Production

An important objective of the INMAS program is to improve agricultural performance and farm incomes in the major irrigation schemes (see section 2.3). This section assesses the impact of the INMAS on agricultural performance in terms of improvements in paddy yield, cropping intensity, and the development of home gardens.

(a) *Impact on paddy yields*

During the questionnaire survey farmers' were asked to compare their paddy yield before and after the implementation of the INMAS program. About 40 % of the farmers claimed that they had obtained higher paddy yields since the introduction of the INMAS program. Some 24% had reported a decline in yield and the rest no change. Table 22 summarizes reasons given by farmers for the change in yield. Increased use of fertilizer and better seed quality were the major reasons given by farmers for the yield increase.

Variations in paddy yields and cropping intensity were compared between resource rich and resource poor schemes and between high intervention and low intervention schemes, to determine whether there were any significant differences between these groups. The results of the analysis are given in Table 23. Paddy yields in both maha and yala seasons, and cropping intensities in the high intervention and resource rich schemes were statistically significantly higher than the mean values in the low intervention and resource poor schemes. This suggests that higher level of physical interventions such as rehabilitation combined with improved management do contribute to yields and cropping intensities.

(b) *Cropping patterns and cropping intensity*

Cropping patterns have not changed much in the schemes. Paddy remains the dominant crop in *maha* and *yala*. Other crops grown, include chillies, onions, cow pea, maize, black gram, soy bean, tobacco, and vegetables. The mix of crops has not changed in recent years, the farmers opting for familiar crops than new crops. Crop diversification has apparently not taken off, due to high cost of production, fluctuating output prices, and possibly lack of technical know.

Only a small proportion of the farmers claimed that there had been an increase in the area they cultivate after the introduction of the INMAS program. The cropping intensity remains low. The average cropping intensity on paddy lands was 1.53 for the year 1999 / 2000. The average cropping intensity including other crops was estimated at 1.55 for the same year.

(c) *Home gardens development*

The main perennial crops grown in home gardens are coconut and banana and other such aak, lemon, mango, cadju and teak trees. Farmers claimed that the Project Managers were responsible for promoting the cultivation of perennial crops in home gardens and is considered a positive contribution of the INMAS program.

3.3.2. Enterprise development

Attempts were made under INMAS program to develop small business enterprises. However, the achievements were modest. Only about 13% of the farmers from the eight selected schemes received assistance from FO for small enterprise development. The bulk of the enterprises was in agriculture and including livestock development, perennial crops, coconut nurseries and and in a few cases establishing groceries and retail outlets for agricultural inputs.

3.3.3 Household incomes

Table 24 gives the composition of household income in the selected schemes. Average household income in the sample area was Rs 32,635 per annum. On average the largest contribution to household income was

from non-farm employment which accounted for about 64% of the total income. The contribution from paddy production accounted for 32% to the total income. About 25% of the households reported non farm employment of household members.

Table 25 gives the sources of off-farm employment. If we examine the pattern of non farm employment, more than half of those employed outside the farm held government jobs, mostly in the armed forces. Survey results revealed that other sources of off-farm employment included garment factory work (11%), business (15%) and wage labour (12%).

4. ANALYSIS OF INMAS

The INMAS program's main thrust is on farmer participation in irrigation management. Its economic justification was based on the relationship between efficiency in the use of irrigation water and higher productivity on one hand and between farmers' contribution to O & M and the concomitant reduction in government expenditure on the other. Other justifications were based on the utility value of farmer organizations for dialogue, education, supply of inputs and sale of produce. In the long run the planners hoped to achieve commercialized production, crop diversification, marketing, community development, and transfer of management to the farmers.

As an institutional intervention, INMAS was founded on several key principles of management: delegation, flexibility, insulation from political interference, integration of services, stakeholder involvement and teamwork. The mechanism adopted was creation of a special division in the ministry, project management committee, resident project manager, and farmer organizations.

The scope of INMAS program encompassed construction, management, services and production. The research found evidence of near unanimous agreement that INMAS program did not achieve all the objectives it envisaged. Whereas social reality is not static but dynamic, the assessment of achievement itself is a degree of measurement. The program is not a total failure or complete success. In the following sections the achievements and reasons for failures are analyzed.

4.1 What has been achieved

INMAS program was the first national effort at participatory irrigation management. Whilst INMAS has been in progress, many schemes were rehabilitated or modernized with support of foreign aid. The INMAS program contributed to this process both in terms of identification of areas needing attention and farmer participation through FO. These intervention programs had recommended farmer participation as a precondition for loan assistance to rehabilitate or modernize the irrigation schemes following INMAS experience, which shows that INMAS also enabled inflow of capital to the locality.

4.1.1 Maintenance of Irrigation Facilities

FOs are satisfied they have accomplished more work than what is generally acknowledged. Apart from resource mobilization for the maintenance of irrigation facilities, there were instances of FOs carrying out farm road construction. Road construction projects at community level attract people's participation. The quality of maintenance work performed by FO in their respective areas gives a mixed picture. The irrigation authorities expressed reservations on the quality of work whilst acknowledging good quality work by some FOs. The FO officials confessed that where the FO are directly involved in maintenance, the quality of work was good as opposed to when such work is given to others on sub-contract basis. The farmers also expressed mixed opinions about the quality of work. The overall mixed picture confirms the previous findings (IIMI/HKARTI, 1997; Samad & Vermilion 1999).

Farmers' awareness of the complexity of the issue is positive: leaving construction activities in the hands of the government is not an option because of previous experience and also because the government has inadequate funds for canal maintenance.

4.1.2 Management of Irrigation Systems

INMAS program demonstrated its emphasis on management through the appointment of Project Managers with exposure to social sciences, the creation of Project Management Committee and the establishment of a special Irrigation Management Division in the Ministry of Irrigation. This was an alternative to management of irrigation schemes by irrigation engineers. Engineers now recognize the importance of

management. The IMD itself has personnel with engineering background at the head office who have developed the interdisciplinary frame of mind useful in management.

