

Internship Report:

Study on impact of Carp-SIS-Prawn project on household fish consumption

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1. Introduction

Rural development, the process of sustained growth of the rural economy and improvement of well being of rural men, women, and children, has various dimensions, but it is particularly the development of agriculture sector, which is widely believed to provide the main source for ensuring food security, reducing poverty and hunger.

Various types of aquaculture form have been evolved over the period of time as an important component within agricultural and farming systems development. They can contribute to the alleviation of food security, malnutrition and poverty through the provision of food of high nutritional value, income and employment generation (FAO, 2000a, Halwart M. *et al*, 2003).

Fish production in Nepal is 49,730 mt/year (MOAC, 2010). Fish consumption is 16.7 kg at world level, 29.4 kg in China, whereas in Nepal only 1.77 kg per capita per annum (Bhujel, 2009).

Production is low due to lack of motivation and other factor and consumption is also low in poor's. Malnutrition caused by vitamin and mineral deficiencies among poor women and children has been well recognized as a serious health problem in Nepal. Essential micronutrients such as iron, zinc, vitamin A and calcium are lacking in the Nepalese diet and consequently, large population groups are suffering from diseases and disorders associated with micronutrient deficiencies. The most common forms of malnutrition in the country are protein energy malnutrition (PEM), iodine deficiency disorders (IDD), vitamin A deficiency (VAD), and iron deficiency anemia (IDA). About 49% of children under five years of age are stunted and 48% are anemic (MOHP, 2006). Also, 36% of women, aged 15-49 are anaemic (MOHP, 2006). The situation is dire, especially in rural,

ethnic minority women and children as they are resource-poor and have very little education.

Fish are rich in protein, fatty acids, and essential vitamins and minerals which are important for the cognitive and physical development of humans. Small indigenous fish species (SIS) have been found to be much more nutrient-dense than cultured fish, such as carps. Nutrient analyses of common Bangladesh SIS such as mola (*Amblypharyngodon mola*) and darkina (*Esomus danricus*) have shown that the contents of vitamin A, calcium and iron are much higher than in cultured fish (Roos et al., 2006). Unlike large fish, SIS are eaten whole, without loss of nutrients from cleaning or as plate waste. The bones of SIS are very rich in calcium. Likewise, the eyes, head, organs and viscera of some SIS, such as mola are rich in vitamins and minerals, especially vitamin A, iron and zinc. These nutrients in fish are found to be highly bioavailable. Moreover, SIS are self recruiting and therefore can be harvested weekly and biweekly, favouring household consumption.

The polyculture of carps in household ponds is the technology practised in Nepal. SIS such as Mara (*Amblypharyngodon mola*), Dedhwa (*Esomus danricus*) and Pothi (*Puntius sophore*) are considered as “weed” or “trash” fish and are often removed from the ponds, due to fear of food competition with the cultured fish and their impact on total fish production. In fact, farmers and extension workers are not aware of the nutritional value of SIS. Therefore, their culture potential is overlooked.

Improvement of women’s livelihoods, income and nutrition through carp-SIS-prawn polyculture in Terai, Nepal is a project launched by Aquaculture Department of IAAS, Rampur with three partners (RIDS, FDC and BAU) funded by DANIDA.

The major objectives of carp-SIS- prawn polyculture in Terai, Nepal are.

- to increase intake of micronutrients from the diet
- to generate income through sale of fish and prawn
- to involve women in fish farming activities
- to promote carp-SIS-prawn production technology and empower women

Rationale of doing this internship

The main objective of carp-SIS-prawn was to increase intake of micronutrients from the diet. After two years of project implementation, this internship tried to see the trend of change in household fish consumption before and after project implementation of project in those house hold directly involved in carp-SIS-prawn project.

2. Introduction of working area

The Internship was done in Kathar, Bhandara, Piple and Khaireni Village Development Committees (VDCs) of Chitwan district and Lalpur of Hasulia Village Development Committee of Kailali District of Nepal. These VDCs are densely populated with Tharu community, an ethnic group of terai. Altogether 126 farmers are involved in the Carp-SIS-Prawn project.

