

# Enhancement of Capacity of Farmer Organizations for Sustainable Irrigation Systems in Anuradhapura and Kurunegala Districts

*S. Thiruchelvam*

*Department of Agricultural Economics and Business Management  
Faculty of Agriculture, University of Peradeniya, Sri Lanka*

---

## **Abstract**

Over the past decades public investment in major, medium and minor irrigation systems has not yielded the expected results. The solution to the growing water crisis lies in the institutional reform of existing social systems so as to manage the demand for water. In recent times, there has been an emphasis on capacity-building of farmer organizations (FO) in irrigation projects. This study focuses on investigating the institutional capacities of FOs in irrigation systems in the Anuradhapura and Kurunegala districts. Primary data was collected from a stratified random sample of 48 FOs selected from major, medium and minor irrigation systems in the Anuradhapura and Kurunegala districts during 2008. The Group Dynamics Effectiveness Index (GDEI) of FOs was developed by weighing the significance of important parameters and employed in the calculation of the overall effectiveness of FOs.

Most of the FO members in both districts were landowners and there was a powerful dominance from farmers. Generally, the marginal participation in FO activities was about 38 % in both districts. The most common causes for the low participation were the lack of accountability and transparency of the functions of FOs. Farmer organizations (FOs) in major and medium irrigation systems had 51 % and 29 % higher GDEI, respectively, than FOs in minor irrigation systems. The values of 'Gini Coefficients' in major, medium and minor irrigation systems were 0.38, 0.43 and 0.48, respectively, thus indicating that FOs play an important role in minimizing inequalities among farmers. There was no significant difference in water productivity (0.19–0.20 \$/m<sup>3</sup>) between major and medium irrigation systems, but the water productivity was low (0.07 \$/m<sup>3</sup>) in minor irrigation systems. Farmer organizations (FOs) with medium size (30–40 members) and economically homogeneous members had better irrigation management. Chi-square results show that while the income equity had no significant effect on the overall GDEI, the participation rate and water productivity that reflects the success of operation and maintenance (O & M) had a significant impact of 5 % and 10 % probability levels to the GDEI of FOs.

There is a need to establish strong linkages between the FOs and the Irrigation Department for successful irrigation management. The behavioral change that is required to facilitate the adoption of technology can be effected through institutional changes. It is recommended that FOs need a lot of capacity building in technical and institutional issues to sustain the irrigation systems.

## **Introduction**

### ***Background***

The devolution of responsibility in natural resource management from the state to ‘communities’ or local user groups has become a widespread trend that cuts across countries and resource sectors. Programs such as Joint Forest Management, Irrigation Management Transfer, and Fisheries Cooperative Management can all be seen as variations of attempts to establish or strengthen ‘community-based natural resource management’ (ADB 2000). The widespread trend of such decentralization has by and large ignored the implications of intra-community power differences for the effectiveness and equity of natural resource management. The method of organizing farmers and forming farmer organizations (FO) needs to be revised to meet the following development challenges of the twenty-first century: 1) the increasing absolute and relative poverty in many countries; 2) the degradation of natural resources such as soil, water and vegetation; 3) the low involvement of women in agriculture, and other development programmers; 4) the poor health and education facilities in rural areas; and 5) the increasing sociopolitical unrest among communities.

In the above context, FOs can help harness this synergetic power for its members’ survival, growth, and development. Empowered FOs can act as convergent points or platforms for solving local problems and mobilizing human and financial resources for sustainable development. Many studies have been carried out on FO effectiveness in irrigation management and the general conclusion has been that in the past, attention has been diverted to matters other than irrigation system management and maintenance (Thiruchelvam 2009). At the beginning, although irrigation development funds aimed to provide physical structures to the irrigation systems, adequate attention was not given on the efficiency of investments in economic terms. As a result the return of investments in this sector has fallen below expectations.

### ***Legal Background of Farmer Organizations (FOs)***

The organizations registered under the Agrarian Development Act No. 46 of 2000 are the recognized FOs. Earlier, Clauses 42, 58A and 58B of the Agrarian Service Act of 1979 were amended by Act No. 4 of 1991 and Act No. 13 of 1994 for the formation of FOs. The Agrarian Development Act No. 46 of 2000 replaced the Agrarian Service Act. It enabled tenant cultivators to become owner operators. The Agrarian Service Committee was replaced by the Agricultural Development Council with powers to take over and cultivate lands that were not productively used. This new Act also authorized FOs to be informed of any construction projects etc. Now all the by-laws in the study area have been prepared in accordance with the Agrarian Service Act of 2000.