The objective of creating a forum for dialogue and interaction among farmers, and between farmers and officials on irrigation and the related needs has been achieved with the establishment of FO and the PMC. The FO leaders agreed that the government officers are now keen to know farmers' views although action is generally delayed. Both FO and PMC as institutions are functional, and the idea of a Resident Project Manager to set up and guide FO at the project level proved useful in the formative years. In the course of time the PMs were made permanent in their position, and this ensured continuation of the program although it ran counter to the idea of a temporary catalytic role. After the transfer of management responsibilities to FO the PMs have been instructed by the IMD to give back seat guidance to the FO.

FO have been organized and developed successfully to facilitate participatory management. FOs are socially acknowledged as a useful institution. Most farmers are members of FO. Generally the leaders are elected on moral uprightness. In the scheme located in the south, educational level is recognized as the most important factor in the selection of FO leaders.

4.1.3 Input Supply and Services

The objective of better coordination of services has been achieved to a limited degree due to personal connections the PMs have developed with the government officers. Out of the total number of FOs surveyed some 37% were actively involved in fertilizer distribution, 31% in the supply of seed paddy and 47% were involved with assisting farmers to obtain credit facilities from the Banks. An important service provided by FOs is conflict resolution. FOs were involved to with the provision of other services such as extension, farm equipment and machinery. In all locations the FOs were deeply involved with community development activities and cultural events.

4.2 What has not been achieved and why?

4.2.1 Maintenance activities

The instances of relatively low quality of maintenance work for which FO are responsible are attributed to several factors identified during the fieldwork. Chief among them according to FO officials is the practice adopted by some FO to sub-contract the maintenance work with the informal help of some of the irrigation officers. Another reason is the deficiencies in the supervisory role performed by the Irrigation Department, which in some cases is related to the sub-contracts. In other cases, FO officials claim that, although deductions are made in the books on account of supervisory visits to the sites these visits are not actually made. These are not reported to the higher authorities because FO fear that they would be victimized by the officers. A third reason is the disregard of FO views by irrigation authorities. However, the Irrigation Department cannot entertain all FO requests because it has only a limited budget for maintenance work. Fourth, turn-over of canal maintenance responsibilities was organized before the canals were satisfactorily repaired, on an undertaking by the Irrigation Department that it will do it later on. Fifth, some FO officials manipulate the members to get re-elected. Yet another reason is the presence of part-time farmers ("farmers for the name's sake") in the leadership of FO.

4.2.3 System Management

The management principles adopted in the design of the program generally did not work in reality. The main reason for this is related to resource control. With control of resources remaining in the hands of the government, no tangible progress could be made in respect of delegation of authority, flexibility, insulation of FO from political interference, and integrated management of water resources.

Part of the reason for not achieving the management objectives is attributable to the over ambitious and contradictory nature of the objectives. Whereas the program was designed with the focus on turning over O & M responsibility to the farmers, the other objectives such as commercialization, industrialization, marketing were too ambitious to be achieved through the field level adjustments. The accent on participatory management is also not compatible with the expected role for arranging prosecution of offenders under the Irrigation Ordinance.

At the project level, the dialogue and interaction between the officers and the farmers has not always matched the expectations of the farmers. The officers' keenness to talk about the farmers' problems has resulted in raising expectations of the farmers. When farmers' problems remain unresolved the FO officials lose face with the farmers.

The "catalytic role" of the Project Managers turned into a permanent feature instead of withdrawal after turn over. This was primarily because the FOs became dependent on PMs. They felt that interventions by an government agency was more effective than FOs acting alone. FOs perceived that the involvement of the PM meant government support of their actions.

According to the PMs, the coordination of various inputs from respective line agencies was limited. This is partly because the perception of that the PM is not a powerful position vis-à-vis, for example, the Resident Irrigation Engineer. If not for PM's regulatory powers over payments for O & M payments he/she has hardly any symbolic power, and is left only to meet with the FO leaders. Officials from other agencies are not paid financial incentives for participating in INMAS activities. They have their own programs for which they are responsible adding to the difficulty in achieving line agency coordination for INMAS purposes. Therefore, the administrative control allowed to the PM over other agency officers has not worked in practice. The PMs point out that the hierarchical system adopted by Mahaweli Authority is successful in achieving coordination. In the INMAS system, the problems of coordination are communicated to the District Secretary directly by the PM or by the FO themselves.

4.2.4 Agricultural Production

INMAS intervention has not had a marked impact on agricultural productivity. Although farmers are market-oriented, only minimal increases in the area cultivated and the yield levels were achieved, and the yield still remains below the potential. The cropping intensity is low and the cropping patterns are rather static.

Crop diversification failed due to high cost of production, fluctuating output prices, and possibly lack of technical know. The proportion of land under such crops as chillies and onions is too small to influence farm family income despite the relatively high returns. Unlike paddy these crops are perishable and carry greater risk due to market failure.

4.2.5 Input Supply

Although the FO have a mandate get involved with input supply and marketing of farm produce under the INMAS program, only a few FOs were involved with these activities. Private traders are actively involved with input supply and it will difficult for FOs to compete with the private trade which is well-established. Moreover, most FOs do not have the basic infrastructure (stores etc) for them to actively engage in retailing agricultural input and produce marketing.

