Performance of FMIS Improved Under NGO Assistance: The Case of the National Development Foundation in Sri Lanka

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ABSTRACT

SIX KEY INDICATORS were used to evaluate the performance of a pilot project implemented in Kurunegala District located in the Northwestern Province of Sri Lanka. These indicators which can be used in other assistance programs as well are: Area Increase, Production Increase, Profitability, Resource Mobilization, Institutional Effectiveness, and System Sustainability. The first three indicators were quantitative measurements by which tangible achievements were assessed, while the other three were intangible achievements which could not be readily quantified. The impact of these indicators could be identified by assets and/or attributes created by the system performance. The qualitative indicators were more critical than the quantitative ones since those indicators were vital to sustainable system management and assured self-management. As collectively shown by these indicators, the performance of the National Development Foundation (NDF) contrasts with other assistance programs which have not proven to be sustainable for a longer time since they have not been successful in relieving the people of the "dependency trap." The performance of NDF-assisted FMIS seems to be positive as their approach and strategy have helped farmers to gradually become self-managed as a result of making farmers the owners of the systems improved.

INTRODUCTION

Of the nongovernment organizations (NGOs) operational in Sri Lanka, only a few are directly involved in irrigation rehabilitation or their improvement process. These NGOs offer assistance programs with minor irrigation improvements as one of their development activities, classified under the broad field of rural development. The National Development Foundation (NDF) is one of the two major NGOs having a fairly large assistance program for minor tank improvement. The largest organization which has an island-wide minor-irrigation assistance program is a Statutory Board, the Sri Lanka National Freedom From Hunger Campaign Board (FFHC), which follows an NGO approach in carrying out its assistance strategy.

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National Development Foundation

The National Development Foundation was established in 1979 as a nonprofit, nonpolitical, voluntary organization, registered under the Societies Ordinance of Sri Lanka. In a sense, it is an improved variant of FFHC, as it has introduced some innovative elements to the NGO-assisted rural development in Sri Lanka.

The NDF has several objectives for its rural development exercise. As stated by the NDF (Magedaragamage 1990), these objectives are: 1) Build up people's self-confidence to handle their economic, social, cultural, religious and political affairs by themselves; 2) Help and facilitate people to identify their resources and to mobilize them for their advantage with the least external help; 3) Assist people to initiate and develop their strength and power, so they are able to know their rights and demand them; 4) Initiate a suitable village-based people's institution, to effect proper coordination between the farmers and government officials; and 5) Train a team of youths from their own communities to carry out their initiatives for the purpose of attaining self-reliance.

Tank Renovation Program of the NDF

The NDF has carried out six major rural development projects which include a series of activities aiming at the enhancement of the livelihood and the socioeconomic status of the rural communities. Of these projects, renovation of minor tanks in Kurunegala and Puttalam districts (located in the Northwestern Province of Sri Lanka) was an important project implemented during the mid 1980s. Phase I of the project was carried out in Kurunegala District from 1984 to 1987 when work on 10 tank communities was completed. Phase II of the project is presently in progress in Kurunegala and Puttalam districts, with an improved capacity based on the experience of the implementation of Phase I. The completed Phase I of the project had several planned activities. They were: 1) Renovating village tanks with the beneficiary participation; 2) Initiating and developing a suitable institutional arrangement for effective coordination between the farmers and the officers; 3) Introducing modern agricultural techniques to small farmer groups; 4) Training selected local youth as change agents of agricultural development; and 5) Paving the way to organize informal educational programs for farmers.

The selection criteria for tank renovation as stated by NDF included the capacity of the tank; economic background of the community which depended on the tank; farmers' desire for external help to improve their irrigation system; lack of help from any other source to renovate the tank; and the landownership pattern under the tank.

Phase I of the Tank Renovation Project was carried out as a pilot exercise in Kurunegala District. For this phase, 10 out of 16 planned small tanks were renovated with the active participation of beneficiary farmers. These village tanks were in a state of disrepair before NDF's intervention which is well-documented as a systematic participatory process with the involvement of farmers and competent officers. Several assessment studies have been carried out on NDF's tank renovation project which has extended its assistance program to transform some semi-abandoned village tanks into real farmer-managed irrigation systems. These studies include: NDF's own assessments (Magedaragamage 1990 and 1991), an appraisal by an outside consultant (Perera 1988), a comparative study with another NGO intervention (Vimaladharma 1990), and two of IIMI's recent studies (Dayaratne 1991). This paper is generally based on the findings of the above studies and particularly on IIMI's recent study on "Sustainability Aspects."

