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Enhancing nutritional and livelihood security of the Coastal farmers in an Integrated fish farming system

SelvarasuT and Velvizhi. S
M.S. Swaminathan Research Foundation
Fish for All Research and Training Centre, Poompuhar -609105, Tamil Nadu, India
Email: selvarasu@mssrf.res.ins

Introduction

The coastal crop production enterprises are subject to a high degree of risk and under training due to various natural calamities (tsunami, flood, salinization and drought). To identified as one of the major farming villages of the Sirkali and Sembanarkovil block in Mayiladuthurai district of Tamil Nadu. These two blocks of farmers constitute of 72 percent of marginal and small-scale farmers. Indian Meteorological Department, Chennai reported that during the period 1891 and 2017, nearly 32 per cent of cyclones that formed in the Bay of Bengal struck the coast of Tamil Nadu; of which 61 severe cyclones crossed the Mayiladuthruai region mostly during the months of October to November in addition of frequent cyclone, mid-season drought, floods and water logging due to the flat topography and improper/disturbed drainage systems make the region more vulnerable. One of the options for addressing the issue is economically and ecologically sustainable development of farming systems, which can be achieved by integrating aquaculture and agriculture. Integrating appropriate farming components in fish culture requiring lesser input, space and time for ensuring higher productivity of the system is the only alternative option. Such integrated farming systems can contribute to the alleviation of food insecurity, malnutrition and poverty through the provision of food of high nutritional value, income and employment generation, decreased risk of production, improved access to water, sustainable resource management and increased farm sustainability. The integration of diverse components in the farming system ensures increased returns, sustainable farming and further it prevents the migration of farmers from farming sector. Since then, 30 integrated farming systems has been established scientifically and its economics in terms of the components integrated has been studied.

Methodology

The study was conducted in two blocks namely Sirkali and Sembanrkovil of Mayiladuthurai district of Tamilnadu. The questionarnaire used for base line data consisting of farmers profile, fish farming, integration of farming activities, source of irrigation and associated issues, accessibility of government schemes etc. The collected data from Primary and secondary sources from farmers and line departments have been entered into the tabulation data sheet and maintain the, individual farmers. The study was conducted during 2019- 2021.

Results

Productivity of systems: The system productivity varied widely between the models. The model involving, the components like fish, poultry, fodder crop, Horticulture crops and azollaculture recorded the highest system yield and productivity during 2019 to 2021 with Rs.11,0369/ha. Similar findings were reported by Bhatnagar et al. (2005) and Rangasamy et al. (1988). The system

productivity per day was higher in IFS (42.6kg/ha/day) compared to conventional (18.2kg/ha/day). The substantial additional income could be generated by practicing different enterprise combinations based on the location specificity and capabilities of farmers were reported by Murugan and Kathiresan, 2005.

Table: 1. Increased productivity (yield in kg)

Components integrated in IFS	Baseline data	End line data
Fish culture	4668	10926
Vegetable cultivation	1328	5210
Fodder cultivation	0	20000
Fruit crops	2500	8750
Tree crops	Approx. value: 2.5 lakh	10 lakhs
Azolla culture	0	5400

Economics of systems: Among the different IFS model studied, the system fish + livestock + poultry + fodder crop +Horticulture crops + azolla registered the maximum gross income of Rs.110369/ha net income of 77658 /ha. In spite of clear scientific knowledge on fish culture, out of 12 interventions a farmer obtained 2375 kg, of fish/ha/10months. Similar results reported by Jayanthi et al., (2003), Channabasavanna et al., (2009), Ugwumba et al., (2010) and Singh *et al*., (2009).

Table2: Enhanced Income

Components integrated in IFS	Before intervention (Rs)	After Intervention (Rs)
Fish culture	6,06,960	11,62,000
Vegetable cultivation	39,840	47,950
Fodder cultivation	0	20,000
Fruit crops	1,25,000	4,37,500
Tree crops	2,50,000	10,00,000
Azolla culture	0	10,800

Employment generation and LRI: Fish + poultry + fodder crop +Horticulture crops and azolla culture. IFS system generated more employment opportunities of 1383 man days/year/ha-1. The aforesaid system also registered the highest LRI of 45.7%.

Conclusion

Sustainable development in fish culture to promote the integrated farming system can only be achieved through optimum utilization of the natural resources. A favorable will have to be provided and a socio-economic and technical constraint needs to be addressed in order to enable the fish culture farmers for integrated farming system (IFS) development.

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