Institutional reform and capacity-building are taking place under government initiatives and with external assistance. However, the necessary reforms have not been initiated in many irrigation rehabilitation projects. Capacity-building of FOs is considered as a prerequisite for the sustainable management of irrigation systems. Farmer organizations (FOs) were given legal recognition in 1991 and capacity-building of FOs received particular emphasis in 1994. Since 1998 under the Participatory Irrigation Management (PIM) programs, FOs were further encouraged to act on independently. However, when looking at projects and implications, there is still a wide gap between policy objectives and project realities (Thiruchelvam 2004).

The solution to the growing water crisis lies in institutional reform in existing social systems so as to better manage the demand for water. In recent times, the focus of agricultural development has gradually shifted more towards the economic advancement of the poor in irrigation schemes through irrigation system rehabilitation, community empowerment, and other related activities. The rehabilitation of irrigation projects in the North Central and Western provinces emphasized the need for improved capacity-building for FOs. This process adopted social mobilization processes to improve efficiency and pave ways to strengthen FOs, and find ways and means to improve the commercial and income generation activities of the FOs.

In this context, this study focuses on investigating the impact of these project interventions on the capacity-building of FOs in irrigation systems in the Anuradhapura and Kurunegala districts. Specifically this study aims to investigate project intervention on FOs' functions, membership participation, performance in irrigation management, and group effectiveness.

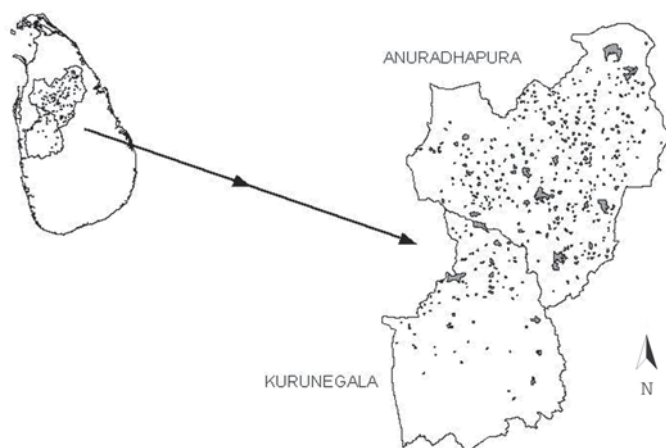
## **Methodology**

### ***Study Area, Sampling and Data Collection***

The study areas of the Anuradhapura and Kurunegala districts principally fall under three agro-ecological zones namely, Low-country Intermediate Zone 1 (IL1), Low-country Intermediate Zone 2 (IL2) and Low-country Dry Zone from South to North. The annual rainfall in IL1 is less than 1,016 mm (Figure 1). It covers sections of the North Western, North Central and Central provinces. Irrigation schemes under gravity irrigation are divided into major, medium and minor on the basis of the land extent served (command area) by these schemes. Major irrigation systems are defined as those that have command areas of more than 1,000 ha, while systems between 80 and 1,000 ha are considered to be medium irrigation systems. Minor irrigation systems are those with command areas of 80 ha or less. However, in terms of the total extent and total number of farmers served in the country, minor irrigation systems, often referred to as village tanks, occupy an important place.

Primary data were collected from a total of 48 FOs, including 25 and 23 FOs in the Anuradhapura and Kurunegala districts, respectively, from the selected major, medium and minor irrigation systems. The data used stratified sampling, which was based on the location of the farms in the irrigation systems in relation to water distribution and channel network. Semi-structured questionnaires were used to collect data during February and March 2008. Secondary data was obtained from the reports of the Department of Agriculture, Irrigation Department, and District Offices of the Department of Agrarian Development of Anuradhapura and Kurunegala districts.

