MINOR IRRIGATION REHABILITATION

An Assessment of Awarding Rehabilitation Contracts to Farmer Organizations

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FOREWORD

One of the key determinants of mitigating the vulnerabilities of smallholder farmers is accessibility to irrigated water throughout the year. This is on account of the temporal variations and anomalies in rainfall distribution. In recent years, the need for irrigated water has become even more crucial due to the adverse effects of climate change. However, many of the smaller tanks are in a state of disrepair and require significant investments for rehabilitation on account of breaches caused by floods as well as lack of maintenance. In fact regular maintenance and, in the case of older structures, continuous rehabilitation, is required to ensure full functionality.

The maintenance of small tanks and canals in minor irrigation systems was traditionally the responsibility of the particular beneficiary community. Such tasks were later taken over by the state. In more recent times, there have been moves to obtain the participation of beneficiaries. It was envisaged that the farmers' traditional wisdom, if twinned with technical expertise would make for greater efficiency. Providing rehabilitation contracts to farmer organizations was a measure introduced by the Department of Agrarian Development (DAD) to achieve this.

This study was launched to find out the weaknesses and opportunities of providing Minor Irrigation Rehabilitation (MIR) contracts to Farmer Organizations (FOs) without following established bidding procedures. There are important lessons generated by the study which, hopefully, will inform policy decisions with respect to MIR.

Malinda Seneviratne
Director/Chief Executive Officer

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EXECUTIVE SUMMARY

Awarding Minor Irrigation Rehabilitation (MIR) contracts to FO was initiated in 2003. The maximum value of the MIR contracts offered to Farmer Organizations (FOs) were initially limited to Rupees two million and it was later increased to Rupees five million in the circular MNPEA 3/2016 of the Ministry of National Policies and Economic Affairs. As per the circular, there were two objectives to be achieved by awarding MIR contracts to FOs. The primary objective was to rehabilitate the Minor Irrigation Systems (MISs) effectively and the secondary goal was to maintain the system sustainability by providing the beneficiaries, the members of the FOs, a sense of ownership, technological skills, increased financial capability of FOs, and assurance of physical work without seeking financial gain and community mobilization towards system health and sustainability. This study was designed to provide answers to two basic questions related to the above programme; whether the Department of Agrarian Development (DAD) was able to achieve its objectives of awarding contracts of MIR to FOs without following a competitive bidding procedure, and whether the awarding of MIR contracts to FOs without following competitive bidding system is sustainable.

A total of 43 randomly selected MIR projects, which were implemented during the last five years (2014-2018) in five districts; Kurunegala, Anuradhapura, Nuwara Eliya, Badulla and Vavuniya were selected for the field survey. Most of the rehabilitation contracts undertaken by the FOs have proved to be successful, meeting the expectations of the beneficiaries at various levels. FOs that are functioning with active office bearers have reaped maximum benefits from the funds allocated for the rehabilitation work. Farmers have benefited when rehabilitation work was carried out by their own Farmer Organization (FO) or other FOs that were situated close by rather than outside contractors. MIR of this nature could be handed over to FOs after considering their capacity.

Strengthening the Farmer organizations is an important strategy to improve irrigation system efficiency which could be achieved by providing opportunities for capacity building workshops and conducting regular training. DAD can closely monitor and intervene in the FOs activities like developing the FOs constitution, the appointment of office bearers, elections, and financial transparency. This would develop much stronger institutional linkages with the FOs and assure more transparency in FOs.

The selection of MIR should be based on the felt need of the beneficiary farmers and the impact should be economically sound. Prior to awarding MIR contracts to FOs, well-developed training should be provided for the office bearers and/or the MIR contract oversee committee. Farmer training should be a continuous process and it is important to plan and implement a detailed training manual. Assuring recognition to the MIR contract/agreement as a valid document to prove the financial capabilities of the FOs to obtain capital is important when undertaking MIR contracts by the FO themselves. Paying due attention to the recognition of the contract agreement may increase the MIR project undertaken by the relevant FOs. The MIR process should not be taken as an individual project or isolated system but should consider the entire

irrigation system as one. This will enable the farmers to maintain the system sustainably for a longer duration.

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LIST OF ABBREVIATIONS

ADB	-	Asian Development Bank
ADZAP	-	Anuradhapura Dry Zone Agricultural Project
AOs	-	Agriculture Officials
ARPA	-	Agricultural Research and Production Assistant
ASCs	-	Agrarian Service Centers
CBO	-	Community Based Organization
CMC	-	Cascade Management Committee
DAD	-	Department of Agrarian Development
DCS	-	Department of Census and Statistics
DOs	-	Divisional Officers
DSD	-	Divisional Secretariat Division
DZADP	-	Dry Zone Agricultural Development Project
DZLiSPP	-	Dry Zone Livelihood Support and Partnership Programme
FFHC	-	Freedom from Hunger Campaign
FGDs	-	Focus Group Discussions
FOs	-	Farmer Organizations
HARTI	-	Hector Kobbekaduwa Agrarian Research and Training Institute
ICT	-	Information and Communication Technology
IFAD	-	International Fund for Agricultural Development
IRDP	-	Integrated Rural Development Project
IWMI	-	International Water Management Institute
KIIs	-	Key Informant Interviews
MASL	-	Mahaweli Authority of Sri Lanka
MDP	-	Mahaweli Development Programme
MIR	-	Minor Irrigation Rehabilitation/Reconstruction
MISs	-	Minor Irrigation Systems
MNPEA	-	Ministry of National Policies and Economic Affairs
NGOs	-	Non Governmental Organizations
O&M	-	Operation and Maintenance
PEACE	-	Pro-poor Economic Advancement and Community Empowerment Project

VCRP	-	Village Community Rehabilitation Programme
VIRP	-	Village Irrigation Rehabilitation Project
WFP	-	World Food Programme
WUG	-	Water User Group

CHAPTER ONE

Introduction

1.1 Overview of the Irrigation Agriculture Sector of Sri Lanka

Sri Lankan irrigation civilization is more than 2000 years old, the great kings of the past played a major role in the development of irrigated agriculture by constructing a large number of major tanks and also contributing to the construction of small scale tanks. The development of our irrigation system was based on the experience, insights and thoughts of our ancestors and handed down through the generations. Early inhabitants of the country settled in the dry zone of Sri Lanka mainly due to the prevalence of favorable environmental, physical and natural resources for better agricultural performance, because they depended on agriculture-based livelihoods. Although the dry zone was conducive to agriculture, due to the temporal variations and anomalies in rainfall distribution they were inspired to build tanks throughout the dry zone to store water during the rainy season to be used in dry season for agricultural activities. Thus, major irrigation systems were developed along the valleys of key rivers in the dry zone area to facilitate paddy-based lowland crop cultivation. These major irrigation systems were well supported by a large number of small tanks arranged in a cascade system developed in the mini watersheds of associated tributaries of major rivers in the areas of dry and intermediate zones.

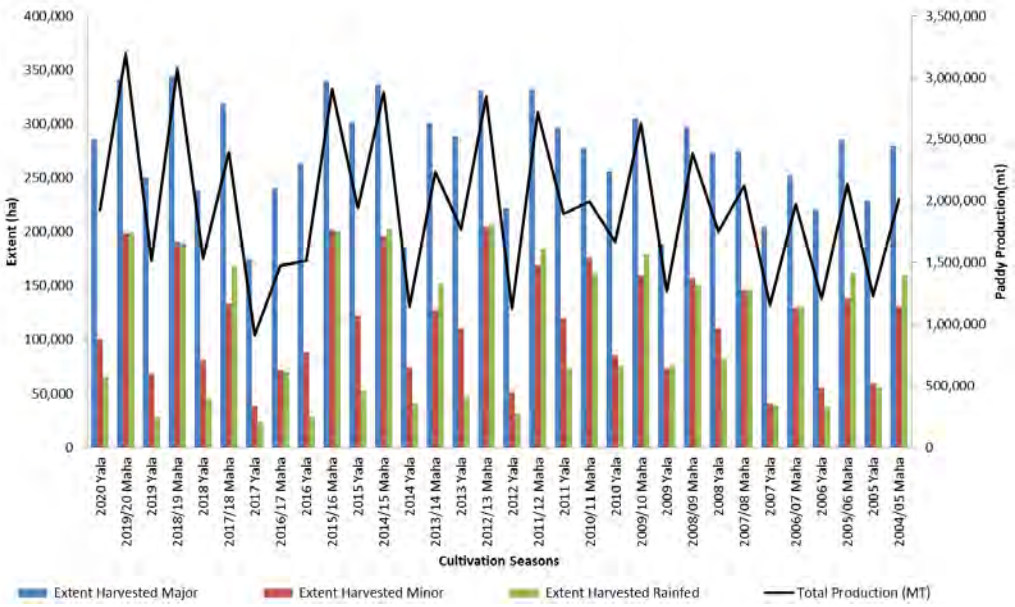
Presently, on average over 77 percent of annual paddy cultivation is carried out under irrigated conditions. According to the statistics, in the last two cultivation seasons, 2019/2020 *Maha* and 2020 *Yala,* the contribution of irrigated paddy lands to the total cultivated extent was reported to be 73 percent and 85 percent respectively (Department of Census and Statistics, 2021).

Based on the command area the irrigation systems have been delineated as: more than 200 ha as major irrigation, 80-200 ha as medium and less than 80 ha as minor irrigation systems. For the purpose of this study both major and medium are considered as major. The principal irrigated crop, paddy, is grown on nearly 730,000 ha of land, and 389,000 ha of this total land is grown under major irrigation schemes and 170,000 ha of this total is grown under medium and minor irrigation schemes (International Water Management Institute, 2005). Remaining 171,000 ha, which is non-irrigable paddy land is sown by small scale paddy farmers under rain fed conditions. According to the Irrigation Ordinance of 1946, minor irrigation systems are the schemes constructed and maintained by landowners without government support. The Irrigation Department is responsible for its refurbishment, while its operation and maintenance are vested in the Department of Agrarian Development (DAD) with the participation of the system beneficiaries (Groenfeldt, Alwis & Perera, 1987). Minor irrigation systems are predominantly dispersed in the dry zone of Sri

Lanka. The highest densities of minor tanks are found in the Kurunegala District followed by the central part of Anuradhapura District.

1.2 Role of Minor Irrigation Systems toward Food Security and Village Livelihood

Minor irrigation systems are also called village irrigation systems. As at 2018, there are 14,421 functioning small tanks that irrigate 470,776ac under their command area. There are 386,860 farmer families benefiting from these minor tanks. However, there are about 2,055 abandoned tanks that could have provided irrigation water to 43,825ac of cultivable land (DAD, 2018). Minor irrigation systems have provided irrigation facilities for 27 percent and 22 percent of the total cultivated paddy extent in 2019/2020 *Maha* and 2020 *Yala* seasons respectively (Department of Census and Statistics, 2021). These figures highlight the significance of MISs in food security and rural livelihood. Figure 1.1 shows the annual paddy production under different irrigation systems for the period of 2005-2020 in the country.



Source: Information Division, HARTI

Figure 1.1: Annual Paddy Production by Irrigation System (2005 – 2020)

Providing irrigation water to the low land paddy cultivation is not the only function performed by the Minor Irrigation Systems (MISs). It also functions as a multipurpose resource for the village. The microclimate environment that surrounds the village is mainly dependent on the tank water level, its evaporation and seepage. Many perennial crops like fruits and annual food trees are basically dependent on the seepage water that flows laterally and horizontally from the tank sidewalls and tank bed. Many of the domestic water requirements such as bathing, washing and cleaning utensils are met with the water from the tank. Keeping the water table at a given level

is important as the levels of water in the domestic wells are also dependent on water levels of the village tank. In addition to providing water, it provides a good source of protein to the village peasant by carrying fish stocks.

Even though the farmer has fully recognized the importance of village tank systems to their livelihoods, they do not often have the capacity to rehabilitate any damages to the tanks. In recent times due to the uncertainties of the rainy seasons and also reduction of water availability caused by climate variability, incomes from low land paddy through these systems have been a disappointment. Farmers are reluctant to invest in these systems with marginal incomes and rainfall uncertainties. These issues have been identified by government departments and Non-Governmental Organizations (NGOs) and reconstruction or rehabilitation of these systems has been carried out regularly under different modalities.

Currently one of the primary problems faced by the farmers in the minor irrigation schemes in Sri Lanka is scarcity of water during the most critical period of the cultivation. Farmers have often had a bad experience of cultivating with the onset of rain and losing the crop due to poor rainfall during peak demand time especially in *Yala* seasons. Though there are a large number of small tanks to harvest and store the seasonal rainfall, they are mostly silted and deteriorated, thus losing the total capacity to provide water for a full *Yala* season and sometimes in *Maha* seasons as well. Therefore, the issues such as low input agriculture and low productivity, seasonal and uncertain income, low cropping intensity and various other socio-economic issues are the contemporary factors that influence the sustainability of minor irrigation systems in Sri Lanka (Esham and Garforth, 2013).

1.3 Management of Minor Irrigation Systems

One of the main constraints to the development of minor irrigation systems in Sri Lanka is the continuing change in the management of these systems that has occurred over the years, and continues to occur without any regard to its beneficiaries. Minor irrigations thrive on unique customary water laws and traditions that have sustained a certain level of rural livelihood (Samad, 2005).

During the pre-colonial era, under the '*Rajakariya*' system minor irrigations were operated and managed by the community themselves. The responsibility of management was vested with the "*Gamarala*" under the "*Gamsabawa*" system. With abolition of the '*Rajakariya*' system in 1932 all customary regulations and traditions began to collapse (Herath, 2002; Panabokke, Tennakoon and Ariyabandu, 2001). This led to a vacuum in the responsibility of managing minor irrigations which resulted in the degradation of these systems, thus warranting the import of rice to feed the population. The Government has started to invest public money recognizing the importance of these systems sustainability and multi-purpose context to reconstruct or rehabilitate these systems with or without the support of the NGOs.

1.4 Research Problem and the Significance of the Study

Many village irrigation development projects that have been undertaken previously such as Village Irrigation Rehabilitation Project (VIRP), the Integrated Rural Development Project (IRDP), Anuradhapura Dry Zone Agricultural Project (ADZAP), and the Village Community Rehabilitation Programme of the National Freedom from Hunger Campaign (FFHC) had to encounter many unanticipated problems during the implementation process. This was basically due to the fact that the irrigation agencies have not fully understood the nature of state intervention that is necessary to involve rural communities in these projects. Community perception during these past projects was that the Government owns the irrigation systems and it is their responsibility to ensure system-operation and maintenance (Abeyratna, 1984; Abeyratne and Perera, 1986; Aheeyar, 2001; Medagama, 1987). In a situation where the community has no sense of ownership of the tank, getting their involvement in system maintenance is rather difficult. This situation was further aggravated due to gradual change of many of the characteristics of traditional village communities.

With this background, the DAD initiated a new scheme of irrigation rehabilitation programme by granting certain MIR contracts to FOs without following a competitive bidding procedure. Awarding MIR contracts to FOs was made formal with the issuing of the circular MNPEA 3/2003. Initially, the MIR contracts that were given to FOs were restricted to the maximum value of two million rupees and it was amended by the circular MNPEA 3/2016 up to the value of five million rupees. Expectations of this new intervention and the subsequent circulars issued were twofold. Primary goal was to undertake the rehabilitation work of the irrigation system and the secondary aim was to undertake the system maintenance for sustainability. The program expected to achieve this by providing them with a sense of ownership, necessary technological skills and increasing financial capability of respective FOs. Further, it expected to attract community mobilization towards system health and sustainability through assured physical work without seeking financial gain.

In order to decide whether this programme could be continued or not, it is of crucial importance to evaluate the programme to identify its strengths and weaknesses for the sustainability of minor irrigation systems. Besides, if it is decided to continue this programme, revisiting the whole process is essential so as to modify it to minimize drawbacks and for increased efficiency.