PERFORMANCE

The performance of 10 renovated tank systems in Kurunegala District, since the inception of NDF's assistance program, and more particularly since the completion of renovation activities, is evaluated in this paper using a set of selected indicators.

Performance Indicators

Six indicators have been used as performance measurements to evaluate the small tank renovation-cum-water management program of NDF: a) Area Increase; b) Production Increase; c) Profitability of the Assistance Program; d) Resource Mobilization; e) Institutional Effectiveness; and f) System Sustainability.

Area Increase

All the renovated tanks were formerly working tanks which had fallen into a state of disrepair thus limiting the possibility for incremental command area. The cultivable area, however, could be increased with renovation since the storage capacity and thus the water duty could be increased. This was possible in NDF-assisted tanks located mainly in the Intermediate Zone where seasonal rains are more reliable than in the Dry Zone. Table 1 shows the area increase under the improved systems.

Table 1. Area increase due to renovation of tanks.

Tank name	No. of Farmers	Command area				Increase		
		Before		After				
		acres	(ha)	acres	(ha)	acres	(ha)	%
Aralugaswewa	34	22	(9.0)	25	(10.7)	3	(1.1)	14
Dalupothuwewa	14	18	(7.3)	18	(7.3)	0		20
Habawewa	18	18	(7.3)	25	(10.1)	7	(2.8)	38
Mawathagama Wewa	18	24	(9.7)	33	(13.4)	9	(3.7)	37.5
Nabadathenge Wewa	15	15	(6.1)	15	(6.1)	0		0
Pannala-Aluthwewa	13	16	(6.5)	20	(8.1)	4	(1.6)	25
Uswewa	22	24	(9.7)	24	(9.7)	0		0
Wegollagama Wewa	7	7	(2.8)	7	(2.8)	0		0
Weliagara Wewa	17	14.5	(5.9)	19.5	(7.9)	5	(2.0)	34.5
Yakadapotha Wewa	18	27	(10.9)	36	(14.6)	9	(3.7)	33.3
Total	176	185.5	(75.2)	222.5	(90.1)	37	(14.9)	20

Source: Field Survey 1990 and NDF files.

The total command area of the 10 tanks has been increased by 20 percent on average. The command area has not changed in four tanks owning to the unavailability of land and to physical constraints for capacity increase. The absolute area increase, varies from 1.1 ha (3 acres) to 3.7 ha (9 acres) in the remaining 6 tanks. This indicator shows that the physical performance of the systems is positive since more lands have been brought under cultivation as a direct impact of NDF's assistance. This is particularly important as the available land for physical area increase, in most cases, is limited under working tank conditions.

The tank duty, however, is below the required volume for the Intermediate Zone, (2.5 acre feet per acre) resulting in limited or no *yala* (dry season) cultivation. Nonetheless, the pre-project cultivated area was mostly limited to the head-end area of the tank command areas even during *maha* (wet season) owing to the reduced tank capacity over the years. The cropping intensity of these tanks was, thus, between 50 and 80 percent before the project. Cultivation in one tank was totally abandoned, with a zero cropping intensity. With the cultivation of rice and other field crops (OFCs) during maha and a limited OFC cultivation during yala, the cropping intensity under the post-project condition has increased up to between 90 and 140 percent in most of the systems studied. The increased command area has, therefore, not only enhanced cultivation during the maha season, but has caused diversification of the cropping pattern, especially in yala, showing increased cropping intensities, and in turn showing positive system performance.

Production Increase

Minor irrigation systems in Sri Lanka function as integrated systems which depend partly on irrigated agriculture and partly on rain-fed upland farming and off-farm activities. Therefore, production increase may not directly affect the economic condition or income level of the tank communities. Compared to the pre-project condition, NDF-assisted tank systems show a considerable production increase. As indicated in Table 2, over 50 percent of the tanks had yields below 40 bushels of unhusked rice per acre (2,570 kgs per ha) and another 20 percent between 40 and 60 bushels of unhusked rice per acre (2,570 to 3,800 kg per ha), under the pre-project conditions. With the project, production has increased over 100 percent in most cases. Sixty percent of tanks have received 80 to 120 bushels of unhusked rice per acre (5,000 kg to 7,700 kg per ha).