**Figure 1.** Map of study area with irrigation tanks in the Anuradhapura and Kurunegala districts.

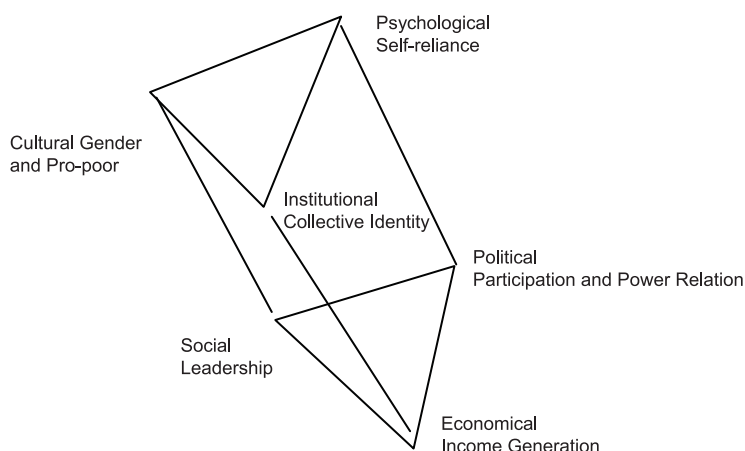


## *Conceptual Framework*

### *Dimensions of Community Empowerment*

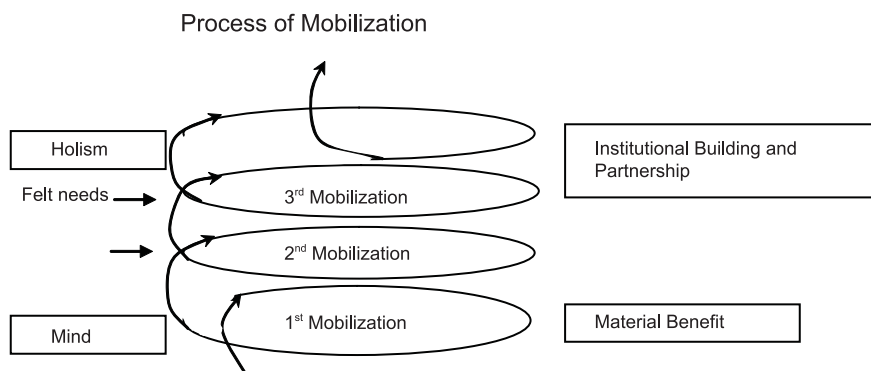
Empowerment could be defined as the process by which people, organizations, or groups, who are otherwise powerless, are formed into a group to consolidate their rights. Under the rehabilitation project, activities in social mobilization processes, participatory development and empowerment help the community to improve efficiency, strengthen co-ordination and find ways and means to visualize their economic resources. The community becomes aware of the power dynamics at work in the context of their life and are therefore, able to appreciate the effect of changes in any political culture (Figure 2).

**Figure 2.** Dimensions of community empowerment and economic advancement.



Understanding the above characteristics of the community is important for capacity-building, which is given an important place in the rehabilitation project. The above process intends to uplift the mindset of the people to use self-reliance as a process approach (Figure 3).

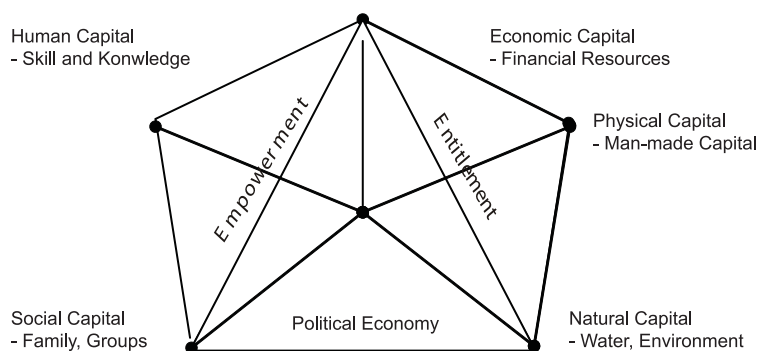
**Figure 3.** Process approach.



### *Sustainable Irrigation Framework - Livelihood Capital/ Assets*

Strategies for 'Sustainable Irrigation Management' include five capitals of community development. The broad conceptual framework is presented in Figure 4.

**Figure 4.** Sustainable irrigation framework - livelihood capital/assets.



### *Group Effectiveness of Farmer Organizations*

To understand the effectiveness of FOs, a Group Dynamic Effective Index (GDEI) was used on the basis of five different parameters, which were afforded different weights in calculation of overall group effectiveness. Parameters like participation, decision-making, operation and

maintenance (O&M) functions, fund generation and focus on women and poor, were considered. Each parameter was assessed using three statements from which farmers' responses were taken, based on a five-point continuum ranging from very low to very high. Mean and standard deviation values of each initiator were calculated as a first step and thereafter, overall group dynamics effectiveness was calculated on the basis of the different weights given to the five factors in GDEI.