In accordance with the government policy statement, the “Vistas of Prosperity and Splendour” (Ministry of Finance in Sri Lanka), the conventional agricultural setup of the country is expected to be converted into Modern Technological Agriculture. In achieving the aforementioned objective, *“water management and management of water supply according to farmer requirements”* has been prioritized as one of the key special priority areas listed under the Ministry of Agriculture. Further, “*maximizing economic benefits of water consumption with the introduction of high yielding methodologies by the economical use of water*” has been recognized as a prioritized area of the functions of the State Ministry of Agriculture as well. In that sense, this

study is a timely and pertinent research initiative towards increased efficiency and the sustainability of minor irrigation systems of the country.

The present study mainly focused on minor irrigation rehabilitation projects that were undertaken under the DAD vote. It covered rehabilitation or reconstruction projects of minor tanks and anicut systems from 2014 to 2018.

1.5 Research Questions to be Answered in this Study

a) Whether the DAD has been able to achieve its objectives by awarding contracts of Minor Irrigation Rehabilitation MIR to FOs without following a competitive bidding procedure?
b) Is the awarding of MIR contracts to FOs without following a competitive bidding system sustainable?

1.6 Research Objectives

General Objective

The major objective of this study is to assess the impact of awarding MIR contracts to FOs without following competitive bidding procedure and to examine whether the original objectives relating to this procedure were achieved.

Specific Objectives of the Study

1) To assess the impact of MIR on strengthening FOs, increasing their financial levels and developing individual capacities of member farmers towards managing the minor irrigation system sustainably.
2) To assess the overall quality and completion of rehabilitation work, fulfilment of farmers' needs, and farmer participation in rehabilitation processes.
3) To assess the sense of ownership, responsibility and accountability of the FOs (farmers) developed through self-governing the irrigation rehabilitation and Operation and Maintenance (O&M) processes.
4) To assess the impact of rehabilitation of MISs on livelihoods of farmers.
5) To review the procedure of awarding contracts to FOs for more sustainable and effective MIR.

1.7 Limitations of the Study

Information collected from the stakeholders were basically dependent on their capacity to recall MIR projects conducted by the DAD, their opinions on certain government policies, other national level as well as localized projects that were implemented during the same period.

CHAPTER TWO

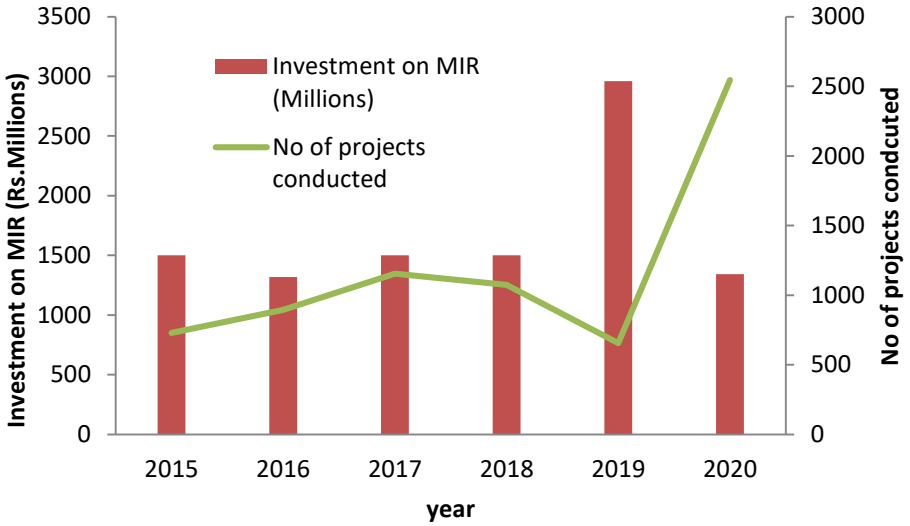
Review of Literature

2.1 Farmer Participation in Minor Irrigation System Management

Government intervention on MIR started in the early 1950's, however, at that time those were basically top down approaches with little or no involvement of the farming community. As a result, these rehabilitated schemes were not adequately maintained by farmers and led to repeated premature rehabilitation (Panabokke, 2002). In 1991, the Agrarian Services Act No. 59 was amended to establish FOs and to give legal authority to FOs to undertake irrigation contracts. Though this is considered the best alternative for farmers, the formation of FOs on village boundaries complicated the independent functioning of FOs. However, FOs often are not properly established or effectively organized to manage irrigation systems. Therefore, transferring irrigation systems management to farmers was undertaken more systematically and slowly. Farmers alone cannot satisfactorily manage irrigation systems and continuous technical support from irrigation staff became mandatory (Wickramaarachchi, Wijesekera, and Gamage, 2002).

2.2 Public Sector Investment in Irrigation Development

Public investment in the irrigation sub-sector has increased from about three million rupees per annum in the 1940s to about Rs. 50 million per annum on average in the 1950s and 1960s (Abeyratne, 1984). With the implementation of Mahaweli Development Programme (MDP) in the 1970s, the investments in the irrigation sector increased significantly and declined rapidly during the 1990s with the completion of the MDP and most of the other major irrigation projects. Investment in minor (village level) irrigation systems have remained more or less static and have continued with a smaller allocation. Expenditure on minor irrigation rehabilitation/reconstruction under the DAD from 2015 to 2020 is illustrated in Figure 2.1.



Source: Department of Agrarian Development

Figure 2.1: Number of MIR Projects and Investments by DAD (2015-2020)

2.3 Experiences of Past Minor Irrigation Rehabilitation Projects

Government and other NGOs have also been part of small tank rehabilitation from or before the mid-18th century. Even British administrators considered restoration of minor tanks as a way of serving the rural peasant communities to produce their own food and look after their social welfare with little outside interference. Successive governments have implemented numbers of MIR projects using different approaches and strategies (Aheeyar, 2013). However, Dharmasena (2007) has observed that certain factors have contributed so as not to achieve the anticipated productivity increase from these rehabilitation efforts. This includes, limiting the development interventions only to hardware components such as repair of tank structures and development of community infrastructure like access roads, community centres, developing individual tanks without paying attention to the whole cascade system and insufficient attention paid to restoration of tank bed and its surrounding ecosystem.

i. Village Irrigation Rehabilitation Project (VIRP)

The VIRP funded by the World Bank was started in 1980 and covered 1,200 of small tanks and anicuts distributed in the wet and dry zones of the country. It was to benefit about 25,000 farm families. According to the post evaluation report of the project, disregarding the local knowledge and experience in the design and construction phase of the project has been identified as one of the main factors that has contributed to the failure of VIRP, as a rehabilitation project. Further, the project had not utilized local farmers as labourers, instead labourers and constructors were usually brought from outside (Abeyratne, 1986).

i. Small Tank Rehabilitation Project Implemented by the Freedom from Hunger Campaign (FFHC)

The project funded by various international NGOs started in the late 1970s and mainly focused on rehabilitation of isolated tanks. Unlike in VIRP, the project's strategy was to facilitate the maximum role and contribution from beneficiary communities (Groenfeldt et al, 1987).

ii. Anuradhapura Dry Zone Agricultural Project (ADZAP)

Anuradhapura Dry Zone Agriculture Project (ADZAP) was funded by the International Fund for Agricultural Development (IFAD) and the Asian Development Bank (ADB), commenced in 1981. ADZAP was aiming at introducing an efficient farming system to enhance the living conditions of dry zone farmers. However, the project had failed to achieve its initial objectives due to poor coordination among stakeholders and agencies which consequently resulted in weakening the project implementation process (Jayasena, 1991).

iii. World Food Programme (WFP) funded Minor Irrigation Rehabilitation Projects

During the periods 1994 – 2000 (phase I) and 2002 – 2006 (Phase II), small tank rehabilitation work was carried out in two phases covering dry and intermediate zones of the country. The World Food Programme (WFP) funded the project and it did not use outside labourers or contractors for the rehabilitation work. The farmer participation was obtained throughout the project from planning, designing and implementation. This was done through establishing and strengthening FOs.

iv. Minor Tank Rehabilitation under the Dry Zone Agricultural Development Project (DZADP) of Care International

Care International Sri Lanka launched a minor tank rehabilitation project aiming to increase living standards of the rural communities. DZADP was implemented during 2002-2005 in the dry zone districts of Moneragala, Puttalam and Mannar. The project had rehabilitated a total of 42 minor tanks. The main strategy of the project was to enhance productivity and income of communities in command and catchment areas of micro tanks in the project areas. Four interventions have been adopted in the project namely, a) Farming Systems Development, b) Institutional Development and Organizational Strengthening, c) Business Development and, d) Water Resources Management. DZADP not only focused on tanks, but on the surrounding watersheds and cascade connections. The project worked in collaboration with relevant Government institutes of Sri Lanka, NGOs and the private sector in implementing the project. Twenty percent of farmer contribution for the project was compulsory and it was sought through intense farmer consultation.

v. Small Tank Cascade Development Programme by Kala–Oya Basin Management Organization

Kala-oya Basin Management Organization is the river basin organization formed by the Mahaweli Authority of Sri Lanka (MASL) for Mahaweli system H. The Kala Oya Basin Management Organization launched a cascade development programme in 2004 starting with two cascades in Mahagalkadawala in Galgamuwa DSD and Manewa in Ipalogama DSD. Ten tanks were partially desilted under this project to increase the capacity (Dharmasena, 2007).

vi. 'Kethata Aruna Nil Diyawara' – Ten Thousand Tank Rehabilitation Programme

The Government of Sri Lanka in 2005 initiated a project to rehabilitate ten thousand tanks. It included both damaged and abandoned village tanks. The project expected to rehabilitate 2000 tanks each year from 2005–2009. The objective of the rehabilitation was to enhance the productivity by increasing water storage capacity of respective village tanks. The project had a strong component to mobilize beneficiaries for rehabilitation activities. However, the project had not paid much attention to designing a mechanism for sustainable post project maintenance. A Cascade Management Committee (CMC) comprises farmers, officers from relevant government organizations and religious leaders under this project. This program did not progress beyond the first year due to the change of the Government.

vii. Small Tank Rehabilitation Programme under the "Pro-poor Economic Advancement and Community Empowerment Project (PEACE)"

The above programme was implemented by the DAD from 2006-2011. The main objective of the PEACE project was to uplift the living conditions of rural farmers through the development and upgrading of irrigation infrastructure which will subsequently increase the farmers' income and living standards. The project had a component of rehabilitating 80 minor irrigation schemes in the Anuradhapura, Kurunegala, Matale and Puttalam Districts. The main feature of the "PEACE" project was the high degree of beneficiary involvement. In all the major activities of the project such as problem identification, planning, implementation and operation were solely performed with participation of beneficiary farmers.

The due recognition given to line agencies that had involvement in the project activities had helped to develop a sense of ownership among the line agency officers of this project. Early orientation provided about the project at district and divisional level during the project and post project periods has been successful in creating a clear idea about the project approach and roles and responsibilities of the officers. Inclusion of a strong component for community mobilization by appointing specialized catalysts and systematic training programmes is important for rehabilitation projects (Aheeyar, 2013).

viii. Small Scale Irrigation Schemes "Rehabilitation Approach Adopted by the "Dry Zone Livelihood Support and Partnership Programme" (DZLiSPP) (2008-2012)

Dry Zone Livelihood Support and Partnership Programme (DZLiSPP) was funded by the International Fund for Agricultural Development (IFAD). The project had completed rehabilitation of over 700 small scale irrigation schemes including tanks and anicuts. The project has recognized the need of building stronger and supportive institutional structures at the village level to allow adoption of participatory approaches that are vital for long term sustainability of operation and maintenance of rehabilitated infrastructure. The novel concept of the project was the introduction of the formation of a scheme level Water User Group (WUG), where the FO was responsible for multiple numbers of schemes. These WUGs were expected to perform as the focal point for planning and management of scheme level activities. Further, the DZLiSP programme had realized the vital importance of having strong partnership with line agencies working at divisional, district and scheme levels in order to ensure their post project involvement. Absence of even a few beneficiary farmers as office bearers of contracting FO or some authority for them to monitor the contract works had resulted in quality deterioration in some schemes (Aheeyar, Padmajani and Bandara 2012).

ix. Accelerated Tank De-silting Programme Conducted in 2012

Emergency Drought Mitigation and Relief Programme was planned and implemented by the government of Sri Lanka in 2012 with the objective of enhancing the livelihood condition of the drought affected people in the dry zone. The project was implemented under the supervision of the Ministry of Economic Development. Accelerated tank de-silting project was expected to de-silt 1,278 major and medium size tanks located in dry and intermediate zones. It was expected that the project would relieve the hardships faced by farmers in cultivation and everyday activities due to prolonged droughts. Beneficiary participation was taken whenever necessary and FOs have felt the project as their own. This has motivated them to give their fullest support to the project. The programme has contributed in improving their leadership qualities as well. However, due to the accelerated nature of the project, implementation agencies have faced issues in selection of tanks, finding machinery and getting sufficient involvement of FOs when implementing the programme resulting in incomplete de-siltation work (Bandara and Samarasinha, 2016).

2.4 Awarding Minor Irrigation Rehabilitation Projects direct to the Farmer Organizations

Criteria to be considered while awarding direct contracts to CBOs according to Circular No: MNPEA 03/2016 of the Ministry of National Policies and Economic Affairs

Qualified FOs can directly award work related to MISs and related agricultural road rehabilitation up to five million rupees subject to the following criteria;

1. When considering the respective Community Based Organization (CBO) for awarding a MIR contract, that particular organization must be registered as a society under the Commissioner General of Agrarian at least two years prior to the time of consideration for the proposed contract award.
2. The CBO, the total number of contracts to be executed by the Society, including the proposed contract for award, shall not exceed three (03).
3. The value of the remaining work of the contracts already awarded and the sum of the value of the proposed contract shall prove that the Society has the manpower, equipment and financial capacity to perform all such work. When the necessary equipment is not available to the Society, it should be ensured that it can be met on a rental basis.
4. Priority should be given to FOs in the jurisdiction when more than one Farmer Organization comes forward to fulfill the proposed contract. The contract should be awarded to the relevant FOs after a three-member committee consisting of a civil engineer and an accountant, chaired by the Deputy/Assistant Agrarian Commissioner, checks and confirms the above qualifications.
5. The cost estimate of the contract shall be approved by the Deputy/Assistant Commissioner of Agrarian Services on the basis of rates previously approved by the District Pricing Committee.
6. Payment shall be made after the personal satisfaction of the Engineer/ Technical Officer (TO) of the District Agrarian Services Office that the relevant work has been done properly in the payment of bills.
7. The Deputy/Assistant Commissioner of Agrarian Services shall ensure that the work assigned is not subcontracted.
8. At the meeting of the District Agriculture Committee chaired by the District Secretary, such contracts should be included in the agenda so as to discuss the contracts assigned to each area and their progress.

Other conditions in awarding direct contracts to CBOs

a. Evidence of proof issued by a bank or other financial institutions, which issues bank statements, stating that the particular CBO has the facility of obtaining a credit.
b. Evidence of proof on completing similar projects previously to show satisfactory and quality work
c. A complete report prepared by the organization on projects they have undertaken, completed and ongoing within one year's time. The report should include the name of the CBO, type of work, value of the project, contractors name and current status of the project.

d. A statement issued by the community organization saying that they will not give the project on sub contract. If they do so, they would be listed in the disqualified list.

e. The project site should lie within the area covered by the CBO.

f. The project area should lie within the respective CBO area.

CHAPTER THREE

Methodology

3.1 Sampling Procedure and Selection of Study Sites

Initially, review of monthly and year-end progress reports and key informant interviews were conducted to identify main rehabilitation projects undertaken by various FOs under this scheme during the period of 2014-2018. Further, in the sample selection process, it was ensured to select rehabilitated schemes that had been totally completed and been through a certain time period so that the impact of the rehabilitation could also be considered. Taking this information into consideration, the districts with the highest number of minor irrigation rehabilitation works undertaken by FOs were selected for the detailed study. Further, time and resource constraints were considered in finalizing the projects and respective districts for the study. Forty three randomly selected MIR projects, which were implemented during the last five years (2014-2018) in five districts; Kurunegala, Anuradhapura, Nuwara Eliya, Badulla and Vavuniya were selected for the field survey (Table 3.1).