4.3 Is it time to activate the “Sunset” Clause?

The INMAS program has achieved one of its main tasks – transfer of O & M responsibilities from government agencies to farmer organization. The government has benefited from increased savings on its O & M budget. In addition to O & M, FO play an important role in conflict resolution by resolving disputes amicably. They also contribute to the decision taking process by participating effectively at PMC meetings. The primary benefit of participatory management was the improved relations between farmers and irrigation agency personnel. They have not been very successful in mobilizing funds to carry out major repairs. The Irrigation Department continue to provide resources to FOs to undertake maintenance. The key issue then is if INMAS has achieved its main objectives, and if the FO can perform the relevant tasks as expected (despite quality issues), whether INMAS is set for sunset closure.

In terms of objectives ancillary to irrigation management, the INMAS program has fallen short of expectations. These are additional objectives of INMAS although they are in line with the ideas of moving goals, the program and the provisions in the Act. Some of the tasks, particularly the provision of services – inputs, credit, extension, marketing – are optional rather than mandatory. Private traders are actively involved in retailing inputs and produce marketing. State agencies like CWE also intervene in produce marketing. FO involvement in commercial activities has popular appeal. But, in reality the comparative advantage FOs have over private traders and public sector agencies may not sufficiently attractive for FOs to continue with commercial activities over longer periods.

Although FOs are a legally recognized institution and have power to enter into legally enforceable contracts and pass by-laws, FO leaders are generally ignorant about their legal powers. FOs were critical of their perceived lack of legal powers to penalize those who do not comply with their decisions. At present they act by persuasion and by appealing to the accepted social values for consensus and agreement rather by resorting to legal provisions vested with them through the Irrigation Ordinance and the Agrarian Services Act. Moreover, a majority of FOs do not have funds to pursue cases in the court of law. In these instances FOs seek the intervention of PMs who use their official status to get defaulters to comply.

Overall FOs are still not very competent in financial management. They have not acquired capacity to maintain accurate accounts of their financial transactions or to make estimates for maintenance contracts

The conclusion that emerges is that FOs are not fully competent to function as a viable and independent management entities. They continue to depend on government officials to carry out their functions. However, The extent to which the dependency syndrome is nurtured by agency officials acting in self-interest needs to be investigated. The experience at Ridi-Bendi Ela suggests that with the correct incentives and appropriate support, farmer communities are able to adopt independent management of irrigation schemes.

From PMs and IDOs point of view the INMAS program and the IMD should continue. Security of employment is their foremost consideration. This is a reasonable concern. They too perceive that their role to set up farmer organizations has been largely fulfilled and believe they have a useful role play in providing support services to FOs. But, this is an area that needs to be clearly defined. Most of the FOs leaders who were interviewed wanted the PMs office to continue. The mere presence of a government agency in the irrigation system gives farmers a sense security.

5. SUMMARY AND RECOMMENDATIONS

5.1 Summary of Program Outcomes

5.1.1 Objectives and scope of operations

The overall aim INMAS of the program was to improve the productivity of land and water in the major irrigation schemes in Sri Lanka by enlisting farmer participation in management. The program placed a heavy emphasis on an integrated approach to management of physical and human resources. Over time the program broadened its scope with the addition of various objectives: water management, cost recovery and resource mobilization, input supply, credit, savings, extension, home gardens, livestock, fishery, forestry, industrialization, sale of produce and marketing and community development. These objectives made INMAS a complex program and rather unwieldy. The primary objective of efficient water management through farmer participation was overwhelmed by the desire to address major systemic issues that are not amenable to solution by INMAS type of intervention. This led to a partial loss of focus of the program as the years passed by.

5.1.2 Participatory management

The INMAS program succeeded in enlisting farmer participation in decision making by making farmer organizations a constituent of the PMC. This facilitated interaction and dialogue, also raising the expectations of farmers whose problems were the subject of discussion at the PMC. There is evidence that participatory management has improved water distribution, but the impacts on provision of other support systems is mixed. Thus, the primary benefit of participatory management was the improved relations between farmers and irrigation agency personnel. The major burden falls on the farmer leaders who carry out the responsibilities vested with them purely on a voluntary basis. How long they will perform a voluntary service is worth considering.

5.1.3 Operation and maintenance

Farmers and agency officials acknowledge that farmer organizations established under INMAS have played a useful role in water management. Despite some initial success in cost recovery, the government changed its position due to political pressure and favored a system that encourages farmers' to concentrate on input supply and O & M activities. INMAS program adjusted itself accordingly and was successful in obtaining farmers' contribution to O & M in the form of labour and material (occasionally cash), resulting in progressively reduced expenditure to the government thereby increasing savings for the national budget.

Conversely, the farmers' contribution by cash and labour increased in respect of O & M. Where labour is concerned, INMAS program contributed to employment generation in the paddy sector – the largest private sector of the country. The largest employment absorption has been in the sub-sector of infrastructure development where further potential remains.

The assessment of quality of construction work by FO gives a mixed picture. Most FOs do not have the capacity nor adequate resources to undertake construction activities. They either sub-contract construction works or attempt to do these by themselves. Low quality work is attributed to the incidence of sub-contracting and problems of supervision.

5.2 Future Alternatives

Where irrigation management is concerned the alternative styles of management are agency management or bureaucratic management, management by farmers, and joint management. In the context of increased population, sub-division and fragmentation of land, encroachment, and low productivity, other conditions being equal, what system of management appears having the best chances of success?

Given that the government continues to be responsible for of the management of the main system, and that it does not have sufficient funds for upkeep of the distributory system, the option available is a joint management system. Besides, farmers' participation cannot replace institutions with specialized knowledge and powers of administration of an Act of Parliament. However, given the experience of INMAS what improvements to management system can be suggested?

In this regard, the next step would be empowering FO to empowering FOs to be independent decision making bodies with government agencies providing technical expertise. FOs should be trained in resource mobilization and monitoring procedures. The available funds for O & M should be announced before the year begins and be transferred to the FO federation for allocation among the FO. Similarly, FO should announce the value of its contribution before the year begins. The FO through a process of interaction should be allowed to decide on priorities for allocation of the total value of the joint contribution. No outside officer should be allowed a role in this connection.

