



[www.ijmra.us](http://www.ijmra.us)

July 2014

Volume-4, Issue-7

Impact Factor (IJSS) 2.628 for 2012 and 3.797 for 2013



**IJPSS**

(ISSN: 2249-5894)

**INTERNATIONAL JOURNAL  
OF  
PHYSICAL & SOCIAL SCIENCES**

- [editorijmie@gmail.com](mailto:editorijmie@gmail.com)
- [info@ijmra.us](mailto:info@ijmra.us)
- [www.ijmra.us](http://www.ijmra.us)





## **Chief Patron**

**Dr. JOSE G. VARGAS-HERNANDEZ**

Member of the National System of Researchers, Mexico

Research professor at University Center of Economic and Managerial Sciences,  
University of Guadalajara

Director of Mass Media at Ayuntamiento de Cd. Guzman  
Ex. director of Centro de Capacitacion y Adiestramiento

**DR. RAMACHANDRAN GURUPRASAD**

Scientist, Knowledge and Technology Management Division (KTMD),  
National Aerospace Laboratories.

## **Patron**

**Dr. Mohammad Reza Noruzi**

PhD: Public Administration, Public Sector Policy Making Management,  
Tarbiat Modarres University, Tehran, Iran

Faculty of Economics and Management, Tarbiat Modarres University, Tehran, Iran  
Young Researchers' Club Member, Islamic Azad University, Bonab, Iran

## **Chief Advisors**

**Dr. NAGENDRA. S.**

Senior Asst. Professor,

Department of MBA, Mangalore Institute of Technology and Engineering, Moodabidri

**Dr. SUNIL KUMAR MISHRA**

Associate Professor,

Dronacharya College of Engineering, Gurgaon, INDIA

**Mr. GARRY TAN WEI HAN**

Lecturer and Chairperson (Centre for Business and Management),  
Department of Marketing, University Tunku Abdul Rahman, MALAYSIA

**MS. R. KAVITHA**

Assistant Professor,

Aloysius Institute of Management and Information, Mangalore, INDIA

**Dr. A. JUSTIN DIRAVIAM**

Assistant Professor,

Dept. of Computer Science and Engineering, Sardar Raja College of Engineering,  
Alangulam Tirunelveli, TAMIL NADU, INDIA



www.ijmra.us

July 2014

Volume-4, Issue-7

**Impact Factor (IJPSS) 2.628 for 2012 and 3.797 for 2013**

**Dr. Krishan kumar**

Dean,  
School of Life Sciences, Singhania University Rajasthan, INDIA

**Dr. G. D. Singh**

Certified Manager - Cambridge Association of Managers, England,  
Founder & President, The Indian Management Academy - IMA

**Dr. Sorinel Capusneanu**

Associate Professor,  
Faculty of Finance and Accounting, "ARTIFEX" University, Bucharest, ROMANIA

**Benard Okelo Nyaare**

Assistant Lecturer,  
Bondo University College, Bondo, KENYA

**Dr. Meenakshi Gupta**

Assistant Professor,  
Shri Mata Vaishno Devi University- Katra, INDIA

## **Editor-in-chief**

**Dr. Li-Juan Lilie Tsay**

Chair, Assistant Professor  
Dept. of Applied English, Ming Chuan University, Tao-Yuan Campus

## **International Editorial Board**

**Prof. Dr. Prakash. M. M. S. Kinthada**

Associate Professor,  
Department Of Chemistrygit, Gitam University Visakhapatnam,530045, INDIA

**Dr. Yogesh K. Vermani**

Senior Assistant Professor ,  
Dept. Of Applied Sciences And Humanities, ITM University, Gurgaon, INDIA

**P Kiran Sree**

Principal,  
NBKR Institute Of Science And Technology, Vidyannagar 524 413, Nellore Dist, A.P., INDIA

**Dhahri Amel**

Assistant Professor ,  
Department Of Physics , Gafsa University-Faculty Of Sciences , Tunisia

**Ashish Kumar Sharma**



www.ijmra.us

July 2014  
Volume-4, Issue-7

**Impact Factor (IJPSS) 2.628 for 2012 and 3.797 for 2013**

Assistant Professor,  
Dept. Of Mathematics, Manav Bharti University, Solan (H.P), INDIA

**Dr. Zeeshan Ahmed**

Department Of Bioinformatics,  
University Of Wuerzburg, Wuerzburg, Germany.

