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Inland Fishery as an Additional Source of Income and Protein in Minor Tanks in Sri Lanka

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In the past, village irrigation-tank based fisheries have played an important role in the Dry Zone of Sri Lanka. However, currently, its contribution to the economy is far below expectation (Ministry of fisheries & ocean resources – 2002). This is mainly due to the poor condition of minor irrigation systems and lack of multiple use approach in the planning and development of these schemes. The Minor Irrigation Tank Rehabilitation project implemented by Plan Sri Lanka supports the development of small irrigation systems in the Anuradhapura district in an integrated manner, taking peoples' multiple water needs into consideration. Project interventions include infrastructure improvements, capacity building of farmers and partners, integrated watershed management, crop diversification and an inland fishery program to improve livelihoods and food security. Under this project, Twelve of the rehabilitated schemes were identified by the National Aquaculture Development Authority as suitable for inland fisheries and in 2006 /2007, 6 of the 12 tanks were stocked with fingerlings. The economic returns in some tanks have far outweighed the costs incurred. The paper discusses Plan Sri Lanka's experiences in integrating inland fisheries within its tank rehabilitation project as part of Plan's MUS programme for poverty alleviation. It will explain demonstrated benefits in income generation, provision of a supplementary protein source for improvement of nutritional status and improved institutional stability. It will highlight best practices in institutional and resource management and appropriate technological practices for increasing benefits and effectiveness in multiple water use.

Introduction

Small tanks in Sri Lanka are defined as those with an irrigated cultivation area of 80 ha or less. Such small tanks are located in the Dry Zone of Sri Lanka that receives a mean annual rainfall of less than 1,250 mm. Small tanks or reservoirs therefore, are the pivot of the village economies and rural life as they are of multiple uses (Agricultural, Domestic and Environmental) and support human settlements in vicinity of tanks. It is estimated that small tank technology dates back to the pre Aryan settlements (6th Century B.C), in Sri Lanka. The tanks are also part of an integrated system that is known as a cascade defined as a "connected series of tanks organized within the meso-catchments of the dry zone landscape, storing, conveying and utilizing water from an ephemeral rivulet" (Madduma Bandara, 1995). So the cascade is a collection of tanks in an identified geographical area.

The Project

Plan has worked in Sri Lanka for over 27 years. For operational purposes the program areas are grouped into four main geographical zones out of which the Northwestern program area comprising of the Polpithigama Divisional secretariat in the Kurunegala District and Mahawilachchiya, Anuradhapura Central and Medawachiya divisional secretariat are the areas in Anuradhapura district. Through a technical feasibility study, Plan identified 40 minor irrigation tanks that are hydrologically feasible within 12 hydrological feasible cascades in Mahawilachchiya, Anuradhapura Central and Medawachchiya Divisional Secretariat areas in Plan North west program unit. With the financial support of Plan Netherlands, Plan Sri Lanka is in the process of developing 5 cascades in Anuradhapura Central (MANUPA), Medawachiya and Mahawilachchiya Divisional Secretary areas. The rehabilitation activities are being carried out with 29 irrigation tanks located under selected five selected cascades and fingerlings were stocked in six rehabilitated tanks listed in table 1& 2 in 2006 and 2007.

Project Approach and Methodology

Project is implemented in an approach that encompasses physical improvement of minor tanks in cascades, conservation of watershed areas improving income generating activities by introducing agriculture related livelihood options of the tanks within the respective cascades emphasizing the multiple usage of water, for optimal productivity.

Community Mobilization

Although there is policy and legislative support for Farmer Organizations, effective mechanisms for service delivery was lacking in the project location and most of farmer organizations who manage and look after operational and maintenance of minor tanks were dysfunctional. As the main service delivery mechanism Plan sought to address the issues that affect the functionality of the Farmer Organizations. Some of the key interventions were conducting a series of capacity building trainings for the farmer organizations on different aspects such as minor tanks development, operation and maintenance, integrated watershed management and multiple uses of cascade systems in Sri Lanka. At the same time Plan initiated coordination with the officers of the National Aquaculture Development Authority and Department of Agrarian Development to change the attitudes of Farmer Organizations to introduce the inland fishery program. Traditionally inland fisheries addressed the nutrition needs of these communities and it was imperative to re-introduce these sources of food intake to address poverty and food insecurity. Consequently inland fishery committees were formed as a subcommittee in farmer organization to implement activities related to fisheries in 6 minor tanks in two cascades which were rehabilitated by the project.

Partnering with Related Stakeholders

Minor tanks (Cascade) development requires a multifaceted approach that needs effective involvement of all relevant line agencies such as the Department of Irrigations, Agriculture, Agrarian Services, Forestry, and Fishery related institutes and Divisional Secretariats. So at the beginning of project, a Project Steering Committee (PSC) was formed with the chairmanship of Government Agent (District Head of the Gvt. Departments) of Anuradhapura District. The presence of all the relevant government agencies at the PSC meeting played a vital role acting as a coordinating body at district level to develop multiple uses of irrigation systems. After community mobilization and networking with partners' physical improvement of the tanks was initiated. The forest reservations just above the tanks were demarcated and some reservations were reforested to provide favorable conditions for the tank systems. Members of Farmer Organizations were instructed to reduce human activity in watersheds to reduce the turbidity of the water.

