

VOCATIONAL AND ENTREPRENEURIAL SKILLS REQUIRED BY FARMERS IN FISH BREEDING ENTERPRISE FOR SUSTAINABLE INCOME IN DELTA STATE

BY

¹ONWUDIWE NIKEJAH AND

²OKONKWO CHIDUMEJE NDIDI PATIENCE

¹Department of Crop Science, University of Nigeria, Nsukka

²University of New England, Armidale, New South Wales, Australia

Abstract

The study was designed to identify vocational and entrepreneurial skills required by Farmers in Fish Breeding Enterprise for sustainable income in Delta State. Three research questions and one null hypothesis guided the study. The population comprised three hundred and forty four (344) registered fish farmers in Delta State. Purposive sampling technique was used to obtain a sample of 100 respondents who are into fish spawning (breeding) business. Data was collected from respondents using structured questionnaire which was validated by experts and reliability coefficient of 0.86 was obtained using the test-retest method. Hypothesis was tested at 0.05 level of significance using t-test. The results of the analysis revealed that appropriate site for breeding, consumers preference in the location, ability to identify fish species that are efficient converters, advertising of products, good record keeping, recognition of business opportunities, identification of market channels for fry and fingerlings, identification and maintenance good customer relationship amongst others were entrepreneurial skills required to for fish breeding business. Nature of the brooding stock; timing and temperature management are vocational skills required to induce mature female fish. Starvation and selection of mature stock injecting pituitary hormone, collection of gametes and supply of running water and/or compressed air are vocational skills required to hatch fish. The null hypothesis tested was accepted. The study recommended that the findings of the study should be used as training module for would-be fish breeders in vocational centers. The finding should also be provided in printed and electronic forms for interested persons or farmers to reach when needed.

Introduction

The Nigerian fishing industry comprises of three major sub sectors namely the artisanal, industrial and aquaculture. The awareness on the potential of aquaculture to contribute to domestic fish production has continued to increase in the country. This stems from the need to meet the much needed fish for domestic use and export. Fish species which could be cultured include *Tilapia spp*, *Heterobranchus bodorsalis*, *Clarias gariepinus*, *Mugie spp*, *Chrysichthys nigrodigitatus*, *Heterotis niloticus*, *Ophiocephalus obscure*, *Cyprinus carpio* and *Megalo spp*. Fish culture is carried out in enclosures such as tanks and various

types of ponds. The aquaculture sub sector contributes between 0.5% and 1% to Nigeria's domestic fish production (Adekoya, Ayansanwo, Iduwu, Kudoro and Salisu, 2006).

The rapid increase in population of the world has resulted in a huge increase in the demand for animal protein (which is essentially higher in quality than plant protein). The average protein intake in Nigeria which is about 19.38/output/ day is low and far below FAO recommendation of 65g/output/day (Adekoya et al., 2006). The nutritional requirement is particularly crucial in a developing country such as Nigeria where malnutrition and

starvation are the major facing by millions of rural dwellers. The low protein intake is an indication of shortage of high quality protein food in the diet of Nigerians. The consumption has been estimated to be 1.56267 metric tones (Tabor, 1990). In order to meet with fish production needed to meet protein demand of Nigerians, there is need for farmers to equip themselves with vocational skills for effective fish production.

Vocational skills refer to hands-on training in a specific trade or job industry. The training takes place outside the traditional classroom setting in schools. Learners are placed in manual labour intern positions that coincide with their vocational career choice. The learners are exposed to hands-on activities through first-hand experience, and they acquire classroom knowledge. Equipping farmers with vocational skills will allow them to work in their areas of interest while obtaining first-hand knowledge and experience, for more income. Equipping famers skills in fish production like fish breeding will ensure continuity in production that will meet the demand in animal protein and provide sustainable income for the famers.