Table 3.1: Selected MIR Project and Responsible FOs

District	ASC	MIR Project	Responsible FO
Kurunegala	Madahapola	Wagale Amuna	Ekamuthu
	Thambuththa	Ihala Giribawa wewa	Parakum
	Kobeigane	Kadhaththawa kadawala amuna	Weera Parakrama
	Kumbukgate	Dhadapalagamuwa wewa	Dadapalagamuwa Ekamuthu
	Naagollagama	Kadambava yatakalanegama poshaka ela -2nd step	Nagollagama Eksath
	Ganewaththa	Pannawa maha wewa	Pannawa Parakum
	Boraluwewa	Aluthwewa	Aswadduma Saarabumi
	Polgahawela	Morugama wewa	Morugama
	Munamaldeniya	Akarawatthe maha wewa	Eksath
Anuradhapura	Eppawala	Kuda thimbiri wewa	Samagi
	Thirappane	Thirappane maha wewa	Mahasen
	Galenbidunuwewa	Ihala koka wewa	Ihalakokawawa
	Ipalogama	Karambewewa	Gamini Halmillawa
	Kabithigollawa	Thiththalgala wewa	Maha Nabadawawa Samagi
	Koonwewa	Rambapothana wewa	Eksath (Koonwawa)
	Gambirigaswewa	Upathissagama wewa	Wijaya
	Rambawa	Pahalakatukaliyawa wewa	Katukaliyawa
	Nochchiyagama	Palugaha wewa	Saarabumi

Badulla	Mahiyanganaya	Kottagahakanaththa wewa and amuna	Kottagahakanaththa
		Diyalabuwelkatiya wewa	Minimuthu
	Ridimaliyadda	Tholavisi kandura amuna	Galeyaya Sucharitha
		Welkatiya ela and amuna	Kotaganwella Pubudu
	Balleketuwa	Digiyathanna ela	Madawela - Batahira
	Boralanda	Rathkarawwa wijekoon ela	Rathkarawwa
		Hawariyamalwala wewa	Hawariyamalwala
	Bogahakubura	Pattipola ela	Kalubululanda
	Kotawera	Dikbaddha wewa	Kotawera Udagama
Nuwara-Eliya	Ginigathhena	Ruwanpura wewa	Mahaweli
	Karalliyadda	Galbokkawewa	Malulla Sulu
		Bandiyawa Wewa	Udagalauda Sulu
	Nildandahinna	Raththjawewa	Samagi
		Golawelapathana Wewa	Gamunu
	Pudaluoya	Pudaluoya wewa	Kadadorapitiya
	Theripaha	Karakaduwa Podiwewa	Pubudu
Vavuniya	Madukanda	IhalaPuthukkulama	Arunalu
	Kanagarayankulam	Mannankulam	Mannankulam
		Karampaikkulam	Pollar Puliyankulam
	Nedunkarni	Mavilankankulam	Unchalkadi
	Kovilkulam	Mudavankulam	Kallikulam
	Pampaimadu	Kalvelikulam	Kalvelikulam
	Omanthai	Arumugathanputhukulam	Arumugathamkulam
		Sinnamaraiilluppaikulam	Mahilankulam
		Maruthankulam	Velarsinnakulam

Source: HARTI Survey Data, 2019

3.2 Sample Size

The MIR contracts, both anicuts and tanks, implemented under said circular of the DAD during 2014 to 2018 were considered in this study. The sample size required for a study depends on many factors such as study design, objectives of the study, type one error rate, required power, variability of the primary variable, margin of error and the population size, and so on. In this study population size was 4,117 and the objective was to assess the impact of awarding MIR contracts to FOs. Hence the required sample size was computed by using a Cochran's sample size formula for categorical data (Cochran, 1977).

$$n_0 = \frac{z^2 \times (p)(1-p)}{d^2}$$

Where, n_0 is the sample size required, p = Expected proportion of success (in decimal), z is the selected critical value of desired confidence level, d is the desired level of precision. Expecting 90 percent confidence level, ten percent margin of error and 80 percent success rate, required sample size for the study is;

$$n_0 = \frac{(1.65)^2 \times (0.8)(0.2)}{(0.1)^2} = 43$$

Since the population of minor irrigation systems is heterogeneous and distributed in different districts, districts with the highest number of projects were selected in a manner so that the total numbers of projects of those selected districts were represented 50 percent of the beneficiary population. The sample was proportionally allocated based on ratio between minor tank/anicut population of the selected district and the total number of rehabilitated schemes (Proportionate Allocation Method).

3.3 Type of Data Used

Both quantitative and qualitative data collected from the primary and secondary sources were used in this study and primary data was collected during July to September 2019.

3.4 Data Collection Tools

A number of data collection tools were adopted to gather data and information required to achieve the objectives of the study.

Questionnaire Survey

In each selected scheme farmer leaders and fellow farmers were interviewed using two separate pretested structured questionnaires. Three main office bearers and five member farmers were interviewed in each selected FO.

Key Informant Interviews (KIIs)

Guided interviews were conducted with the office bearers of the FOs in the study area and officers attached to line agencies relevant to the implementation of the project such as DOs, Agriculture Officials in order to understand the prospects and issues of the project.

Focus Group Discussions (FGDs)

FGDs were conducted in all selected locations targeting various beneficiary groups in the villages where the projects were implemented. A checklist prepared using the initial information through reviewing literature and from key informant discussions was instrumental in this task.

Informal Discussions

Informal discussions were conducted among farmers, farmer representatives, field officers of the project and grass root officials to triangulate the various issues that emerged in the project.

Direct Field Observations

Field observations were made during the field visits to acquire a understanding of the quality of the rehabilitation work completed, current situation of the tank/anicut and other structures, existing problems and farmers' attitudes on maintenance of irrigation systems.

3.5 Analytical Framework

Descriptive and inferential statistical tools were used to analyze data. The collected data included farmers' views about the contracting process, implementation mechanism, and the impacts of the MIR projects for their livelihoods. In addition, the aspirations of farmers towards sustainability of the irrigation systems and the selection procedures of the minor irrigation rehabilitation projects were also assessed. The opinion and the knowledge of the experts on MIR were also incorporated into the analysis. Finally, the analysis was undertaken targeting to assess whether the objectives of the said Circulars had been achieved and the recommendations of the study were also made considering the said objectives of the Circulars.

The variables and indicators for the assessment were selected after reviewing literature and conducting initial key informant interviews. The following parameters were considered in the detailed analysis to achieve the research objectives.

Objective 1:

One of the primary objectives of awarding MIR to FOs is to manage the respective minor irrigation systems in a sustainable manner through strengthening FOs, increasing their financial levels and developing individual capacities of member farmers (Delobbe, Haccoun and Vandenberghe, 2002; Hakelius and Hansson, 2016; Halbrendt et al., 2014). Hence, the present study evaluated these three aspects; the strength of the FOs, degree of financial viability of those FOs and development of individual capacities of member farmers. Indicators used to measure the strength of the FOs were the number of members in the FO, quality of the leadership of respective FOs, the nature of building linkages/networking with external organizations, usefulness of FO meetings, effectiveness of the decision making process in the FO. In addition, effectiveness of FOs in conflict resolution/management and internal communication was also considered. To measure the degree of financial viability of FOs, quality of FOs financial management and financial capacity of FO were taken as the indicators. The project's influence over the development of individual capacities of member farmers was evaluated by using indicators such as management skills, operation and maintenance skills, basic construction and repairing skills and building linkage/networking with relevant officials and institutes.

Objective 2:

To assess the overall quality and completion of rehabilitation work and project's success in fulfillment of farmers' needs and farmer participation in rehabilitation process, the following indicators were selected as suggested by Aheeyar and Smith 1999; Liberato et al., 2011; Meinzen-Dick, Raju and Gulati, 2002; Oweis and Hachum, 2006: preparation of the work plan, communication mechanism within the project team/FO, community mobilization rate, fund allocation mechanism (transparency, accountability), performance of O&M planning and operations, performance in mobilization of resources for O&M Further, field observations, rate of completion, quality assurance by beneficiaries, attitudes towards O&M and quality assurance by

the line agency officials were collected to understand the quality of rehabilitation work (Illukpitiya and Gopalakrishnan, 2004; Rosairo and Potts, 2016).

Objective 3:

The project was expected to create a sense of ownership, responsibility and accountability in FO/farmers by self-governing the irrigation rehabilitation processes and O&M activities. Success of the said objective was evaluated using the indicators such as self-identity[1] (Porteous, 1976), accountability[2] (Lerner and Tetlock, 1999), territoriality[3] (Brown, Lawrence and Robinson, 2005) and responsibility[4] (Cummings and Anton, 1990) and were assessed by setting a number of questions to get the responses of how they behave towards irrigation system sustainability and management. Further, the study gathered information on how they would preserve these resources for their younger and future generations.

Objective 4:

Data and information was collected on tank/anicut water availability, changes of cultivable extent/ productivity, status of water loss, effect on other water resources in surrounding area, consequence of other livelihood activities and other social impacts such as development of village roads to assess the impact of rehabilitation of irrigation schemes on beneficiary farmers.

Objective 5:

To review the procedure of awarding contracts to FOs for more sustainable and effective MIR the related assessment was conducted using two activities; the selection procedure of awarding contracts and the role of contract awarding institution (North, 1991; Townley, 2002; Zamil and Shammot, 2011). While studying the selection procedure of awarding contracts, application process, selection criteria adopted by the DAD and the contract awarding procedure was also taken into consideration in this exercise.

[1] A personal cognitive connection between an individual and an object (e.g. Minor irrigation system/tank), The individual's perception of oneness with the target (e.g. tank/anicut)

[2] The implicit or explicit expectation of the perceived right to hold others and oneself accountable for influences on one's target of ownership

[3] An individual's behavioral expression of his/her feelings of ownership toward a physical or social object

[4] The state of cognitive and emotional acceptance of responsibility

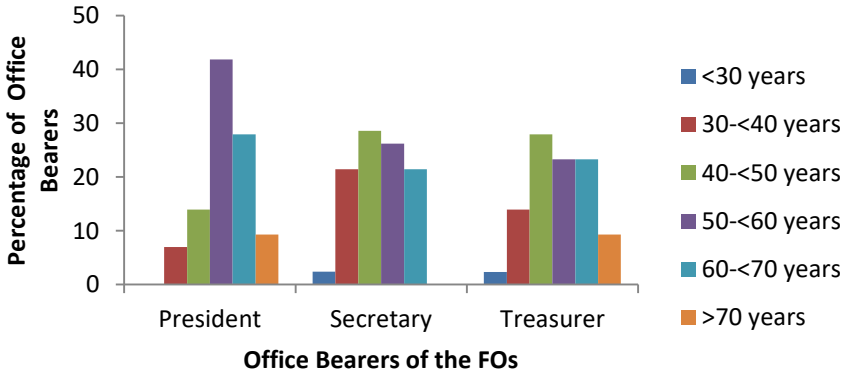
CHAPTER FOUR

Intervention of Farmer Organizations in Minor Irrigation Rehabilitation

This chapter discusses the matters related to functions of FOs and the way they have performed their routine activities through the organization. Further, this chapter covers the MIR projects carried out by the FOs and the processes and procedures followed in the projects and the issues encountered by the FOs in the course of those activities. The strength, leadership, effectiveness of the decision making process relating to the FOs and the financial capabilities of FOs were analyzed to understand how effectively the resources have been used for the success of tank rehabilitation activities and their performances.

4.1 Demographic Features of Farmer Leaders and Members in Selected Areas

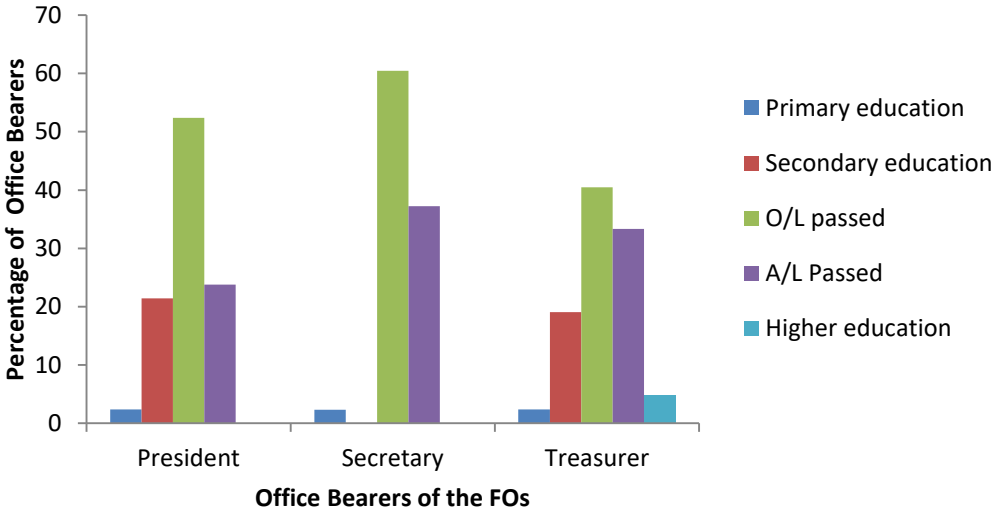
The effective leadership is one of the key factors that directly affects the performance of the FO and success of the activities performed. Also, demographic characteristics of the leaders directly determine the performance level of the FO. Thus the study attempted to gather demographic information from office bearers of the FOs. Figure 4.1 illustrates the age categories of farmer leaders of respective FOs. It indicates that the majority of the farmer leaders are in the age category 50 - 60 years. This is the real cross section of the farming community currently involved in crop production in many parts of the island (Udari, Perera and Wickramasinghe, 2019).



Source: HARTI Survey Data, 2019

Figure 4.1: Age Distribution of Office Bearers of FOs

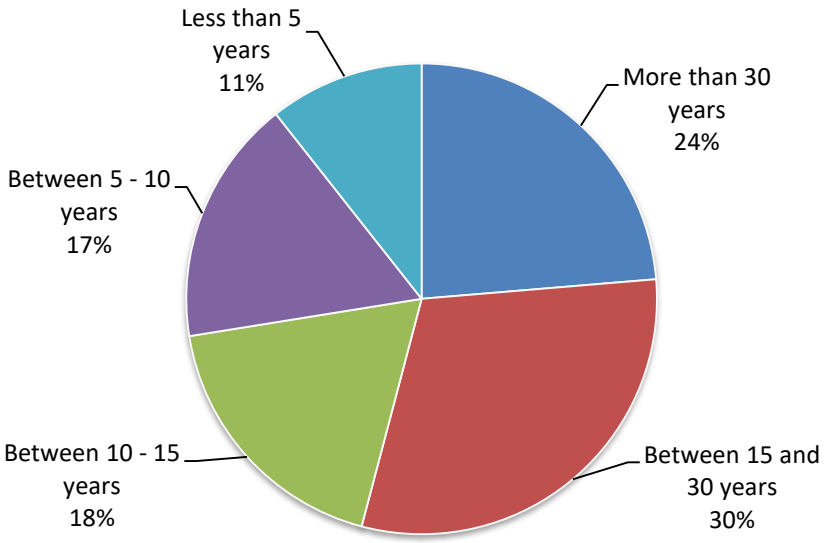
As illustrated in the Figure 4.2, present-day farming communities are more educated than earlier communities and the majority of the office bearers of the FOs have a minimum of the GCE Ordinary Level qualifications. A significant number of farmer leaders have GCE Advanced Level qualifications while a few have educational qualifications above the Advanced Level.



Source: HARTI Survey Data, 2019

Figure 4.2: Education Status of Office Bearers of the FOs

The data was collected from the ordinary member farmers of respective FOs on farming experience and the information on how long they have been a member of the organization as this will indicate the social capital associated with the FOs. The social capital impacts the organizational management and behaviour of the leaders of the FOs (Uphoff and Wijayaratna, 2000). According to farmers interviewed, the majority (90 percent) has been a member of the FO for at least more than five years (Figure 4.3).



