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Impact of Training Programme on Knowledge Level of Fish Farmers on Composite Fish Culture

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Authors' contributions

This work was carried out among all the authors. Author MS deigned the study, collected data, performed statistical data analysis, procedures analyzed and the results and wrote the first draft. Author MM contributed the technical information towards development of knowledge test and administered preliminary knowledge test. Author RVTBN contributed towards statistical data collection. Authors BR and PVK managed the literature searches. Authors MB and MS corrected the first draft. All the authors read and approved the final manuscript.

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ABSTRACT

Aims: The study focused on assessment of the knowledge level of fish farmers on scientific operation of composite fish culture. It specifically examined the profile, socio–economic, psychological, situational characteristics and knowledge level on scientific composite fish farming.
Study Design: Ex-post facto research design was followed.
Place and Duration of the Study: Krishi Vigyan Kendra, Rudrur, Nizamabad district, Telangana, India, 2019-20.

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Methodology: To assess the knowledge level of fish farmers on composite fish culture in Nizamabad district, 50 fish farmers from fishing communities with prevalence fish farming and artisanal fisheries were randomly selected and interviewed with a pre-test interview schedule. All the farmers were imparted three days specialized training programme on composite fish culture and re-assessed their knowledge after its completion.
Results: The study revealed that majority of the respondents were middle aged (48.00%), lliterates (72.00%), with medium fish farming experience (58.00%)and majority had low level of scientific orientation towards composite fish culture (32.00%). Before training only 18.00 per cent fish farmers belonged to high level of knowledge category while 58.00 per cent (P<0.01) of fish farmers possessed high level of knowledge after training.
Conclusion: It may be concluded from the present study that knowledge level on scientific fish culture is low regarding composite fish culture and training is an effective tool to improve the knowledge and understanding of fish farmers.

Keywords: Composite fish culture; training; fish farmer; knowledge; investigation; socio economic; psychological; annual income; credit orientation.

1. INTRODUCTION

Aquaculture in India is seen as an attractive option for enhancing fish production at a stage when there has been stagnation of growth from open water fisheries. Fresh water aquaculture continues to contribute a giant share of over95 per cent of the total aquaculture production in terms of quantity. This has increased the national average productivity from the ponds and tanks to the present level of 2200 kg/ha, an over two folds growth in the last two decades [1]. Indian fisheries and aquaculture is an important sector of food production, providing nutritional security to the food basket, contributing to the agricultural exports and engaging about fourteen million people in different activities. It has been observed and recognized as powerful income and employment generator as it stimulates growth of a number of subsidiary industries and is a source of cheap and nutritious food besides being a source of foreign exchange earner. Most important is that it is the source of livelihood for a large section of economically backward population of the country. Although Telangana state has third largest water spread. about six in fish position in Inland fish production in India. In order to increase fish production all the existing water resources in the state both the natural and man-made are being utilized for fisheries development. Reservoirs being the major water bodies therefore these water bodies receive special attention to take up the fisheries and also for yield optimization. The Inland fish production in North Telangana districts is mainly from reservoirs, perennial tanks, village tanks and farmer dugout ponds. More than half of the perennial tank is situated in Nizamabad district in North Telangana, both numerically and in terms of water spread. Reservoirs and tanks together constitute large amount of water area in North Telangana Zone [2].

Training provides knowledge, skill or attitude they need to perform up to that standard. Training is conducted whenever an individual engages in an activity that results in the ability to exercise a skill that he or she does not previously have [3]. The training on composite fish culture involves four basic components (1) acquiring knowledge of the skill on composite fish culture; (2) observing a model perform the skill; (3) practicing the skill; and (4) reinforcing the newly acquired behavior. asserted that training is the most singular factor affecting individuals' attitude, productivity, improvement, minimization of risks and quality of job performance in any endeavour.