Once the funds are allocated, the respective FO should take responsibility to expend it in terms of various projects designed with community participation. The system of sub-contracting to individuals must be completely done away with.

IMD and the Irrigation Department should be involved with monitoring and evaluation and thereby ensure that quality is not compromised. This system is an alternative to the system of nominal system of participatory management, and allows space for manifestation of the management principles adopted at the time INMAS was designed.

Where marketing and supply of inputs are concerned, the role of FO should not be that of a commercial organization that works under different parameters. FO could be requested to indicate the requirements, rather than taking over the functions. Private organizations should be allowed to develop to cater to these needs.

One option that merits further consideration is the setting up of farmer companies which can operate effectively in liberalized market conditions. The replication of the Ridi Bendi Ela Farmer Company model in other schemes merits attention.

Thus far INMAS interventions have been confined to the individual irrigation scheme. An alternative to this in future is river basin development and regional development that calls for planning in a wider framework than seasonal planning associated with water issues.

5.3 Development Strategies Recommended

The future program of IMD and INMAS should be formulated in terms of a few key objectives followed by a clear understanding of the issue/s to be dealt with.

INMAS should continue to address O & M as the main focus. The value of farmers' labour contribution should be evaluated realistically and recorded.

INMAS should pay attention to river basin development and regional planning rather than remaining within the scheme. The IMD and PMs cadre have valuable experience in mobilizing of rural communities.

This experience can be utilized to promote wider participation in natural resources management, with a particular focus on water resources, that is expected to become a priority in Sri Lanka. IMD is well placed to contribute expertise to the process of formation of river basin organizations in collaboration with the Water Resources Secretariat/Authority and the transformed Mahaweli Authority.

With respect to the continued support to farmer organizations created under the INMAS program a core group of PM should be retained at the IMD office in Colombo, or in two regional centers. This core group should become a training resource able to help train new and existing officers of FOs. A clear program for withdrawal of project level officers should be established and FOs given sufficient notice of the need to adopt full O&M responsibilities. A realistic target would be to withdraw all PMs from field offices in three years.

Tables

Table 1. Farmer organizations according to length of existence

Name of Scheme	Total No. of FO	Period of existence		
		< 5 years	5 – 10 years	>10 years
Nachchaduwa	11	1(9)	2(18)	8(73)
Mahakanadarawa	15	0	5(33)	10(67)
Minneriya	14	0	0	15(100)
Kaudulla	15	0	0	14(100)
Tabbowa	6	1(17)	3(50)	2(33)
Devahuva	8	0	5(62)	3(38)
Kirindi Oya	15	0	2(13)	13(87)
Muruthawela	20	0	7(15)	13(65)
All Schemes	100	2(2)	20(20)	78(78)

Source: Survey data – IWMI 2000

Figures in parentheses gives percentages

Table 2. Farmer organizations according to legal status

Name of Scheme	Total no. of FO	% FO reporting registered under		
		56A	56B	No response
Nachchaduwa	11	73	18	9
Mahakanadarawa	15	60	13	27
Minneriya	14	50	43	7
Kaudulla	15	47	53	
Tabbowa	6	33	50	17
Devahuva	8	62	37	
Kirindi Oya	15	73	13	14
Muruthawela	16	55	20	6
All Schemes	100	60	30	10

Source: Survey data – IWMI 2000

Table 3. Membership of Sample Farmer Organizations

Name of Scheme	Membership at inception	Present membership	Increase in membership %	Active Members %	Non member households
Nachchaduwa	1424	1491	5	26	1870
Mahakanadarawa	1486	2087	40	45	1481
Minneriya	2499	3442	38	33	833
Kaudulla	2502	3101	24	31	1300
Tabbowa	548	863	57	28	30
Devahuva	387	1198	210	26	682
Kirindi Oya	1828	2353	29	37	249
Muruthawela	768	1190	55	40	595
All Schemes	11442	15725	34	34	7040

Source: Survey data – IWMI 2000.

Table 4. Incidence of and reasons for change of leadership

Name of Scheme	All FO	Changed	Reasons for change of leadership						
			A	B	C	D	E	F	G
Nachchaduwa	11	11	1	0	0	2	6	0	2
Mahakanadarawa	15	12	0	5	1	0	6	0	3
Minneriya	14	13	0	1	8	0	2	2	1
Kaudulla	15	15	2	3	7	0	3	0	0
Tabbowa	6	5	0	0	3	0	1	0	1
Devahuva	8	8	1	0	3	0	1	1	0
Kirindi Oya	15	14	1	1	5	0	7	0	1
Muruthawela	20	13	2	2	3	0	7	0	2
All Schemes	100	91	7	12	30	2	33	3	13

Source: Survey data – IWMI 2000

Notes: A = Financial irregularities, dishonesty; B = Inefficiency; C = Loss of public confidence; D = incapability; E = voluntary resignation; G = Did not change

Table 5. Sources and amounts of income by farmer organizations

Scheme	Membership fees	ID Grant	Development Fund	Contract profit	Others	ALL
Nachchaduwa	7,021	126,400	45,000	112,000	42,050	332,471
Mahakanadarawa	4,972	218,183	90,228	36,600	14,700	364,683
Minneriya	25	287,075	516,000	83,750	11,700	898,550
Kaudulla	500	185,810	24,500	88,500	45,100	344,410
Tabbowa	9,020	29,000	1,625	35,495	20,731	95,871
Devahuva	4,350	60,200	8,000	152,500	38,200	263,250
Kirindi Oya	28,550	55,761	2,050	57,786	14,900	159,047
Muruthawela	2,800	37,200	0	5,000	900	45,900
ALL	57,238 (2.3%)	999,629 (40%)	687,403 (27.5%)	571,631 (22.8%)	188,281 (7.5%)	2,504,182 (100)