**Parul Mishra**

Assistant Professor , Department Of Applied Sciences And Humanities ,  
Dronacharya College Of Engineering , Farrukhnagar, Gurgaon-123506(Haryana) , INDIA

**Dr Ajmer Singh**

Senior Scientist, Agri Economics, Social Science Section,  
Central Agricultural Research Institute, Port Blair, A & N Islands, INDIA

**Dr.N.Seraman**

Department Of English Language And Literature, Central University Of Tamilnadu,  
City, State, Country: Tiruvarur, Tamilnadu, INDIA

**Dr. B. R. Venkatraman**

Assistant Professor, Periyar E.V.R.College (Autonomous),  
Pg & Research Dept. Of Chemistry, Tiruchirappalli, Tamilnadu, INDIA

**Dr. S. Sreenivasa**

Chairman And Deputy Registrar ( Evaluation ),  
Department Of Chemistry, Tumkur University, Tumkur -572 103

**Dr. Subhash Chand**

Central Agricultural Research Institute,  
Social Science Division, Garacharma, Post, Port Blair -744105, Andaman And Nicobar Islands

**Dr M. S. Kundu**

Senior Scientist ( Animal Nutrition),  
Central Agricultural Research Institute, C.A.R.I. Port Blair A & N Islands

**K.V.L.N.Acharyulu**

Faculty Of Mathematics ,  
Bapatla Engineering College, Bapatla-522101, Andhra Pradesh, INDIA

**Dr. Modhera Bharatkumar K.**

Assistant Professor, Department Of Chemical Engineering ,  
Maulana Azad National Institute Of Technology, Bhopal, INDIA

**Dr. GOVINDU VANUM**

Asst.Professor, Institute of Geo-Information and Earth Observation Sciences,  
Mekelle University Main Campus, Arid, Mekelle, Tegray, Ethiopia.

**Technical Advisors**



www.ijmra.us

July 2014

Volume-4, Issue-7

**Impact Factor (IJSS) 2.628 for 2012 and 3.797 for 2013**

**Mr. Rajan Verma**

Lecturer, Department of Computer Science, Ambala, INDIA

**Mr. Ankit Jain**

Department of Chemical Engineering, NIT Karnataka, Mangalore, INDIA

**Mr. Anil Chandra**

Department of Biotechnology, Indian Institute of Technology Guwahati, Assam, INDIA

**Prof. Bharati Veerendra**

Asst. Professor - MCA, K. J. Somaiya's SIMSR., univeristy of Mumbai, Mumbai, INDIA