Table 2. Unhusked rice yield under irrigated agriculture (N=10).

Yield level kg/ha	Before project No. of tanks	After project No. of tanks
Below 1,900	01	–
1,900 – 2,570	04	–
2,570 – 3,800	01	01
3,800 – 5,000	04	03
5,000 – 7,700	–	03
Over 7,700	–	03

Source: Field Survey 1990.

Production has increased from a negligible and below-subsistence level (in most cases) under pre-project condition to an above-subsistence and surplus production level, with project condition, because of a number of inputs provided by the assistance program. These inputs included: 1) Improvements to the physical system for restoration of the tank capacity; 2) Motivation of farmers for new innovations such as cultivation of short-term rice varieties, cultivation of other field crops (OFCs), and the use of fertilizer and agro-chemicals; and 3) NDF's intervention to provide facilities such as rice-seed sprayers and other agro-inputs on a soft loan basis.

The production increase in the village tanks, as mentioned above, has contributed to increase their overall income which consists of irrigated agriculture, non-irrigated agricultural and off-farm activities. The production increase has resulted in increased consumption by the farmers and in reduced purchase of rice for consumption from outside, thereby inducing some savings. These savings plus motivation by NDF have enabled the establishment of a tank fund for system maintenance.

Profitability

The third indicator by which the performance of the NDF assistance program is evaluated is its economic profitability. This is calculated in simple terms by using the benefit/cost analysis method. Total project costs plus production costs and average income under 10 tanks for 5 years of project implementation are used in the calculations. Project costs and benefits over 5 years are summarized below.

Project costs	a) Farmers' contribution in cash	Rs	78,000
	in kind		20,000
	b) Estimated government contribution	Rs	300,000
	c) NDF's contribution	Rs	1,216,500
	Subtotal	Rs	1,614,500
	d) Cost of production per year (at Rs 7,410 per ha)	Rs	667,500
	Total cost	Rs	2,282,000
Project benefits	(Average yield/income for maha of 5 years/seasons)		
	a) Average production per ha=5,335 kg (80 bushels/acre)		
	b) Total production of 90 ha=480,150 kg		
	c) Total value of production at guaranteed price (1985–88 prices)= Rs 80/bushels (Rs 2.96/kg) (a * b * c) = total benefits	Rs	1,421,244

The benefit/cost ratio at the end of the first year [Rs 1,421, 244 / Rs 2,282,000] is 0.62; this will rise to more than one at gross calculations only after the third year, giving a value of 1.18. These calculations are made without applying any discounting factor for the 5-year period. Therefore, gross profit margins are calculated using a discounting factor of 15 percent as shown in Table 3. According to these calculations too, project benefits become positive only by the end of the third year. The gross profit margin by the end of the fifth year is 1.24.

As mentioned earlier, the importance of irrigated agriculture in a minor system (with each individual owning between 0.2 and 0.6 ha of land on average) is marginal since the farmers' main cash incomes are derived from other agricultural and non-agricultural sources. But with the

assistance program the system performance has been enhanced from a below-subsistence level to at least subsistence level and/or above-subsistence level in most cases, showing some savings. The fact that a project reaches a break-even point within three years of an assistance program and then becomes profitable is an encouraging fact, for FMIS.

Table 3. Benefit/cost ratio: Gross margin calculation (in Sri Lanka Rs.)

Year	Cost	Benefits	Present Value at 15% DF		
			Cost (1)	Benefits (2)	2–1
0 (1984)	1,614,500	–	1,614,500	–	-1,614,500
1 (1985)	667,500	1,421,250	580,725	1,236,488	655,763
2 (1986)	667,500	1,421,250	504,630	1,074,465	569,835
3 (1987)	667,500	1,421,250	439,215	935,183	495,968
4 (1988)	667,500	1,421,250	381,810	812,955	431,145
5 (1989)	667,500	1,421,250	331,748	706,361	374,613
5 years	4,952,000	7,106,250	3,852,628	4,765,452	912,824
US$	(198,080)	(284,250)	(154,105)	(190,618)	(36,513)

(1) = Total project cost. (2) = Cost of production per year/season.
DF = Discount Factor.
US$1.00 = Rs. 25 (at 1985 prices) is used for conversion.

