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KEY CHALLENGES FOR PROGRESSIVE FISH FARMERS AND ENTREPRENEURSHIP
(Development of a Measurement Scale)

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ABSTRACT

Entrepreneurship in fish firm sector is still an unattended subject under the rural management and entrepreneurship. In rural economy fishing and fish business holds a key position to an unattended segment and communities in any states of country India. Amidst of many challenges confronted by the fish farmers, some of them are now becoming the progressive fish farmers and undertaking fishing and fish cultivation as the vocation and as the entrepreneurship which promises lot of opportunities. While we talk of fish farmers are facing many challenges, we do not have a readymade concept and scale for measuring it. This paper theorizes the challenges of progressive fish farmers as well as attempts to empirically delve out the challenges of entrepreneurship through factor analysis. The outcomes of the research could deliver an assessment scale for measuring the challenges faced by the progressive fish farmer in rural sector.

KEY WORDS: *Business Challenge, Ecological, Entrepreneurship, Finance, Fish Farming, Market Related, Production, Technological Challenges, Scale for Measurement*

1. INTRODUCTION

Progressive fish farmer are those farmers who are fit and able to move their farming business to the future. Usually a farms being progressive or not depend on the following factors- history of fixed capital investment, proven experience of expansion, tendency to accept innovation, tendency to innovate, farm output, focus on market, and communication with the larger farming community about farming. Since fish farming is done in an aquatic environment, risk factors are high in this business. The demographic profile of fish farmers also adds as risks in some cases of fish farming (Phukan et. al., 2013). The fish farmers face many obstacles and these can be distinguished as constraints and problems. The constraints and problems of fish farmers can be differentiated from each other (Elfitasari, 2010). However, as a whole these constraints and problems can be described as challenges of fish farming. The oxford (2008) definition of constraints is "a limitation or restriction or stiffness of manner and inhibition" and the definition of problem is "an unwelcome or harmful matter needing to be dealt with". Again, challenge is mentioned as "a demanding task or situation". Thus, in relation to fish farming business constraints refer to the internal restrictions and limitation of a fish farmer. Again, the problems in fish farming business refer to the external difficult conditions for the fish farmers to do his fish farming business. These constraints and problems of fish farming business are described as challenges in progressive fish farming in this chapter.

2. CHALLENGES IN FISH FARMING BUSINESS

Entrepreneurs in fish farm are not devoid of challenges. From the literatures we found a few cluster of challenges. They are-

(a) **Financial Challenges**: For any business, finance is called as the backbone. The fish farming business also needs the venture capital for the business performance (Awulachew et al 2008, Das 2006). The fish farms normally belong to lower income family with limited funds to start up. The capital needed for water management, harvesting and marketing. The fish farmers have to secure sufficient loans from loan providing institutions; whether it is government or private provider. The inability of the fish farmers to secure sufficient loans is one of the most common problems in the developing countries. Applying for a loan requires a well-planned financial projection. But many small scale fish farmers cannot plan out and organize such financial plans (Nam and Thouk 1999). The factors which may appear as financial challenges for the fish farmers in their business can be, thus, identified as:

- Lack of fund,
- Difficult to get institutional credit,
- Lack of knowledge on financial tools to start Fish Farming Business,
- Unwillingness to use available financial tools,
- Fish farmer's non familiarity with lender,
- Initial cost of digging out new pond is high, and
- Cost of fishing net is more.

(b) **Technical Challenges**: Fish farming business needs knowledge and technique. The business potentiality alone cannot result in successful harvest if the farmer has limited technical skills (Mkoka 2007). The challenges of fish farming in terms of technique can be, thus, identified as:

- Non availability of Skilled Labour for pond preparation,
- Lack of facilities for soil and water testing,
- Inadequate training programme on fish culture,
- Inadequate visit of extension personnel to farm site,
- Lack of follow up action by extension workers,
- Lack of technological knowhow,
- Lack of standardized technology for indigenous fish species,
- Lack of knowledge on integrated fish farming and expansion, and
- Farm Location is not suitable for Integrated Fish Farming.