A representation of about 10 % in the total number of members in the sampled FOs under the selected three different irrigation systems, including three office bearers, was considered adequate. Accordingly, a total of 123 and 139 farmers were interviewed under the three irrigation systems in Anuradhapura and Kurunegala districts, respectively. The Chi-square test was used to assess the contribution of the group dynamics performance of FOs among major, medium and minor irrigation systems for the two districts. The 'Gini Coefficient' and water productivity were estimated using standard methods.

## **Results and Discussion**

### ***Functioning of Farmer Organizations***

Generally, it was observed that there was no clear understanding of the Agrarian Development Act of 2000 and the registration process, and there is therefore, an urgent need to give more attention to the formalization of the registration process. According to the information collected, the general marginal participation in FO activities was about 38 % in both districts. The participation of women was low in both districts. The most common causes for the overall low participation rate at FO meetings were dissatisfaction with the way the FOs function and, especially the suspicion of misallocation of funds, distrust and jealousy. These concerns were manifest mostly in minor tanks compared to medium and major irrigation systems.

The lack of accountability and transparency in the functions of FOs had resulted in the level of satisfaction in the function of FOs to be at approximately 34 % and 25 % in the Anuradhapura and Kurunegala districts, respectively. In both districts, most of the FO members were landowners and there was a powerful farmer domination in the decision-making of FOs.

Table 1 highlights that the FOs were not strong enough to solve their problems and were unable to effectively fulfill their responsibilities. Many factors, both external and internal, determined the strength and the sustainability of FOs. Profit-oriented leaderships guided many FOs. Linkages with other community-based organizations such as Rural Women Societies, Youth Clubs etc., may assist FOs to obtain funds and services when their resources become insufficient. There was no real networking of community-based organizations (CBOs), which would have helped in sharing and exchanging information and ideas. Such a system of networking would have enabled FOs and other CBOs to operate more effectively and efficiently, and with a greater impact on the community they represent.

**Table 1.** Activity of farmer organizations in the Anuradhapura and Kurunegala districts.

Irrigation Systems	Linkages with other CBOs			Problems Solved by FO			Difficulties/Conflicts Types in FO			
	% of Farmers Reported									
	Poor	Average	Good	Occasionally	Often	Always	Shortage of irrigation	Reservation/Chena cultivation	Animal/Elephant damage	Poor Communication
Anuradhapura										
Major	22	36	42	52	31	17	35	14	11	40
Medium	14	37	49	56	36	08	37	13	16	34
Minor	23	44	33	60	27	13	43	16	18	23
Average	20	39	42	56	31	13	38	14	15	33
Kurunegala										
Major	27	29	44	47	39	14	32	19	14	35
Medium	29	30	41	54	29	17	43	16	14	27
Minor	37	24	39	58	27	13	47	21	17	15
Average	31	28	41	53	32	15	41	18	15	26

Note: FO stands for farmer organizations; CBO stands for community-based organizations

### ***Performance of Farmer Organizations (FOs)***

Although FOs had been established in all irrigation schemes, they have various problems such as poor maintenance of irrigation facilities, low member participation in FO activities, lack of good leadership and poor communication.

Table 2 shows that farmers perceive that FO strengthening can enable them to manage scarce water, increase cropping intensities and realize high yields. The focus on the poor and improving the participation of women was less, amounting to only an average of 13 % and 17 % of FOs in Anuradhapura and Kurunegala districts, respectively, reporting. These figures generally did not change among the three schemes. Farmers and women had no formal land rights and did not have a strong voice. However, should women decide to become members of FOs, they can participate in decision-making, and will be entitled to receive the benefits of FO membership such as access to seeds, fertilizer, credit, income-generating activities, etc. Approximately 75-85 % of the women in all the schemes in both the districts are actively involved in paddy and chena cultivation. A small percentage of women (2 to 3 %) were compelled to assume responsibility for their cultivation by virtue of being widows. The number of poor farmers in relation to the total farmer population was approximately 20 %. There were particular reasons why women deliberately