According to Akankali, Seiyaboh and Abowei (2011) fish breeding is the act of producing fry from parent fish. Fish breeding is a very important activity stock that makes fingerlings available for stocking in ponds, pens, tanks or cages. In fishes, reproduction or breeding is controlled by internal and external or environmental factors. The internal factors are the endocrine system as well as physiological state of the fish while the environmental factors refer to temperature, salinity, good water quality, adequate food and photoperiods. Fish breeding can be achieved by either natural methods or induced (artificial) breeding despite the species of fish.

Different species of fish choose different places in the aquatic environment for breeding. They

also breed in different season. For example, Clarias breeds during the flood season while Tarpon breeds during the dry season. Tilapias breed throughout the year. In fishponds, natural breeding is achieved, having acquired a thorough knowledge of the reproductive biology and habits of the cultured fish. The fish breeder is expected to provide and simulate the natural environment to succeed in the spawning of the species to ensure sustainable production (Adekoya *et al.*, 2006). Sustenance of fish production depends heavily on fish breeding. Brain and Amy (1980) reported that economically productive aquaculture is heavily depended on adequate supply of fish seeds or juvenile fish with which to stock ponds, other aquaculture systems. This is because of few numbers of fish breeders. Ayinla (1991) opines that the production of fast growing fingerlings is very important for development of viable fish farming venture. Fish breeding business has a huge potential for contributing to food security, lower-priced fish, employment generation and increase foreign exchange earning capacity as well as poverty reduction as it can generate much income to elevate fish farmers socioeconomic status (Oguntade *et al.*, 2006). It is therefore important for farmers to develop entrepreneurship skills in fish breeding to remain economically viable in the nation.

Omolayo (2006) defined entrepreneurship as the process of bringing together creative and innovative ideas and coupling these with management and organizational skills in order to combine people, money and resources to meet an identified need and create wealth. Many scholars have written widely on entrepreneurship and its potency to generate employment, thus, underscoring the quintessence, significance and relevance of this sub-sector in the development of any given economy. The experiences of developed economies in relation to the roles played by entrepreneurship buttresses the importance of

entrepreneurship especially in among the developing countries. Entrepreneurial activities have been found to be capable of making positive impacts on the economy of a nation and the quality of life of the people (Adejumo, 2000). Therefore, entrepreneurial skills are skills needed to have to succeed in a business venture. In this study, entrepreneurial skills are the basic skills necessary to start, develop, finance and succeed in fish breeding enterprise while vocational skills are the technical or practical skills required to successful in fish breeding enterprise. Entrepreneurial skills would enable the individual to explore and make profits in the business and sustain a living. As means to sustain fish demand in the market as well as sustain livelihood of fish famers there need for them to be equipped with entrepreneurship skills for fish breeding enterprise. In Delta State, there is a gap between demand and output of animal protein, a number of options were considered. One of them was to step-up in the exploitation of fish breeding to ensure sustainability in fishery production. The research is based on the identification of vocational and entrepreneurial skills in fish breeding that are required to breed fish locally.

Objectives of the study

The general purpose of this study is to identify the vocational and entrepreneurial skills required by farmers in fish breeding enterprise in Delta State. Specifically, the study seeks to identify:

1. Entrepreneurial skills required by farmers for planning fish breeding enterprise.
2. vocational skills required by farmers for induction of fish breeding
3. vocational skills required by farmers for hatching and breeding of fish

Items with mean value of 3.0 and above were accepted while items with less mean weight were rejected. The questionnaire was coded the basis of the following code. The items are on 5 point scale of Strongly Agreed-1 (SA),

Research Questions

The following research questions guided the research work

1. What are the entrepreneurial skills required by farmers for planning fish breeding enterprise?
2. What are the vocational skills are required by farmers in fish induction?
3. What are the vocational skills required by farmers for hatching and breeding fish?

Research Hypotheses

The following hypothesis was formulated for the study and tested at 0.05 level of significance.

Ho₁: There is no significant difference between the mean rating of fish farmers in urban and rural areas in the entrepreneurial skills required for fish breeding enterprise.

Methodology

The study adopted a descriptive survey research design and was carried out in Delta State. The population is made up of three hundred and forty four (344) registered fish farmers in Delta State, Nigeria (ADP, 2012). Purposive sampling was used to select 100 fish farmers who are into fish spawning (breeding) business.