How Tank Rehabilitation Supports Food Production and Other Community activities?

Rehabilitation of minor tanks located in cascades gives multiple benefits such as providing adequate water for agriculture and aquaculture, Increment of water table at the vicinity of tank(drought mitigation) and ensure water for bathing and washing for village communities. After implementing Minor tank rehabilitation project of Plan Sri Lanka many results could be achieved.

Capacity improvement and renovation of canal systems have led to the reduction in water losses in the tanks and has ensured availability of water throughout the year. Increased levels groundwater enabled survival of trees in home-gardens located below the tank bed elevations during the dry periods. This is evident in Ethdathkalla tank where 5 acres are being irrigated by agro wells. The water availability of wells in the periphery of rehabilitated tanks has increased with reducing fetching time for water. A 15% increase of paddy yield has occurred due to the rehabilitation of the tank and a value was added to water spread area of tank by introducing inland fish into tanks. With balance water in dry periods Cultivation of Other Field Crops such as maize, chili, Mung bean etc in paddy lands assured the food security in dry season. Multiplicity of services from tanks such as cultivation through out the year, availability of fish, credit facilities being implemented through fund raising activities attracted and absorbed community members to the farmer organizations making them functional and effective through out the year . This has influenced to institutional strength and stability with multiple services which could be obtained from farmer organizations. Earlier services from farmer organization could be obtained for a limited period of time and gathered only to organize their cultivations in rainy season. Due to the project interventions, membership and participation for farmer meetings has increased significantly. At present, 328 families in the project area where the inland

fishery program implemented receive direct economic benefits from inland fisheries and are assured water for the cultivation of 405 acres of paddy.

Inland Fishery with the availability of water

In order to provide additional income generation activities and also to meet the protein requirement of villages, the project, in consultation with Project Steering Committee decided to implement an inland fishery program with the technical support of the National Aquaculture Development Authority and this has become a best practice introduced by Plan Sri Lanka as some Farmer Organizations achieved significant results with proper management of their minor irrigation systems. Out of the rehabilitated irrigation schemes, 12 systems were identified as suitable for inland fisheries by the National Aquaculture Development Authority and in 2006 fingerlings were stocked in two tanks. The value of the harvested fish amounted to US\$1,814 against the cost incurred US\$685. In 2007, investment for fingerlings in 5 minor irrigation tanks was US\$1,449 and value of harvested fish was US\$7,008. Rohu, Big head carp, Catla and Common carp were the varieties introduced to the tanks that have no competition and predation on local/indigenous varieties.

Tank Name	Number of fingerling stocked	Cost for fingerlings (US\$)	Number of Kgs harvested	Income(US\$)
Ethdathkalla	30,000	450	1,215 Kg	790
Kiulekada	12,620	235	1,711 Kg	1024
Total	42,620	685	2,926	1,814

Source: Farmer Organization records

Name of the tank	No of fingerlings	Cost for Fingerlings(US\$)	Harvest (Kg)	Income(US\$)
Millawetiya	7,200	105	476.5 Kg	309
Ethdathkalla	40,000	600	7,786 Kg	6034
Loku katukeliyawa	7,000	104	555 Kg	492
Mahahalambewewa	10,000	100	195 Kg	126
Katukeliyawa	36,000	540	69 Kg	47
Total	100,200	1,449	9,012	7,008

Source: Farmer Organization records

In these regions which are far away from sea, inland fish represent an essential, often irreplaceable source of high quality and cheap animal protein crucial to the balance of diets in marginally food secure communities. The fish harvest that could be obtained from tanks meets the protein requirement of immediate beneficiaries of tanks while providing rice as the staple food. Most inland fish produced in tanks is being consumed locally and sells at a half rate which is affordable to the other communities.

Lessons Learnt

Key elements for success are coordinated and collaborative efforts of all agrarian and agriculture related organizations and early participation in planning for development and management. Introducing Multiple and integrated services from minor tanks enhance the effective participation of respective communities for management of water resources than to a single use approach (Cultivation oriented). With that different type of needy people gets together with community organizations where they can discuss meet and built consent

on their requirement and needs. Having realized tangible and intangible benefits that could be obtained from minor tanks rather than crop cultivation would endure the organizational stability and sustainable usages of tanks. As meeting of protein requirement for rural poor is difficult, inland fishery at least in one or two hydrological well endowed tanks per cascade is well accepted by communities. Following key challenges are still prevailing to maintaining and enhancing inland fish production and need policy level influences to make a positive different in dry zone of Sri Lanka.

- Un-integrated approach for minor tank development works including improper coordination among line agencies
- Degradation of aquatic resources and environments due to bad and intensive agronomic practices
- Insufficient institutional and political recognition
- Seasonality of tanks which hinder the provision of fish through out the year



Photograph 1. Harvested fish ,Ethdathkalla Tank



Photograph 2. Fishing at Ethdathkalla Tank

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References

- Panabokke, C.R and Amarasinghe L.A. (2004) *Report on identification of fifteen cascade systems in five divisional secretary divisions of the Anuradhapura district and selection of individual tanks for rehabilitation within them for plan Sri Lanka, plan Sri Lanka.*
- Records of Farmer Organizations in project area
- Plan Sri Lanka and Centre for Development Research (2006) *Midterm review report of cascade system development project*
- Ministry of Fisheries & Ocean Resources (2002)

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