Knowledge about scientific fish culture plays a very important role in the adoption of scientific technologies. But due to lack of adequate knowledge and skills of the fish farmers towards composite fish farming they are not able to maximize their productivity. Because fisheries technology is continuously changing, many skills are needed for use of these techniques by the fish farmers in increasing production. For this reason it is necessary to arrange timely training programmes to acquire necessary knowledge and skills in different aspects of improved composite fish farming. So, adequate training is essential for the composite fish farmers on composite fish farming. Based on the above issues the study was carried out to determine the extent of training needs of the fish farmers on composite fish farming and to assess the level of knowledge gained by the fish farmers on

composite fish culture through the training programmes organised by Krishi Vigyan Kendra, Rudrur.

2. MATERIALS AND METHODS

The investigation was carried out in Nizamabad district of Telangana state. Krishi Vigyan Kendra, Rudrur, Nizamabad is disseminating knowledge about scientific fish farming technology through demonstrations, training programmes and its adoption at farmers' level. For this study, a total of 50 respondents who have undergone trainings were selected from five randomly selected villages of Nizamabad district. All these fish farmers constituted the sample of respondents for the study. The survey was undertaken to collect the data from the selected farmers through face to face interview with the help of an interview schedule.

2.1 Location of the Study

A knowledge test was developed by conducting item analysis. For the purpose of present investigation, a teacher made knowledge test was constructed to measure the knowledge of the respondents about the composite fish culture practices. [4] have remarked that the ' short answer tests· are used mainly because of their virtue to test examinee's ability to produce or recall the answer. [5] opines that teacher made test may meet special needs of particular content of the subject and of local condition. Further, they are easy to score and may be more effective for a specialised purpose.

The procedure followed in the construction of knowledge test is as follows:

2.2 Item Collection

The content of knowledge test was composed of questions called items. An Item pool of questions was prepared by referring to different sources such as literature, extension publications of Department of Fisheries, discussions with Scientists and Specialists in the field of inland fisheries development and fisheries departmental officers involved in extension activities. This process was further supplemented with the review of literature. On the basis of this, a set of knowledge questions with correct answers were prepared in consultation with scientists and experienced departmental officers involved in extension and training programme of fish farmers in the state. The set of knowledge questions so prepared was given to a panel of experts comprising of subject matter specialists, scientists and senior departmental officers who had vast experience in the field for their comments and suggestions. Based on the criticism and suggestion made by the experts, the knowledge items were modified and new items were added wherever pointed out. Adequate care was taken while finalising the knowledge questions about the clarity and the items should promote thinking rather than memorization. Finally 25 knowledge items were retained out of the 41 items initially listed with possible answers.

2.3 Method of Scoring

The knowledge test consisted of 25 items covering different aspects of composite fish culture practices i.e., pre-stocking, stocking and post stocking practices with required management skills. All the items were objective type and 'one' score was given for the 'yes' response and 'zero' for 'no' response. The summation of scores for the 'yes' responses over all the items for a particular respondent indicates his extent of knowledge. The maximum and minimum score would be fifty and zero. Further the raw knowledge score at each individual respondent was converted into knowledge index using the formula:

$$\text{Knowledge index (KI)} = \frac{\text{No. of correct responses X 100}}{\text{Total number of knowledge items}}$$

Thus, after computing knowledge index scores, the respondents were categorised into three categories taking mean and standard deviation as a measure of check. The information about independent variables viz., age , education, fish farming experience, occupation status, socio economic status, social participation, credit orientation, possession of fish farming equipment, annual income, risk orientation, scientific orientation, economic motivation, innovative proneness, extension participation, mass media participation, cosmopoliteness, size of the water body, distance of water body to the residence, duration of water availability, source of water and extent of weed infestation were collected with the help of structured interview schedule. The data were analysed by paired 't' test using software package SPSS version 16 (SPSS, 2007) and results were prepared to know the impact of training on knowledge level of fish farmers.