The instrument used for the study is questionnaire which was validated by 2 experts from Delta State University, Abraka and reliability coefficient of 0.86 was obtained using the test-retest method. The value was high enough to support the use of the instrument in the research (Inomiesa, 1993). Ninety two copies (92 %) of the questionnaires distributed were duly completed and returned.

with nominal values designed for each response that was expected from the respondents. Each of the items was scored on

Agreed-2 (A), Undecided-3 (U), Disagreed-4 (D) and Strongly Disagree-4 (SD). The data

were analysed using means, standard deviation while t-test was used to analyse the hypothesis.

Results

Research Question 1

What entrepreneurial skills are required by farmers for planning fish breeding enterprise?

Table 1: Entrepreneurial skills required by farmers in planning for fish breeding enterprise (N= 92)

S/N	Statement items	Mean	S.D	Remark
1	Identify fish accepted by consumers in the area	3.31	0.63	Agreed
2	Identify appropriate site to use for breeding	3.81	0.71	Agreed
3	Identify and select appropriate equipment for induced spawning and larval rearing.	3.56	0.61	Agreed
4	identify fish species that are efficient converters	3.01	0.63	Agreed
5	Segregate breeding stock by sex and satisfactory characteristics	3.51	0.71	Agreed
6	Reproduce in captivity	3.50	0.81	Agreed
7	Advertise products	3.81	0.65	Agreed
8	Keep record of sales and revenue	3.08	0.68	Agreed
9	Transport live fingerlings in second containers for delivery to buyers.	3.72	0.72	Agreed
10	Provide good leadership, networking and cooperation with other hatching enterprises.	3.83	0.74	Agreed
11	Fix moderate and competitive prices and ability to review prices periodically to suit current mark of situation	3.91	0.89	Agreed
12	Recognize business opportunities	3.03	0.72	Agreed
13	Identify market channels for fry and fingerlings	3.52	0.75	Agreed
14	Identify and maintain good customers' relationship.	3.51	0.76	Agreed
15	Grade fish species according to reproductive and growth characteristics.	3.52	0.77	Agreed

Source: Field Work, 2015

The data presented in Table 1 showed that the 15 statement items were agreed by the respondents to be entrepreneurial skills required by farmers in planning for fish

breeding enterprise. The standard deviation of the items ranged from 0.63 to 0.89. This indicated that respondents were close to the mean and to each other in their responses.

Research Question 2

What are the vocational skills required by farmers in fish induction?

Table 2: Vocational skills required by farmers in fish induction (N= 92)

S/N	Statement items	Mean	S.D	Remark
-----	-----------------	------	-----	--------

1	Inject brooding stock with anesthetic to increase survival rate and ease of handling.	3.39	0.73	Agreed
2	Inject 2-4mg of the extract per kg body weight of the breeding female fish	3.27	0.61	Agreed
3	Inject the same breeding female fish 6 hours later with 6-12mg/kg body weight of extract.	3.16	0.66	Agreed
4	Stripe (gentle pressure on stomach) the female for ripe eggs.	3.06	0.67	Agreed
5	Remove the excess milk from the surface of water through washing.	3.81	0.81	Agreed
6	Leave the fertilized eggs in the basin for 30 minutes	3.66	0.71	Agreed
7	Incubate the fertilized eggs in the incubator	3.51	0.60	Agreed
8	Fill the incubator with clean well oxygenated water at 25-27 ⁰ c.	3.48	0.68	Agreed

Source: Field Work, 2015

Onwudiwe, N. & Okonkwo C.N.P

The data in Table 2 showed that the eight (8) items had the values mean range from 3.06 to 3.66. The mean values were above the cut-off point of 3.00 which indicated that the respondents accepted that the identified items

were vocational skills required to induct mature fish. The standard deviation of the items ranged from 0.60 to 0.81. This indicates that the respondents were close to the mean and to one another in their responses.

Research Question 3

What are the vocational skills required by farmers in hatching fish?

