

Knowledge Level of Fish Farmers on Scientific Farming of Pengba (*Osteobrama belangeri*) in the Valleys of Manipur

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ABSTRACT

A study was conducted to understand the knowledge level of fish farmers on scientific Pengba farming practices in the valleys of Manipur. Imphal West, Bishnupur, and Thoubal districts were purposively selected based on the higher concentration of Pengba farmers. After consultation with Department of Fisheries, Government of Manipur and with the village key informants, a total of 80 respondents were selected for the study. Primary data were collected through pre tested and structured interview schedule. Analysis of the collected data showed that majority (50%) of the respondents had medium level of knowledge towards scientific farming of Pengba. It was found that majority of the respondents had good knowledge of stocking appropriate size of Pengba in grow out ponds with a mean score value of 0.97. The study also revealed that the socio personal and socio economic characteristic such as age, experience in fisheries activities, annual income from Pengba farming and scientific orientation had significant relationship with the extent of knowledge level of the fish farmers towards scientific farming of Pengba at 5 % level of significance.

Highlights

- Majority (50%) of the respondents had medium level of knowledge towards the scientific farming of Pengba.
- The characteristic such as age, experience in fisheries activities, annual income from Pengba farming and scientific orientation had significant relationship with the extent of knowledge level of the fish farmers towards scientific farming of Pengba at 5 % level of significance.

Keywords: Knowledge, Fish Farmers, Pengba, Manipur

Osteobrama belangeri is endemic to Manipur (India), Myanmar and Yunan provinces (China). It is the state fish of Manipur, locally known as Pengba. The fish has great demand in the state; however, its production in the state is very less due to habitat degradation, pollution, introduction of non-native fish species, etc. (Behera *et al.* 2015). Migratory activity of the fish for breeding purpose is prohibited due to the construction of Ithai Barrage in the state (Dinesh and Mema 2012). The fish was once categorised as being extinct in the wild in India. (CAMP 1999).

The fish was successfully induced bred by the Indian Council of Agricultural Research and other fisheries organizations in the state. Pengba is suitable for composite fish culture due to its herbivorous nature and is generally cultured replacing grass carp (*Ctenopharyngodon idella*). Production of Pengba was commercially achieved through induced breeding in captivity using pituitary gland extract, Ovaprim, Ovatide and Wova-FH. However, problems such as high mortality, less growth and competition for feed with other fishes were frequently observed in the grow-out pond causing less production of the



fish (Behera *et al.* 2015). For grow out production practice, 7000-8000 number of Pengba fingerlings/ha were stocked and fed with mixture of rice bran and mustard seed cake as supplementary feed. A marketable size (400 to 500g) of the fish can be achieved and harvested in a year (Behera *et al.* 2015). However, production of the fish is very less and price is also high in the market. This might be due to the poor level of knowledge of the fish farmers towards the scientific Pengba farming and the unavailability of raw materials. Knowledge level of the fish farmers on scientific farming of Pengba acts as a key factor towards the level of production of the fish. Therefore, it is necessary to examine and understand the knowledge level of the fish farmers who practises Pengba farming. Based on this fact, the study was carried out to identify the extent of knowledge level of the fish farmers towards scientific farming of Pengba and to comprehend the relationship between selected socio-personal and socio-economic characteristics of the fish farmers and their knowledge level towards scientific fish farming of Pengba.

