

**NSAP****47th Annual Conference**
(JOS 2022)**CONFERENCE PROCEEDINGS**THEME
SECURING ANIMAL AGRICULTURE AMIDST GLOBAL CHALLENGES**AWARENESS AND USAGE OF FISH FARMING INNOVATIONS AMONG FISH FARMERS IN NASARAWA STATE, NIGERIA**^{*1}J.B. Ogunremi, ²F. Igbani, ³A.K. Dauda and ⁴J.N. Ogbonna^{1, 2, 3&4}Department of Fisheries and Aquaculture, Federal University Wukari, Taraba State, Nigeria^{1*}jogunremi@gmail.com**ABSTRACT**

Awareness and usage of fish farming innovations among fish farmers in Nasarawa State was studied. Random sampling technique was used to select ninety available fish farmers in Lafia and Keffi Local Government areas from the list of registered fish farmers obtained from Agricultural Development Project Headquarters (ADP) in the State. Data were obtained through structured questionnaire and interview scheduled which were analyzed with the use of descriptive statistics such as frequency counts and percentages while inferential statistics (Pearson Product Moment Correlation (PPMC)) was used to test level of significant relationship among the variables ($p < 0.005$). Majority of the respondents agreed that they were aware of most of the innovations available in fish farming; liming and fertilization of ponds (94.4%), water inlet and outlet devices (91.1%). Perceived benefits of innovations were expansion of fish farm size ($\bar{X} = 3.82$), reduction in fish mortality ($\bar{X} = 3.63$) and disease management ($\bar{X} = 3.63$). Major innovations used by fish farmers are fertilization of ponds (94.4%) and inlet and outlet devices (91.1%). There is a significant relationship between awareness of fish farming innovation and usage among fish farmers ($p < .0001$). The study concluded that awareness of fish farming innovations enhanced the usage of innovations among fish farmers in the study. It is recommended that more fish farming innovations should be introduced to the fish farmers by researchers through the Extension service officers.

Key words: Awareness, fish farmers, farming, innovation, perceive**INTRODUCTION**

Considering the current precarious economic situation in Nigeria, the task of matching the fish production deficit is no longer a rural affair. Semi-urban and urban communities have also become key players in the process of reducing the production deficit through fish farming. This becomes quite important considering the unemployment, underemployment and youth unemployment rates as it can be used to engage the labour potential that is going to waste (Badiru and Amure, 2020). Success of a new innovation relies strongly on mechanisms of its dissemination. The effective transfer of technology is facilitated when knowledge, information, and skills pertaining to new technologies get transferred from its source of invention to a wide range of potential end users (Brown and Ratna 2013). In what is essentially a communication process, knowledge gathering agencies (e.g., extension) bridge the gap between source of innovation (researchers) and end users (farmers). Some of the key approaches used by extension agents to promulgate technology transfer along with detailing their role in propagating useful technologies cannot be over emphasized. Contact with extension personnel is a very important positive determinant of technology adoption as it counterbalances the negative effects arising from technology complexities (Joffre *et al.* 2017), thus promoting innovation transfer. The traditional agricultural extension follows a linear approach wherein research results are extended to farms, leading to adoption and increased productivity. Fish farming has experienced spectacular growth in the past decades, during which continuous innovation has played a significant role, but it faces increasing criticism regarding its ecological and social sustainability practices and the resulting challenges for future innovation usage. Therefore the study aimed at investigating awareness and usage of fish farming innovations among fish farmers in Nasarawa State, Nigeria. Specific objectives are: (i) examined awareness of fish farming innovations (ii) identified perceived benefits of innovations (iii) determine the usage of innovations among the respondents

Key words: Awareness, fish farmers, perceive, innovation, usage



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MATERIALS AND METHODS

Study Area

Nassarawa State is located between Latitude 7° and 9° N and Longitude 7° and 10° E. It is bounded in the North by Kaduna State, in the West by the Federal Capital Territory, in the South by Kogi and Benue States and in the East by Taraba and Plateau States. The State has 13 local Government areas with three National Senatorial Districts (South, North and West) has a population of 1,869,377, agriculture is the dominant occupation of the inhabitants (Nasarawa Geology, 2020)

SAMPLING PROCEDURE AND SAMPLE SIZE

The list of fish farmers was obtained from Agricultural Development Programme (ADP) Headquarters in Lafia. Random sampling technique was used to select ninety available fish farmers in Lafia and Keffi Local Government Areas of the State.