Table 3: Vocational skills required by farmers for hatching fish (N=92)

S/N	Statement items	Mean	S.D	Remark
1	Starve fish 2 days prior to sexing to reduce stress.	3.51	0.63	Agreed
2	Separate fish into sexes	3.31	0.72	Agreed
3	Select good and mature stock	3.56	0.74	Agreed
4	Weigh the brooder	4.51	0.78	Agreed
5	Prepare solution of the extracted pituitary gland.	3.61	0.68	Agreed
6	Inject the female spawner with the prepared pituitary hormone	4.03	0.84	Agreed
7	Dry and store freshly collected pituitary hormone.	4.11	0.79	Agreed
8	Prepare spawner containers	3.09	0.88	Agreed
9	Collect ovulated egg from female spawner (stripping)	3.33	0.71	Agreed
10	Collect milk (spermatozoon) from male brood stock	3.18	0.83	Agreed
11	Supply running water and/or compressed air to induce hatching	3.04	0.77	Agreed

Source: Field Work, 2015

The result in Table 3 showed the statement items had a mean range of 3.18 to 4.11. The means were above the cut-off of 3.00. This implied that the respondents agreed that the identified items were vocational skills are required by farmers for hatching and breeding

Hypothesis

Ho₁: There is no significant difference between the mean rating of fish farmers in urban and rural areas on entrepreneurial skills required by farmers for fish breeding enterprise.

Table 4: t-test analysis of the mean ratings of respondents on entrepreneurial skills required by farmers for fish breeding enterprise.

Location	N	Mean	SD	t-value	t-tab	Decision
Urban	43	3.10	0.80	1.62	1.98	Accepted
Rural	49	3.29	0.73			
Total	92					

Table 4 showed the t-test summary analysis of entrepreneurial skills required by farmers in fish breeding enterprise. The data showed that the t-value was lesser than the t-tab at 0.05 level of significance. This indicates that there is no significant difference between the mean ratings of the fish farmers in urban and rural areas on skills required for fish breeding enterprise. Therefore the null hypothesis is accepted.

Discussion of the findings

Entrepreneurial skills required by farmers for fish breeding enterprise

The findings in Table 1 showed that: appropriate site for breeding, consumers preference in the location, ability to identify fish species that are efficient converters, advertise products, good record keeping, recognition of business opportunities, identify market channels for fry and fingerlings, identify and maintain good customer relationship amongst others were entrepreneurial skills required to for fish breeding business. These skills are responsible for farmers' sustainable income and livelihood through the business of fish breeding. The findings were in agreement with the view of Fulmer (1989), who listed steps relevant for thorough planning to include:

fish. The standard deviations of the statement items ranged from 0.54 to 0.78, which indicated that the respondents' responses were close to one another and also were not far from the mean.

choosing objectives of fish farming enterprise, establishing of budget for the farm, establishing of time-table for the enterprise etc. Also, Ngozi (2016) found out that formulate objectives of breeding enterprise, establish time schedule for breeding, budget for breeding etc were entrepreneurial skills required by farmers in fish breeding. When a farmer is equipped entrepreneurship skills he or will be creative and innovative with ideas coupled these with management and organizational skills in order to combine people, money and resources to meet an identifi

Onwudiwe, N. & Okonkwo C.N.P

Vocational skills required by farmers for fish induction

The finding in Table 2 indicated that nature of the brooding stock; timing and temperature management are vocational skills required to induce mature female fish. Brood stock must be prepared for spawning, and this is why they are usually kept in special brood stock ponds. The result of study on induction of fish is in conformity with the findings of Food and Agricultural Organization (2007) report, which enumerated skills in induction to include inducing final maturation and ovulation with hormone treatment, procurement of eggs by

stripping, artificial fertilization among others. Good time and temperature management are pertinent to carry out successful fish breeding business. The findings of the researchers cited above had further help to improve the reliability of the result of the study.