**Mr. Gagandeep Singh**

Department of Biotechnology, Kurukshetra University, Kurukshetra, INDIA

## **Associate Editors**

**Dr. SANJAY J. BHAYANI**

Associate Professor, Department of Business Management, RAJKOT, INDIA

**MOID UDDIN AHMAD**

Assistant Professor, Jaipuria Institute of Management, NOIDA

**Dr. SUNEEL ARORA**

Assistant Professor, G D Goenka World Institute, Lancaster University, NEW DELHI

**Mr. P. PRABHU**

Assistant Professor, Alagappa University, KARAIKUDI

**Mr. MANISH KUMAR**

Assistant Professor, DBIT, Deptt. Of MBA, DEHRADUN

**Mrs. BABITA VERMA**

Assistant Professor, Bhilai Institute Of Technology, DURG

**Ms. MONIKA BHATNAGAR**

Assistant Professor, Technocrat Institute of Technology, BHOPAL

**Ms. SUPRIYA RAHEJA**

Assistant Professor, CSE Department of ITM University, GURGAON



**International Journal of Physical and Social Sciences**  
(ISSN: 2249-5894)

**CONTENTS**

	TITLE & NAME OF THE AUTHOR (S)	Page No.
1	<b>A Strategy to Ensuring That the Development of Tourism in Cape Coast Metropolis over the Next 10-15 Years Is Based On Competitiveness, Environmental, Social, Cultural and Economic Sustainability.</b> Tsatsu MacCarthy [MIH]	<u>1-19</u>
2	The study of knowledge management's effect on CRM success. Fereshteh Mohseni and Seyedyahya Seyeddaneh	<u>20-27</u>
3	<b>Gender Inequality In Home Based Care For People Living With Hiv/Aids In Monduli District, Tanzania.</b> Theresia Elias Ntogwa	<u>28-39</u>
4	The relationship between Economic Growth and Environment and Trade in Developing Countries. Mohsen Mehrara, Abbas Rezaadehkarsalari and MaysamMusai	<u>40-52</u>
5	<b>Towards Understanding The Coping Strategy Among Student-Athletes.</b> M.S. Omar-Fauzee, Fauzi Husin, Arumugam Raman and Ismail Hussein Amzat	<u>53-63</u>
6	<b>Shahbandar (A Mughal Port Officer); His Role in the customhouse during Mughal period.</b> Sagufita Parveen	<u>64-72</u>
7	<b>The Harem of the Mughal Nobles: A comparative study.</b> Majida Khatoon	<u>73-79</u>
8	<b>Agricultural Productivity and Food Security in India: Issues and Concerns.</b> Dr.Zeba Sheereen	<u>80-96</u>
9	<b>Farmer's Adoption of Improved Techniques of Sweet Potato Production in Niger State, Nigeria.</b> Tsado, J. H., M.A. Ojo, E.S. Yisa and O.J. Ajayi	<u>97-110</u>
10	A study on knowledge of primigravidas regarding minor problems of newborns in a selected hospital at Mangalore Taluk with a view to develop an information booklet. Mrs. Sujatha.R and Ms. Reshma	<u>111-122</u>
11	<b>Climate Change, Sustainable Development and Indian Economy.</b> Dr. SR.Keshava	<u>123-133</u>
12	A Study On The Psychosocial Problems Among Antenatal Women In Selected Community At Mangalore. Mrs. Nalini M and Mrs.Aruni G	<u>134-143</u>

	<b>The Indian Newspapers Focus too much on Crime Stories?</b> Wahab Mughani Vadhera	<u>144-150</u>
<u>14</u>	<b>Care Givers' Opinion On Home Based Care Services Provided To People Living With HIV/AIDS In Manduli, Tanzania.</b> Theresia Elias Ntogwa	<u>151-160</u>
<u>15</u>	<b>Inflation And Economic Growth In The Indian Economy.</b> Dr. S. V. Hariharan and M. Tamizharasan	<u>161-180</u>
<u>16</u>	<b>Understanding of Sponsorship, Brands, Social Media and Technology, and Future Directions of Professional Sport: From Three Sport Management Programs' Students.</b> Jong-Chae Kim, Jaeyeon Hwang and Young Tae Kim	<u>181-195</u>
<u>17</u>	<b>Non-Governmental Organizations' (NGOs) Participation in Empowering HIV/AIDS Orphaned Children through Dietary Support in Njoro District, Nakuru County, Kenya.</b> Nyangena Emily Moraa and Dr. Erick K. Bor	<u>196-210</u>
<u>18</u>	<b>Urban chicken Production and Household income in Dodoma Municipality, Tanzania.</b> Joyce Steven, Upendo W. Mmari and Immaculate O. Gillo	<u>211-228</u>
<u>19</u>	<b>Identification of Oromotor Impairments Perceived by Parents related to Feeding Difficulties in Children with Cerebral Palsy.</b> Nadeem Ghayas, Dr. ShaistaNaz, Dr. HinaFazil and Prof. Dr. NasirSulman	<u>229-250</u>
<u>20</u>	<b>Themes and Subject Areas of Mass Communication Research - A study of undergraduate research projects in two selected universities.</b> Christopher Enwefah Itetegbe	<u>251-262</u>
<u>21</u>	<b>A Study On Awareness And Attitude Towards Family Welfare Program.</b> Prof. J.Vijaya Lakshmi	<u>263-271</u>
<u>22</u>	<b>Effects Of Socio-Economic Factors On The Adoption Of Improved Production Technologies By Fish Farmers In Kogi State, Nigeria.</b> O.J. Ajayi, O.B Adeniji, R.S. Olaleye and J.O. Oyero	<u>272-284</u>
<u>23</u>	<b>The 'Self-Dignity' Movement of Eighteen Seventy Three: Caste, Protest and Social Boycott of the Namasudras of Bengal.</b> Manosanta Biswas	<u>285-296</u>
<u>24</u>	<b>Gender Stereotyping In Secondary Schools And Aftermath Of The Socialization: A Case Of Morogoro Municipality.</b> Solomon Mhango and Gaston Stanslaus	<u>297-314</u>
<u>25</u>	<b>Environmental Education and Attitude towards Social Awareness on Plastic Pollution of Higher Secondary School Students in Hooghly District.</b> Dr. Mridula Das	<u>315-335</u>
<u>26</u>	<b>The Relationship Of Isfahan Architecture And Music(Safavi).</b> Bahareh Pishkhan and Dr.Majid Salehi Nia	<u>336-356</u>
<u>27</u>	<b>Sustainability Of Sunflower Farming Projects In Improving Farmers' Livelihoods: A Case Of Mvomero District.</b> Mameho, Baptista. Zemba, Janeth. and Sewando, Ponsian	<u>357-371</u>
<u>28</u>	<b>Collective Bargaining In Jammu And Kashmir Bank.</b> Sheikh Raheela Nazir, Orusa Yaseen Bisati and Aushaq Hussain	<u>372-381</u>