MATERIALS AND METHODS

Imphal west, Bishnupur and Thoubal districts were the locales of the study as these districts have the highest concentration of Pengba fish farmers as per the record of Department of Fisheries, Govt. of Manipur. Ten villages were purposively chosen based on the prevalence of Pengba farmers from the list of beneficiaries under the scheme, "Mass Scale Production of State Fish Pengba" with the assistance of Department of Fisheries, Government of Manipur and also through informal discussion with village key informants. Thirty three respondents were selected from the scheme and another 44 respondents were selected after discussing with village key informants. Finally, a total of 80 respondents were fixed as sample size for the study. Primary data were collected by using pre tested and structured interview schedule which was prepared based on the objectives of the study. Eleven independent variables viz. age, educational status, family type and size, experience in fisheries activities, information source exposure, annual income from Pengba farming, training exposure on scientific aquaculture practices, mass media exposure, contact with extension agency, scientific

orientation, innovativeness and social participation status were selected. The extent of knowledge level of the fish farmers towards scientific fish farming of Pengba was selected as the dependent variable and was measured using procedure followed by Sakib *et al.* 2014 with slight modification. Fifteen questions based on fifteen different aspects on scientific farming of Pengba were administered in order to find out the knowledge level of the fish farmers. Knowledge index was calculated by using the following formula:

$$\text{Knowledge index} = \frac{\text{Respondent's total score}}{\text{Total possible score}} \times 100$$

RESULTS AND DISCUSSION

Extent of knowledge level of the fish farmers towards scientific fish farming of Pengba

The data from Table 1 reveals that majority (50%) of the respondents had medium level of knowledge towards the scientific farming of Pengba followed by 26.25 per cent and 23.75 per cent of the respondents who had high and low level of knowledge respectively. The reasons for most of the respondents to have medium level of knowledge towards scientific fish farming of Pengba may be due to their level of participation in different training programmes and their level of information source exposure.

Table 1: Distribution of respondents based on their knowledge level (n=80)

Category	Frequency	Percentage	Mean Score	Standard deviation
Low (<40.71)	19	23.75		
Medium (40.71 to 79.45)	40	50.00	9.01	2.90
High (>79.45)	21	26.25		
Total	80	100		

MS = Mean Score.

It is observed from Table 2 that the mean knowledge score of the fish farmers was 0.6. It also revealed that most of the fish farmers had knowledge on stocking favourable size of Pengba fingerlings in grow out ponds (MS 0.97, I); followed by construction of outlet (MS 0.94, II); fertilization of pond after 7 days of liming (MS 0.84, III); maintaining water



level of pond between 1.5m to 2m depth (MS 0.79, IV); feeding the fish with conventional as well as supplementary artificial feeds (MS 0.77, V); correction of water pH after liming by adding water (MS 0.69, VI); stocking around 7,000-8,000 fingerlings/ha in semi intensive farming (MS 0.64, VII); determination of pH value of water and pond soil prior to application of lime (MS 0.6, VIII); application of lime in split doses (MS 0.46, IX); early morning and evening are best timing for stocking the fingerlings and use of aerator in the pond to maximize dissolved oxygen content in the pond (MS 0.44, X); basal dose of fresh raw cow dung at the rate of 15,000- 20,000 kg/ha/yr (MS 0.49, XI); herbivorous nature of Pengba and acclimatization of Pengba seed before stocking in order to reduce stress and avoid mortality (MS 0.37, XII) and eradication of unwanted fishes, aquatic weeds and aquatic insects prior to Pengba culture (MS 0.31, XIII).

Table 2: Aspect-wise knowledge level of fish farmers about different fish farming practices (n=80)

Aspects	Mean Score	Rank
Pengba is a herbivorous fish.	0.37	XII
Water level of fish pond should be around 1.5 to 2 m.	0.79	IV
Construction of outlet (the mouth is covered with net) in the pond.	0.94	II
Eradication of unwanted fishes, aquatic weeds and aquatic insects prior to Pengba culture.	0.31	XIII
Determination of pH value of water and soil of pond prior to application of lime.	0.6	VIII
After liming, it is important to fill the pond with little water for proper pH correction and should be left for one week.	0.69	VI
Application of lime in split doses.	0.46	IX
Fertilization of the pond should be done after 7 days of liming.	0.84	III
The basal dose of fresh raw cow dung is 15,000- 20,000 kg/ha/yr.	0.39	XI
Most favourable size of Pengba fingerling for stocking in grow-out pond is 50 – 80 mm.	0.97	I
Best timing for stocking the fingerlings are early morning and evening.	0.44	X
Acclimatization of Pengba seed before stocking is to reduce stress and avoid mortality.	0.37	XII