Source: Survey data – IWMI 2000

Table 6. Distribution of income across farmer organizations

Income category	NCH	MAK	MIN	KAV	TAB	DEVA	KIRI	MURU	ALL
0 - 9000	3	3	1	1	2	2	6	14	32
10000 - 19000	1	2	1	9	2	3	5	0	23
20000 - 29000	1	2	1	2	1	1	3	0	11
30000 - 39000	3	2	0	0	1	0	0	0	6
40000 - 49000	1	2	1	1	0	0	0	0	5
50000 - 59000	2	0	4	1	0	0	0	0	7
60000 =<	0	2	6	1	0	2	0	0	11
No response	0	2	0	0	0	0	1	2	5
Total No. Fos	11	15	14	15	6	8	15	16	100

Source: Survey data – IWMI 2000

Table 7 Farmer assessment of maintenance activities by farmer organizations

Farmers opinion of Maintenance activities by FO	Assessment (% farmers reporting)			
	Very good	Good	Unsatisfactory	No opinion
FC maintenance	41	39	17	3
DC maintenance	39	42	18	1
Repair of structures	21	44	32	3
Road maintenance	12	35	51	2
Organizing Shramadana activities	26	52	20	2

Table 8. Operation of irrigation canals

Mode of operation	Distributory canal (% FO reporting)	Field channel (% FO reporting)
I D irrigator	41	
I D labourer	1	
F O irrigator	25	
F C representative	5	79
F O officers	11	16
Appointed farmer	16	5
All	100	100

Source: Survey data – IWMI 2000

Table 9. Leadership Qualities

Qualities	Nach	Maha	Minn	Kavu	Tabb	Deva	Kiri	Muru	All
1. Honesty and integrity	23 (12)	15 (8)	32 (17)	28 (15)	12 (6)	15 (8)	34 (18)	31 (16)	190 (100)
2. Commitment	12 (9)	19 (15)	23 (18)	16 (12)	3 (2)	9 (7)	24 (19)	23 (18)	129 (100)
3. Public confidence	8 (9)	9 (10)	10 (11)	7 (8)	9 (10)	8 (9)	18 (20)	21 (23)	90 (100)
4. Long time FO leader	10 (12)	13 (15)	14 (16)	15 (18)	4 (5)	6 (7)	15 (18)	8 (9)	85 (100)
5. Leader in other organizations	15 (19)	16 (20)	9 (11)	13 (16)	5 (6)	4 (5)	11 (14)	7 (9)	80 (100)
6. Education	6 (11)	6 (11)	4 (7)	6 (11)	3 (5)	8 (15)	11 (20)	11 (20)	55 (100)
7. Sociability / Popularity	5 (12)	10 (24)	7 (17)	9 (17)	2 (5)	2 (5)	3 (7)	4 (10)	42 (100)
8. Successful farmer	6 (16)	9 (24)	9 (24)	4 (11)	2 (5)	2 (5)	1 (3)	5 (13)	38 (100)
9. Connections with govt. offices	7 (27)	4 (15)	3 (12)	5 (19)	1 (4)	1 (4)	2 (8)	3 (12)	26 (100)
10. Being tail-end farmer	0	0	17 (85)	3 (15)	0	0	0	0	20 (100)
11. Political connections	1 (8)	4 (31)	0	4 (31)	2 (15)	1 (8)	0	1 (8)	13 (100)
12. Youthful leadership	0	0	2 (33)	2 (33)	0	0	1 (17)	1 (17)	6 (100)

Source: Survey data – IWMI 2000

Notes: Figures given in parentheses are percentages.

Table 10. Means adopted for communication of information

Type of information disseminated	Posters	FC reps	Few people	Loud speakers	Meetings
Pre kanna decisions	37	30	9	3	9
Kanna decisions	44	30	10	5	7
PMC decisions	21	45	8	2	19
Credit	12	27	4	1	19
Festivals	35	31	2	3	14
Seeds	22	26	7	1	15
Extension	13	6	1	0	16
Marketing	11	24	4	1	12
Government institutions	11	22	3	1	48
Special FO meetings	15	29	0	2	43
Audit reports	2	1	0	6	45
Accounts	1	1	1	0	90

Source: Survey data – IWMI 2000

Table 11. Conflict resolution by farmers organizations

Type of conflict	Incidence of conflicts		Settled locally		Referred out		All	No. of FO reporting incidence compared to the first years*		
	No	%	No	%	No	%		%	More	Less
Boundary	35	23	25	71	10	29	100	15	18	67
Water	66	44	64	97	2	3	100	32	28	40
Land	24	16	16	67	8	33	100	11	9	80
Damage by cattle	18	12	8	44	10	56	100	13	7	80
Negligence of Maintenance	6	4	3	50	3	50	100	3	1	96
All conflicts	149	100	116	78	33	22	100			

Source: Survey data – IWMI 2000 * Percentage and absolute numbers are same

Table 12. Assessment of Farmer Organizations of their relationship with the Project Management Committee

	Number of FOs Sampled	Unsatisfactory		Satisfactory		Moderately Satisfactory		Not Maintained	
		No.	No	%	No	%	No	%	No
Nachchaduwa	11	1	9	9	82	1	9		
Mahakanadarawa	15	1	7	9	60	5	33		
Minneriya	14			11	79	3	21		
Kaudulla	15			11	73	4	27		
Tabbowa	6			6	100				
Dewahuwa	8			3	37	5	62		
Kirindi Oya	15	1	7	8	53	4	27	2	13
Muruthawela	16			9	37	6	37	1	6
All schemes	100	3	3	66	66	28	28	3	3

Source: Survey data – IWMI 2000

Table 13. Assessment of external relationships developed by farmer organizations

Type of external institution	Assessment of relationships (% FO)			
	Unsatisfactory	Satisfactory	Moderately Good	Not Maintained
Government institutions	16	37	43	4
Regional Agricultural Committee	7	32	34	27
District coordinating committee	3	12	30	55
Private institutions	1	13	13	73
Non-government institutions	1	7	11	80
Other institutions	0	2	1	97

Source: Survey data – IWMI 2000

Table 14. Institutional relationships within the scheme

Type of Institutions within the scheme	Assessment of relationship			
	Unsatisfactory	Satisfactory	Moderately Good	Not Maintained
	No	No	No	No
Field channel groups	3	64	28	5
Farmer organizations	6	63	27	4
Other distributary canal organizations	2	63	31	4
Project management committee	3	66	28	3
Other institutions	3	15	10	72

Source: Survey data – IWMI 2000

Note: % and the absolute numbers are the same.