**Impact Factor (IJPSS) 2.628 for 2012 and 3.797 for 2013**

<b>Impact Of Leadership On Organisational Performance With Specific Reference To Multinational Companies In Sri Lanka.</b> Dr. Naim Abeysekera and Pashpa J.S. Rajapakse	<u>382-404</u>
<b>Protection Of Environment: A Constitutional Goal.</b> Dr. Krishan Kumar Kajal	<u>405-421</u>
<b>THE RETAIL INDIA: Present will guide the future.</b> Dr. Anand Quashi and Dr. Sharad Tiwari	<u>422-439</u>





EFFECTS OF SOCIO-ECONOMIC FACTORS ON THE  
ADOPTION OF IMPROVED PRODUCTION TECHNOLOGIES  
BY FISH FARMERS IN KOGI STATE, NIGERIA

O.J. Ajavi\*

O.B. Adeniji\*

R.S. Olaleve\*

O. Overo\*\*

*Abstract*

The study investigated the effects of socio-economic factors on the adoption of improved technologies by fish farmers in Kogi state, Nigeria. The specific objectives of the study were to examine the socio-economic characteristics of the fish farmers, ascertain the level of awareness of improved fish production technologies, identify the improved fish production technologies adopted and determine the factors affecting the adoption of improved technologies by the fish farmers in the area. Five Local Government Areas were purposively selected for the study because of the concentration of fish farmers in the areas. They are Lokoja, Idah, Ajaokuta, Kabba/Bunu and Igarra. A total of 80 fish farmers (using multi stage sampling techniques) were selected and information elicited from them using interview schedule. Data analysis involved descriptive and inferential statistics. Result shows that the mean age of the fish farmers was 47 years. Stocking (93.8%), fish feeding technique (91.2%), harvesting (81.3%) and pond draining method (75.0%) were the most adopted technologies. Binomial logit regression indicated that at 0.05 level of significance, there was a positive and significant relationship between education and extension visits. Fish farmers should encourage education and extension visits in order to enhance the food security status of the study area and consequently Nigeria.

*Keywords:* Fish farmers, Technology, Adoption

*Corresponding Author:* O.J. Ajavi, Department of Agricultural Economics and Extension Technology, Federal University of Agriculture, P.M.B 65, Minna, Niger State, Nigeria.

*Co-author:* R.S. Olaleve, Department of Water Resources, Aquaculture and Fisheries Technology, Federal University of Agriculture, P.M.B 65, Minna, Niger State, Nigeria.