(c) **Ecological Challenges**: Fish farming is totally dependent on soil, water and climate. Therefore the ecology related issues sometimes stand as obstacles in performance. As the global aquaculture development is significantly growing, the environment sustainability is not increasing (Elfitasari 2006). The environmental degradation and poor quality of water for fish growth and habitat is resulted from the global aquaculture development. Among all the ecology related issues, fish disease and parasite management is also considered as a critical factor in achieving sustainable aquaculture (Sukadi 2006). The ecology related challenges of fish farming can be identified as:

- Inadequate land for fish farming,
- Poaching of fish,
- Outbreak of disease,
- High acidity of soil,
- Water retention capacity of soil is low,
- Monsoon is irregular,
- Occurrence of flood,
- Lack of suitable temperature for growth of fish throughout the year,
- Decrease in rainfall and inadequate water for fish farming, and
- Poisoning of the water body.

(d) **Production Related Challenges**: Fish production is dependent on quality fish seed, fish feed and proper feeding schedule along with proper pond management. The quality fish seed sometimes are not available locally and obtaining such seeds cause higher operational costs. Sometimes shortage of fish seed supply results from limited numbers of hatcheries in the local region (Akpaniteaku, Weimin and Xinhua 2005). Both the quality and quantity of fish seed suffers from limitations (FAO 2009). Along with seed, fish feed are also important. The success of a sustainable aquaculture system depends on the fish feed and fish nutrition (Hasssan 2001). The factors for which production related challenges occur in fish farming can be thus identified as:

- Lack of good quality fish seeds of required size and number at stocking time,
- Difficulty in identifying good quality fish seed,
- Difficult to get good brooders during breeding,
- Cost of fingerlings/carried over seeds is high,
- Unavailability of formulated fish feed,
- Lack of fishery input supplier in the locality,
- Cost of fish medicine is high, and
- Growth of fish is less.

(e) Business Related Challenges: The challenges related to the business of fish farming are basically the internal ideas and thinking of fish farmers. The importance of family and running the business also has a positive correlation (Verheul, Van Stel and Thurik 2006). The attractiveness of the fish farming business for the farmers depends on several factors. However, business related challenges can be distinguished as:

- Fish farming as a business is not attractive,
- Lack of expected result from fish culture,
- Risk factor is high to do fish farming business,
- Local government support not availed,
- Lack of knowledge of social awareness on benefits of Fish farming Business, and
- From Fish farming, nothing beyond livelihood is achieved

(f) Market Related Challenges: The fish farmers who are engaged in fish farming at the farm sites far away from the potential market, they face a problem of lacking of potential market. The fish farmers doing farming since long time period may have steady customers and may not consider access to market as a problem (Elfitasari 2010). Low selling price of fish is also another issue regarding market related challenges. The fish farmers, when unable to secure sufficient loans, it forces them to find other loans from money lenders at higher interest rates. Therefore they have to sell their harvest at lower prices. The existence of market intermediaries in the supply chain also dominates the selling price and farmers' profit. The market related challenges can be identified as:

- Unavailability of fish market infrastructure,
- Selling price at farm front is low,
- Fish farmer's inaccessibility to the fish market,
- Lack of proper distribution channel,
- Exploitation by middlemen,
- Difficult and expensive to carry fish for selling to the distant market where price of fish is more, and
- Finally, lack of good storage and carriage facility to the market.

3. IDENTIFICATION OF KEY CHALLENGES BASED ON PRINCIPAL COMPONENT ANALYSIS

There are total 47 variables as challenges under six different headings being collected and discussed above. Through revision and expert opinion 29 variables out of 47 are kept for analysis. In order to analyse the interdependencies among the variables, it is used Factor Analysis based on Principal Component. On the basis of the factors as identified a three point rating based on Likert Scale is proposed where respondents having positive reply is measured with a score of 3 and negative reply with 1, whereas no reply or cannot say is measured with score of 2. The reason for 3 point scale to choose by considering the poor education level and responding capacity of the fish farmers. The Analysis of principal components is classified among the descriptive methods analyzing interdependencies between variables. Therefore there are no dependent variables and independent variables; the simultaneous combination of analyzed variables (interdependences) is important (Constantin, 2006). The Analysis of principal components consists in identifying, based on a set of variables, a few factors that can synthesize most of the total information contained in the original variables. These factors are those common elements, latent, which is the basis of the variables inter-collinearity (Lefter, 2004).