3. RESULTS AND DISCUSSION

3.1 Profile of Fish Farmers

The study revealed that majority of the fish farmers(Table 1) middle aged (48.00%), literates (72.00%) followed by had middle school level education (24.00%), medium fish farming experience (58.00%), fishing as secondary occupation (66.00%), low social participation (24.00%), high credit orientation (46.00%), high possession of fishing equipment's (26.00%), small farmer land holdings (46.00%), up to 50,000 Rs/- annual income (50.00%), medium risk orientation (34.00%), low scientific orientation (32.00%), medium economic motivation (24.00%), high innovative proneness (32.00%), low extension participation (36.00%), medium mass media participation (34.00%), medium cosmopolitans (34.00%), medium size of fish ponds (32.00%), short seasonal tanks (36.00%) rain water is the major source of water (46.00%) with moderate weed infestation (32.00%).

The data regarding knowledge level of farmers about composite fish farming (Table 2 and Fig. 1) highlighted that 48.00 per cent (*P< 0.01*) belonged to low level knowledge category. Whereas, after attending the training 58.00 per cent fish farmers possessed high level of knowledge. It indicated that skill training programme on composite fish culture was an effective tool to improve their knowledge. [6] also reported significant improvement in the knowledge level of participants after attending the training programme. Similar findings were [7] reported that the average knowledge level score of the dairy farmers increased due to training.

The knowledge level of trainees (Table 3) regarding the minimum depth of water required for fish culture (58.00%), the suitable soil for fish culture (80.00%), the advantages of manuring fish culture (60.00%), the manual method of eradication/ control of predatory and weed fish (26.00%), the best method of feeding the fish in ponds (46.00%), the indicators of oxygen depletion in fish ponds (6.00%), the necessity of checking the growth after stocking (50.00%) and the optimum size of fish for harvesting (50.00%) had improved significantly (*P<0.01*) after training 90.00 per cent, 100 per cent, 92.00 per cent, 90.00 per cent, 92.00 per cent, 90.00 per cent, 90.00 per cent and 92.00 per cent respectively.

The study on knowledge level of fish farmers regarding composite fish culture (Table 3) only few fish farmers knew about the recommended dosage of lime used, predatory and weed fishes, names of Indian major and exotic carps, the recommended species combination for composite fish culture, the indicators of oxygen depletion in fish pond and the diseases that occur in fish culture ponds before training. However, after training their knowledge about these parameters improved significantly (*P<0.01*). similar observation were reported by Nagarajaiah [8] Goswami and Samajdar [9] with respect to good soil type for fish culture, use of lime, desirability of predatory and weed fishes, name of the Indian major carps, commonly used supplementary feeds, necessary to stop manuring and feeding when pond water turns greenish and duration of fish stocking.

Correction of acidic condition of fish culture pond is very important in management of fish ponds. About 49.00 per cent and 83.00 per cent of fish farmers knew the appropriate methods for correction of acidic condition of fish pond before and after the training respectively. Knowledge level of fish farmers on organic manures used in fish culture, manure application before stocking, aquatic weeds, fastest growing Indian and exotic carps, the ideal size of fish for stocking, measures to take when pond water turns greenish, how to control fish diseases and after how many months of stocking the fish crop should be harvested improved significantly due to the skill training on composite fish culture. More or less similar findings were reported by Praveena [10] with respect to rate of application of manures, fertilizers and diseases.Regarding scientific oriented knowledge of the fish farmers were low due to low level of education, low level of social participation before training. Meeran (1983) [8,10,11] also reported that majority of fish farmers were having medium level of knowledge related to fish culture practices.

The reason for the higher knowledge level of fish farmers might be due to appropriateness of covered subject matter against the needs of the respondents, practical training environment provided at Krishi Vigyan Kendra, experienced experts and exposure visits to model fish culture ponds. Higher interest of the trainees and availing opportunity to discuss their doubts with subject matter specialists may be another reason for their improved knowledge level.