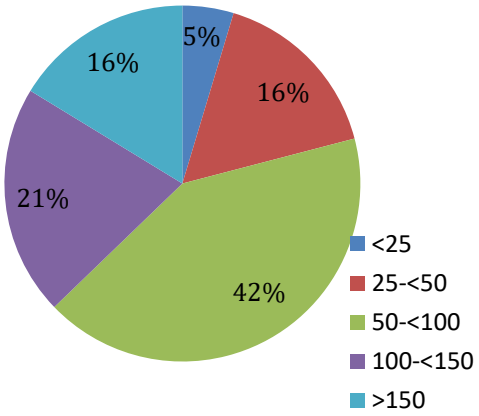
Source: HARTI Survey Data, 2019

Figure 4.3: Length of FO Membership

4.2 Strength of Farmer Organizations

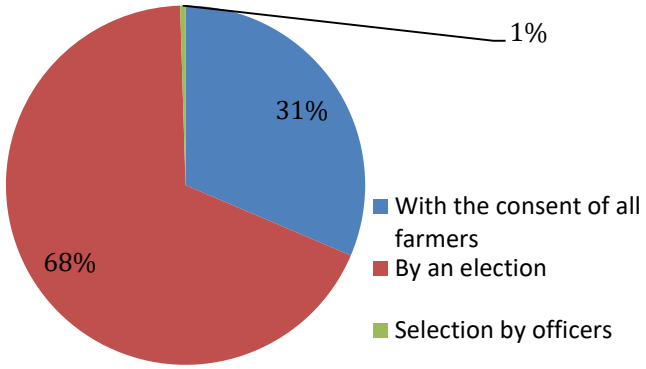
One of the basic objectives of establishing FOs was to facilitate the implementation of participatory irrigation management in the country (Aheeyar, Padmajani and Bandara, 2012). The involvement of FOs in all stages of minor tank rehabilitation from planning, designing, through construction to the finalization of project activities are important in the rehabilitation process. The strength of farmer organization is one of the key factors in taking collective decisions and it induces members to be actively involved in the rehabilitation activities. The strength of FOs can be derived in many ways, but in this study, it is assessed by gathering key factors like number of members, the decision making process, leadership qualities, financial capacities of the farmer organization, frequency of gatherings, and so on.

Figure 4.4 and Figure 4.5 illustrate the number of members in selected FOs and the procedure followed in electing office bearers for the FOs respectively. The majority of the FOs have 50 to 100 members. The membership numbers in between 100 – 150 and above 150 accounts for about 21 percent and 16 percent FOs respectively. According to the sample, five percent of FOs have less than 25 members. It was observed that the FOs under small tanks with relatively small command areas have a smaller number of members.



Source: HARTI Survey Data, 2019

Figure 4.4: Number of Members in the FO



Source: HARTI Survey Data, 2019

Figure 4.5: Selection Methods of Office Bearers of FO

To assess the institutional mechanism of FOs, the information related to various activities and functions of FOs were collected in the survey. Selection criteria used in selecting/electing leaders to the institution/organization are considered as a key indicator in assessing the democracy of the FOs. In this study, the members of one FO stated that the membership does not have the opportunity to select the office bearers since it is completely handled by the ex-officials. However, this was a very rare incident, since at present it also depends on the strength of the FO. Nevertheless, in many FOs, elections are followed to elect the officials as depicted in the Figure 4.5. In some FOs, the office bearers are selected by the consent of all the members without

going for an election. This was to promote unity and harmony within the FO and eliminate any divisions among the members of respective FOs.

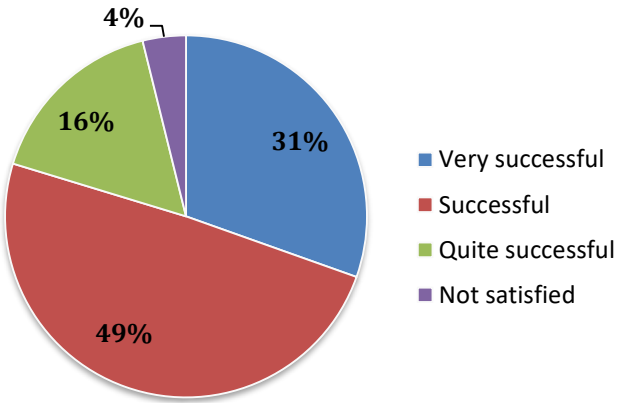
The performance of the officer bearers of the FO was evaluated based on the information obtained from the member farmers. Accordingly, indicators like enthusiasm, efficiency, accountability, performance in organizational management and resource management for the betterment of the irrigation system were considered. Approximately, 91 percent of the respondents are reported to be very satisfied with the performance and quality of the leadership (Table 4.1). The reasons for the higher levels of satisfaction were listed as holding meetings frequently, making decisions considering the views and suggestions of the FO members, addressing issues relating to irrigation management.

Table 4.1: The Farmers' Feedback on the Quality of the Leaders of FO

Response	Percentage
Strongly agreed	41
Agreed	50
Disagreed	8
Strongly disagreed	1

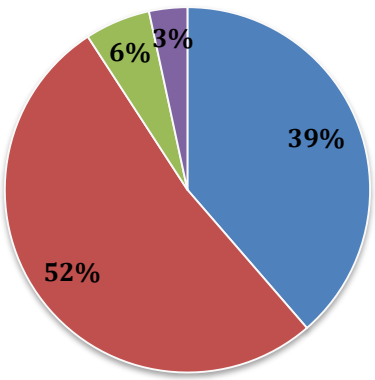
Source: HARTI Survey Data, 2019

Responses were obtained to understand the capabilities of the FO leaders and their management qualities. Many of the responses were directed to the answer of "FO has been able to solve the problems of its members successfully" (Figure 4.6). Farmers were asked about the impartiality in decision making of their farmer leaders and the overwhelming majority of respondent farmers are of the view that the office bearers of the FOs are very impartial in the process of decision-making relating to the issues which have arisen in the FOs (Figure 4.7).



Source: HARTI Survey Data, 2019

Figure 4.6: Influence of FO Leaders in Solving Members Issues



Source: HARTI Survey Data, 2019

Figure 4.7: Nature of Impartial Decision Making by the Leadership

The availability of a well-established communication system within the FO indicates its ability to disseminate the decisions and other information to fellow farmers and how effectively it mobilizes farmers to achieve the common goal. Table 4.2 shows the responses of farmers on frequency of meetings held by FOs when the organization has been conducting special projects. Accordingly, over 52 percent of the farmers have expressed that the number of meetings has increased during such periods while 29 percent of farmers said that the number of meetings have not changed even when the special occasions arose. For FOs, there are several ways to inform the membership when and where the meetings will be conducted (Tripp, Wijeratne and Piyadasa, 2005). In early days, the information about the time and the venue were informed to the fellow farmers by posters, or by personal communications, but at present it has gradually changed to telephone calls or text messages (Figure 4.9). In addition, some farmer groups have created WhatsApp or Viber groups to communicate with each other. This is a remarkable development of the communications strategy within the farmer groups and it was reported under the other category of Figure 4.9 which demonstrates the high level of coordinating arrangements in the organization. De Silva and Ratnadiwakara (2008) revealed that use of Information and Communication Technology can reduce transaction costs in agriculture through better communication. Besides, the information on farmer participation for regular meetings was collected (Table 4.3) and it shows that nearly 100 percent farmer participation have been recorded in 22 percent of respondent FOs. Altogether FOs in which over half of the membership has participated in the meetings accounts for 95 percent.

Table 4.2: Frequency of Meetings held During Special Projects Implementation

Response	Percentage of FOs
The frequency of meetings always increased	26
Probably the number of meetings increased	26
Special meetings are calling when it was necessary	19
The frequency of meetings did not change	29

Source: HARTI Survey Data, 2019

Table 4.3: Participation in FO Meetings

Response	Percentage of FOs
All members participate (100%)	22
Most of the members participate (75%)	45
Member participation is in average (50%)	28
Farmers' participation is not at satisfactory level (less than 25%)	5

Source: HARTI Survey Data, 2019

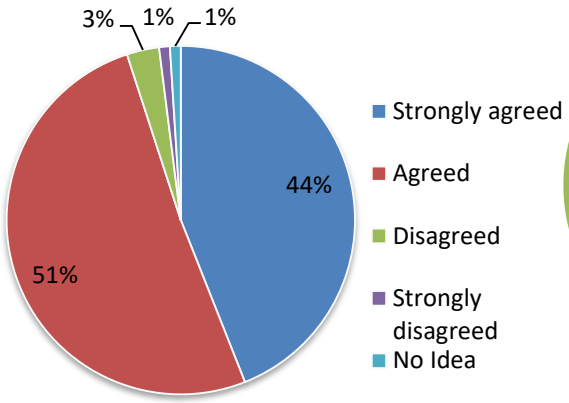
The farmers' responses were assessed to analyze the communication network in the FOs and how they have been operated. Further, the mode of dissemination of the

meeting calendar, the importance of the meetings and the effectiveness of the conducting meetings were also considered. Many of the respondents have agreed that the meetings of the FO have been conducted in an effective manner, so that the membership has an adequate opportunity to express their ideas and suggestions (Table 4.4). The vast majority of the respondents feel that FO always makes decisions based on the views and suggestions expressed by the membership (Figure 4.8).

Table 4.4: Feedback on the Effectiveness of FO Meetings

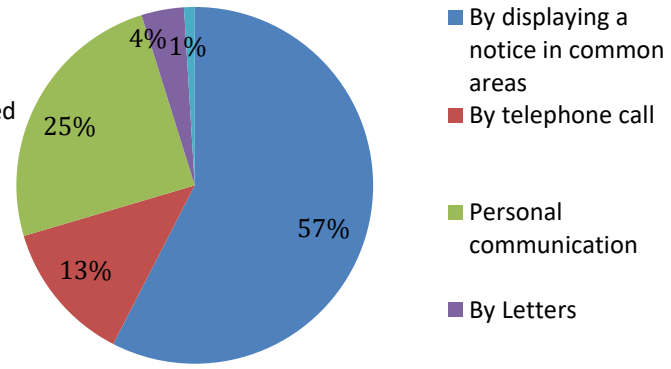
Response	Percentage of Responses
Conducted in an effective way that they can express their ideas	73
Often conducted in an effective and expressive manner	20
Sometimes it is conducted in a constructive and expressive manner	7

Source: HARTI Survey Data, 2019



Source: HARTI Survey Data, 2019

Figure 4.8: Respondents Views on Complete Involvement of Membership in Decision Making



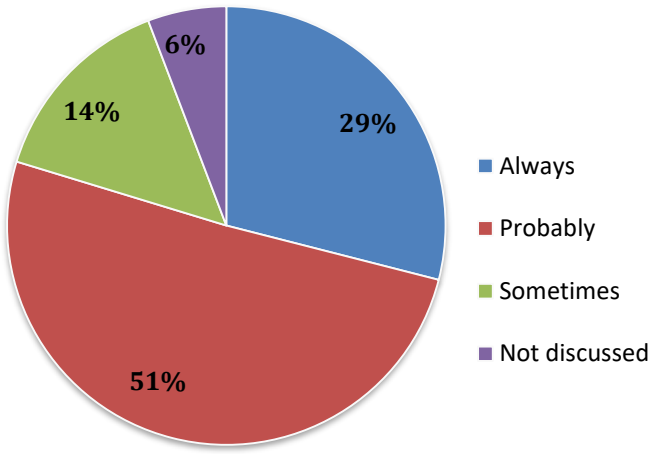
Source: HARTI Survey Data, 2019

Figure 4.9: Methods of Receiving Information on FO Meetings

As per the responses given by farmers about the communication network of the FO, it shows a great improvement compared to the modes used in the past. The participation rates, communication networks, freedom to speak and ability to express ideas within the FO indicate the effectiveness of the management process of the FO. As mentioned by Uphoff (1986), reasoning relies too heavily on effective institutional communication networks that can have a chance to increase conflict resolution on water disputes and from it increases the positive interactions among members.

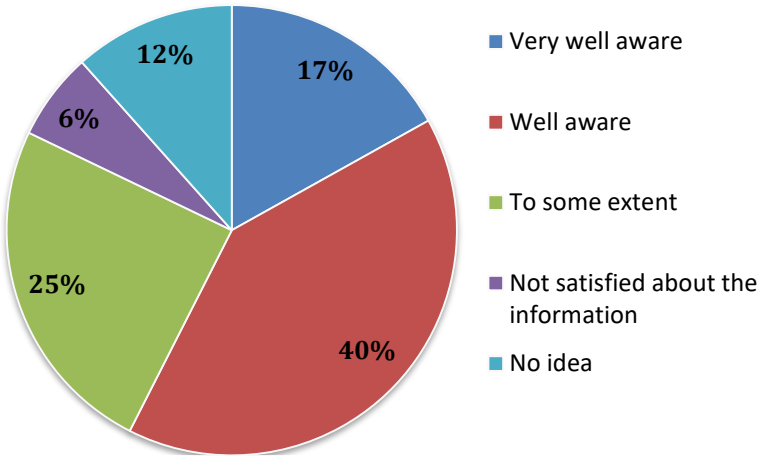
4.4 Usefulness of FO Meetings

Meetings enhance the decision-making process of the FO while allowing farmers to raise issues and obtain reasonable solutions. There are several types of meetings; annual meetings, *kanna* meetings, monthly meetings and special meetings conducted by the FOs on different occasions to cater for various purposes. Even though the types and the frequencies of the meetings are different from FO to FO, the annual meetings and *kanna* meetings are very common and compulsory in most of the agricultural systems. The monthly or other occasional/special meetings are held on a need basis. The effectiveness of the FO meetings can be measured in one way by getting the views of farmers about the extent the FO members discussed irrigation system maintenance requirements and other agriculture related matters at those meetings (Figure 4.10). On the other hand, it can be measured by assessing whether the number of meetings and the enthusiasm has increased with the MIR project completion. In addition, the information on decision-making relating to implementing such projects or activities by the FO was also gathered (Figure 4.11). Accordingly, only six percent of the farmers said that the matters relating to irrigation system maintenance requirements are not discussed in the FO meetings. However, the response of the rest of the sample farmers was that the FO meetings are always a forum for the discussions on irrigation system maintenance.



Source: HARTI Survey Data, 2019

Figure 4.10: Frequency of Discussions on O&M Requirements at FO Meetings



Source: HARTI Survey Data, 2019

Figure 4.11: Awareness of the Membership on MIR Projects Received by the FO

The farmers' awareness on decisions made by the FO and their involvement in the decision-making process within the FO is given in Table 4.5. Accordingly, 43 percent of the FOs make its membership aware of the projects received by the respective FOs and allow the entire membership to be involved in decision-making processes relating to the said projects. Though this is a progressive indication on awareness creation within the FO, there is more room for the further improvement in the particular aspect.

Table 4.5: Members Involvement in Decision Making

Responses	Percentage of responses
At all times, decisions are made with the knowledge and involvement of all its members	45
In many cases decisions are made with the knowledge and involvement of all members	31
In some cases decisions are made with the knowledge and involvement of all members	17
Decisions made without the knowledge and involvement of the members	7

Source: HARTI Survey Data, 2019

4.5 Degree of Financial Viability of FOs

As an institute, FOs are expected to perform certain activities relating to O&M and related management of minor irrigation systems on a voluntary basis. Therefore, the accountability, transparency, and fair decisions facilitate the growth and the sustainability of such institutions. Regular meetings, decision-making processes, conflict resolution, providing financial statements, transparency of expenses and so on. Indicate the sustainability and governing mechanism of FOs. The membership of

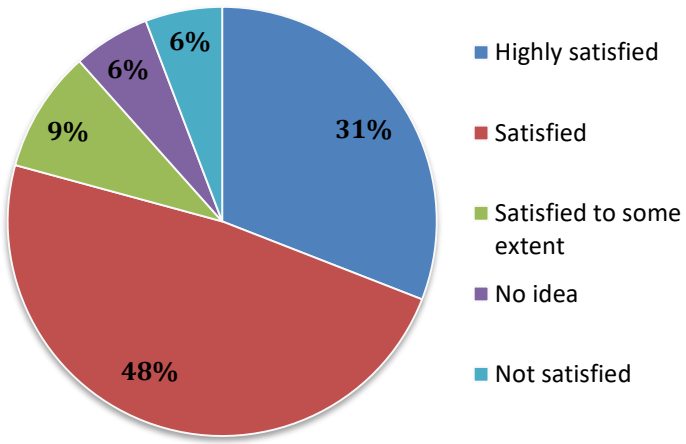
the FOs has the right to know the budgets associated with the projects and programs carried out by the organization and the transparency and the accuracy of the transactions made by the office bearers of the FO. The Table 4.6 presents the information in this regard and in addition, it details the satisfaction of the membership on the overall financial management process of the FO. About 52 percent of the surveyed farmers responded that they are well aware of the income and expenditure statements of each project that the organization has completed. Of the rest of the respondents, 40 percent have complained that such a practice does not exist in the respective organizations while six percent have no idea about the statements.