For the Principal Component Analysis (PCA), the interrelationships between several variables are being analysed, based on which the real challenges encountered by the progressive fish farmers can be known. The assessed variables are given as below:

- Lack of fund (V01)
- Difficult to get institutional credit (V02)
- Lack of knowledge of financial tools available to start Fish Farming Business (V03)

- Non availability of Skilled Labour for pond preparation (V04)
- Lack of facilities for soil and water testing (V05)
- Lack of technological knowhow (V06)
- Inadequate land for fish farming (V07)
- High acidity of soil (V08)
- Poisoning of the water body (V09)
- Difficulty in identifying good quality fish seed, (V10)
- Difficult to get good brooders during breeding (V11)
- Cost of fingerlings/carried over seeds is high (V12)
- Unavailability of formulated fish feed (V13)
- Lack of fishery input supplier in the locality (V14)
- Cost of fish medicine is high (V15)
- Lack of good quality fish seeds of required size and number at stocking time (V16)
- Fish farming as a business is not attractive (V17)
- Lack of expected result from fish culture (V18)
- From Fish farming, nothing beyond livelihood is achieved (V19)
- Risk factor is high to do fish farming business (V20)
- Local government support not availed (V21)
- Lack of knowledge of social awareness on benefits of Fish farming Business (V22)
- Unavailability of fish market infrastructure (V23)
- Selling price at farm front is low (V24)
- Fish farmer's inaccessibility to the fish market (V25)
- Lack of proper distribution channel (V26)
- Exploitation by middlemen (V27)
- Difficult and expensive to carry fish for selling to the distant market where price of fish is more (V28).
- Lack of good storage and carriage facility to the market (V29).

The result of principal component analysis at first step is presented in matrix form between correlations among the variables. It can be found from that several set of correlations among variables are above 0.30, therefore the factorial analysis on these variables is appropriate. The correlation determinant is greater than 0.00001, therefore multi colinearity or singularity between variables are absent.

Table-1, KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**0.661**
Bartlett's Test of Sphericity	Approx. Chi-Square	7170.779
	Df	406
	Sig.	.000

In order to confirm the suitability of factor analysis, KMO and Bartlett's test is being carried out and the result of the test is being presented in the Bartlett and KMO tests Table-1. It may be noted that for the Bartlett's sphericity test $[\chi]^2(406)=7170.779$, $p < 0.001$ and therefore the correlations matrix is significantly different from the identity matrix in which the variables would not correlate with each other, the variables being appropriate for factorization. KMO Index = 0.661 characterizes the set of variables as being very good for factorial analysis

Table-2, Communalities

	Initial	Extraction		Initial	Extraction
V01	1	0.673	V16	1	0.865
V02	1	0.593	V17	1	0.836
V03	1	0.842	V18	1	0.831
V04	1	0.69	V19	1	0.752
V05	1	0.784	V20	1	0.865
V06	1	0.753	V21	1	0.55
V07	1	0.486	V22	1	0.374
V08	1	0.633	V23	1	0.868
V09	1	0.729	V24	1	0.849
V10	1	0.9	V25	1	0.414
V11	1	0.939	V26	1	0.382
V12	1	0.706	V27	1	0.714
V13	1	0.856	V28	1	0.551
V14	1	0.416	V29	1	0.714
V15	1	0.626			

The communality is the representation of the extent to which a variable correlates with other variables. The higher communality is better i.e. if the communality of a particular variable is below 50% then that variable is not significantly loaded to a factor. Table 4.14 presents in the extraction column the communalities for each variable after extraction of the factors. Thus, for the item V01, the communality is 0.673, which means that the factors extracted explain 67.3% of the V01 item variance.

Table-3, Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	12.685	43.741	43.741	12.685	43.741	43.741	11.327
2	2.492	8.593	52.334	2.492	8.593	52.334	5.409
3	1.494	5.152	57.486	1.494	5.152	57.486	3.723
4	1.312	4.526	62.011	1.312	4.526	62.011	2.325
5	1.139	3.929	65.940	1.139	3.929	65.940	1.248
6	1.069	3.686	69.626	1.069	3.686	69.626	2.908
7	.970	3.346	72.972				
8	.936	3.227	76.199				
9	.857	2.955	79.154				
10	.822	2.833	81.987				

Total Variance Explained in Table-3 is one of the most important, because it contains eigen values for each factor, the percentage of variance explained by each extracted factor as well as the percentages of cumulative variance explained by all factors extracted before and after rotation. (Labar, 2008). Thus, factor 1 explains 43.74% of items variance, factor 2 explains 8.59% of the items variance, factor 3 explains 5.15% of total items variance, factor 4 explains 4.52% of total items variance and the four factors altogether explain 62.01% of total variance of items. Here we have taken 04 factors since, these explains more than 60% of the total variance.