Blind Peer Reviewed Refereed Open Access International e-Journal - Included in the International Serial Directories  
Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate, India as well as in Cabell's Directories of Publishing Opportunities, U.S.A.

International Journal of Physical and Social Sciences

<http://www.ijmra.us>

## INTRODUCTION

Out of the three fundamental needs of human beings (i.e. food, clothing and shelter), food is probably the most important. Food contains nutrients that give energy, growth and maintenance of health. Achieving and maintaining food security is a fundamental problem facing the world today. Despite substantial increase in food production in many countries, over 500 million people still suffer from malnutrition (Tacon, 2001).

Aquaculture which has been defined as the husbandry of aquatic organisms such as fish, shellfish and even plants is an integral sub-sector of agriculture and it is still one of the primary occupation of most people in developing nations of the world. It is an essential part of the world's food producing sector, providing about 50 % of the world's food fish supply (FAO 2011).

In the year 2010, capture fisheries and aquaculture provided the world population with about 148 million metric tonnes of fish, of which about 128 million tonnes was utilized as food for people (FAO, 2010). With sustained growth in fish production and improved distribution channels, world fish food supply has grown dramatically in the last five decades, with an average growth rate of 3.2 % per year in the period 1961 – 2009, outpacing the increase of 1.7 % per year in the world population (FAO, 2010). Aquaculture development has not realized its potential in many developing countries as the need for integrating aquaculture development into overall comprehensive rural development programs has not been fully appreciated. While an annual growth of 14 % in aquaculture appears impressive, most of the growth has been recorded in China with only about 4.4 % occurring in other countries. The least developed countries (LDCs), mostly in Sub-Saharan Africa and in Asia; remain minor in terms of their share of world aquaculture production (4.1 % by quantity and 3.6 % by value). However, some developing countries in Asia and Sub-Saharan Africa including Nigeria are making rapid progress to become significant or major aquaculture producers in their regions. Therefore, fish and fishery products represent a very valuable source of protein and essential micronutrients for balanced nutrition and good health. In 2009, fish accounted for 16.6 % of the world population's intake of animal protein and 6.5 % of all protein consumed (FAO, 2010)

In Nigeria, production of fish from aquaculture experiences an annual increase of 10 % which accounts for about 20 % of the domestic need. This rate is translated to about 80, 000 metric

tonnes of fish per annum which is far less than national demand of 1.5 million metric tonnes ([www.africanagriculture.com](http://www.africanagriculture.com), 2008). The only way the deficit of 1.1 million metric tonnes can be met is through importation which will cost the country about \$241 million per annum if local production cannot meet the deficit ([www.africanagriculture.com](http://www.africanagriculture.com), 2008).

According to the World Fish Centre (2007), one of the promising solutions to the shortage of animal protein intake in developing countries is the proper development of aquaculture.

The total environment can be divided into two elements namely: technology and human. Technology determines the type and physical potential for fish farming, including the physical and biological factors that can be modified through technology development. The human element is characterized by exogenous (community structures, external institutions etc.) and endogenous factors, which can be controlled by the farm household. At the centre of this interaction is the fish farmer. The fish farmer ultimately decides on whether or not to adopt technologies and how to assign resources to support them (Ingold, 2002).

#### Problem Statement

Fish constitutes a major source of protein in human diet and it has no religious rejections or bias when compared with other animal sources of protein like pigs which is condemned by the Muslims and cattle by the Hindus.

Fish is a relatively cheaper source of protein. It has an important role in world protein supplies particularly in developing countries. Besides protein, fish provides energy, fatty acids, vitamins and minerals (Ladipo, 1994). It is also a well-known fact that animal protein is seriously inadequate in the daily diet of many people in the tropics including Nigeria.

Fish oil is also rich in vitamins A and D, which are needed for the proper functioning of the eyes and healthy bone development. Protein deficiency is responsible for a number of illness and death. It reduces immunity to diseases and can lead to poor growth (Nwuba and Onuoha, 2006).

The continued increase in desert encroachment has resulted in greater dependency on fish as the main source of animal protein. Fish is particularly adapted to the water environment but show great variation in size as well as in shape. The main sources of fish supply in Nigeria are domestic fish production and fish importation.

