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EVALUATION OF THE LEVEL OF ADOPTION OF IMPROVED FISH PRODUCTION PRACTICES AMONG FISH FARMERS

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ABSTRACT
The study explores the level of adoption of recommended fish management practices with the view to improving the level of adoption among farmers. Anambra State served as the study area, the population for the study comprised of all the fish farmers in the state 120 fish farmers were selected through the random sampling method to obtain the sample size. Data was obtained from the respondents through the questionnaire techniques and the questionnaire items border on record keeping, fish preservation techniques among others. The data obtained were analysed through the descriptive statistics the study recommend among other things that youths and men should be encouraged into the fish farming industry to enhance sustainable fish production.
Keywords: Evaluation; Adoption; Fish Production; Practices; Fish Farmers

Introduction
Fish farming involves raising fish commercially in tanks or enclosures such as fishponds, usually for human consumption (Wikipedia, 2019). Similarly, it is defined as an act of rearing fish for commercial purpose. This involves building the earthen, tarpaulin or concrete pond, fertilizing the pond, stocking the fingerlings in good water and feeding the Mackerel, Tilapia or catfish until market size (Steve, 2015). Kassam, Subasinghe and Phillips (2011), asserted that aquaculture entered the global prominence at a time when governments were striving to ensure food security among communities. Fish farming is an approach for economic transformation and poverty alleviation. It focuses on mitigating the significant barriers faced by fish farmers, traders, processors and other related actors in the value chain. This inevitably includes various activities such as ensuring success to a full range of necessary resources, inputs and technology (Mwaijande and Lugendo, 2015).

In the recent times, Nigeria has become one of the fastest and highest aquaculture producing Countries in sub Saharan Africa and second to Egypt in Africa due to present pace of growth in Fish farming production (fejika, Uzokwe and Oladosu, 2013). Fish and fish products are Known widely as a very important diet because of their high nutritive quality and significant in improving human health (Olaoye, Ashley-Dejo and Adekoya, 2014). Fish plays a vital role in feeding the world's

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population and contributing significantly to the dietary protein intake of Hundreds of millions of the populace (Amao, Oluwatayo, and Osuntope, 2006). According to Nidhi (2015), fisheries sector has a significant strategic role in food security, international trade and employment generation Olaoye, Ezeri, Akegbejo-Samsons, Awotunde and Ojebiyi (2016) noted that fishery Sector has continued to maintain its crucial position through its contribution to agriculture's Share of Gross Domestic Product (GDP) in Nigeria. Fish is relatively cheap and easily available source of protein in dietary supplement for the poor, who cannot afford animal protein and depend mainly on food of low nutritional value (Ume, Ebeniro, Ochiaka and Uche, 2016). Apart from dietary source, fish is source of fish oil, a raw material for pharmaceutical Companies, provision of livestock feeds, and provision of employment for different categories of people in the area of fisheries production, processing, packaging and marketing (Fleuren, 2006). According to Folayan and Folayan (2017), trials have shown that fish oil Supplementation is effective in the treatment of many disorders including rheumatoid, arthritis, Diabetes, ulcerative colitis and Reynard's disease.

According to Food and Agriculture Organization (FAO) (2018), strong evidence underlines How consumption of fish and in particular oily fish. Lowers the risk of Coronary Heart Disease (CHD) mortality. Similarly, it has been estimated that fish consumption reduces the risk of Dying of coronary heart diseases by up to 36 percent due to the long-chain omega3 fatty acids Found in fish and fishery products (FAO, 2019a). Fish farming has become an enviable Subsector which provides employment to a large proportion of the nation's population (about 65-70%), especially those in riverside areas (Olaoye, 2010; Shettima, Mohammed, Ghide and Zindam, 2014). Olaoye and Oluruntoba (2011) recorded that Nigerians are high fish consumers and offers the largest market for fish and fishery products in Africa. According to Federal Department of Fisheries (2014), the contribution of fishery subsector to agriculture Gross Domestic Product was estimated at 0.48% in the year 2014, out of the total estimate of 20.24% being contributed by agriculture to the GDP.

Asiru and Ahmed (2016) noted that among the different food production systems around the World, fish farming is widely seen as an essential weapon in the global fight against poverty, Nutritional disorder and food insecurity, particularly within a developing country like Nigeria and Anambra State in particular. Fish farming is regarded as a vital domestic provider of much Needed high-quality animal protein and other important nutrients. Okoronkwo and Ume (2013) Noted that Anambra State is crisscrossed by numerous rivers, swamps, abundant rainfall, Effective harvesting and storage surface water, run off undoubtedly favour fish farming. It is Pertinent to note that the bulk of fish production is in the hands of numerous landless, marginal and small farmers in the state. To most of them, fishing is only a supplementary or Complimentary enterprise. Hence, next to crop production, fish production has the largest employment capacity and income generating potential for the poor. This aligns with Nidhi (2015) who opined that the most important feature of fish production process is that it provides Subsidiary occupation, offer gainful employment at the location itself and make better Utilization of family labour.