DATA COLLECTION AND METHOD OF ANALYSIS

Structured questionnaire and scheduled interview were used to obtain information from the fish farmers. Data collected were analyzed using descriptive statistics (frequency and percentages). Inferential statistics (Pearson Product Moment Correlation (PPMC) was used to test level of significant relationship among the variables ($p < 0.005$).

RESULTS AND DISCUSSION

Table 1 shows the awareness of fish farming innovations among fish farmers. Results showed that innovations which fish farmers were aware of inlet and outlet devices (92.2%), liming and fertilization of ponds (91.1%) and improved breeding of fingerlings (86.7%). Soil testing before site selection had the least (56.7%) awareness. This showed that majority of fish farmers in the study area were aware of most of the innovations used to improve the fish farming conditions of their farms. Low level of awareness on soil testing before site selection among others could be attributed to the equipment and technicalities involved which does not make it common unlike other innovations. Muhammad *et al*, (2019) affirmed that awareness and adoption rate about water and soil testing techniques are good for obtaining healthy fish yield from ponds.

Table 1 Awareness of fish farming innovations among fish farmers

Innovations	No	%	Yes	%
Floating feeds	13	14.4	77	85.6
Soil testing before site selection	39	43.3	51	56.7
Water test kit	32	35.6	58	64.4
Liming and fertilization of ponds	8	8.9	82	91.1
Inlet and outlet devices	7	7.8	83	92.2
Improved breed of fingerlings	12	13.3	78	86.7
Feed formulation	22	24.4	68	75.6

Source; field survey 2021

Majority of fish farmers were in agreement with all the statements on perceived benefits of fish farming innovations considering the weighted mean ($\bar{X}$) value of 3.46 as shown in Table 2. Expansion of fish farm size ($\bar{X} = 3.82$) was rated highest, reduction in fish mortality ($\bar{X} = 3.63$), fish farm disease management ($\bar{X} = 3.63$), save cost on fingerlings, juvenile purchases ($\bar{X} = 3.60$); and proper water quality management ($\bar{X} = 3.57$). Analyzing how fish farming innovations has been perceived by the end users will not only identify research gaps, but also inform future innovation management models to support aquaculture growth and contribute to global food system sustainability.

Farmers may not adopt innovation due to lack of awareness; because ignorance about the benefits of recommended innovations plays major role in its usage. Mbabu and Hall (2012) opined that innovations have enabled the growth of the aquaculture sector within a broad spectrum of production systems. Dissemination of innovation such as



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fish breeding of commercially important species, diseases management, improved feeds and feeding have triggered fish farming development (Kumar and Engle, 2016)

Table 2 Fish farmers perceived benefits of innovations

Perceived benefits	SD	D	A	SA	$\bar{X}$	S.D.
Expansion of fish farm	2(2.2%)	1(1.1%)	8(8.9%)	79(87.8%)	3.82	0.55
Reduced fish mortality	3(3.3%)	-	24(26.7%)	63(70.0%)	3.63	0.66
Disease management	2(2.2%)	-	27(30.0%)	61(67.8%)	3.63	0.61
Save cost of fingerlings	4(4.4%)	-	24(26.7%)	62(68.9%)	3.60	0.72
Proper farm management	3(3.3%)	2(2.2%)	26(28.9%)	59(65.6%)	3.57	0.70

Source: Field survey 2021 Weighted mean = 3.6, figures in parentheses are in percentages

Table 3 shows the usage of fish farming innovations by fish farmers to include liming and fertilization of ponds (94.4%), inlet and outlet devices (91.1%), floating feeds (87.8%), improved breed of fingerlings (81.1%), while soil testing before site selection was the least (51.1%). Joffre *et al.*; (2019) the use or adoption of fisheries innovation by farmers depends on cost, availability of recommended inputs and ease of handling. Decision to adopt any innovation is complex, and the farmer must consider wide varieties of factors to determine if it is in the best interest of the farmer to do so at any given point in time (Kumar, 2018). Usage as the integration of an innovation into farmers' normal farming activities is not a permanent behavior of the farmers sometimes.