Table 4.6: Members Perception on the Budget Presented

Responses	Percentage of responses
Most of the time it was an accurate and acceptable reports	74
Although there are some pitfalls, reports accepted subject to minor revisions	21
Members have certain issues, not satisfied about the report	3
Members were not satisfied with the reports	2

Source: HARTI Survey Data, 2019

Table 4.6 presents the responses given by the members of FOs on the accuracy of the budget statements presented by the office bearers of the respective FOs (this includes only the responses of farmers who are well aware of the income and expenditure statements in each project handled by the organization). Finally, the overall financial management status of the FOs was measured by assessing the views of the fellow farmers (Figure 4.12).

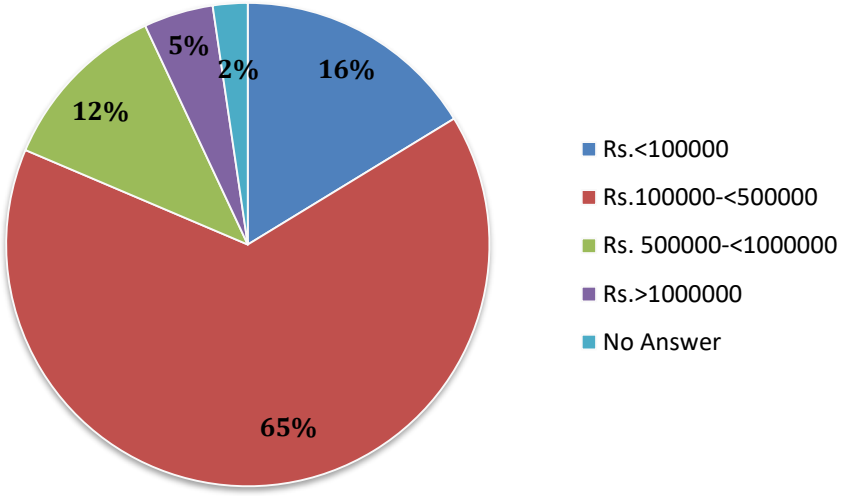


Source: HARTI Survey Data, 2019

Figure 4.12: Satisfaction of Overall Financial Management of the FO

On average, 31 percent of the farmers are highly satisfied with the way the FOs are maintaining the accounts. However, 21 percent of the respondents have mentioned that book keeping relating to the projects are practiced in an acceptable manner. But,

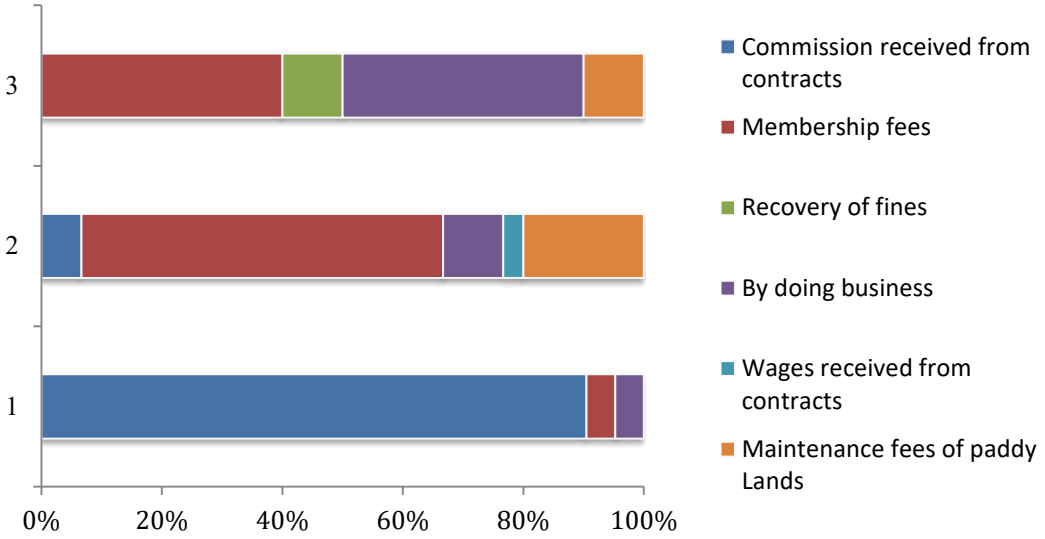
low percentage of book keeping indicates room for further improvements on financial responsibility of the FOs. Figure 4.13 and 4.14 illustrate the financial strength of selected FOs at the end of year 2019 respectively and the priority activities contributed to raise the financial status of FOs.



Source: HARTI Survey Data, 2019

Figure 4.13: Financial Status of Selected FOs

As indicated in Figure 4.16, the financial strength of the majority of FOs (90 percent) is increased by commissions received through contracts carried out by the organization. The second important factor in earning income is the membership fee collected from the members.



Source: HARTI Survey Data, 2019

Figure 4.14: Priority Activities that Contributed to FOs Financial Strength

CHAPTER FIVE

Role of Farmer Organizations in Tank Rehabilitation Process

The FOs act as a key stakeholder of managing minor irrigation schemes including irrigation scheduling, minor maintenance matters, farmer welfare, and assisting fertilizer subsidy programmes. Interventions of FOs towards rehabilitation of irrigation systems are essentially important to maintain its sustainability since they are the right holders of those systems. Since way back in time minor irrigation system operation, maintenance and minor repairs have been the responsibility of the FOs.

Reconstruction and rehabilitation of minor tank and anicut systems are important activities to keep the system sustainable and also to battle the climate change impact that threaten farmer's livelihoods. Though FOs have been established to manage irrigation water and related matters, it seems that the lack of sustainability of those systems is connected with the attention paid to keep it sustainable. Because, even if it is a minor repair, it will not be done by the FO and it is believed that the repair should be done by the DAD as they have perceived that those systems are owned by the DAD.

However, some studies have argued that in the past that the tank systems were owned and operated by the farmers very sustainably (Herath, 2002; Panabokke, Tennakoon and Ariyabandu, 2001). During the British rule the century old protocols and systems were neglected leading to the collapse of the irrigation systems. On the other hand, many of those systems have deteriorated and are not easily rebuilt with the available resources of the FOs. Unlike major irrigation systems, the financial capacities of the FOs in minor irrigation systems are very low. As per Figure 4.13, it is very clear that only five percent of the FOs have been able to achieve more than Rs. 1,000,000 savings, as an indicator of its financial capacity. However, this was more institutionalized after issuing the circular of granting minor irrigation reconstruction or rehabilitation projects to the relevant FO to conduct under some regulations. As stated in the circular number MNPEA 03/2016, the minor irrigation rehabilitation projects of less than five million rupees can be directly handed over to the relevant FO without following any bidding procedures.

5.1 Minor Irrigation Rehabilitation Projects Conducted by Farmer Organizations

Table 5.1 presents the breakdown of the MIR projects studied, in terms of the way they were carried out. Accordingly, only six rehabilitation projects (14 percent) have been solely conducted by the respective FO. However, the rest of the MIR projects (86 percent) have been subcontracted to a third party. The subcontracted details are given in Table 5.2 and the majority of subcontractors belong to the same village where the rehabilitation projects were conducted. The farmers and the farmer leaders

emphasized that receiving of MIR projects and their benefits are attached to a great extent to the local and national level political interventions[5].

Table 5.1: Division of Responsibility MIR Projects

District	Number of projects		
	Fully by the FO	Sub contracted	Total
Anuradhapura	1	8	9
Kurunegala	2	7	9
Nuwara Eliya	1	6	7
Vavuniya	1	8	9
Badulla	1	8	9
Total	**6**	**37**	**43**

Source: HARTI Survey Data, 2019

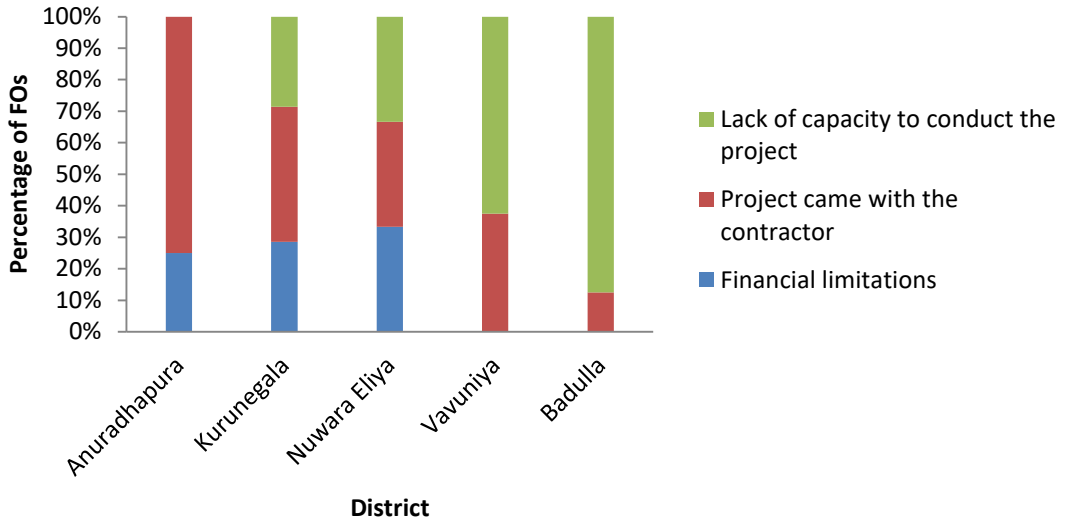
The subcontracting of MIR projects can be attributed to different reasons including not having properly developed soft and hardware skills within the FO and poor management of external interventions (Figure 5.1). The financial limitations with the FOs also have contributed to divert MIR projects to some other agencies including FOs in nearby villages that have more capabilities in MIR activities. In general, the lack of awareness of FOs on legal recognition given to FOs under the Agrarian Development Act is one of the main reasons behind many FOs not possessing capabilities in the particular area. Mainly, because of not knowing the power and authority that have been given by the Agrarian Act to the FOs to facilitate their activities related to managing the irrigation systems. Similar observations have been made by studies conducted by Aheeyar, Padmajani and Bandara, 2012; Wijekoon, Gunawardena and Aheeyar, 2016.

Table 5.2: Subcontractor Profile of MIR Projects

District	Private contractor within the village (%)	Predetermined subcontracting (%)	Contractor outside the village (%)
Anuradhapura	8	11	3
Kurunegala	19	0	0
Nuwara Eliya	11	5	0
Vavuniya	8	0	14
Badulla	14	3	5
Total	**59**	**19**	**22**

Source: HARTI Survey Data, 2019

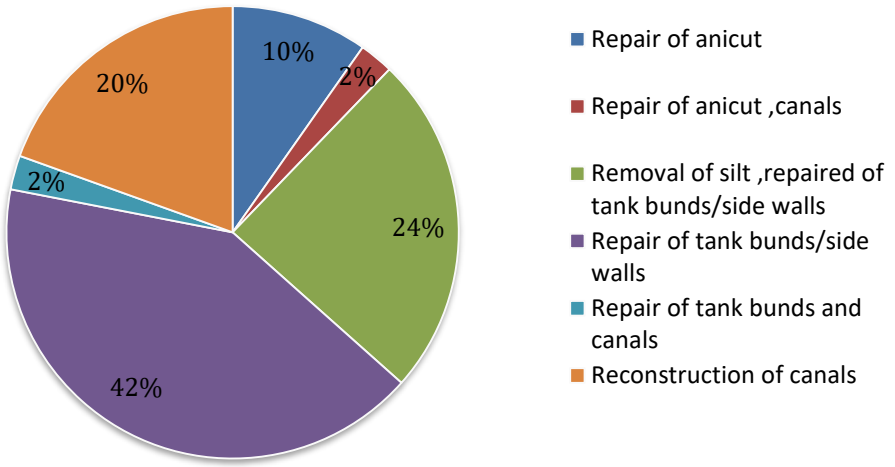
[5] In provision of minor tank selection, contracts awarding, political pressure and patronage play an important role in what irrigation system/people would receive priority.



Source: HARTI Survey Data, 2019

Figure 5.1: Reasons for Subcontracting MIR Projects

As shown in Figure 5.2, MIR projects awarded for FOs are diverse such as removal of silt, repairing of bunds and side walls, reconstruction of canals and anicuts etc. Out of these, 42 percent of the projects selected for the study were granted for renovation of tank bund and retention walls. Another 24 percent of the projects were implemented for tank de-silting.



Source: HARTI Survey Data, 2019

Figure 5.2: Nature of MIR Projects

Table 5.3 details the facts and figures related to 43 projects awarded to FOs by the DAD to undertake reconstruction or rehabilitation of minor irrigation systems. However, during the survey it was found that only six FOs who were given contracts were carried out by the respective FOs themselves (Table 5.1). Rest of the FOs had subcontracted to different agents such as different FOs, private contractors, individual persons, and so on.

Table 5.3 also provides information on how the FOs have carried out MIR projects and the experiences gained in the course of the project/s. Of the six FOs, one FO was not aware of the total cash allocation the authority had approved for the particular project. Further, the said FO had received an advance payment to commence the project. By processing the detailed information given in the Table 5.3 and taking the data and information collected through the informal discussions held with the farming communities into consideration, it was revealed that majority of the FOs do not have a clear understanding on the particular Circular and the primary intentions/objectives of the granting institution (the DAD) in granting MIR projects to FOs. However, the FOs have to sign the project agreement/s with the DAD, after reading and understanding it. The Box 01 provides further elaboration to the issues and matters raised in the Table 5.3 and Figure 5.1.

Table 5.3: Information on the MIR Project Solely Conducted by the FOs

District	Kurunegala	Kurunegala	Anuradhapura	Vauniya	Badulla	Nuwaraeliya
ASC	Naagollagama	Boraluwawa	Eppawala	Kanagarayan	Ridimaliyadda	Ginigathhena
FO Name	Nagollagama Eksath	Aswadduma Saarabumi	Samagi	Pollar Puliyankulam	Kotaganwella Pubudu	Mahaweli
Approved amount (Rs.)	1,300,000.00	3,000,000.00	No idea	3,000,000.00	1,300,000.00	1,700,000.00
Initial amount received (Rs.)	-	-	-	200,000.00	130,000.00	170,000.00
Is that Initial amount were adequate to mange the project activities	Not Received Initial payment	Not Received Initial	Not Received Initial payment	Not enough	Not enough	Not enough
If not how did you finance the project	Obtaining a loan	Obtaining a loan	Obtaining a loan	Work carried out on credit (Payment made after receiving funds)	Farmer Organization Funds	Money borrowed from relative/neighbour
Did the FO receive full payment after completion	Yes	Yes	No	No	Yes	No
If not, reasons?	Not applicable	Not applicable	Incomplete	Incomplete	Not applicable	Incomplete
Amount of saved money (Rs.)	65,000.00	150,000.00	150,000.00	-		35,000.00
How FO Used saved money	Money deposited in a bank account	Money deposited in a bank account, Used for other irrigation rehabilitation and maintenance activities	Money deposited in a bank account	No save from the project		Money deposited in a bank account
How often does the FO present financial statement/ budget report after each project	Once a year at the general meeting (AGM)	Once year at the general meeting (AGM)	When office be arears were changed	After every 6 months at seasonal meeting	After every 6 months at seasonal meeting	Once a year at the general meeting (AGM)
Submission of budget report after each project	Yes	Yes	No	Yes	No	Yes
If yes How did the budget report get approved	Agreed with majority's consent without any issue	Agreed with majority's consent without any issue	Not applicable	Agreed with amendments	Not applicable	Agreed with majority's consent without any issue

Source: HARTI Survey Data, 2019

In order to achieve the envisaged objectives of the DAD implementing the provisions of the Circular, the FOs should be well aware of the important information and provisions relating to the protocols of this circular. For example, initially a small percentage of total budget is given as an advance payment and total payment will be done once the respective activity is completed. Therefore, FOs should have sufficient funds to mobilize these projects which is lacking in many FOs. This situation has deterred many FO from carrying out such MIR projects. Also, FOs should be aware of the amount that was initially given as advance payment to commence the MIR project work. But, in many cases FOs are not aware of the terms and conditions of the agreements that they had signed. As the proportion of the advance payment of contract projects given to FOs cannot be changed owing to the government financial and administrative regulations, there should be alternative arrangements in the FOs who do not have adequate financial capacity. Once such FOs achieved the financial capabilities required by conducting a few projects, they could undertake similar project activities. Instead, such FOs tends to gain the five percent commission from the total budget of the project which is mostly subcontracted to a third party agent/s and is detrimental in achieving the basic objectives of DAD of awarding MIR contracts to the FOs.