3. Objectives

- a) To study the household fish consumption status during and after project implementation
- b) To determine the contribution of the project on household fish consumption

4. Methodology

A total of 126 farmers were involved in this study out of these 76 farmers were (New Groups-Fafaini, Majhui, Hasulia) involved in fish farming through Danida-SIS Project in 2010 and rest 50 farmers (Old Groups- Piple, Fuloria, Mudavar) were involved in 2009. For this study, the data of two crops (2009, 2010) of fish from old groups and one crop (2010) of fish production from new groups' were used for analysis.

The semi structured questionnaire (Annex 1) is used for collecting the information from the fish farmers and the farmers were interviewed individually during information collection. The collected information was analyzed by MS-Excel and SPSS 16.0.

5. Results and Discussion

Table 2. Mean of seasonal household consumption of fish by different groups in 2010 (Mean±S.E.)

Parameters	Groups					
	G ₁	G ₂	G ₃	G ₄	G ₅	G ₆
Summer season (Kg/Family)	2.28±0.27 ^b	3.97±0.64 ^a	2.93±0.64 ^b	1.26±0.12 ^b	1.01±0.26 ^b	3.00±0.37 ^b
Rainy season (Kg/Family)	2.96±0.39 ^b	6.08±1.03 ^a	4.75±0.93 ^b	2.21±0.21 ^b	2.62±0.39 ^b	4.44±0.51 ^b
Winter season (Kg/Family)	7.37±0.85 ^b	11.5±1.5 ^b	10.7±1.58 ^b	15.9±1.62 ^a	11.8±1.08 ^b	10.55±0.60 ^b

G1- Piple, G2- Fuloria, G3-Mudavar, G4-Fafaini, G5-Majhui and G6-Hasulia

Table 3. Mean of source of household consumption of fish by different groups in 2008, 2009 and 2010 (Mean±S.E.).

Parameters	Groups					
	G ₁	G ₂	G ₃	G ₄	G ₅	G ₆
Own pond in 2008 (kg)	-	-	-	-	-	-
Market in 2008 (Kg)	2.50±0.22	3.86±0.31	2.46±0.37	-	-	-
Collect in 2008 (kg)	2.50±0.28	3.00±0.45	2.93±0.46	-	-	-
Own pond in 2009 (kg)	9.20±0.85 ^a	7.72±1.13 ^b	7.20±1.57 ^b	0.48±0.48 ^b	1.52±0.94 ^b	0.00±0.00 ^b
Market in 2009 (Kg)	0.12±0.12 ^b	0.43±0.22 ^b	0.13±0.13 ^b	6.29±0.62	6.60±0.96	8.30±1.24 ^a
Collect in 2009 (kg)	0.69±0.27 ^b	0.17±0.12 ^b	1.20±0.41 ^b	1.48±0.26 ^b	0.09±0.09 ^b	5.46±0.77 ^a

Own pond in 2010 (kg)	10.5±1.66 ^b	20.9±3.05 ^b	15.5±2.77 ^b	18.7±1.76 ^a	14.6±1.54 ^b	7.74±0.45 ^b
Market in 2010 (Kg)	0.56±0.38 ^b	0.34±0.27 ^b	0.00±0.00 ^b	0.00±0.00 ^b	0.19±0.19 ^b	6.00±0.80 ^a
Collect in 2010 (kg)	2.00±0.45	0.27±0.27	1.20±0.45	0.00±0.00	0.00±0.00	2.44±0.75

Table 4. Mean of Species wise household consumption of fish by different groups in 2008, 2009 and 2010 (Mean±S.E.).

Parameters	Groups					
	G ₁	G ₂	G ₃	G ₄	G ₅	G ₆
Carp in 2008 (kg)	2.37±0.20	.30±0.30	2.26±0.35	0.00±0.00	0.00±0.00	0.00±0.00
SIS in 2008 (Kg)	2.66±0.25	2.95±0.42	3.13±0.46	0.00±0.00	0.00±0.00	0.00±0.00
Carp in 2009(kg)	9.12±0.85 ^a	5.76±0.99 ^b	6.11±1.41	4.08±0.46 ^b	4.85±0.71	7.07±0.88 ^b
SIS in 2009 (kg)	1.03±0.27 ^b	1.62±0.65 ^b	2.58±1.14 ^b	4.21±0.28 ^b	2.85±0.44 ^b	6.88±1.08 ^a
Carp in 2010 (Kg)	10.5±1.42 ^b	19.8±3.03 ^a	12.9±2.79 ^b	17.65±1.78 ^b	12.1±1.39 ^b	12.4±1.78 ^b
SIS in 2010 (kg)	2.50±0.32 ^b	1.68±0.39 ^b	2.63±0.64 ^b	1.59±0.32 ^b	2.55±0.51 ^b	4.59±0.32 ^a