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According to Gerster-Bentaya and Hoffmann (2011), training need assessment is a gap between the present and the desired future. Benefits of training need assessment include determining Telt need, categorization of trainees, identification of adequate training methodology and knowing the appropriate time to deliver. Whereas, Famuyiwa, Adesoji and Lawal (2012) opined that training programmes in agriculture are aimed at developing farmers to make them better entrepreneurs and decision makers. Similarly, Sajeev, Singha and Venkatasubramanian (2012) highlighted that training plays an important role in the advancement of human Performance in a given situation. In order words, training provides a systematic improvement of knowledge and skills, which in turn helps the trainees to function effectively and efficient in their given task on completion of the training. According to Osei, Bakang and Nimoh (2013), Farmers' training is conducted with view to changing their behavior and improving their performance through the acquisition of increased knowledge, improved skills and positive changes in attitude and aspirations. However, Iwuchukwu, Udoye and Onwubuya .(2013) observed that it is counterproductive to offer training to individuals who do not need it or to offer the wrong kind of training to farmers.

Farmers' competency in fish production depends on the effectiveness of the training they received. According to Aphunu and Ajayi (2010), an effective training on fish productive confers new knowledge, better skills and effective performance in farmer's productivity. As fisheries technology is continuously changing, the fish farmers in increasing production, needs many skills for the use of these technologies. For this reason, it is necessary to arrange timely training programmes for farmers, in order to acquire necessary knowledge and skills in different aspects of improved fish farming. Since training in agriculture is necessary to support the adoption of emerging aquaculture innovations and technologies for positive impact on wellbeing (Shava and Gunhidzirai, 201 7). More so, Hempel (2010) advocated for training of fish farmers and extension agents to get the desired result among end users in order to sustain present tempo of the booming enterprise in fish farming. The global fishing industry has nearly exhausted fish stocks and catches are declining. The United Nations and major fishery countries have placed significant mp on the Development of the aquaculture industry (Patrick and Kagiri. 2016). Fish farmers Maximize fish productivity can be attributed to lack of adequate knowledge and training towards integrated fish farming. However, there are other numerous challenges confronting fish farming practices, among which are poor management, inadequate supply of good quality Seed, lack of capital, and high cost of feed. Availability of extension services and the products (Yeasmin, Hoque and Zulfikar-Rahman (2014). In addition, increased popuiaoe encouraged the drastic changes in livestock consumption and production patters, paving the way for what can be referred to as food reyolution". This implies that other sources of protein intake have to be looked into. Of which fish is a common one (Zilberman, Ote, Roland-Holst and Pfeiffer, 2011).

With the efforts of research and extension services, there are improved packages on fish production. However, farmers are not adequately utilizing them and this may be as a result of lack of

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information on those improved production packages or there is no adequate training on them (Ofuoke, Emah and Itedjere, 2008). In addition, a research by Adinya, Cffem and Ikpi (2011) stated that fish farming projects fail because of limited skills to use modern technology.

The results of the study reflected that there was a huge skills gap, which inhibited fish farming to expand which calls for education provision for fish farmers to enhance food security and employment creation. Based on these Findings, it Temans a challenge to both the government and non-governmental organizations to impalement effective fish farming in Anambra state that can enhance production and increase income and food security among the farmers. Hence in view of this development, fish farmers need training to remove barriers, improve technical competency and efficiency for better resource utilization, increase productivity and performance. The study seeks to investigate into the adoption of improved fish production practice among farmers.

Purpose of this study

The purpose of this study is to ascertain the level of adoption of improved fish production practices such as the record keeping, fish preservation techniques, use of improved breeds for stocking among others.

Research Question

The study seeks to answer this question

- What is the level of adoption of improved fish production practices such as the record keeping, fish preservation techniques, use of improved breeds for stocking among others?

Population of the study

The population of the study comprise all the 120 fish pond farmer in the state.

Sampling technique

Multi-stage involving purposive and random sampling techniques was used to select one hundred and twenty respondents that were used for the study.

Method of data collection

Data for the study was collected from a primary source using a well-structured questionnaire. The questionnaire contained relevant questions and was divided into sections according to the number of objectives in the study. The information collected from the fish farmers bordered on their socio-economic characteristics such as age, gender, marital status, educational level, farm size, household size and farming experience.

Method of data analysis

Descriptive statistics such as frequently count, percentage and mean score were used analysis the data collected.