Resource Mobilization

The NDF has adopted a "non-regimented intervention style" to ensure successful community participation and self-management (Vimaladharma 1990). A group of farmers under each of these tank systems was mobilized to fully utilize their physical, financial and human resources for their own benefits. The mobilization of human resources is of vital importance, since it has 1) led farmers to organize into their own associations; b) encouraged them to adopt new innovations such as integrated farming systems and other income-generating activities; and c) resulted in effective use of community labor for physical construction.

The NDF has mobilized farmers mainly to increase the productivity of lands already cultivated under the renovated tank, by their own initiative. The added extent brought under the plow as a result of increased tank capacity has been efficiently used to increase the productivity by mobilizing farmers to conserve irrigation water, to cultivate OFCs during yala, and to have constant community interaction for better participation in system management.

The major components improved under NDF assistance included consolidation of the tank bund with full or partial manual labor, and construction of sluices, spills and the channel system. Machinery has been used only to supplement manual labor, where heavy works were involved. There too, farmers were mobilized to contribute for fuel purchase out of their tank fund. With a farmer mobilization process throughout the assistance program, it has been easier to get positive contributions from the farmers. This has not been common under other assistance strategies, particularly under government agencies. The total financial contribution of the farmers exceeds Rs 75,000 (US$3,000) and the value of their labor should be the highest of all contributions. The

farmer's organizations, plus the farmer federation created for sustained system performance have been effective, from project completion to the present post-project condition, where self-management of systems is evident in most of the systems studied. The communities were not only organized into coherent groups for project-related activities, but were also motivated to carry out successful water management programs, O&M activities, and conflict management by themselves during the post-project conditions.

Institutional Effectiveness

Three main institutions were introduced and developed by NDF's assistance program. They are a) the Field Coordinator (FC); b) the Farmers' Organization (FO); and c) the Small Farmers' Federation (SFF).

The FC is NDF's field-level facilitator who acts as a change agent. He works full time and each has passed the GCE (Advance Level) examination. The FCs are resident in the project area and possess sufficient knowledge of the society, culture and development needs of the farmers of the area in general and of the ten renovated tanks in particular. The FC's role was more important during the initial period of intervention when people were motivated to discuss their problems and organized into groups to plan and implement an integrated farming system based primarily on the village tank. The FC also helped train volunteers in community work aimed at sustainable system management. Further, he acted as mediator between farmers and government agencies for mobilization of available resources and services. Motivation of farmers during the initial period and during project implementation was the main responsibility of the FC who visited the farmers very frequently to achieve this purpose. These visits became less frequent after the project, since the trained volunteers could take over the FC's activities in the latter part of the project. Although they approached the communities with tank renovation in mind, their service in motivating people and mobilizing resources in general has been quite effective even at the post-project level. The FC has also played the role of a liaison officer to obtain the services of the relevant government officers such as Technical Officers, Managers of the Agricultural Development Authority, Divisional Officers of the Department of Agrarian Services (DAS) and Assistant Government Agents (AGAs).

The FOs were formed under each tank community as the main bodies for management of development activities throughout the assistance program and thereafter. Prior to renovation of tanks, farmers rarely gathered to discuss their problems. *Kanna* (seasonal cultivation) meeting was the only forum at which they could discuss their problems with government officials. With the formation of FOs, farmers' participation in project activities increased, starting from planning through construction work to post-rehabilitation O&M of tanks. These project-related tasks became more systematic and meaningful as the farmers organized themselves into FOs and established their group fund and appointed several subcommittees for various functions such as water management (Perera 1988). The motivated FOs were effective enough to elect their leaders, enact a constitution of the group, open a group bank account and negotiate with NDF and other agencies on their needs and problems. The responsibility for O&M of the tanks rests with the FOs as a group. They used the group fund for annual repairs to channel systems and cleaning of the bund. Through group activities farmers have realized the importance of irrigation water management and of contributions of money and labor to renovate and continue regular maintenance of the tank. These farmers' groups were further effective in realizing an integrated farming system based on the tank, for the benefit of the entire community. The FOs, thus, provide a powerful mechanism to organize and direct farmers to work together.