In semi intensive farming of Pengba, stocking rate is around 7,000-8,000 fingerlings/ha.	0.64	VII
To attain more growth and production it is necessary to feed the fish with conventional feed and supplementary artificial feed.	0.77	V
Aerator is used in the pond to maximize dissolved oxygen content in the pond.	0.44	X
Overall mean	0.6	

MS = Mean Score.

Relationship between selected socio-personal and socio-economic characteristics of the fish farmers and their knowledge level towards scientific fish farming of Pengba

The data from Table 3 indicates that the variables such as age, experience in fisheries activities, information source exposure and scientific orientation had positive and significant relationship with the extent of knowledge level of the fish farmers towards scientific fish farming of Pengba at 1% level of significance while the variable such as family size and annual income from Pengba farming have positive and significant relationship with the extent of knowledge level of the fish farmers at 5% level of significance.

Table 3: Relationship between the selected socio-personal and socio-economic characteristics of the fish farmers variables and the extent of knowledge level of the fish farmers towards scientific fish farming of Pengba (n=80)

Variables	Correlation Coefficient
Age	0.595**
Educational status	-.090
Family size	0.272*
Experience in fisheries activities	0.646**
Information source exposure	0.312**
Annual income from Pengba farming	0.249*
Training exposure on scientific aquaculture practices	0.075
Contact with extension agencies	0.187
Scientific orientation	0.307**
Innovativeness	0.068
Social participation status	-.069

(* indicates significant at 5% level of significance, **indicates significant at 1% level of significance)



Table 4: Association between the selected socio-personal and socio-economic characteristics of the fish farmers and the extent of knowledge level of the fish farmers towards scientific fish farming of Pengba (n=80)

	Unstandardized Coefficients		Standardized Coefficients	t- value	Level of Significance
	B	Std. Error	Beta		
(Constant)	-25.706	16.947		-1.517	.134
Age	10.516	3.043	.366	3.456	.001
Experience in fisheries activities	5.598	1.954	.319	2.865	.005
Annual income from Pengba faming	6.707	3.111	.181	2.156	.034
Scientific orientation	1.456	.664	.184	2.194	.031
R square = 0.520		Adjusted R square = 0.494		F= 20.286	

In order to find out the most important variables that affect the knowledge level of the fish farmers towards scientific fish farming of Pengba, step wise regression analysis was carried out. It was found that age, experience in fisheries activities, annual income from Pengba farming and scientific orientation had significant relationship with the extent of knowledge level of the fish farmers towards scientific fish farming of Pengba at 5% level of significance. The R square value was found to be 0.520 which explained that 52.00 per cent of total variation in the extent of knowledge level of the fish farmers was exhibited by the above mentioned four variables (Table 4).

CONCLUSION

Knowledge level of the fish farmers towards scientific farming practises plays a significant role not only to improve the production but also helps in decision making towards adoption of new fish farming technology. This study concluded that fish farmers had medium level of knowledge on scientific Pengba farming. As there are no standard recommended practices of scientific Pengba farming, the fish farmers depend on their own experience. This study revealed that majority of the fish farmers have good knowledge on stocking most favourable size of fingerling in grow out pond, construction of outlet in the pond and fertilization of the pond. This study also concluded that 52.00 per cent of total variation in the extent of knowledge level of the fish

farmers was exhibited by the characteristics such as age, experience in fisheries activities, annual income from Pengba farming and scientific orientation. This study recommended that different relevant should play an main role in order to improve the knowledge level of the fish farmers by organising and conducting hands on training programme, workshop, demonstration programme and by providing bulletin and leaflet.

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