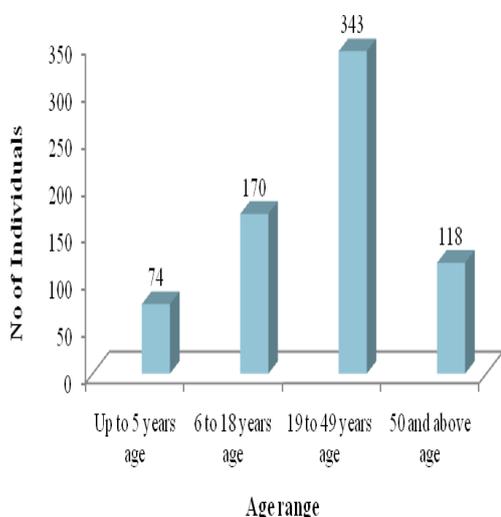


Figure 2: Range of age in groups

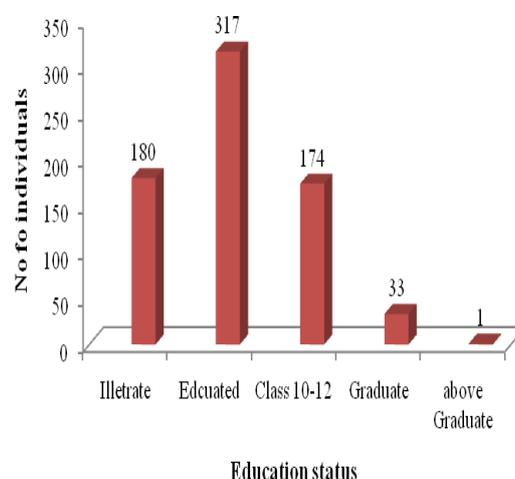


Figure 3: Education status in groups

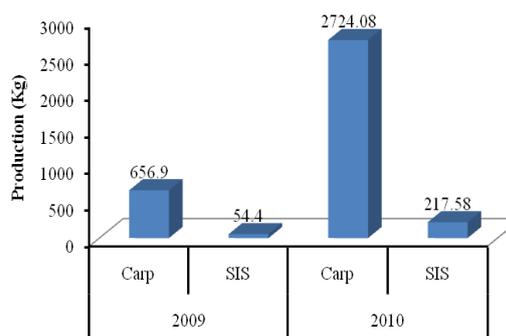
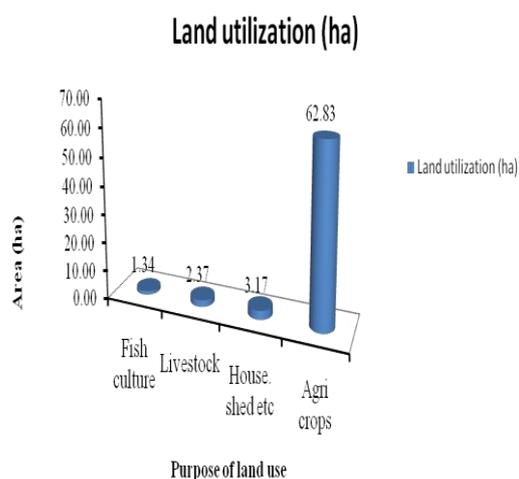


