Indian J Hill Farmg 12 (1 & 2) : 52–57 (1999)

Adoption Behaviour of Rural Farmers of Assam Towards Different Aquaculture Technologies

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ABSTRACT

The present communication envisages adoption behaviour of farmers of 5 villages of Jorhat district of Assam, towards high yielding aquaculture technologies. It was observed that although 77.2% reported adoption of different aquaculture technologies, only 28.8% followed the complete package of practices as per recommendation. Reasons for adoption as well as for non-adoption of aquaculture technologies were identified. The most highly assigned reason for non adoption/partial adoption was high investment followed by unavailability of finance and inadequate availability of inputs. Educational level and economic status of farmers were found to be positively related with adoption level of aquaculture technology.

Aquaculture can play a significant role in meeting people's nutritional requirement, augmenting food supply, in generating employment and earning foreign exchange. Incorporation of aquaculture in farming system can improve ecoromic viability in an ecologically sustainable way. Although, a good number of high yielding aquaculture technologies have been developed in India most of the rural fish farming is still done in traditional way (Bhagowati, 1990; Bhowmik, 1992; Misra, 1996).

Assam is bestowed with vast and varied potential resources in the form of 4.820 km rivers, 0.55 lakh ha reservoirs, more than 0.21 lakh ha tanks and ponds and 1.10 lakh ha beels (Anon, 1993). Inspite of this enormous potential, fish production in the state is lagging far behind the actual demand of the population, about 95% of which consumes fish (Bhagowati, 1990).

It was therefore considered to study the adoption behaviour of rural fish farmers of Assam towards different fish farming technologies recommended for the state and also to identify the bottlenecks so that a strategy can be developed for future projection of the extension programmes.

MATERIALS AND METHODS

The study was done during 1997-98. A total of 5 villages at a distance of around 40 km from Assam Agricultural University in Jorhat district, Assam were surveyed on the basis of predetermined criteria, viz. availability of water resources and exposure to extension programmes. A list of farmers from the villages was prepared and a total of 250 farmers were selected by quasi-random sampling. The study was done by pretested questionnaire and personal interviews.

The socio-economic conditions of each respondent was studied. Adoption behaviour towards aquaculture technologies was determined and reasons for adoption as well as non adoption were diagnosed.

To find out the relationship between the independent variables like age, educational level, economic status of the farmers and the adoption behaviour towards fish farming technologies, Karl Pearson's co-efficient of co-relation was used by applying the following formula.

$$r = \frac{\Sigma xy - \frac{\Sigma x \times \Sigma y}{n}}{\sqrt{\left[\Sigma x^2 - \frac{(\Sigma x)^2}{n}\right]\left[\Sigma y^2 - \frac{(\Sigma y)^2}{n}\right]}}$$

RESULTS AND DISCUSSION

Background information of the respondents (Table 1) revealed that majority (61.6%) of them lived below the poverty line. Being not highly qualified educationally (only 16.4% were matriculate and 9.2% studied above matric level) job opportunities were very limited. More than 50% of the respondents either did not have agricultural land (19.6%) or small farmers (34.8%). On the other hand, water resources were commonly available in the form of ponds (74.8%) and low-lying paddy fields (32%), some farmers had both ponds and lowlying paddy fields (13.2%). Only 6.4% did not have any water resource for aquaculture. Majority of them were exposed to various extension programmes pertaining to aquaculture.

Personal interview revealed that 100% of the respondents were aware of the recent development of the fish farming technologies. However, only 28.8% adopted the technology completely and 48.4% partially. The farmers are not docile acceptors of technologies (Bhagowati, 1990; Mishra, 1996; Bhowmik, 1992). Generally they have a risk averse attitude towards investments in new ventures like aquaculture. Adoption was found to be highest (36.8%) in case of composite carp culture technology (CCCT) followed by (15.2%) of synchronous refuge pond system of rice fish farming (SRPSRFF) 9.6% in integrated horti-fish (IHF) pig fish (8.4%), poultry fish (3.2%) 2.4% in perennial system of RF farming (PSRFF) and 1.6% of integrated duck fish farming (IDFF) respectively (Table 2). All the 193 farmers who adopted the technology did not, however, adopt all steps of the package of practices recommended for higher yield. In case of CCCT, only 21.7% of the adopters followed the complete package, whereas 78.3% followed it only partially. Most of the partial adopters were reluctant to apply fertilizer and supplementary feed due to high cost involvement and inadequate availability. In case of ILFF technologies although only 13.2% had adopted the technology, 50-71.4% adopters completely followed the package of practices which was primarily due to deletion of supplementary feeding and fertilization under these technologies. However, there was adoption gap in stocking density of fish and livestock and liming. Among the Integrated agriculture aquaculture technologies

(IAAT) adoption level was low in (PSRFF) (33.3%) as this system requires high cost involvement in plot renovation. In case of SRFF 52.4% completely adopted the technology, whereas 47.6% were reluctant about proper renovation of plot, maintaining stocking density of fish and paddy cultivation as per recommended package of practices. Similar was the case in IHF technology, in which only 33.3% of the adopters completely adopted the package (Table 3).