Table 15. Farmer attendance at meetings

Type of meeting	Attendance at meetings (% farmers)			
	Always	Some times	Rarely	Never
Office bearer elections	82	10	4	4
General meetings	70	14	7	8
Committee meetings	8	3	1	88
Field channel group meetings	13	7	3	76
Other meetings	0	1	0	98

Source: Survey data – IWMI 2000

Table 16. Assessment of services by farmer organizations

Services	FO reporting assessment*			
	No Service	Very good	Relatively good	Not satisfactory
Water distribution information	2	57	39	2
Water management advice	4	49	42	5
Irrigation shramadana	15	38	44	3
Conflict resolution	19	41	40	0
PMC representation	23	42	35	0
Seed paddy	69	12	16	3
Perennial crops	22	45	32	1
Other crops	81	11	8	0
Fertilizer	63	17	11	9
Chemicals	87	6	3	4
Tractors	95	3	2	0
Other machinery	95	3	2	0
Agricultural implements	84	13	3	0
Extension organization	10	43	43	4
Credit	87	7	2	4
Credit coordination	53	27	19	1
Marketing	85	5	5	5
Marketing coordination	68	11	17	4
Welfare	52	28	20	0
Community Development	67	16	16	1
Cultural activities	11	66	23	0

Source: Survey data – IWMI 2000

* Absolute numbers and percentages are the same.

Table 17. Self-assessment of performance by farmer organizations

Opinion statement	Strongly agree	Agree	Disagree	Strongly disagree
Farmer organizations have achieved all objectives	14	10	56	20
Farmer organizations contributed to the tail end farmers' increased awareness of the importance of water management	86	6	3	3
Farmer organizations are essential for effective management of irrigation systems	91	7	0	2
Farmers are more willing to work collectively when organized by farmer organizations	25	42	11	10
Physical rehabilitation is more effective than establishing farmer organizations to improve water management	11	8	20	61
Farmer organizations are capable of resolving local conflicts and uniting farmers	79	16	3	3
Identification of a suitable leader is crucial for effectiveness of farmer organization	96	4	0	0
Periodic changes in farmer organization leadership reduces the effectiveness of the organization	21	18	20	41
Less land is left fallow during yala now because of farmer organizations	55	18	5	16
Farmers prefer contractual work and individual payments rather than community action	52	21	10	15
Farmer-officer relationship has improved due to farmers' organizations	72	20	5	3
Farmers' ability to bring their problems to the authorities has improved due to farmers' organizations	89	11	0	0
Government officers demonstrate an interest to know the farmers' views at the PMC	55	28	6	6
Because farmer organizations are legalized, registered and connected to the government agencies they are constrained to work independently	18	26	19	37
Imposition of punishment has strengthened and increased the efficiency of farmers' organizations	17	9	9	45
Because of farmer organizations mutual understanding between and among government officers has improved	74	20	2	4

Source: Survey data – IWMI 2000

Table 18. Farmers' assessment of functions of farmer organizations

Functions of farmer organizations	% Of farmers reporting		
	Very good	Good	Not Satisfactory
Financial	45	36	19
Maintenance of DC	42	39	19
Distribution of water	43	42	16
Water conflict	38	43	19
Land conflict	31	48	21
Communication	61	31	8

Source: Survey data – IWMI 2000

Table 19. Categorical Analysis of Functions of Farmer Organizations

Functions of Farmer Organizations	Estimated Statistic		
	RR / RP	LI vs HI	HI/LI & RR/RP
Financial	7.7*	0.4	7.8
Maintenance of DC	3.5	2.4	8.1
Distribution of water	1.7	0.5	5.6
Water conflict	0.2	1.2	5.0
Land conflict	6.6*	0.2	12.2
Communication	1.4	6.7*	27.4**

Source: Survey data – IWMI 2000

* Significant at 95% confidence level

RR-Resource Rich, RP-Resource Poor, HI-High Level of Intervention, LI – Low Level of Intervention.

Table 20. Farmers' assessment of water management by farmer organizations

Activities carried out by FOs	% of Farmers reporting		
	Worsened	Same	Improved
Irrigation Management by FO's			
Water adequacy	28.4	31.5	40.0
Water reliability	29.3	29.6	40.9
Allocation of water	24.2	26.8	48.9
Water conflicts	23.9	24.3	51.7
Condition of irrigation structures	40.9	32.7	26.2
Condition of irrigation canals	38.1	33.9	27.8
Quality of repair	37.6	34.4	27.9
O&M by Farmer Organization	17.9	38.2	43.4

Source: Survey data – IWMI 2000

Table 21. Categorical analysis of water management

Irrigation Management by FO's	Estimated Statistic		
	RR vs. RP	LI vs HI	HI/LI & RR/RP
Water adequacy	10.1**	1.0	15.8
Water reliability	7.7*	3.3	12.7
Allocation of water	3.7	10.1**	15.7
Water conflicts	0.4	15.7**	20.5*
Condition of irrigation structures	1.5	15.2**	29.7**
Condition of irrigation canals	0.7	13.5**	22.8**
Quality of repair	0.6	7.5*	10.6
O&M by Farmer Organization	2.2	11.7**	20.9**

Source: Survey data – IWMI 2000

* Significant (Exceeds Chi Square statistic at 95% confidence limits)

** Significant (Exceeds Chi Square statistic at 99% confidence limits)

RR-Resource Rich, RP-Resource Poor, HI-High Level of Intervention, LI – Low Level of Intervention.