Box 01

Great Western Tank: Rehabilitation project of Great Western Tank was carried out by *Watagoda Pragathi* FO. The Great Western Tank is located in a tea estate. There is no FO that is directly involved in water management, operation and maintenance and undertaking rehabilitation work of this tank. Since the funds are allocated only to a FO by the Agrarian Service Center, *Watagoda Pragathi* FO which is the FO in close proximity to the said tank has received the contract for rehabilitation work. This *Watagoda Pragathi* FO belongs to *Watagoda* Grama Niladahari Division in *Lindula* Agrarian Service Centre. The only objective of *Watagoda Pragathi* FO was to increase the financial strength of the FO through the commission they received from the project. The knowledge and competency of small tank rehabilitation was lacking among the members and the office bearers of the FO. Hence, the *Watagoda Pragathi* FO has given the task of rehabilitating of Great Western Tank to a third party as a subcontract. From this project neither the members nor the FO has benefited as the FO have not received the retention portion of the project budget as anticipated. Moreover, the membership and the office bearers of the FO have not been adequately aware about the rules and regulations regarding MIR projects.

5.2 Resource Mobilization for MIR by Farmer Organizations

To achieve the sustainability of the irrigation systems, there are certain protocols to be followed when carrying out rehabilitation projects by the organizations like FOs. In order to mobilize fellow farmers toward efficient management of irrigation systems including rehabilitation work, the features like preparation of advance work plans, maintaining efficient communication mechanisms, preparation of duty roster of the activities, fund allocation, monitoring and evaluations are important.

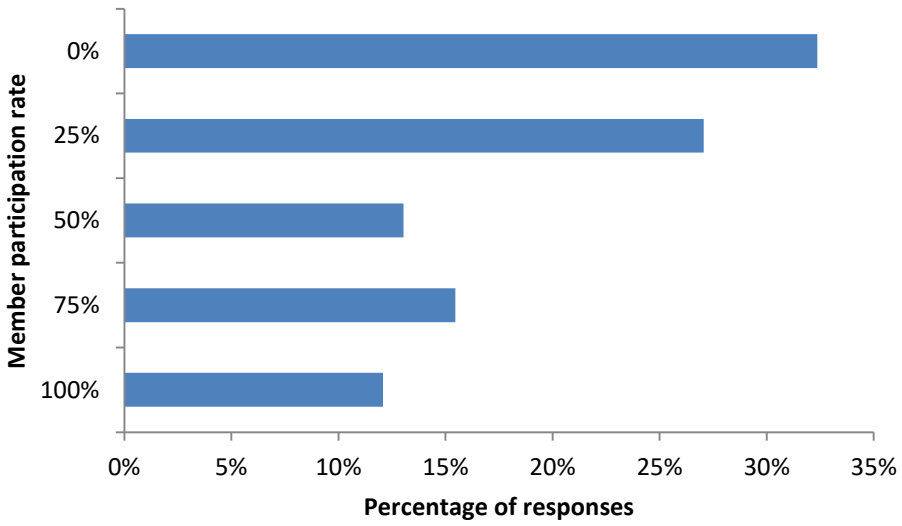
Table 5.4 presents the summary of responses given by the membership of the FOs on the modes of information relating to MIR projects received and conducted by the respective FOs. Majority (72 percent) of the farmers are made aware of such projects by the office bearers of the FO.

Table 5.4: Nature of Members Involvement in Planning and Implementation of MIR Projects

Response	Percentage
By discussing with all farmer members of the FO	72
Decisions were made by office bearers only	5
In discussions among FO office bearers and relevant government officials	11
Members involvement in this regard is minimal	13

Source: HARTI Survey Data, 2019

As far as the participation of the membership in the various activities related to MIR projects is concerned, only 12 percent of the FOs have been able to get the participation of the entire membership (Figure 5.3). Interestingly, 32 percent of the FOs have no member involvement in the activities related to MIR projects undertaken by the same FO, thus, only the office bearers have been involved in the particular activities and such situation is totally opposite to the objectives of the DAD awarding non-competitive MIR contracts to the FOs. In the absence of the active participation from the majority of membership in MIR and management activities the sense of ownership towards irrigation infrastructures and the sustainability of the irrigation systems are at risk. The Box 02 provides details on a MIR project in which the participation of the membership was reported to be minimal.



Source: HARTI Survey Data, 2019

Figure 5.3: Active Membership in the MIR Project

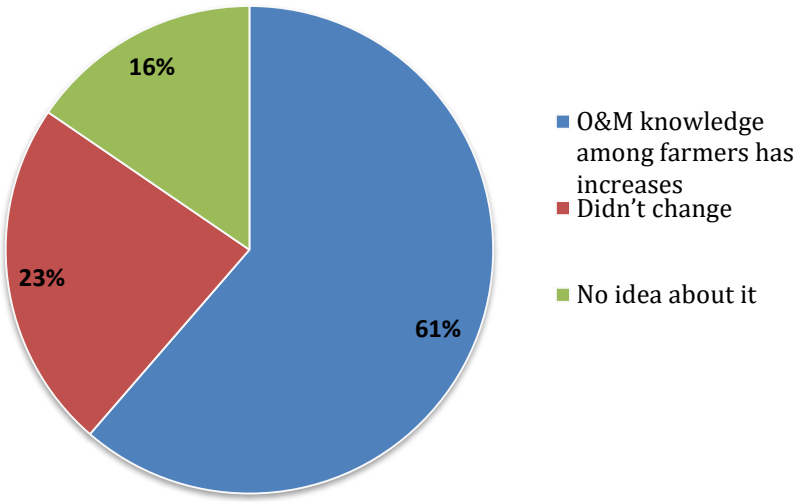
Box 02

Pundaluoya Tank: This tank belongs to Kadadorapitiya Farmer Organization located in Pundaluoya Agrarian Service Centre in the NuwaraEliya district. The main crops cultivated under the tank are paddy and vegetables. Command area of the tank being 80ac presently, cultivation is only continued in less than 50ac. Paddy farming has decreased as the majority is engaged in other types of employments.

The rehabilitation work of the said tank has been carried out in 2014 with an estimated budget of Rs. 1,500,000. The MIR activities have been subcontracted to an individual who has been a member of the same FO having strong contacts with the officials, so that, the membership of the FO was in the opinion that the MIR contract was awarded by the DAD due to his influence. Kadadorapitiya Farmer Organization had only received five percent of the total budget as the commission. The members of the FO were not given any opportunity to work even as paid laborers of the project. The MIR project consisted of removing salvinia, partial de-silting and laying concrete to a section of the side walls of the tank.

Though the office bearers of the Kadadorapitiya FO stated that the project was a success to a certain extent, the opinion of the fellow farmers is completely different. They were not happy and satisfied with the work done. There are about 70 members in the FO, however, less than 25 farmers generally attend the meetings. The Office bearers remain unchanged since 2009 and farmers are not happy about it. According to office bearers, there is an insufficient number of farmers attending meetings due to which office bearers cannot be changed. However, the fellow member farmers are complaining about the Agricultural Research and Production Assistant (ARPA) having least interest in calling regular meetings of the FO. Since the meetings are not held regularly, the 'Shramadana' activities to cleaning canals and bunds take place rarely. As the annual budget and other financial statements relating to organizations regular businesses and the special MIR projects are not discussed in the meetings, farmers are not aware of the financial management of the FO. Farmers feel the repair of sluice gate and laying a pipeline to convey water form tank to the fields instead of the existing wasteful open canal from which the illegal water tapping is taken place are in dire needs.

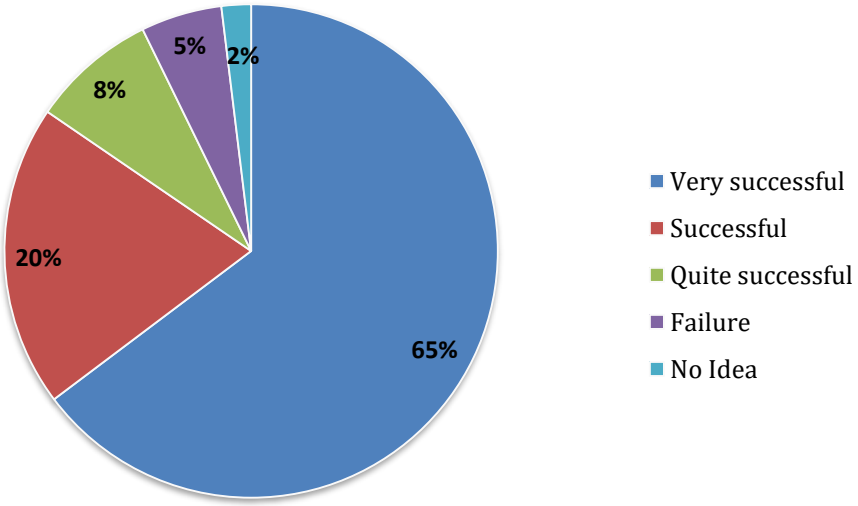
As illustrated in the Figure 5.4, 61 percent of the respondent farmers are of the opinion that the FO gains from being involved in MIR projects and their knowledge on O&M activities related to the tank also increased.



Source: HARTI Survey Data, 2019

Figure 5.4: Effects of MIR Projects on Developing O&M Skills

Beneficiary farmers cultivating under a particular irrigation scheme are the best people to judge the quality of the activities carried out under the MIR project. Also 85 percent of the farmers believe that the MIR projects under the respective FOs have been successfully completed (Figure 5.5).



Source: HARTI Survey Data, 2019

Figure 5.5: Farmers Responses on Overall Quality of the MIR Project

The Box 03 provides information on how the MIR projects could be successfully conducted and what parameters would aggravate it.

Box 03

Tholavisikadura Anicut: This project was implemented in 2016, to rehabilitate Tholavisikadura Anicut located in Rideemaliyadda, Badulla. It provides irrigation facilities for about 50 ac lowland area belonging to 23 farmers. This project was carried out by the FO (Gale yaya Sucharitha Farmer Organization) to which the management authority of the said anicut is vested. Chair of the FO has officially received the contract and the Agriculture Research and Production Assistant (AR&PA) of the area has been helpful in this regard. The total funds allocated for the project was Rs. 23,500,000/-. Generally, the FO does not let any contract related to the organizational boundary to go to the hands of an outside party. The FO has a fairly active and united membership governed by a set of rules. For those who are unable to participate in Shramadana activities organized by the organization is liable to pay Rs. 1500/- per day in addition to the Rs. 100 that regularly collected from each member in every season for the maintenance of irrigation systems. The project activities are supervised daily by two officers including the technical officer.

The funds required to initiate the project has been obtained as a loan from the available funds of the FO, by the chair who has taken the contract. Until funds are released from the DAD, the members have contributed by cash and labour to carry on project activities. Because of the active participation of beneficiary farmers in the FO, the project has succeeded in achieving the expected objectives.

CHAPTER SIX

Effects and Impacts of Minor Irrigation Rehabilitation towards Sustainable Irrigation System Management

One of the main objectives of awarding MIR activities to the FOs was to maintain the sustainability of the irrigation systems by providing them with a sense of ownership, technological skills, increased financial capability of FOs, and assurance of physical work without seeking financial gain and community mobilization towards system health and sustainability. Therefore, this chapter attempts to scrutinize the effects of MIR projects towards the sustainability of the irrigation systems from the farmers' perspective.

6.1 Farmer Contribution towards Sustainable Irrigation System Management

Towards Sustainable Irrigation System Management (Ordinary Farmer)

This section discusses the farmers' contribution towards sustainable management of the irrigation system based on farmer perceptions. The farmers' perception on O&M of the irrigation systems after the completion of rehabilitation activities is presented in Table 6.1 28 percent and 48 percent farmers are of the opinion that O&M of irrigation systems are well managed and very well managed respectively. Moreover, unlike in other districts, almost all the farmers surveyed in Badulla district are satisfied with the O&M activities carried out by the FO. At the same time, a small number of farmers had no idea about the services rendered by the FO related to O&M and this number is comparatively high in Nuwara Eliya district. There might be several reasons for having a larger number of FOs saying O&M activities are low compared to other districts. Unlike dry zone tank or anicut irrigation systems in areas like Nuwara Eliya and Badulla the water sources are further away from the command area. This is due to the hilly nature of these areas, where most of the water sources originate from either storage reservoirs' or fountains.

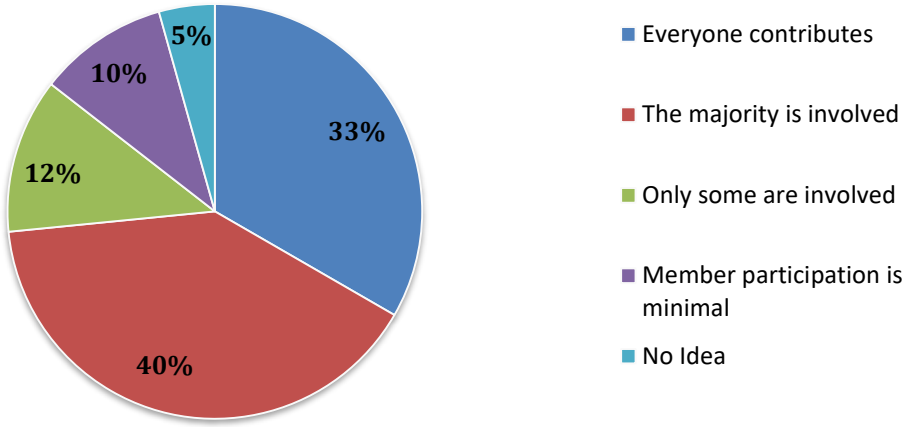
Table 6.1: Farmer Perception on Post Project O&M

District	Very well managed (%)	Well managed (%)	Managed to some extent (%)	No idea (%)
Anuradhapura	24	62	7	7
Kurunegala	28	33	21	8
Nuwara Eliya	9	37	14	17
Vavuniya	59	20	11	2
Badulla	17	81	0	0
Total	**28**	**48**	**10**	**6**

Source: HARTI Survey Data, 2019

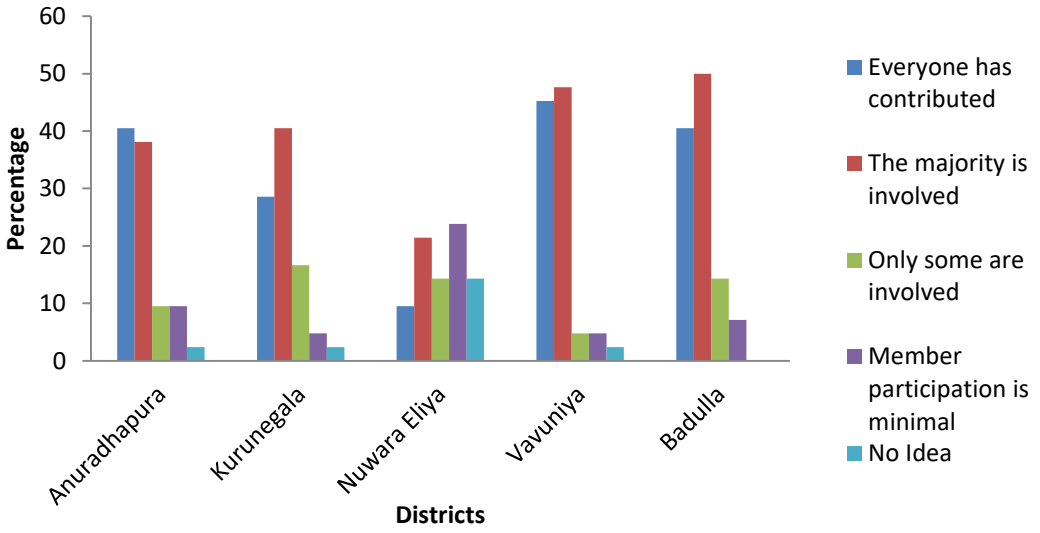
In general, active status of FOs and the active members of the FOs for collective work have shown to be very minimal in these areas. It has been clearly depicted in Figure 6.1b, that there is a significant reduction in FO member contribution on operation and maintenance of the rehabilitated irrigation systems when compared to other areas.