Figure 4. Land utilization pattern in groups

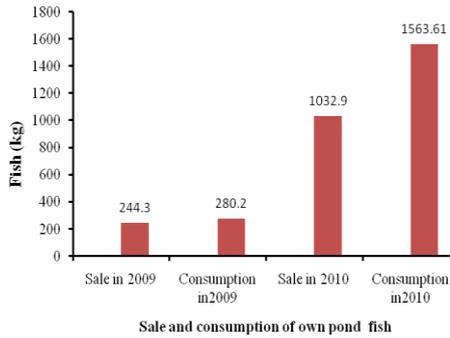


Figure 5. Production of Carp and SIS in Groups

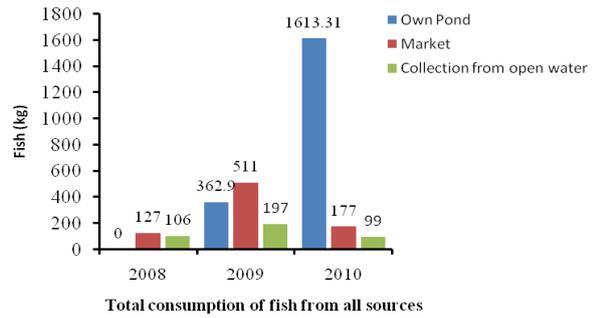
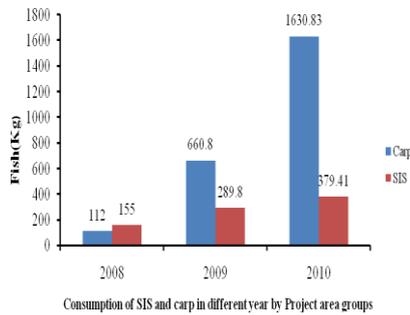


Figure 6. Sale and consumption of all fish by groups

Figure 7. Household consumption of fish from different sources



Fish consumption Kg//head/Yr

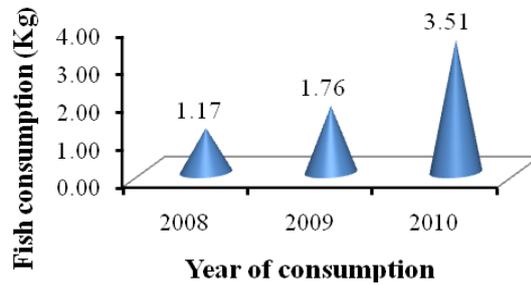


Figure 8. Comparison of SIS and Carp in household consumption (all groups)

Figure 9. Per head fish consumption in different year

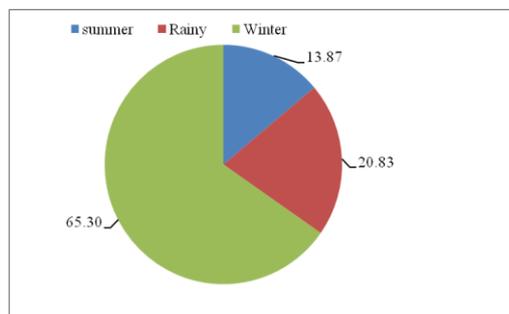


Figure 10. Seasonal household consumption of fish (%) by all groups (2010)

- Both SIS and Carp household consumption increased.
- Household consumption of produced fish was high than sale.
- Increase household income by selling Carp and Prawn.

- It is assumed due to increased intake of fish, health and nutrition is improved after project implementation.
- SIS species were consumed whole, including bones, heads and gut where most micronutrients are concentrated.
- Variation in seasonal consumption due to final harvesting is done in winter for data taking.
- Priority in fish consumption both by volume and approach was in small children and school age group.
- By sex approach in fish consumption was 60:40 in male and female.

6. Summary and Conclusions

Malnutrition is the major problem in third and fourth world. Although number of small species found in this country which is very rich in Vitamin and minerals. Recently small scale aquaculture has been emerged in many countries especially where rural people dominates the country and recognized that the small scale fish farming system is fruitful to contribute to the food security, mal-nutrition, employment generation and ultimately the poverty alleviation and rural development but very little emphasis paid on conservation , production and consumption of SIS .

In Nepal not attempts have been paid to introduce small-scale fish farming system with SIS. But, recently (2009), it has been introduced as a study and diffusion the package to contribute and support in food security, mal-nutrition and employment generation activity from IAAS, Rampur.

Consumption of both SIS and Carp were increased in household after implementation of Carp-SIS project so it helps to improves health and economic condition of poor peoples.

Carp-SIS-Prawn project implemented in two district of Nepal.126 fish farmers are organized in six groups with the help of local NGO. The women member of the farm family were motivated and mobilized towards this farming. For the further expansion and strengthen of this programme in other location of the country GOs, NGOs, should be involved and support strongly for the betterment of rural poor people health.

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