Vocational skills required by farmers for hatching fish

The results in Table 3 indicated that starvation and selection of mature stock, brooders weight, injecting pituitary hormone, collection of gametes and supply of running water and/or compressed air are vocational skills required for hatch fish. The use of pituitary hormone and careful management of the environment such as water and air determines successful hatchability in fish breeding enterprise. In line with finding, Krol, Glogowski, Demska-Zakes, Hliwa (2006) found that the use of both synthetic and natural hormones brings about quick ovulation and higher percentage of hatched fish, though synthetic hormone gives higher yield than the natural hormones. In consonance with the Ngozi (2016) found out that aerating the hatching to keep the larvae alive, transferring the Larvae to Larvae rearing tanks, Feed the fry according to specification, and observing the eggs of fish for hatching characteristics after 38hours were among skills required for hatching fish.

Hypothesis

The finding in Table 4 indicated that there is no significant difference between the mean ratings of the fish farmers in urban and rural areas. This implies that irrespective of farmers' location entrepreneurial skills required to run fish breeding enterprise remains the same.

Conclusion

Fish breeding bridges the gap between demand and output to meet animal protein in Delta State. It does not only sustain production of fish but can serve as a means to livelihood if one

engages in the enterprise. The findings of the study showed that farmers equipped with entrepreneurship skills will be creative and innovative, coupled with ideas to management or combine people, money and resources to meet up fish demand of consumers and create wealth through fish breeding enterprise. Vocational skills in induction and hatchery provide the technical know-how to sustain fish production.

Recommendations

1. The findings of the study should be as training module for would be fish breeders in vocational centers in Delta State
2. The finding should be provided in printed and electronic forms by the government of Delta State for interested persons or farmers to reach when needed.

References

- Adejumo, G. (2001). Indigenous entrepreneurship development in Nigeria: characteristics, problems and prospects. *Advances in Management: Journal of Department of Business Administration, University of Ilorin, Ilorin Nigeria*, 2(1), 112-122.
- Adekoya, B.B., Ayansanwo, T.O., Iduwu, A.A., Kudoro, O.A and Salisu, A.A. (2006). *Directory of fish Hatcheries in Ogun State*. Ogun State Agricultural Development Programme. (OGADEP). Abeokuta, pp: 18.
- Ayinla, O.A. (1991). *Fish Feed and Nutrition*. Paper presented at Fisheries society of Nigeria FISON Symposium, Gingiya Hotel, Sokoto
- Donaldson, E. M. (1975). Physiological and physico-chemical factors associated with maturation and spawning. *FAO - EIFAC Tech. Pap.* 25: 53 – 71.
- FAO (2004). *Nigeria's Fisheries Profile*. Retrieved from:

www.fao.org/fi/fcp/en/NGA

(Accessed on: February 2, 2006).

- Inomiesa, E.A. (1993). Developing Primary School Science Test for Continuous Assessment of Primary Six Pupil. *Review of Education*, 13, 15-26.
- Krol, J., Glogowski, J., Demska-Zakes, K., Hliwa, P. (2006). Quality of semen and histological analysis of testis in *Perca fluviatilis* L. during spawning period. *Czech J. Anim. Sci.* 51, 220-226.
- Ngozi, F.A. (2016). Entrepreneurship skills required for the training of youths in fish breeding enterprise for self-employment in Anambra State. *International Journal of Educational Benchmark*, 2(1), 99 – 106.
- Nwangwu, I.O. (2007). *Higher education for self reliance: An imperative for the Nigerian economy*. NEAP publication.
- Oguntade, O.S., Ayinla, O.A. Oresgun, A. Adeogun, O.A. Ogunbadejo, H.K. and Alhaji, T. (2006). Trends in fish culture in urban and Peri-urban areas of Lagos State. *Proceedings of the 20th Annual Conference of Fisheries Society of Nigeria* (FISON), 56-67.
- Omelayo, B. (2006). Entrepreneurship in theory and practice. In F. Omotosho, T.K.O. Aluko, O.I. Wale Awe and G. Adaramola (eds). *Introduction to Entrepreneurship development in Nigeria*. Ado-Ekiti; UNAD Press.