The main activities related to maintenance of irrigation systems assigned to FOs are cleaning including removal of shrubs and grass and de-silting irrigation canals. In addition, FOs are expected to attend regular minor repairs of the system including bund fillings, maintenance of canal gates, and so on. Farmer perception was assessed relating to the level of participation by the membership in O&M activities and the responses have been summarized in Figures 6.1a and 6.1b.



Source: HARTI Survey Data, 2019

Figure 6.1a: Member Participation towards O&M of Irrigation System



Source: HARTI Survey Data, 2019

Figure 6.1b: Member Participation in O&M of Irrigation Systems in Sampled Districts

Almost all the members are actively involved in O&M activities in around 33 percent of the FOs while 40 percent of FOs have been able to secure the majority of members' involvement. In 10 percent of the FOs, the participation of the membership in regular maintenance activities are reported to be very minimal. This situation is comparatively high in Nuwara Eliya district (29 percent of the total respondents in Nuwara Eliya district).

As discussed earlier only six out of the 43 FOs surveyed had completely conducted rehabilitation work by their respective FO. Non availability of the technical knowledge and experience to perform the required rehabilitation task is one of the reasons for subcontracting MIR projects. The farmers' perception on the technical capacity available within the FO is presented in Table 6.2. Approximately, half of the respondent farmers in Anuradhapura and Vavuniya districts are of the opinion that the respective FOs have the capacity to undertake any type of O&M activity including large scale constructions. Thirty-seven percent of the total respondents are certain that the FO have the technical know-how to carry out most of the O&M activities awarded by the DAD except large scale constructions.

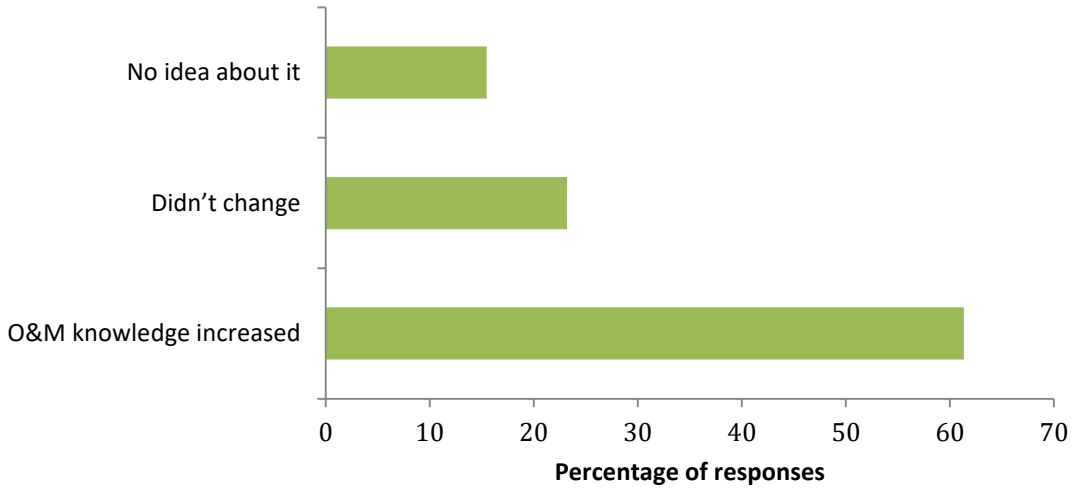
Table 6.2: Technical Capacity of FOs to Undertake Rehabilitation Activities

	Percentage of farmer responses					
	Anuradha-pura	**Kurune-gala**	**Nuwara Eliya**	**Vavuniya**	**Badulla**	**Total**
The FO has the technical capacity to undertake any O&M activity	48	10	29	55	15	**31**
The FO has the technical capability to carry out any O&M other than large scale construction	29	49	37	34	38	**37**
The FO can only clean canals, remove silt and make minor repairs.	17	15	26	9	32	**20**
The FO does not have sufficient technical capability to carry out O&M activities	6	23	2	2	15	**11**
No idea	0	3	6	0	0	**1**
Total	**100**	**100**	**100**	**100**	**100**	**100**

Source: HARTI Survey Data, 2019

However, one fifth of the respondents believe that the capacity of the respective FOs is limited to the activities like canal cleaning, removing silt and conducting minor repairs in the system. Twenty-three percent of respondents in Kurunegala district have perceived that the respective FOs lack the technical knowledge to carry out O&M activities.

Increased technical knowledge related to O&M within FOs is one of the objectives to be achieved by awarding MIR to the FOs, as per the Circular. Although most of the MIR projects have been carried out by a third party agent/s, the office bearers and the membership have the opportunity to be involved in monitoring and supervision of the MIR project activities. Thus, it has indirectly contributed to increase the technical knowledge of the members of the FOs. Involvement of the membership in MIR projects by providing skilled (masonry) and unskilled labour has resulted in receiving technical skills relating to MIR. Thus, a majority of respondents (60 percent) acknowledge that the technical knowledge and skills of the membership of the FO has improved through the implementation and active involvement in the MIR project as illustrated in Figure 6.2.



Source: HARTI Survey Data, 2019

Figure 6.2: Contribution of the Project to Enhance Technical Knowledge on O&M

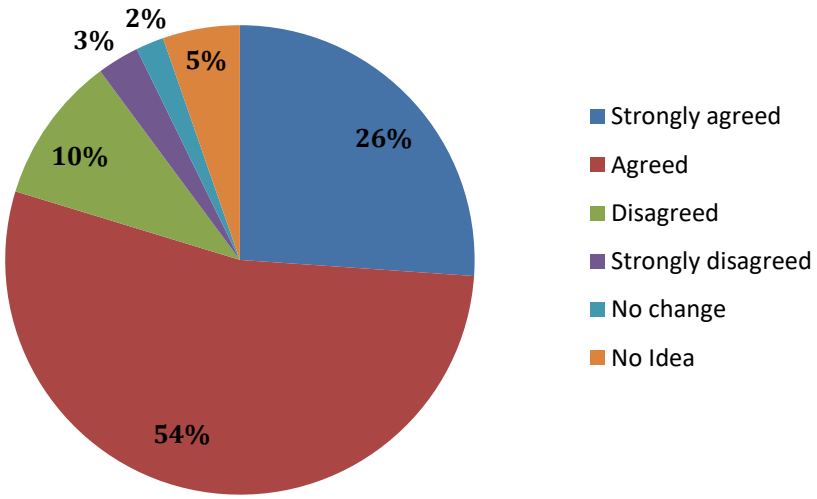
The government has formally adopted the participatory irrigation management policy by transferring the full responsibility of O&M activities of minor irrigation schemes to FOs (Samad and Vermillion, 1999). The farmers' awareness on the responsibility and the actual situation of the O&M activities in FOs was also assessed in this study. As shown in Table 6.3, slight differences can be observed between the districts regarding the responsibility of irrigation canal maintenance. Nevertheless, more than 70 percent of the respondents stated that the maintenance activities of the respective irrigation system are undertaken with the total labor contribution by the farmers and with the assistance of the DAD for a portion of the raw materials and capital required. Nearly 41 percent of the farmers in Kurunegala district claimed that O&M activities of the irrigation channels are solely carried out by using the own resources of the FOs.

Table 6.3: Farmer Awareness on O&M Activities of their Irrigation Channels

	Percentage of farmer responses					
	Anuradha pura	**Kurune gala**	**Nuwara Eliya**	**Vavuniya**	**Badulla**	**Total**
By FO (Labor + Raw Materials + Expenditure)	7	41	3	7	19	**15**
By members of the FO (labor + part of raw materials + part of cost)	83	49	74	61	81	**70**
Participatory Management (Labour by FO, Raw Materials and Expenditure DAD)	5	2	3	20	0	**6**
DAD	0	5	0	5	0	**2**
No idea	5	3	20	7	0	**7**
Total	**100**	**100**	**100**	**100**	**100**	**100**

Source: HARTI Survey Data, 2019

Figure 6.3 presents the farmers' opinion on whether the O&M activities undertaken by the FO were more effective than those carried out by any other external entity. Accordingly, 26 percent of the farmers strongly believe that the best candidate to perform the MIR activities is the respective FOs. Another 54 percent of farmers agreed that the O&M activities carried out by the FO had yielded better results (Figure 6.3).



Source: HARTI Survey Data, 2019

Figure 6.3: Farmers Opinion on Success of O&M Activities Done by the FOs

It is imperative that the needs of the membership in terms of irrigation supply in the respective FO are met by the initiating and completion of MIR projects. As shown in the Table 6.4, respondent farmers have different views regarding the extent to which the project has been able to meet the needs of the member farmers relating to irrigation systems.

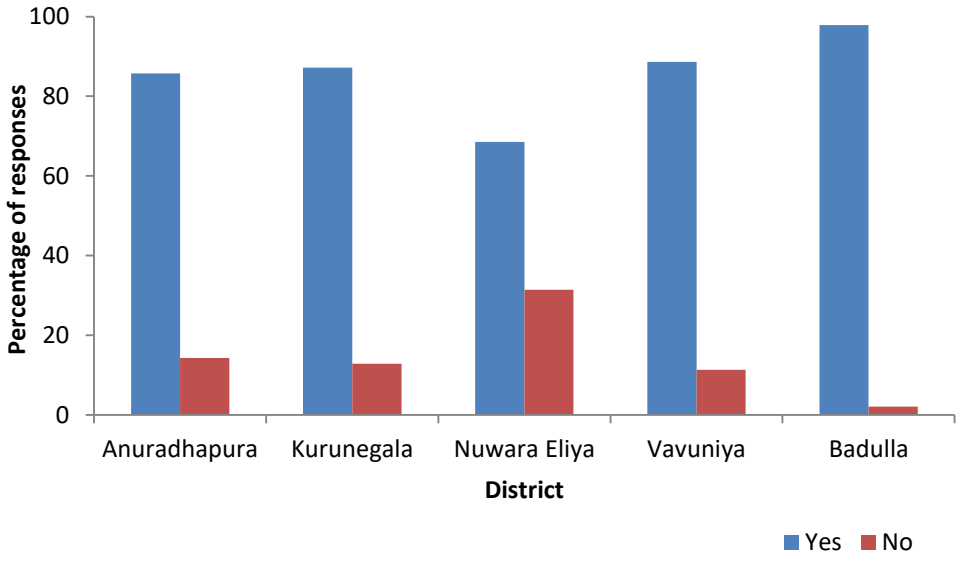
Accordingly, one third of the respondents are in the view that the irrigation requirements of the farmers were very well looked after through the MIR projects while, another 30 percent of the respondents agreed that projects have been able to fulfil the irrigation system requirement. According to the responses 23 percent of the farmers are fully satisfied with the outputs delivered. In Kurunegala and Nuwara Eliya districts, 28 percent and 11 percent of the respondent farmers respectively have expressed that the project had not catered to the actual irrigation requirements of the membership.

Table 6.4: Farmer Perception on Success of the MIR Project

	Percentage of farmer responses					
	Anuradha -pura	**Kurunegala**	**Nuwara Eliya**	**Vavuniya**	**Badulla**	**Total**
Very well catered the need	29	38	23	43	32	33
Well catered the need	36	23	17	20	51	30
Somewhat catered the need	26	10	29	34	15	23
Not catered the need	7	28	11	2	0	9
No Idea	2	0	20	0	2	4
Total	**100**	**100**	**100**	**100**	**100**	**100**

Source: HARTI Survey Data, 2019

The prioritization of needs and requirements with respect to irrigation management of the FOs is pivotal to the system sustainability and the satisfaction of the membership (Figure 6.4). Interestingly, the overwhelming majority of the respondents (86 percent) opine that the MIR project undertaken by the FO was not the first priority of the organization. This finding underscores the need to focus more on field-level data when designing such MIR projects.



Source: HARTI Survey Data, 2019

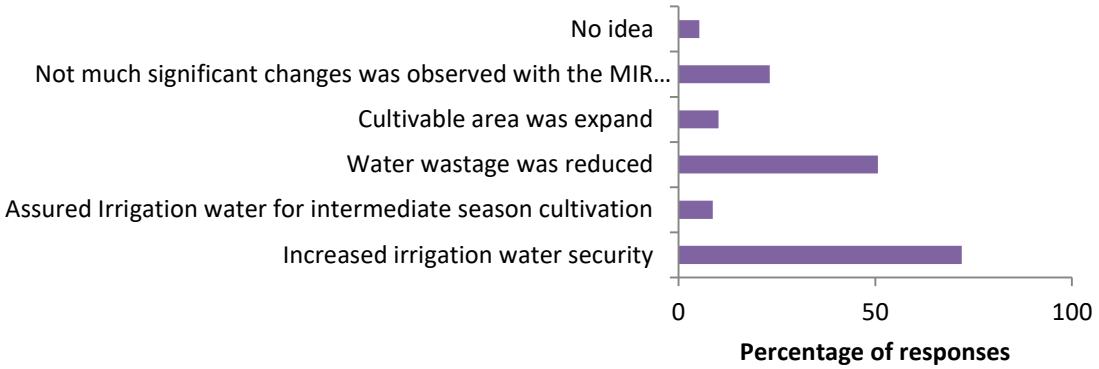
Figure 6.4: Farmers View on MIR Projects Prioritization

However, nearly two thirds of the respondents (63 percent) believed that the project had been completed with acceptable quality and standards. However there were some incidents where farmers were not satisfied with the quality of the end product. Furthermore, discussions held with the office bearers of the FO and members revealed that although most of the projects had been carried out by external contractors for various reasons, the FO had been able to complete the project as they wished in collaboration with the contractors. In some cases, FOs have been able to complete additional work than initially designed and assigned by the project due to good financial and resource management. After all, more than 85 percent of the interviewed farmers in all five districts strongly believe that successful outcomes could be achieved through conducting irrigation rehabilitation work through FO rather than outsourcing it on contract basis. However, in order to achieve fruitful results, it is crucial to provide basic technical knowledge on O&M as well as other management training including proper record keeping at least for the selected FOs prior to granting project (Aheeyar, Padmajani and Bandara, 2012).

6.2 Impacts of Tank Rehabilitation on Agricultural Production, Livelihood and Agrarian Society

This section examines the post construction scenario of the MIR projects. The views of the leaders and general membership of the FOs on the resultant improvements due to the MIR projects were assessed.

Figure 6.5 displays the farmers' perception on the improvements in livelihoods and living standards made through the irrigation rehabilitation project carried out by the respective FOs. Majority of the farmers irrespective of the FO claimed that the MIR projects have increased irrigation water security. More than 50 percent of the member farmers in selected FOs reported that rehabilitation has helped to reduce water wastage in the system. Theoretically efficient water management could bring more extent under cultivation; however, more than 90 percent of the farmers have not experienced any increase of land extent under abandon cultivation as an impact of the MIR project. However, only a few farmers said that they were able to cultivate in the third season with the water saved due to the improved irrigation structures. The response of a minority of farmers in the total sample revealed that rehabilitation had not been able to make significant changes in the livelihoods and living conditions of the beneficiary farmers.



Source: HARTI Survey Data, 2019

Figure 6.5: Farmer Perception on Impacts of the MIR Project to their Livelihood

The DAD expects to achieve a sustainable and healthy irrigation system by awarding MIR activities to FOs. To realize the said expectations farmers should also have a sense of ownership to the irrigation systems and to necessarily maintain a healthy system. To measure the motivation of farmers to maintain the sustainability of the irrigation systems, farmers were questioned about to what extent they are discussing irrigation system related issues in the FO meetings and whether the MIR projects carried out by them (FOs) have any substantial changes in level of farmer involvement in such discussions.