Table 22. Change in yield and reasons for any increase in paddy yield

Change in yield before and after INMAS	Percent of farmers reporting
Decline in yield	24
No change in yield	35
Increase in yield	41
Reasons for Change in Yield	
Increased use of fertilizer	16
Improved seed	12
Better cultivation practice	6
Improved water management by FO	3
Easy availability of inputs through FO	1
Better extension services through FO	2
No response	3

Source: Survey data – IWMI 2000

Table 23. Comparison of yields, cropping intensity between resource rich versus resource poor and high intervention versus low intervention schemes.

Variables	High Intervention	Low Intervention	T Statistic	Resource Rich	Resource Poor	T Statistic
Mean Maha Yields kg/ha	3829	3103	5.028*	3503	3062	3.31*
Mean Yala Yields kg/ha	3521	1950	13.05*	3628	2017	13.64*
Cropping Intensity	1.76	1.26	13.74*	1.66	1.40	6.66*

Source: Survey data – IWMI 2000

- Significant (exceeds t statistic value of 1.96 at 95% confidence limits)

Table 24. Farm and non-farm household income

Income source	Annual income (Rs)	% of total income
Paddy	10,445	32
Other Crops	818	2
Perennial Crops	300	1
Non-farm	20720	64
Other	350	1
Total	32635	100

Source: Survey data – IWMI 2000

Table 25 Sources Non- farm employment

Category of Employment	Number Employed	% of Total Employed	Average Monthly Income (Rs)
Agricultural Labour	2	1	9,000
Wage Labour	41	12	4,220
Garment Factory	37	11	3,910
Armed Forces	95	29	5,430
Business	51	15	4,740
Foreign Employment	6	2	10,580
Public Service	98	30	5,000
Total	330	100	4,990

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Annexes

Annex 1 – Terms of Reference for the Study

Introduction

The Irrigation Management Division (IMD) of the Ministry of Irrigation requested the International Water Management Institute (IWMI) to prepare proposals for evaluation of the Integrated Management of Agricultural Settlements (INMAS) Program. The Terms of Reference (TOR) provided to IWMI are recapitulated below for completeness and to assist evaluation of the proposals.

The INMAS program is one major institutional reform program implemented by the government to improve the management and performance of irrigation schemes.² The objectives of the program and its key components are well documented. The fundamental premise of the INMAS initiative is that organized farmer participation in irrigation management is central to enhancing the performance of irrigation schemes (IMD, 1984).³ INMAS was launched in 1984. By 1999, 1130 farmer organizations had been established and vested with responsibility for operation and maintenance of irrigation facilities downstream of distributory canal head-works. In addition, INMAD has developed and implemented systems for seasonal planning with full participation of farmers and officials, although legal basis for such activities was established much later. The program sought during this period to:

- Increase profitability of paddy cultivation by optimizing productivity and increase cropping intensity in major irrigation systems
- Diversify cropping including introduction of perennial crops in water short systems
- Integrated livestock and fisheries (food and ornamental) in the agricultural systems. Ensure timely availability of inputs including quality seeds in a sustainable manner
- Promote coconut, home garden crops and forestry to develop homesteads as productive components of the farming system
- Stabilize paddy prices with limited market interventions
- Increase availability of farm credit
- Promote improved saving habits in farm communities
- Develop entrepreneurial skills of farmers and farm communities
- Mobilize farmers' resources for upkeep of irrigation system, including areas not under participatory management agreements

There have been a number of studies of the INMAS initiative. However, to date there has not been a systematic and comprehensive evaluation of the INMAS program. Studies of the experiences and impact of participatory management have been undertaken at some schemes within the INMAS program. However, although these studies have provided valuable insights to the INMAS activities, they give a mixed impression of the impacts (IIMI/HKARTI, 1997; Samad and Vermillion, 1999).⁴ The Ministry of Irrigation and Power (MIP) has determined that it is now appropriate for a more comprehensive assessment of the INMAS program to document the achievements, shortcomings and impacts of the program. This

² The other programs are the management of Irrigation Schemes (MANIS) and the institutional reform under the Mahaweli Ganga Development Program.

³ (IMD) Irrigation Management division (1984), Program for Integrated Management of Major Irrigation Schemes – INMAS –, Information Booklet No.2., Colombo, Ministry of Lands and Land Development

⁴ IIMI/HKARTI. 1997. Monitoring and Evaluation of Participatory Irrigation Management Policy, duplicated, IIMI, Sri Lanka; Samad, M and Douglas Vermillion (1999) Assessment of Participatory Management of Irrigation Schemes in Sri Lanka: Partial Reforms, Partial Benefits. Research report No. 34, Colombo, Sri Lanka, International Irrigation Management Institute

study will form the basis for planning the future activities, and if necessary the reorientation of the INMAS program to meet the requirements imposed by current and future trends in irrigated agriculture.