Eigen value is the variance explained by each factor of the total variance of items. Component matrix Table-4 presents the factorial saturation of the items in factors before rotation. At the same time the table rotated component matrix is one of the most important output tables of the factor analysis. In this Table 4.16, the 0.919 saturation of the item V23 in F1

factor represents the Pearson correlation coefficient between V23 item and F1 factor and so on.

Factor I

Market Infrastructure: This factor is represented by seventeen numbers of variables with factor loading from .91 to .532 belonged to this factor. It includes variables of challenges related to market infrastructure, exploitation by middlemen in the distribution channel and fish price, unavailability of quality fish seed, inadequacy of land for fish farming and high risk factors associated with fish farming business. These factors explain 43.74% of item variance.

Factor II

Business and Production: This factor is represented by four variables with factor loadings ranging from 0.896 to 0.521 belong to this factor. It includes variables of business challenges of fish farming viz. lack of expected result from fish culture, non-attractiveness of fish farming as a business, unavailability of trained and skilled person for pond preparation and high acidity of soil. This factor explains 8.59% of item variance.

Factor III

Local Governance and State of Water Body: This factor is represented by two variables viz. non-availing the support of local governance and poisoning of water body with factor loadings 0.681 and 0.537 respectively. It explains 5.15% of item variance.

Factor IV

Market Location: Factor IV is comprised of challenges in difficulty and expense of carrying fish for selling to the distant market where price is more. The factor loading is 0.694. It explains 4.52% of item variance.

From Factor I to Factor IV, these four factors all together explains more than 60% of the total variance.

Factor V

Credit and Cost Factor: It is represented by two challenge factors with factor loadings 0.740 and 0.663. These are difficult to get institutional credit and high cost of fish medicine. 3.92% of item variance is explained by this factor.

Factor VI

Lack of Knowledge on Financial Tools: In factor VI it is seen that the variable; lack of fund is loaded negatively with factor loading value -0.815. That indicates that lack of fund is not a constraint for the fish farmers, rather the lack of knowledge on available financial tools is the constraint.

4. RESEARCH IMPLICATION AND CONCLUSION

The factor analysis is a useful tool for reducing the list of variables taken into account, in the study of challenges faced by progressive fish farmers. The review of composition of item in 6 factors as a result of PCA shows that, all most all of the challenge variables are loaded in the first factor. The factor, unavailability of fish market infrastructure is the major component of challenges. Therefore, F1 relates to the market related challenges starting from unavailability of fish market infrastructure, to exploitation by intermediaries in the supply chain and lack of proper distribution channel. The challenges which are significant in related to market are: lack of good quality fish seed of required size and number at stocking time, difficulty in identifying good quality fish seed, from fish farming nothing beyond livelihood is achieved; and risk factor is high to do fish farming business. On the other hand, F2 relates to business challenges such as lack of expected result from fish farming, local government support not availed, poisoning of water body, and lack of input supplier in the locality. In fish farming business the fish farmers find lack of expected result from fish culture and they feel as business fish farming is not attractive may be due to non-availability of skilled labour and high cost. Among financial challenges, it is seen that lack of knowledge of financial tools available to start fish farming business is more significant challenge than lack of fund. Cost of fish medicine is high and the difficulty in getting institutional credit is challenges faced by the fish farmer to some extent. Therefore, in order to increase employability through fish farming the government as well as the policy makers has to have devise ways to tackle the supply chain problem, proper education and modern means of farming. This will not only reduce the cost of production but also result into more profitability, thereby making the business more attractive. In fish farming business, all the fish farmers face constraints and problems. In this study, emphasis is given on the challenges and the ways to avoid it for sustainable entrepreneurial development. The causes of these challenges are discussed as factors and these factors are affecting the fish farmers. Very few farmers are not having some issues, but majority of the fish farmers are facing financial, technical, ecological, production, business and market related issues as challenges at various degrees. In order to make fish farming a profitable entrepreneurial activity, these challenges must be addressed.