As shown in Table 6.5, only 29 percent of the farmers have responded that discussions are always held on the matters related to irrigation management. However, more than half of the farmers in the sample responded as they discuss irrigation related matters more often. On the contrary, the largest number of farmers in Nuwra Eliya district mentioned that they have not discussed irrigation related issues often during the meetings of the FO. Only six percent of the member farmers have claimed they do not discuss irrigation related matters in the meetings. This may be due to poor participation in the meetings as some members of FOs maintain the membership only to obtain the fertilizer subsidy (Aheeyar, Padmajani and Bandara, 2012).

Table 6:5: Involvement of FO Members on Irrigation System Related Issues

District	Percentage of farmer responses						
	To what extent FO members discussed irrigation system maintenance requirements at the FO meetings?				Has farmer involvement in irrigation maintenance related issues have increased, after completion of MIR project by FO?		
	Always	Often	Some-times	Not discussed	Farmer involvement has increased	Not changed	No idea
Anuradhapura	40	43	10	7	57	38	5
Kurunegala	18	54	18	10	59	36	5
Nuwara Eliya	26	23	40	11	31	57	11
Vavuniya	32	57	9	2	61	36	2
Badulla	28	70	2	0	87	11	2
Total sample	**29**	**51**	**14**	**6**	**61**	**34**	**5**

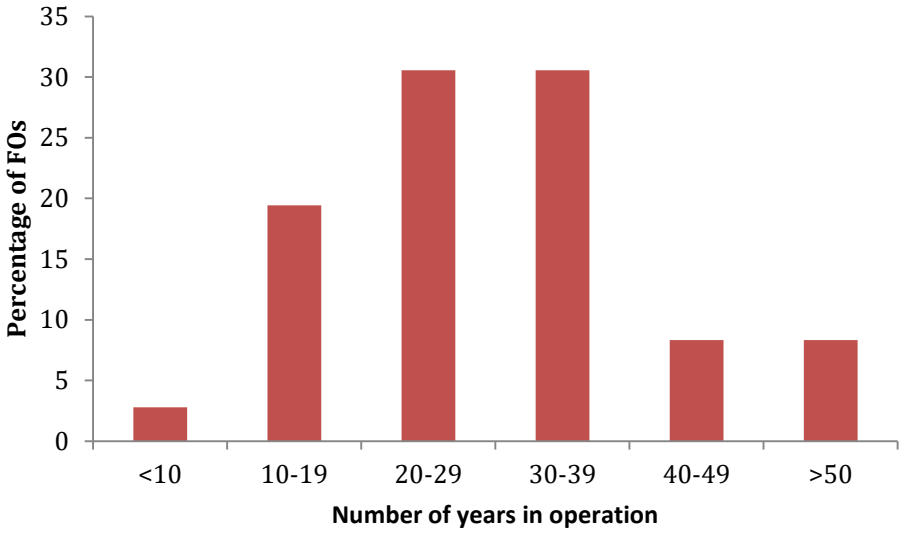
*All values are in percentage
Source: HARTI Survey Data, 2019

Subsequently, as indicated in Table 6.5, the majority of the members acknowledge that after the rehabilitation work done by FO, there is a greater tendency from farmers to intervene and come forward to discuss irrigation system related matters in the meetings.

6.3 Review of Procedure Relating to Awarding Tank Rehabilitation Contracts to FOs

To review the procedure of awarding contracts to FOs for more sustainable and effective MIR

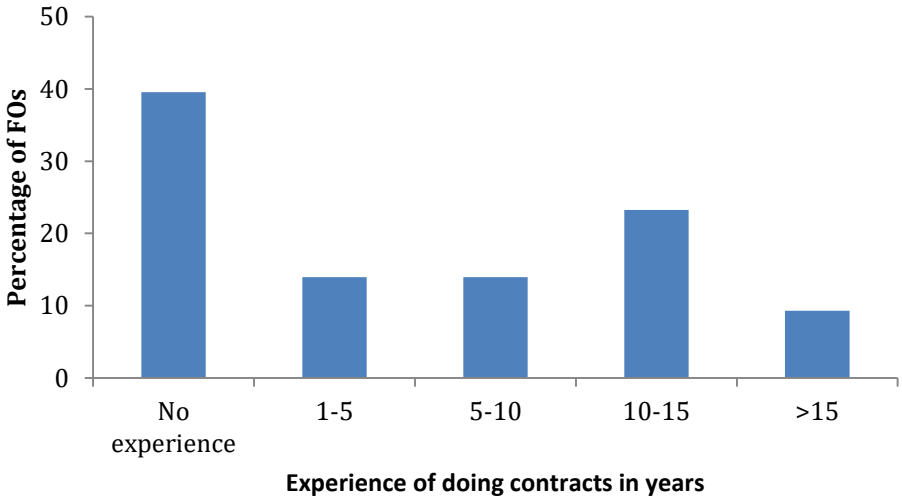
As discussed in details in the previous chapters, a panel of officials has to ensure certain requirements within the organization in order to complete the task successfully prior to awarding minor irrigation system rehabilitation projects to a FO as per the circular. All the FOs selected should meet the requirements such as having registered under the Commissioner General of the Department of Agrarian Development at least for two years prior to applying and not to have more than three other contracts at the time of awarding the project. As illustrated in the Figure 6.6, most of the FOs surveyed have been established ten years ago, while the oldest and most recently registered FOs have established in 1960 and 2017 respectively.



Source: HARTI Survey Data, 2019

Figure 6.6: Number of Years in Operation of the FOs

Figure 6.7 illustrates the previous experience of FOs in undertaking MIR contracts. Over 40 percent of the selected FOs have no previous experience in undertaking any kind of rehabilitation project. Around nine percent of FOs have more than 15 years of experience in carrying out many kinds of MIR projects.



Source: HARTI Survey Data, 2019

Figure 6.7: Experience of Conducting Rehabilitation Contracts

On the contrary, most of the FOs had not met the third pre-requisite, the availability of inputs, machinery and capital with the FO, to be eligible to conduct and be granted MIR projects. The FO should have to ensure that the organization has or is able to have sufficient labour, finances and equipment to complete the tasks in the awarded MIR project. Unlike third party contractors, most of the FOs do not have their own machineries like excavators, trucks, tractors, required for undertaking earth works. Further, as discussed earlier FO do not have proper technical knowledge. They have

to depend on the technical officers attached to the district DAD or Divisional Secretariat office. However, it is very difficult to get a proper and timely service from the said TOs as the availability of such officers is insufficient in addition to their heavy workload thus hindering the successful completion of the project by FOs themselves. Financial constraints have also been highlighted by some of the FOs in carrying out MIR projects. The FOs are given, as soon as the agreement is signed, a certain proportion of the total budget of the project as an advance payment to start the project. The rest of the payment is made to the FO only after the Engineer or the Technical Officer of the District Agrarian Services Office verifies that the relevant work has been done properly and according to the provisions detailed in the circular.

Table 6.6: Financial Status of Selected FOs

Category (Rs.)	No. of FOs	Percentage of FOs
< 50000	2	5
50000-<100000	5	12
100000-<250000	10	23
250000-<500000	18	43
500000-<1 Million	5	12
> 1 Million	2	5
Total	**42**	**100**

Source: HARTI Survey Data, 2019

The Table 6.6 shows the financial status of the selected FOs at the time of survey. The financial strength of 41 percent of the FOs has been limited to less than Rs. 250,000.00. Although there is sufficient financial strength within the FO to implement the project, there are some instances where the approval from all members to invest in the given project is not received.

CHAPTER SEVEN

Findings, Recommendations and Policy Implications

7.1 Findings

As of 2018, there are 14,421 functioning small tanks that are irrigating 470,776ac of command area benefiting 386860 farm families. However, there are 2,055 abandoned tanks that could have provided irrigation water to 43,825ac of cultivable land.

Even though the farming community has fully recognized the importance of village tank systems to their livelihoods they do not often have the capacity to maintain the tank by attending to necessary repairs. Owing to the marginal incomes and rainfall uncertainties, they are unwilling to invest in these systems. One other main constraint to the development of minor irrigation systems in Sri Lanka is the continuously changing strategies of minor tank rehabilitation that has occurred over the years, and continues to occur without sufficient beneficiary involvement.

- **Strength of Farmer Organizations**

The majority of the MIR farmer leaders in the sample belongs to the age category of 50 - 60 years and is more educated than earlier farming communities. Most of the FO have 50 to 100 membership and the vast majority of the FOs respondents are very satisfied with the performance and quality of the leadership. While a smaller number of them believe that the capacity of the respective FOs is limited to provide labour work during rehabilitation projects of the system mainly due to lack of technical knowledge to carry out O&M activities.

The project was expected to strengthen the financial capacity of FOs as well. However, only a few FOs (less than five per cent) have been able to save Rs 1,000,000 from other enterprises including from these projects. Indeed, 55 percent of the FOs (23 FOs among 42) have fallen to the category of their financial savings between Rs 250,000.00 to 1,000,000.00 from various activities performed from the establishment of the FO.

- **Farmer Organization Communication Network**

Participation in meetings, effective communication networks, and freedom of expression within the FOs are key indicators of effective FO management. Information on meetings are currently notified by telephone calls or sending text messages and through WhatsApp or Viber groups instead of posters and personal communications used earlier which is a remarkable development in the communications strategy within the farmer groups.

- **Usefulness of FO Meetings**

The vast majority of the respondents have felt that FO always makes decisions based on the views and suggestions expressed by the membership. Only a small percentage of members mentioned they do not discuss irrigation system maintenance activities

undertaken by the FO adequately and most probably the reason behind is their poor participation in the meetings.

- **Financial Transparency of FOs**

Majority of the respondents expressed their satisfaction regarding the financial transparency of each project that the organization has completed.

- **Competence of Farmer Organizations to undertake MIR Contracts**

MIR contracts undertaken as per the circular solely by the FO were only about 14 percent of the sample. Rest of the projects have been given on subcontracts due to various reasons such as insufficient soft and hardware skills with the FO, external interferences and limited finances.

The DAD was expected to give FOs an understanding about the projects by making them to read and sign the agreement of the MIR contract, evidence suggests that they have neither fully understood the terms specified in it nor the intentions of Department of Agrarian Development expected to achieve by awarding MIR contracts to FOs. FOs lack awareness of their legal rights as an organization.

Until the FOs are financially strengthened from the commission they get by undertaking MIR contracts, it is better to provide them with an alternative arrangement to find required funds enabling them to take up the contracts initially.

Majority of the respondents agree on the fact that in fulfilling the expectations of the beneficiaries of the respective MIR project which is the basic objective of these projects, FOs are the best party to undertake the rehabilitation work.

- **Selections of MIR needs and Procedure of Granting Contracts**

Prioritization of rehabilitation needs and selecting the urgent ones is necessary to transfer the maximum benefits from the project to its beneficiaries as well as for the system sustainability. Though a well-documented criteria developed by various professionals for prioritizing the rehabilitation needs is available, as per the response of the majority of the farmers there is a serious lapse in identifying the rehabilitation needs. Therefore, it should be highlighted the need of considering more on field-level data during the planning and designing phase of the project disregarding external political influence which is mostly for the benefit of their favourites.

- **Resource mobilization for MIR by FOs**

Creation of a sense of ownership by taking the active involvement of members of FOs was one of the key expectations of these MIR contracts. Yet only about ten percent of the FOs studied has been able to get their full membership into project activities while only the office bearers have been involved in nearly 30 percent of the FOs.

- **Impact on MIR Contracts towards Sustainability of the Irrigation System**

MIR projects awarded for FOs are diverse in their intended tasks and they have gained many benefits from MIR contracts. They have increased the irrigation water security

and have reduced the water wastage in the system. Commission received by the FO has been able to strengthen their financial capability and members' knowledge on O&M activities related to the tank has also been increased by participating in the project activities.

- **Farmer contribution towards Sustainable Irrigation System Management**

In general the majority of the respondents consider they have a responsibility to contribute in O&M activities since they are getting benefits from the irrigation system. Due to this reason, they are involved in O&M activities performed by the FO and are satisfied with the state of functioning.

- **Successfulness of MIR Projects**

Though external parties other than FOs have undertaken most of the MIR contracts, majority of the respondents stated that those contractors have done a satisfactory job as per the planned activities. However, they believe in order to maximize their expectations from the project, FO should undertake the project. Therefore, it will be beneficial if they are given substantial training with necessary technical and financial management aspects.

- **Review of Procedure relating to Awarding Minor Irrigation Rehabilitation Contracts to FOs**

Nearly half of the selected FOs have no experience at all in undertaking any kind of rehabilitation project though a smaller percentage of FOs have more than 15 years of experience in undertaking different kinds of MIR projects.

Dependence for external parties to fulfill the third pre requisite, which is inputs such as heavy machinery, finances and technical expertise, was identified by the study as a major hindrance in accepting the MIR contracts by the FOs.

7.2 Recommendations and Policy Implications

1. Strengthening the FOs is an important strategy to improve all activities including water management and O&M activities related to irrigation systems. For that, regular training and capacity building workshops have to be carried out. In addition, the DAD should make sure to help the FOs to develop their own constitution which should spell out details such as appointment of office bearers, elections etc. Closely monitoring the FOs activities like electing office bearers, financial transparency by the DAD and e developing strong institutional linkages with the FOs would assure more transparent FOs.
2. Awarding MIR contracts to FOs has derived considerable benefits for increasing the financial capacities and enhancing their software and hardware skills. Hence, this strategy should be continued with suitable modifications while designing similar projects in the future.
3. The selection of tanks for rehabilitation/reconstructions should be based on the felt need of the beneficiary farmers and the impact should be economically sound.

The weighted average score which takes into consideration the real need of the beneficiaries and other factors such as tank capacity, number of beneficiaries, multi-purpose usage, catchment area and duration from the last rehabilitation could be used as a basis for selecting the tanks.

4. The beneficiaries who belong to the selected MIR should have maximum access to participate in the decision-making process during all the stages from identification and prioritization of rehabilitation needs of the said MIR project.
5. Establishing subcommittees to oversee the MIR projects will strengthen the governing body of the FOs and will facilitate the close monitoring of project activities. This would enhance the devolution of power within the membership of FO while grooming future leaders. In addition, they get the opportunity to supervise the work, which would build up a sense of ownership of the MIS.
6. Rehabilitation projects have to adopt a suitable methodology to provide early orientation and consultation for all stakeholders on project approach and roles and responsibilities of line agencies during the project and also during the post-project period.
7. Prior to awarding MIR contracts to FOs, a well-developed training should be provided for the office bearers and/or the MIR Contract Oversee Committee. This training should make them aware of the project approach and roles and responsibilities of each and every party involved in the task. In addition, the training should enhance the soft skills of the members. To develop the social mobilization capacities, financial management, book keeping and other activities of the member farmers, they should be provided with proper guidance, improved skills and knowledge that are required for their effective functioning. The Awarding MIR Circular reveals that capacity building of FO is an important aspect in undertaking MIR contracts, and subsequent implementation and follow up O&M work. Therefore, farmer training has to be a continuous process.
8. There have not been many studies that have undertaken a serious training needs assessment for farming communities of minor tanks. There has been a lack of attention paid to prepare a detailed training manual for a correct method of carrying out important O&M activities. There should be a very well developed strategy to carry out regular training of farmers.
9. Further, there should be sufficient provisions/allocations within the MIR contract for capacity building of Leaders of FOs in financial, human and technical components and it will ensure their active involvement and mobilize their team towards the success of the MIR project while promoting sustainable operation and maintenance.
10. MIR activities should not coincide with seasonal cultivation cycles causing difficulties for both field level officials and farmers otherwise project work will experience unexpected delays.
11. Legislation should be arranged so that the awarded MIR contract certificate/signed agreement could be considered as a promissory note to obtain

capital from banks while undertaking MIR contracts by the FO themselves. This will remove the financial constraints of FOs while accepting MIR contracts.

12. The Minor Irrigation Rehabilitation / reconstruction process should not be taken as an individual project or isolated system but should consider the entire irrigation systems as one. This will enable the farmers to maintain the system sustainably for a longer duration.

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