Table 1. Profile of fish farmers - personal, socio-economic, psychological, communication and situational characteristics (n=50)

S. No.	Characteristics	Categories	Frequency	Percentage
A. Personal characteristics				
1	Age	a. Young (below 30 yrs)	22	44
		b. Middle (31-45 yrs)	24	48
		c. Old (46 yrs & above)	4	08
2	Education	a. Illiterate	14	28
		b. Can read and write	1	02
		c. Primary school	5	10
		d. Middle school	12	24
		e. High school	10	20
		f. Intermediate	3	06
		g. Graduation	5	10
		h. Post graduation	0	00
3	Fish Farming Experience	a. Low (2 yrs)	4	08
		b. Medium (3-6 yrs)	29	58
		c. High (7 yrs & above)	17	34
4	Occupation status	a. Fishing/Fish culture as primary occupation	17	34
		b. Fishing/Fish culture as secondary occupation	33	66
B. Socio Economic Characteristics				
5	Social participation	a. Low	12	24
		b. Medium	26	52
		c. High	12	24
6	Credit orientation	a. Low	14	28
		b. Medium	13	26
		c. High	23	46
7	Possession of fishing equipments	a. Low	15	30
		b. Medium	22	44
		c. High	13	26
8	Land holding	a. Landless	10	20
		b. Marginal farmers	11	22
		c. Small farmers	23	46
		d. Big farmers	06	12

S. No.	Characteristics	Categories	Frequency	Percentage
9	Annual income	a. Upto 20,000 Rs/-	08	16
		b. Upto 20,000 Rs/- to 50,000 Rs/-	14	28
		c. Upto 50,000 Rs/- to 80,000 Rs/-	25	50
		d. Above 80,000 Rs/-	03	06
C. Psychological characteristics				
10	Risk orientation	a. Low	12	24
		b. Medium	17	34
		c. High	21	42
11	Scientific orientation	a. Low	16	32
		b. Medium	18	36
		c. High	16	32
12	Economic motivation	a. Low	16	32
		b. Medium	12	24
		c. High	22	44
13	Innovative proneness	a. Low	18	36
		b. Medium	16	32
		c. High	16	32
14	Extension participation	a. Low	18	36
		b. Medium	14	28
		c. High	18	36
15	Mass media participation	a. Low	12	24
		b. Medium	17	34
		c. High	21	42
16	Cosmopoliteness	a. Low	12	24
		b. Medium	17	34
		c. High	21	42
D. Situational characteristics				
17	Size of the water body	a. Very Small (Up to 0.3 ha)	9	18
		b. Small (0.3 to 0.5 ha)	12	24
		c. Medium (0.5 to 1 ha)	16	32
		d. Large (above 1 ha)	13	26

S. No.	Characteristics	Categories	Frequency	Percentage
18	Distance of water body to the residence	a. Near to residence (up to 0.3 km)	15	30
		b. Between 0.3 to 1.0 km	19	38
		c. Between 1.1 to 3.0 km	12	24
		d. Above 3 km	4	8
19	Duration of the water availability	a. Short seasonal tanks	18	36
		b. Long seasonal tanks	15	30
		c. Perennial tanks	17	34
20	Source of water	a. Rain water	23	46
		b. Canal water	5	10
		c. Both rain and canal water	10	20
		d. Community tanks	12	24
21	Extent of weed infestation	a. Completely checked	08	16
		b. Moderate extent	16	32
		c. Low extent	13	26
		d. No weeds	13	26

Table 2. Distribution of fish farmers based on their knowledge level (n=50)

Knowledge Level	Score	Pre training (%)	Score	Post training (%)
Low (M-1/2 SD)	5.42	24 (48.00%)	19.58	8 (16.00%)
Medium (M – ½ SD to M+1/2 SD)	5.43-11.60	17 (34.00%)	19.59-23.97	13 (26.00%)
High (Above M+1/2 SD)	11.70	9 (18.00%)	23.98	29 (58.00%)