Among 193 adopters, 52.3% adopted aquaculture as a source of delicious food for family consumption, whereas 37.3% adopted as a source of production and income generation (Table 4). The most highly assigned reason for non-adoption or partial adoption of technology was high investment (44.57%) followed by non-availability of finance (36.01%). Non-availability of inputs (35.40%) was another major bottleneck (Table 5). These findings were in agreement with the observation made by Bhagowati (1990), Bhowmik et al. (1992) and Misra (1996).

In was found that educational level of the respondents had positive and significant co-relation with the adoption behaviour towards fish farming (r=0.43). This implies that higher the education of the respondents, the more the adoption level. Economic status of the respondents also had a significant positive relationship with the level of adoption (r = 0.54). Similar findings were also reported by Bhowmik et al. (1992). However, age of the respondents was found to be non-significantly related with adoption behaviour (r = 0.80).

The success of technology dissemination depends on creating mass awareness and motivation for adoption of technologies among the beneficiaries. From the above findings, it is clearly discernible that modulation of simplified and low cost, high yielding technologies with minimisation of risk factor is the most viable option for popularising aquaculture among the rural farmers. Appropriate extension measures along with financial back-up can definitely gear up fish production in Assam and other North Eastern states.

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Table 1. Background informations of the respondents

N=250

Criteria	F	%
Age		
18-30 yrs	97	38.8
31-45 yrs	74	29.6
46 and above	79	31.6
Educational qualification		
Illiterate	57	22.8
Primary level	62	24.8
High school level	67	26.8
Matriculate	41	16.4
Above Matric level	23	9.2
Family type		
Joint	73	29.2
Nuclear	177	70.8
Family size		
Small (2-4)	88	35.2
Large (>4)	162	64.8
Main occupation of family		
Agriculture + allied farming	201	80.4
Others (daily wage earner, etc.)	49	19.6
Family Income		
*Below poverty line (<Rs. 11,500.00/annum)	154	61.6
*Above poverty line (>Rs. 11,500.00/ annum)	96	38.4
Land holding of family		
No agricultural land	49	19.6
Small farmer	87	34.8
Marginal farmer	114	45.6
Water Resources		
No water resource	16	6.4
Pond> 0.1 ha	41	16.4
Pond < 0.1 ha	146	58.4
Low lying paddy field	80	32.0
Exposure to extension programmes		
Training	67	26.8
Participatory research programmes	34	13.6
Participatory extension programmes	82	32.8
Contact with extension personnel	97	38.8

**As per IRDP Guidelines*

Table 2. Adoption of different aquaculture technologies

N=250

Recommended technologies*	F	%
Composite culture of carps and barbs	92	36.8
Post monsoon culture of carps	0	0
Integrated live stock fish farming technologies		
Pig fish farming	21	8.4
Poultry fish farming	8	3.2
Three-tier fish-pig-poultry farming	0	0
Duck fish farming	4	1.6
Cattle fish farming	0	0
Integrated agriculture aquaculture technologies		
Perennial system of Rice-fish farming	6	2.4
Synchronous refuge pond system of rice fish farming	38	15.2
Enclosure system of rice-fish farming	0	0
Integrated horti-fish farming	24	9.6

**As per POP recommended by Assam Agricultural University.*

Table 3. Level of adoption of package of practices recommended under different technology

Adopted technologies	Complete adoption			Partial adoption		
	N	F	%	N	F	%
Composite culture of carps and barbs	92	20	21.7	92	72	78.3
Integrated pig fish farming	21	15	71.4	21	6	28.6
Integrated poultry fish farming	8	5	62.5	8	3	37.5
Integrated duck fish farming	4	2	50.0	4	2	50.0
Perennial system of Rice-fish farming	6	2	33.3	6	4	66.6
Synchronous refuge pond system of Rice fish farming	38	20	52.4	38	18	47.6
Integrated horti-fish farming	24	8	33.3	24	16	66.6

Table 4. Reasons for adoption of recommended technologies

N=193

Reasons assigned for adoption*	F	%
Supply of delicious protein food for family	101	52.3
High production	32	16.6
High economic return	40	20.7
Advice of extension personnel	42	21.8
Utilization of available resources	56	29.0

**More than one reason assigned by individual adopter*

Table 5. Reasons for non adoption/partial adoption of improved fish culture technologies

N=175
(Nonadopters-57 partial adopters-118)

Reasons assigned for non adoption*	F	%
High investment	78	44.57
Non-availability of inputs	62	35.40
Non-availability of finance	63	36.00
Lack of technical knowledge	24	13.70
Managerial problem	46	26.28
Problem of poaching and poisoning	37	21.14
Problem of fish disease causing high mortality	50	28.57
Non-availability of suitable water body	16	9.14

**More than one reason assigned*