Objectives of the Study

The overall objective of the study is to document the progress of the INMAS program and determine the extent to which the goals of the program have been realized. The specific aims are:

- i. To document the evolution of the INMAS program with particular focus on the adjustments that have been made over time and the reasons for them.
- ii. To determine the extent to which the program has matched the expectations of various stakeholders and to identify constraints that hindered the success of interventions.
- iii. To determine whether the institutional arrangements (agency, beneficiary and collaborative) introduced through the INMAS program facilitate improved management of irrigation schemes
- iv. To determine the impact of the INMAS program on the performance of irrigation schemes including its contribution to national economy.
- v. Identify whether, and what, changes are appropriate in the content and approach of INMAS to cater to the changing management demands and policy objectives.
- vi. Identify major constraints to achieving desired objectives and propose remedial actions to address major issues, such as sustainability, weaknesses of institutions, need for reorientation of agencies etc.
- vii. To comment on the existing structure of IMD and make recommendations, if necessary, for reorganization/restructuring.

Data and Methods

The evaluation will be based on four data collection efforts:

1. Review of official records, and published / unpublished literature relating to the INMAS program
2. Consultations and interviews with key stakeholders
 - Interview of the architects of the program and key personnel currently associated with the program including project managers and other government officials at the project, divisional and district level
 - Interview key personnel at different levels of collaborating Ministries, Departments and Agencies and key officials of the Ministry of Irrigation and Power
 - A survey/interview of Farmer Organization leaders, representatives of Field Canal Groups and key personnel of Farmer Companies
3. Evaluation of spillover impacts in schemes not included in the INMAS program
 - Review of published/unpublished literature, and interviews of farmers and officials in NON-INMAS schemes to draw lessons and determine the degree of adoption of INMAS interventions
4. Farmer surveys in selected INMAS schemes representing different categories of scheme and intervention packages

Outputs

The study findings will be reported with recommendations to address any weaknesses found in the study, and also for reorientation and revitalization of INMAS to continue to meet current and future trends in irrigated agriculture. A draft final report will be distributed two weeks prior to the concluding seminar/workshop to form the basis of discussion. The final report will be submitted two months after the concluding seminar/workshop.

A seminar/workshop will be organized to discuss the findings with IMD officials, project managers and representatives of farmer organizations in the sixth month of the study.

Annex 2 – The Selection of the sample of irrigation schemes and farm-households

The selection of INMAS sample of irrigation schemes was finalized in consultation with the IMD as the implementing agency of the INMAS program. Eight schemes representing a cross-section of INMAS schemes in terms of resource endowment, agro-climatic zone, cultivated extent, agricultural productivity, farmer management, and intensity of intervention, were selected for the study. On the basis of the information supplied the selected schemes were grouped according to whether they were resource rich or resource poor or whether they have had a high or a low level of intervention. Resource rich would include higher water availability and other natural endowments. High intervention would include, rehabilitation or high level of management inputs. Table A2.1 gives the resultant classification of the schemes. Table A2.2 gives the salient features of the selected schemes.

Table A2.1 Categorization of schemes by resource endowment and intensity of intervention

Intensity of Intervention	Resource Rich	Resource Poor
High	Minneriya	Kirindi Oya
	Nachchaduwa	Dewahuwa
Relatively low	Kaudulla	Muruthawela
	Tabbowa	Mahakandarawa

Table A2.2 Salient characteristics of the irrigation schemes selected for study

Scheme	Location			Extent (Ha.)	Yield (Mt./Ha.)	Cropping index (%)	Farm families	Intervention	Endowment	
	ACD	PV	DS							
Nachchaduwa	DL	NC	AN	2780	4.7	175	3027	High	Rich	
Mahakanadarawa					2567	4.9	72	2700	Low	Poor
Minneriya			PN	8903	4.7	184	4065	High	Rich	
Kavudulu weva					5018	4.7	149	4777	Low	Rich
Devahuwa	I	CN	M	1133	4.5	124	1858	High	Poor	
Tabbowa	I	NW	P	874	4.4	164	1143	Low	Rich	
Muruthawela	DL	STH	H	2225	4.0	153	2035	Low	Poor	
Kirindi Oya					9762	6.8	160	11486	High	Poor
Mannankattiya		NCP	AN	450	5.2	185	350	High	Rich	
Galnewa				24871	4.7	138	3924	High	Rich	

Abbreviations: ACD = Agro-Climatic Divisions; PV = Province; DS = District; DCC = Distributary Canals; DL = Dry Low; I = Intermediate; NC = North Central Province; CN = Central Province; NW = North Western Province; STH = Southern Province; AN = Anuradhapura; PN = Polonnaruwa; M = Matale; H = Hambantota; P = Puttalam

The sample survey was designed to capture a representative sample of farm-households from each scheme. This was done by first examining the issue tree of the scheme, and selecting representative Distributory Canals. In each scheme up to 15 farmer organizations were selected. All the officials of the selected FOs were interviewed together with the farmer representatives of the selected FCs.

The sample for the farmer household survey was selected in the following manner. If an FO covered more than one DC, then one of the DCs was selected for the study. Depending on the area covered by each DC, two to three field canals were selected. If the area covered by the DC was less than 50 acres, one FC was selected. If it was between 50-150 acres, two FC's were selected (one from the tail end and one from the head end of the DC) and if it exceeded 150 acres, 3 FC's were selected (one FC each from the head, middle and tail ends). Three farmers were randomly selected from each FC to represent the head, middle and tail ends of the FC. The details of the sample are given in table 2 below.

Table A2.2 Sample for farmer organizations and farm household survey.

Scheme	Farm Households			Farmer Organizations		
	Total Number	Sample	% of total	Total Number	Sample	% of total
Nachchaduwa	3027	119	4	29	11	52
Mahakandarawa	2700	131	5	39	15	38
Minneriya	4065	144	4	54	14	26
Kaudulla	4777	130	3	24	15	62
Dewahuwa	1858	80	4	6	6	100
Tabbowa	1143	76	7	10	8	100
Muruthawela	2297	186	8	18	15	80
Kirindi Oya	11486	184	2	83	16	19
Mannankattiya	350	16	5	06	02	34
Galnewa	3924	58	2	40	07	17