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Human capital assessment of rice-fish farmers: A study from Coastal Odisha

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Abstract

The study was carried out to investigate the socio-economic background, knowledge, and livelihood of the farmers engaged in Rice-Fish farming. Purposive sampling was used to select the study area. One hundred twenty farmers were selected from 6 villages by proportionate random sampling procedure. The responses were obtained from each individual respondent using a pre-tested structured interview schedule designed for data collection. The collected data was tabulated and analysed using appropriate statistical tools and techniques such as frequency, percentage, mean score, and rank order. According to the study, the majority of respondents (48.33%) were middle-aged and had only completed primary school (36.67%). The majority of respondents (46.67%) reported a medium level of social participation. Among the respondents (59.17%) belonged to nuclear families, while the maximum number of respondents (51.66%) had small family size. According to the survey, the majority of respondents (53.33%) had a medium level of extension contact, and all rice growers (100%) had a good understanding of the productivity of high yielding varieties. The vast majority of fish growers (95.0%) knew that the pond should be located in an open space receiving ample sunlight, and the knowledge gap was only (2.50%). The results of the study will be useful to the extension workers for development of appropriate educational strategies, for the researcher, policy makers and commercial farms to extend the benefits of their activities to increase the knowledge and skill of the farmers in respect to Rice-Fish farming system and the livelihood of the farmers also.

Keywords: Rice-fish farming, extension contact, knowledge gap, social participation, human capital

Introduction

Coastal Odisha accounts for 48% of the state's total population and 26% of its entire geographical area, with rice accounting for 38% of land area. The region harbours 40% of the total animal population and 75% of total fish production. The rice-fish farming method is essential in Odisha because it provides food security, reduces agricultural impact on the environment, and may be less influenced by climate change than conventional systems. Integrated rice-fish production can optimize resource utilization through the complementary use of land and water. This practice also improves diversification, intensification, productivity, profitability, and sustainability of the rice agro-ecosystem (Ahmed *et al.*, 2007) ^[1]. Rice-Fish farming system is the cultivation of rice along with fish in pond side by side. This system is mainly adopted to get an additional income from the unused land. This adds to the net income of the farmer which directly helps in improving their livelihood. It also assists farmers in being self-sufficient in terms of food and money. Integrated rice-fish farming is one of the best farming systems for farmers in terms of resource utilization, diversity, productivity, production efficiency and food supply, but it has not been adopted by a large number of farmers due to lack of technical knowledge, high production costs and risks associated with flood and drought (Ahmed *et al.*, 2011) ^[2]. This study assesses the human capital aspects in rice-fish farming system in one of the coastal district (Bhadrak) of Odisha.

Methodology

The ex-post-facto research design was adopted in this study. This design is appropriate because the phenomenon has already occurred. The present study was conducted in Bhadrak district purposively selected for the study. The Bhadrak district in Odisha has the most Rice-Fish farming system, and the researcher is well acquainted with the language, geography,

agriculture, and other characteristics of the area. The blocks and villages were selected purposively and from 6 villages, 120 respondents were selected through proportionate random

sampling method. The study was conducted in Korkora and Arnopal villages of Bhadrak block, Daipur and Govindapur villages of Dhamnagar block, Jalamandua and Bishnupur villages of Bhandaripokhari block of Bhadrak district. The primary data were collected through personal interview method with the help of pre-tested interview schedule, which was prepared on the light of objectives. The statistical tests and procedures were used for analyzing the data with the help

of statistical tools.

Results and Discussion

The data for the human capital aspect in the Rice-Fish farming system were collected from the study area. The results obtained were subjected to treatment and analysis by applying appropriate statistical techniques, are discussed below:

Table 1: Distribution of respondents according to their socio-personal profile

Sl. No.	Variables	Category	Response	
			Frequency (f)	Percentage (%)
1.	Age (years)	Young (<30)	11	9.17
		Middle aged (31 - 50)	58	48.33
		Old (>50)	51	42.50
		Total	120	100
2.	Education	Illiterate	7	5.83
		Can read and write	36	30.0
		Primary school	44	36.67
		High school	27	22.50
		College and above	6	5.0
		Total	120	100
3.	Social participation	Low (<11.33)	49	40.83
		Medium (11.33-15.66)	56	46.67
		High (>15.66)	15	12.50
		Total	120	100
4.	Family type	Nuclear family	71	59.17
		Joint family	49	40.83
		Total	120	100
5.	Family size	Small (Up to 4 members)	62	51.66
		Medium (5-8 members)	41	34.17
		Large (Above 8 members)	17	14.17
		Total	120	100
6.	Outward orientation	Localite	19	15.83
		Cosmopolite	101	84.17
		Total	120	100
7.	Number of earning members	Up to 2 members	63	52.50
		2-4 members	45	37.50
		Above 4 members	12	10.0
		Total	120	100
8.	Extension contact	Low (< 18.66)	20	16.67
		Medium (18.66-27.32)	64	53.33
		High (> 27.32)	36	30.0
		Total	120	100

It was evident from the Table no. 1 that majority of the respondents (48.33%) were from the middle age category followed by old age and young age group. This might due to the fact that middle aged people are more active and enthusiastic about their work and were actively taking part in Rice-Fish farming. Parande (2011) [3] and Amresh (2012) [4] had reported similar observations. Coming to the education of the respondents, it was found that the majority of respondents (36.67%) were educated up to primary school, followed by can read and write (30.0%). Only 22.5% of respondents were educated up to high school. Whereas 5.83% respondents were illiterate and 5.0% went up to college and above, this was in line with the findings of Meena *et al.* (2011) [5].

In terms of social participation, it was found that the majority of respondents (46.67%) had medium level of social participation, followed by low level and high level of social participation as they were more active and interactive with other organisations or agencies or institutes such as co-operative societies and SHGs. This was similar with the

findings of Vinaya Kumar *et al.* (2019) [6]. According to the family type of the respondents, 59.17% were from nuclear families, while the rest were from joint families. This suggests that nuclear type families more actively took part in the Rice-Fish farming system than the other type. This finding was supported by Meena *et al.* (2012) [7] and Routray (2016) [8].

In case of the family size, the findings revealed that maximum number of the respondents (51.66%) had small family size followed by medium (34.17%) and large (14.17%) size of family. It clearly showed that small families were more interested in the Rice-Fish farming system than medium and large families. Similar findings were reported by Parande (2011) [3] and Amresh (2012) [4]. Majority of the respondents were found to have cosmopolite (84.17%) type outward orientation than that of localite nature. This revealed that the respondents were regularly going outside to collect information on their agri-allied activities. The result was in accordance with Shankaraiah and Swamy (2012) [9]. The study revealed that majority of the family had up to 2 earning

members (52.50%) followed by 2-4 earning member (37.50%) and finally above 4 member (10.0%). This could be attributed to the fact that the majority of farmers are from rural areas and rely on agriculture and related activities for their livelihood. The gathered data revealed that majority of the respondents (53.33%) had medium level of extension contact whereas 30.0% and 16.67% of the respondents had high and low level of extension contact respectively. More than half of the respondents had medium level of the

participation because they are more connected with different institutions and departments. The findings are consistent with the results of Deore (2006) [10].

Knowledge

The knowledge level of a respondent was conceptualized as the awareness of the respondent about rice and fish farming. The Table 2 and Table 3 depict the level of knowledge of the respondents regarding the Rice-Fish farming system.

Table 2: Distribution of respondents according to their knowledge about Rice farming

(N=120)