Table 3 usage of fish farming innovation

Fish farming innovation	N0	%	N0	%
Floating feeds	11	12.2	79	87.8
Soil testing before site selection	44	48.9	46	51.1
Water test kit	26	28.9	64	71.1
Liming and fertilization of ponds	5	5.6	85	94.4
Inlet and outlet devices	8	8.9	82	91.1
Improved breed of fingerlings	17	18.9	73	81.1
Feed formulation	36	40.0	54	60.0

Source: Field survey 2021

Table 4 Shows that there is a significant relationship between awareness of fish farming innovations and usage among the fish farmers ($r = .734$, $n = 90$, $p(.0001) < .05$). Hence, awareness of fish farming innovations enhanced the usage. The implication is that the more of innovations introduced to fish farmers the more they apply it on their farms. This is good for the economy because it will contribute to Government programme on food security through increase in protein supply.

Table 4 Pearson Product Moment Correlation (PPMC) showing the relationship between awareness of innovation and use of innovation

Variables	Mean	Std. Dev.	N	R	p-value	Remarks
Awareness of fish innovation	21.2444	2.51874	90	.734*	.0001	Sig.
Usage of fish innovations	20.5000	2.75294				

* Correlation is significant at the 0.05 level (2-tailed).

Source; field survey 2021

CONCLUSION AND RECOMMENDATION

The study concluded that fish farmers were aware of innovations and benefited maximally; their awareness greatly enhanced the usage. It is recommended that more fish farming innovations should be introduced to the fish farmers by researchers through the Extension service officers. Also efforts at sustaining the level of usage recorded in this study should be put in place while intervention programmes should be implemented to increase the level of introduced innovations and awareness for maximum productivity of the sector in the Nigerian's economy.

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- Brown, B. and Ratna, F. (2013). Fish farmer field school: towards healthier milkfish/shrimp poly-culture and fish farmer empowerment in South Sulawesi. *Aquaculture Asia*, 18(2):12–19.
- Badiru, I.O. and Amure, T.O. (2020): Utilization of collapsible fish tank innovation among homestead fish farmers in Osun State, Nigeria, *African Journal of Science, Technology, Innovation and Development* pp 1-10
- Joffre, O., Klerkx L, Dickson M and Verdegem M. (2017). How is innovation in aquaculture conceptualized and managed? A systematic literature review and reflection framework to inform analysis and action *Aquaculture* 470:128-148
- Kumar, G., and Engle, C.R. (2016). Technological advances that led to the growth of Shrimp, Salmon and Tilapia industries. *Reviews in Fisheries Science* 24(2): 136-152
- Kumar, G. (2018) .Factors driving Aquaculture Technology Adoption. *World Aquaculture Society* pp. 447-476
- Mbabu, A., and Hall., A. (2012). Capacity Building for Agricultural Research for Development: Lessons from Practice in Papua New Guinea. United Nations University-Maastricht Economic and Socio Research Institute on Innovation and Technology (UNU-MERIT), Maastrich
- Muhammad, M. Noor, M.A., Ahmed, W., Aldosari, F., Waqas, M.A., Zia, M.A., Zuhaiabe, M.M., and Jalip, M.W. (2019). Awareness and adoption level of fish farmers regarding recommended fish farming practices in Hafizabad, Pakistan *Journal of the Saudi Society of Agricultural Sciences*, 18. PP 41–48
- Nasarawa Geology (2020). Nasarawa State Government up loads www.nasarawastate.gov.ng pp1- 5
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