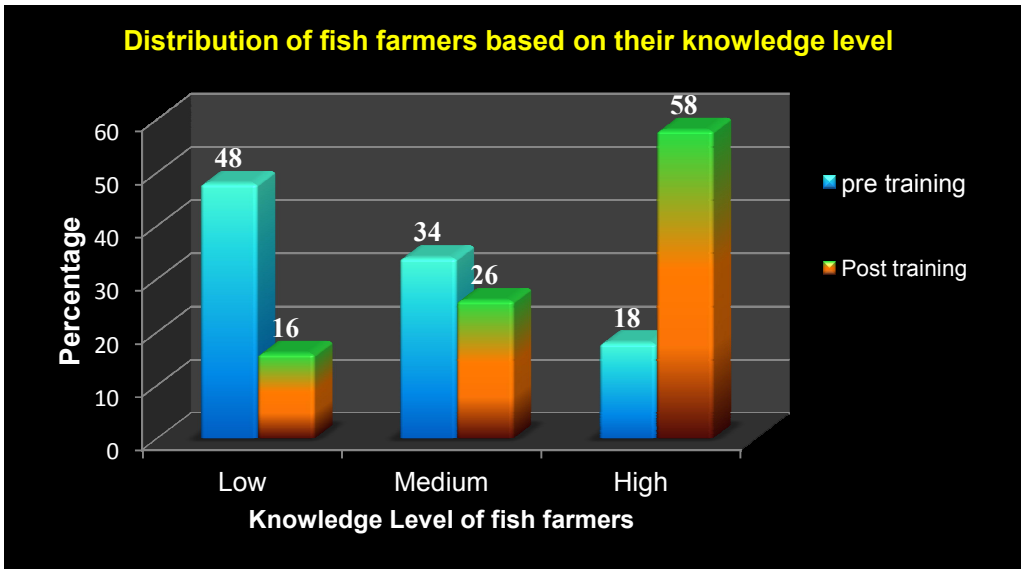
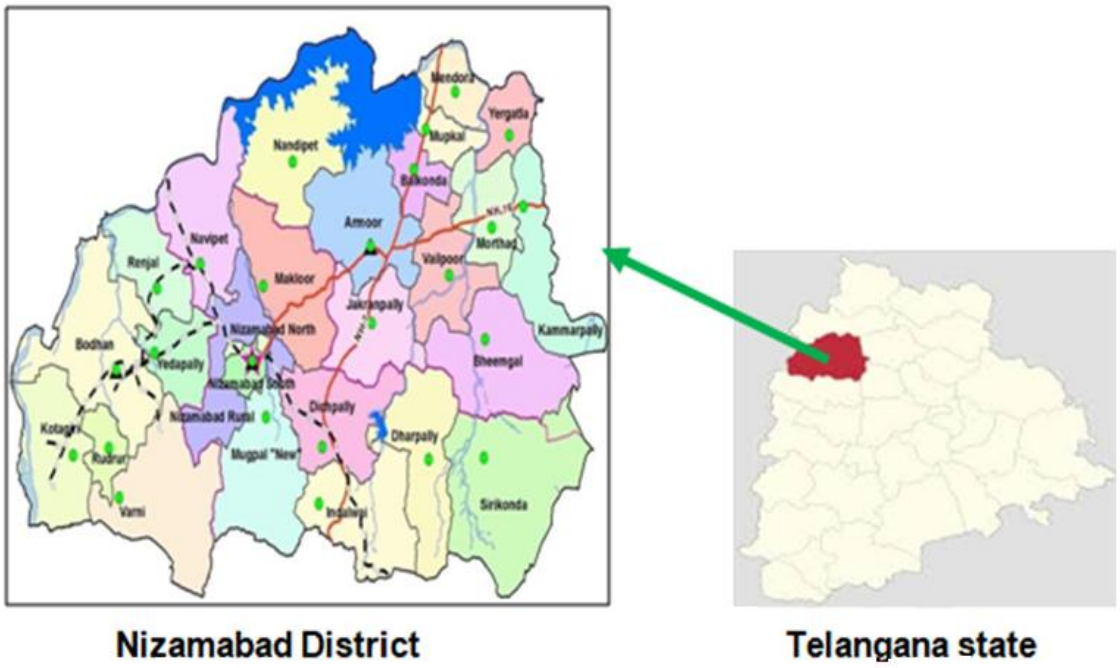


Fig 1. Distribution of fish farmers based on their knowledge level on composite fish culture



Map 1. Showing the location of the study area

Table 3. Knowledge level of fish farmers about specific recommended composite fish culture practices (n = 50)