Sl. No.	Technology list	Statements	Knowledge				Gap %
			Yes		No		
			F	%	F	%	
1.	HYVs of rice	CR1009 and Swarna are the popular high yielding varieties of your area.	116	96.67	4	3.33	1.67
		Yield of Swarna variety is 5 t/ha.	107	89.17	13	10.83	5.41
		Yield of CR1009 is 5 t/ha.	93	77.50	27	22.50	11.25
		High yielding varieties are more productive than local varieties.	120	100	0	0	0
2.	Seed rate	Seed rate of short duration rice variety is 60 kg/ha.	65	54.17	55	45.83	22.91
		Seed rate of medium duration rice variety is 50 kg/ha.	79	65.83	41	34.17	17.08
		Seed rate of long duration rice variety is 30 kg/ha.	101	84.17	19	15.83	7.91
		Seed rate in SRI method is 5-6 kg/ha.	85	70.83	35	29.17	14.58
3.	Intercultural operation	Hand weeding is done in 35-40 days.	120	100	0	0	0
		Cono-weeding is practised in SRI method.	67	55.83	53	44.17	22.08
		Cono-weeding is better than hand weeding.	38	31.67	82	68.33	34.17
		Gap filling is done 7-10 days after transplanting.	107	89.17	13	10.83	5.41
4.	Post-harvest	Threshing is done by both mechanical thresher and hand threshing.	120	100	0	0	0
		Winnowing is done after threshing.	120	100	0	0	0
		Combined harvester is better than manual method.	73	60.83	47	39.17	19.58
		Rice grain should be stored at dry place to avoid stored grain pest.	87	72.50	33	27.50	13.75

From Table 2, it was found that all the rice growers (100%) had good knowledge about productivity of high yielding varieties. Majority (84.17%) of farmers were possessing better knowledge about the seed rate of long duration rice varieties with a knowledge gap of only 7.91%. All the farmers (100%) had better knowledge about hand weeding followed

by 89.17% farmers obtained good knowledge on gap filling and the knowledge gap was only 5.41%. All the farmers (100%) had adequate knowledge on threshing and winnowing. It was also observed that, 72.50% of respondents knew that rice grain should be stored at dry place to avoid stored grain pest and the knowledge gap was 13.75%.

Table 3: Distribution of respondents according to their knowledge about Fish farming

(N=120)

Sl. No.	Technology list	Statements	Knowledge				Gap %
			Yes		No		
			F	%	F	%	
1.	General pond requirement	Pond should be located in an open space receiving ample sunlight.	114	95.0	6	5.0	2.50
		The pond should be perennial.	105	87.50	15	12.50	6.25
		Rectangular shape of pond is ideal for fish farming.	78	65.0	42	35.0	17.5
2.	Predatory and weed fish eradication	Predatory and weed fishes needs to be eradicated from the culture ponds before stocking.	101	84.17	19	15.83	7.91
		The pond is generally dried out to control the predatory and weed fishes.	96	80.0	24	20.0	10.0
		In case of perennial ponds, bleaching powder is used for poisoning and killing the predatory and weed fishes.	43	35.83	77	64.17	32.08
3.	Stocking	Catla, Rohu, Mrigal are indigenous and Grass carp, Silver carp, Common carp are the exotic carps.	81	67.50	39	32.50	16.25
		Indigenous and exotic carps are reared together in the pond.	76	63.33	44	36.67	18.33
		Stocking with fingerlings enhances fish production.	70	58.33	50	41.67	20.83
4.	Harvesting	Fishes above 500 g. body weight can be harvested from the pond.	93	77.50	27	22.50	11.25
		Harvesting can be done by netting.	120	100	0	0	0
		40-70 quintal of fishes can be produced/ha/year.	106	88.33	14	11.67	5.83

From Table 3, it was found that a vast majority (95.0%) of fish growers knew that the pond should be located in an open space receiving ample sunlight and the knowledge gap was

only 2.50%. Majority (84.17%) of fish farmers agreed upon the eradication of predatory and weed fishes from culture ponds before stocking with a knowledge gap of 7.91%. The

study revealed that 67.50% of fish farmers had good knowledge about different indigenous and exotic species of fishes and the knowledge gap was 16.25%. All the fish farmers (100%) had knowledge about the method of harvesting followed by 88.33% farmers had better knowledge about desirable yield from one hectare pond in a year.

Conclusion

Odisha is an agrarian state, where most of the population depends upon agriculture for their livelihood. From the study carried out at Bhadrak district of Odisha, it has been found and concluded that the majority of the respondents were from the middle age category and educated up to primary school. About half of them lived in nuclear families and had medium level of social participation as well as extension contact. The respondents had good knowledge about the Rice-Fish farming. The government line departments should focus more on adoption of the Rice-Fish farming system among the small and marginal farmers which in turn can help in improving their livelihood.

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