The third institution created under the NDF strategy is the Small Farmers' Federation (SFF) formed as the umbrella organization for all the farmer groups under the hitherto improved tank systems. Logically, SFF was to have a membership of all 176 farm families in the 10 tank communities, but in fact, the farmer leaders represented these families in SFF's activities. The main stated activities of SFF are: 1) Coordination of intervillage level farmer activities; 2) Agricultural planning and decision making on crop diversification in a given season; 3) Linking individual village-level farmer groups with external agencies such as DAS and the banks; 4) Providing financial support to individual farmer groups when the need arises. The progress of the 10 renovated tanks has been subjected to a consolidation process which has been attempted through strengthening the financial position of SFF by channeling various grants to it by NDF; for example, OXFAM's seed rice grant has been made available for the tank communities. The SFF has started a program of integrated farming mainly as a survival strategy for rice-biased farmers to diversify their economy. According to recent field studies, however, effectiveness of SFF appears to be limited as an institution as its importance has not been recognized by farmer groups. This is due mainly to the haphazard manner in which SFF activities have been carried out by its representatives. Farmers have not been correctly educated in federating the relevant activities. Some farmers were not even aware of the existence and the functions of the SFF. Of the three main institutions introduced by NDF, SFF is the least effective, making the performance of that institution rather negative. The roles of social organizer (FC) and the FO have been more effective in relation to project implementation and in system management afterwards, showing positive system performance.

System Sustainability

The collective effect of the inputs provided by an assistance strategy should lead to long-term system sustainability. The NDF-assisted tank systems in Kurunegala District have been in operation only for about five years since the completion of the improvements, which may be sufficient to judge the sustainability aspects.

Although sustainability could be a valid indicator to assess a rehabilitated system, it is difficult to apply it directly for renovated tanks which were in working condition even prior to renovation. Nine out of the ten tanks renovated by NDF were in working condition prior to the assistance. For physical sustainability, regular operation and maintenance are required. These aspects, over the post-project five years, have been sufficiently looked after by the farmer groups, but in a few tanks they were not adequate for long-term physical sustainability (Dayaratne 1991).

Since the majority of the farmers depend more on upland agriculture and other activities than on irrigated agriculture, economic sustainability must be measured as a collective impact on the integrated agricultural system in which the tank irrigation system is only one element. Therefore, economic sustainability of the system has been enhanced by the assistance program as the communities now have diverse economic means for their survival.

Of the institutions introduced by NDF, most effective for sustainability are the social organizers (Volunteers and FCs) and FOs that have played vital roles in system sustainability. All the improvements achieved could be sustained thus far, owing mainly to the continuous operation of these institutions. A recent IIMI study (Dayaratne 1991) revealed that the farmers have most positively accepted the leadership and the functions of the FOs in relation to sustainable system performance.

It was found that NDF's assistance program has not given any attention to ecological sustainability which is most important in long-term sustainability. Although physical and eco-

nomic sustainability should go hand in hand with environmental stability, the assistance program has not introduced a specific program including catchment management and soil and water conservation. The recent NDF supplementary program for "Integrated Farming System" can be effective only if these environmental aspects are contemplated.

CONCLUSIONS

Small irrigation systems in Sri Lanka have been traditionally farmer-managed. However, with the agrarian change from subsistence to commercial agriculture in the last century, and a dependency syndrome created by various assistance programs in more recent times, these systems have become jointly managed since the government appears to hold responsibility for O&M activities. The government's efforts at present are to reverse this trend and make all irrigation systems farmer-managed. The achievements of NGOs such as NDF, in this regard, are highly encouraging, as the performance of the assistance program has been positive.

The performance of small irrigation systems may be effectively measured by the indicators used in this paper. Of the six indicators developed, three are quantitative measurements by which tangible achievements were assessed, while the other three are intangible or abstract achievements which cannot be readily quantified. The impact of these indicators too, however, could be identified by assets and/or attributes created by the system performance. The qualitative indicators are more critical than the quantitative ones since these indicators are vital to sustainable system management and assured self-management.

As collectively indicated by these indicators, the performance of NDF contrasts with other assistance programs which have not proved to be sustainable for a longer time since they have not been successful in relieving the people of the "dependency trap." The performance of FMIS under NDF-assisted programs appears to be positive as their approach and strategy have helped farmers to gradually become self-managed or farmer-managed resulting from a process of "putting the farmer first."

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