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The table of data analysis: Adoption level of improved fish management practices among the fish farmers

Improved fish management practices	Adoption Level Of Improved Fish Management Practice (N =120					
	TGE =4	TGE =3		TGE =2	TGE =1	Mean (χ) Rank
Daily sanitation and record-keeping practices	110(91.60)	8(6.70)	2(1.70)	0(0.00)	3.93	1ST
Fish preservation techniques	107(89.16)	11(9.17)	2(1.67)	0(0.00)	3.88	2ND
Use of improved breeds of fingerlings	108(88.33)	6(8.33)	5(3.3)	1(0.83)	3.84	3RD
Use of aerated containers in transporting fingerlings	108(86.66)	14(11.66	1(0.83)	1(0.83)	3.84	3th
Optimum stocking rate	105(87.50)	10(8.33)	5(4.16)	0(0.00)	3.83	4th
Prevention and control of fish diseases	104(86.66)	12(10.00)	3(2.50)	1(0.83)	3.82	5th
Frequent change of water	101(84.17)	15(12.50)	2(1.67)	2(1.66)	3.79	6th
Sorting of fish	102(85.00)	11(9.17)	5(2.50)	2(3.33)	3.77	7th
Provision of inlet and outlet device in pond	92(76.66)	21(17.50)	6(5.00)	1(0.83)	3.70	8th
Construction of modern fishing gears	87(72.50)	17(14.16)	10(8.33)	6(5.00)	3.54	9th
Floating feeds	69(57.50)	27(22.50)	5(4.16)	19(15.83)	3.21	10th
Fertilization and liming of fish pond	41(34.16)	29(24.16)	19(15.83)	31(25.83)	2.66	11th
Improved techniques in pond construction and maintenance	30(25.00)	38(31.66)	15(12.50)	37(30.83)	2.50	12th
Techniques of improving water quality in fish culture	28(23.33)	30(25.00)	35(29.16)	27(22.50)	2.49	13th
Water testing kits for oxygen, acidity and fertility	32(26.66)	37(30.33)	18(15.00)	33(27.50)	2.46	14th
Soil testing before site selection	28(23.33)	24(20.00)	40(33.33)	28(23.33)	2.43	15th
Technique of hatchery and fingerling production	19(15.83)	29(24.16	21(17.50)	51(42.50)	2.13	16th
Integrated fish farming for increased fish production	10(8.33)	19(15.83)	29(24.16)	62(51.66)	1.80	17th

Discussion of Results

The distribution of the fresh catfish farmers according to their adoption level of improved fish production technologies is shown in the result indicated that most of the improved fish production technologies such as daily sanitation and record keeping (π =3.90, 1), fish preservation techniques (π =3.88, 2nd), use of improved breeds of fingerling (π = 3.84, 3), use of aerated containers in transporting fingerlings (π =3.84, 3rd), optimum stocking rate (7-3.83,4th), prevention and control of diseases (π =3.82, 5n) and frequent change of water (7-3.79, 6thy) were highly adopted by the fresh catfish farmers. Other improved fish production technologies that were adopted by the fresh catfish farmers as indicated in the result were sorting of fish (π -3.77, 7h), use of inlet and outlet devices in pond (π -3.70, 8th), construction of modern fishing gears (π -3.54, 9h), floating feed (π -3.21, 10th), fertilization and liming of fish pond (π -2.66, 11th) and improved techniques in construction and maintenance of fish ponds (π -2.50,12h).

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However, the result further indicated that the fresh catfish farmers did not adopt the following improved fish production technologies such as techniques of improving water quality (π -2.49, 13th), water testing kits for oxygen, acidity and fertility (π -2.46, 14th), soil testing before site selection (π -2.43, 15th), techniques of hatchery and fingerling production (π -2.13, 16h) and integrated fish farming for increased fish production (π -1.80, 17in). As shown in the result, most of the improved fish production technologies were adopted by the fish farmers. The adoption level exhibited by the fish farmers in most of the management practices is a clear indication of their determination and zeal in fresh catfish production. The result agrees with Adefalu, Aderinoye-Abdulwahab, Bello, Olorunfemi and Oba (2013) who reported in their study that all fish farmers in Ilorin Metropolis were involved in cleaning their ponds while majority were involved in management practices such as water quality maintenance, disease control, fertilization and liming.

Conclusion

The study showed that the improved fish production technologies such as daily sanitation and record keeping, fish preservation techniques, use of improved breeds of fingerling, use of aerated containers in transportation fingerling, optimum stocking rate, prevention and control of disease and frequent change of water were highly adopted by the fresh catfish farmers. Other adopted were sorting of fish, use of inlet and outlet devices in pond, construction of modern fishing gears, floating feed, fertilization and liming of fish pond. The respondents indicated training needs on techniques on improving water quality, pond management, construction of fishpond, site selection, hatching techniques, value addition, insemination and fertilization, feed formulation and preparation, prevention and control of fish disease and disease diagnoses.

However, to improve on the fish farmers level of adoption of improved fish farming practices, it is however necessary that there should be adequate public enlightenment campaign on the need of adoption both in the areas of productivity, profitability and environmental protection. The farmers should be assisted financially to enable them found the new technologies. There should be regular monitoring of the fish farmers by the ministry of agriculture to ensure compliance level and find out farmers challenges adopting new technologies

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