Table-4 Rotated Matrix

	Components					
	1	2	3	4	5	6
V23	0.919					
V16	0.892					
V10	0.862	0.36				
V19	0.84					
V20	0.834		0.318			
V24	0.81		0.36			
V13	0.795	0.401				
V27	0.789					
V11	0.776	0.441				
V12	0.748		-0.348			
V03	0.729		0.54			
V07	0.662					
V06	0.656			0.38		
V05	0.639	0.448		0.333		
V29	0.634	0.387				
V26	0.532					
V22	0.509					0.302
V18		0.896				
V17		0.891				
V04		0.625		0.401		
V08		0.521	0.346			0.373
V21			0.681			
V09		0.515	0.537			
V14		0.396	0.425			
V28				0.694		
V25				0.468	0.301	
V02					0.74	
V15	0.369				0.663	
V01						-0.815

REFERENCES

1. *Akpaniteaku, R.C., Weimin, M., and Xinhua, Y. (2005): 'Evaluation of the Contribution of Fisheries and Aquaculture to Food Security in Developing Countries', NAGA, World Fish Center Newsletter, vol. 28, no. 1 & 2, Jan-Jun, pp. 28-32*
2. *Awulachew, S.B., Merrey, D., van Koppen, B., Kamara, A., de Vries, P.F. and Boelee, E. (2008): 'Roles, Constraints and Opportunities of Small-scale Irrigation and Water Harvesting in Ethiopian Agricultural Development', available at www.ilri.org browsed on 06.12.2013*
3. *Constantin, C. (2006): Marketing computer systems. Analysis and processing of marketing data, Infomarket Printing House, Brasov*
4. *Das, S.K. (2006): 'Small-scale rural aquaculture in Assam, India-a case study', NAGA World Fish Centre Quarterly, vol. 29, no. 1&2, Jan-Jun, pp. 42-47*
5. *Elfitasari, T. (2006): 'Recent existing condition on shrimp culture at Jepara Coast Central Java', Indonesian Journal of Fisheries Science and Technology, vol.2, no. 1, pp. 94-101*
6. *Elfitasari, T.(2010): Factors influencing entrepreneurial activities of small-scale fish farmers in deriving income improvement and product sustainability in Central Java, Indonesia, Faculty of Business and Enterprise, Swinburne University of Technology*
7. *FAO (2009): 'State of Food Insecurity in the World',10th Progress Report on World Hunger since 1996 World Food Summit (WFS), available at www.fao.org/3/a-i8076e.pdf, browsed on 06.08.2013*
8. *Hassan, M.R. (2001): 'Nutrition and Feeding for Sustainable Aquaculture Development in the Third Millenium', FAO corporate document repository, available at www.fao.org /docrep /00 3 /AB 41 2 E /ab412e10.htm browsed on 23.12.2012*
9. *Labar, A.V. (2008): SPSS for Education, Polirom, Iasi*

10. *Lefter, C. (2004): Marketing Research. Infomarket Printing House, Brasov*
11. *Mkoka, C. (2007): 'Fish farming helps rural poor in Malawi' available at Science and Development Network, www.scidev.net, browsed on 11.02.2011*
12. *Nam, S. and Thuok, N. (1999): Aquaculture Sector Review (1984-1999) and Aquaculture Development Plan (2000-2020), Consultancy report for World Bank/APIP, Department of Fisheries, Phnom Penh, Cambodia*
13. *Phukan, C.S., Barman, A., and Mall, M. (2013): 'Entrepreneurship through Fish Farming in Cachar District of Assam: Challenges and Opportunities', International Journal of Marketing and Technology (IJMT), ISSN 2249-1058, vol. 3, issue 12, Dec. 2013, pp. 176-185*
14. *Sukadi, M.F. (2006): Sustainable aquaculture in Indonesia, RCA International Workshop on Innovative Technologies for Eco-Friendly Fish Farm Management and Production Safe Aquaculture Foods, Bali, Dec. 4-8 2006*
15. *Verheul, I., Van Stel, A., and Thurik, R. (2006): 'Explaining Female and Male Entrepreneurship', Entrepreneurship and Regional Development, no. 18, March, pp. 151-183.*