S. No.	Knowledge items	Response categories			
		Correct responses (%)		Mean correct responses	
		Pre training	Post training	Pre training	Post training
1	What is the minimum depth of water required for fish culture	29 (58.00%)	45 (90.00%)	0.580	0.900
2	What kind of soil is good for fish culture	40 (80.00%)	50 (100%)	0.800	1.000
3	How do you correct acidic condition of fish culture pond/ tank?	25 (50.00%)	42 (84.00%)	0.500	0.840
4	Do you know the recommended dosage of lime used in general?	11 (22.00%)	43 (86.00%)	0.220	0.860
5	What are the advantages of manuring fish culture pond?	30(60.00%)	46 (92.00%)	0.600	0.920
6	Name some common organic manures used in fish culture?	32 (64.00%)	44 (88.00%)	0.640	0.880
7	How many days before of stocking of fish seed manure should be applied?	13 (26.00%)	40 (80.00%)	0.260	0.800
8	Name some aquatic weeds?	22 (44.00%)	45 (90.00%)	0.440	0.860
9	Mention any two predatory and two weed fishes known to you?	5 (10.00%)	43 (86.00%)	0.100	0.860
10	What is the manual method of eradication / control of predatory and weed fishes?	13 (26.00%)	45 (90.00%)	0.260	0.900
11	Name three Indian major carps?	8 (16.00%)	43 (86.00%)	0.160	0.860
12	Name three exotic carps?	5 (10.00%)	43 (86.00%)	0.100	0.860
13	Which is the fastest growing major carp and exotic carp?	4 (8.00%)	40 (80.00%)	0.080	0.800
14	Say Yes/No The recommended species combination for composite fish culture 3 spp – 400 Catla: 300 Rohu: 300 Mrigal or 300 Common carp 4 spp – 300 Catla: 250 Rohu: 150 Mrigal: 300 Common carp 6 spp – 150 Catla: 250 Rohu: 100 Mrigal: 200 Silver carp: 100 Grass carp: 200 Common carp	5 (10.00%)	45 (90.00%)	0.100	0.900
15	What is the ideal size of fish seed for stocking?	8 (16.00%)	43 (86.00%)	0.160	0.860
16	Name the commonly used supplementary feeds	10 (20.00%)	39 (78.00%)	0.200	0.780
17	What is the best method of feeding the fish in ponds?	23 (46.00%)	46 (92.00%)	0.460	0.920
18	Generally supplementary feeding is provided at which body weight of fish?	15 (30.00%)	48 (96.00%)	0.300	0.960
19	Do you know the indicators of oxygen depletion in fish pond?	3 (6.00%)	45 (90.00%)	0.060	0.960
20	Is it necessary to stop manuring and feeding when pond water turns greenish?	28 (56.00%)	43 (86.00%)	0.560	0.860
21	Name any fish disease that occur in fish culture ponds	13 (26.00%)	43 (86.00%)	0.260	0.860
22	How do you control disease outbreaks?	20 (40.00%)	39 (78.00%)	0.400	0.780
23	Is it necessary to check the growth after stocking?	25 (50.00%)	45 (90.00%)	0.500	0.900
24	In general after how many months of stocking the fish crop should be harvested?	16 (32.00%)	40 (80.00%)	0.320	0.800
25	What should be the optimum size of fish for harvesting?	25 (50.00%)	46 (92.00%)	0.500	0.920

4. CONCLUSION

The scientific knowledge about any enterprise is crucial for its success. The present study revealed that about 48 per cent of fish farmers had low level of knowledge on composite fish culture is and there is a significant improvement in their knowledge i.e 58 per cent of fish farmers after attending the skill training on various aspects of composite fish culture traditionally as well as scientifically. 100 per cent of the fish farmers know the type of the soil good for composite fish farming after the training. About the indicators of oxygen depletion in fish pond 96 per cent trainees had knowledge after training but only 6 percent had knowledge before the training. Hence regular need based training programmes must be offered to update fish farmers with latest technology and research findings in fish farming.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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