**Table 2.** Performance of farmer organizations in the Anuradhapura and Kurunegala districts.

Irrigation Systems	Consultation with members		Involvement of the poor and participation of women		Internal linkages and functional linkages		Account keeping	
	% of FOs Reporting							
	Not satisfactory	Satisfactory	Low	Average	Not satisfactory	Satisfactory	Officers only know	No records in the office
Anuradhapura								
Major	82	18	91	09	90	10	64	36
Medium	85	15	83	17	82	18	72	28
Minor	88	12	87	13	92	08	80	20
Average	85	15	87	13	86	12	72	28
Kurunegala								
Major	89	11	87	13	81	19	73	27
Medium	81	19	82	18	86	14	85	15
Minor	92	08	79	21	89	11	90	10
Average	87	13	83	17	85	15	83	17

chose not to attend FO meetings: they were engaged in domestic tasks; the presence and behavior of drunken men in the FO; lack of benefits from FO membership and malfunctioning of the FOs. When they did attend meetings, their participation was limited to listening only. These findings fall in line with the outcome of other studies such as Irna van der Molen (2001).

As regards the effectiveness of FOs in resolving problems, a little over 50 % of the problems were solved occasionally and less than 25 % of the problems were solved completely. In most decision-making cases, only a small group of the ruling party decides on matters related to FOs. Farmer organizations (FOs) in major irrigation systems had sufficient production and infrastructure facilities. The weak status of FOs in minor tank schemes was reflected in inadequate infrastructure facilities and the extent of undeveloped land for cultivation in both districts. Membership fee and money earned through various contractual activities was low and the accounts of such details were not available in the majority (78 %) of the FOs, thus indicating the lack of accountability and transparency of FOs.

Chi square analysis (Table 3) shows that small and homogeneous FOs had better conflict resolution mechanisms in O&M matters. The majority of the FOs had paid less attention to solving their problems by themselves. The expectation was that FOs that were of a small size and that had less inequity between members would be more successful at conflict management. However, the study found, as demonstrated in Table 3, that FOs with memberships between 30 and 60, and less inequity didn't demonstrate a conflict management level as high as what was expected, amounting to 61 %. The null hypotheses that there was



no relationship between the size and equity of FO membership, with conflict management were rejected at 0.05 level of probability.

**Table 3.** Relationship between the capacity of conflict management, and the size and homogeneity of members in irrigation systems in the Anuradhapura and Kurunagela districts.

FO Membership Size	Level of conflict management		
	Low	Medium	High
Low < 30	3 (19 %)	4 (25 %)	9 (56 %)
Medium 30< <60	2 (10 %)	6 (29 %)	13 (61 %)
Large >60	1 (10 %)	6 (60 %)	3 (30 %)
Total FO No. 47	6	16	25

Note: (Chi-square= 13.24, P<0.05) (Given in parenthesis are row percentages)

### *Group Effectiveness of Farmer Organizations*

Levels of indicators of group dynamic effectiveness in major, medium and minor irrigation system FOs in the Anuradhapura and Kurunegala districts are presented in Table 4. Since the values obtained were not different in the two districts, the table reports the average estimated figures of both districts. It is revealed that the member farmers of FOs who perceived that there was participation in FO activities were 4.64, 3.52 and 2.82 in major, medium and minor irrigation systems, respectively, in both districts. The perception on decision-making in FOs was 6.40, 5.50 and 4.51 in major, medium and minor irrigation systems, respectively.

Operation and maintenance (O&M) was perceived to be relatively high and was at 7.3 and 6.1 %, respectively, for members of FOs in major and medium irrigation systems, followed by 4.46 in minor irrigation systems. Farmers' perceptions on fund generation activities had a higher percentage than the participation of women and poor farmers in all irrigation systems.

**Table 4.** Group dynamics efficiency index of farmer organizations in three selected irrigation systems in the Anuradhapura and Kurunegala districts.

Indicators of GDEI	Major Irri. Sys. HHs No. 91	Medium Irri. Sys. HHs No. 101	Minor Irri. System HHs No. 70
Participation	4.46 (0.74)	3.52 (0.98)	2.82 (1.09)
Decision-making	6.40 (0.42)	5.50 (1.49)	4.51 (1.99)
O & M function	7.30 (1.09)	6.10 (0.82)	4.46 (0.73)
Fund generation	4.30 (0.31)	4.14 (0.51)	3.71 (0.94)
Focus on women and poor	3.70 (0.91)	3.60 (0.91)	3.42 (0.91)
Overall GDEI (Weighted Average)	6.27 (1.15)	5.35 (1.64)	4.15 (1.68)

Note: Figures in parenthesis are standard deviation. Maximum and minimum possible scores are 10 and 0, respectively