Nigeria is blessed with about 1.5 million hectares of bond water mass, capable of producing over 1.5 million metric tonnes of fish annually (Ita, 1996). However, the current overall fish production is estimated at 0.6 million metric tonnes of which aquaculture produced some 30, 000 metric tonnes of various freshwater and brackish water fish species in 2000 (Fagbenro, 2005). Due to yearly decline in fish harvest from oceans, rivers and lakes and continued stable demand for fish product, there is rising interest in aquaculture with domestication of more fish species.

The need for the availability of enough food in order to sustain life and good health of the entire world's population at all times across all countries and regions, across all income groups and all members of households requires the supply of an adequate amount of food so as to meet the nutritional requirements/need of all people at all times cannot be overemphasized (Williams, 1996).

#### **Objectives of the study**

The broad objective of the study was to evaluate the effects of socio – economic factors on the adoption of improved production technologies by fish farmers in Kogi state, Nigeria.

The specific objectives were to:

- I. describe the socio- economic characteristics of the fish farmers in the study area.
- II. ascertain the level of awareness of improved fish production technologies by the fish farmers in the study area.
- III. identify the improved fish production technologies adopted by the fish farmers in the study area and ;
- IV. determine the factors affecting the adoption of improved technologies by the fish farmers in the study area.

#### **Methodology**

The study was conducted in Kogistate which was purposely selected due to the prevalence of fishery activities in the states. Kogi state was formed in 1991 from parts of Kwara and Benue states. The state lies on latitude  $7.9^{\circ}$  North and longitude  $6.45^{\circ}$  East. It is bordered to the east by Benue state, Northeast by Nassarawa state, Enugu, Anambra and Delta states borders the state to the south while Ondo, Ekiti and Kwara states borders the state to the west. Niger state and the Federal Capital Territory, Abuja borders the state to the North.

Kogi state has a total land area of 28, 313.53 square kilometres and a projected population of 22,74,487 people according to the census conducted in 2006 (Encyclopaedia Britannica, 2013).

#### Population of the Study

The population for the study consist of all registered fish farmers in the study area. The total number of fish farmers registered and scattered throughout Kogi State at the time of the study was 250 (Kogi State Agricultural Development Project).

#### Sampling Technique and Sample size

Five Local Government Areas (LGAs) each having the highest number of registered fish farmers were selected. The selected LGAs in Kogi state were Lokoja, Idah, Ajaokuta, Kabba/Bunu and Kotonkarfe. 60 % of the registered fish farmers in each of the selected LGAs were sampled. A total of 80 respondents were used. The detail of the sample size is as shown in table 3.1

#### Method of Data Collection

Data were elicited from the fish farmers by using structured interview schedule designed in line with the objectives of the study, administered by the researcher with the assistance of trained enumerators.

Table 3.1: Selection of the Respondents from Five Local Government Area in Kogi State.

Local Government Area	Number of Fish Farmers	Number of Respondents Sampled
Lokoja	45	27
Idah	32	19
Ajaokuta	25	15
Kabba/Bunu	20	12
Kotonkarfe	12	7
Total	134	80

Source: Kogi State Agricultural Development Project, 2012.

#### Analytical Techniques

Objectives I, II and III: This was analysed using descriptive statistics such as frequency distribution, tables, percentage, mean and standard deviation to group and summarize the data obtained from the field.

To achieve the research objective, a multinomial logit model was constructed and used as used by Bandara and Thiruchelvam (2008). The fish farmers were categorized based on the number of technologies adopted.

The explicit form of the function is specified as follows:

$$Y_i = X_0 + X_1AGE + X_2EDU + X_3EXP + X_4POS + X_5SOP + X_6EXC + X_7YLD + X_8HHS$$

Table 3.4: Definition of the Independent Variables used in Adoption Models of the Fish Farmers.

Variables	Definitions
AGE	Chronological age in numbers of completed years by the respondent at the time of interviews.
EDU	Number of years spent in school.
EXP	Number of years to which a respondent has been practicing fish farming.
POS	Extent of water area (in m <sup>2</sup> ) used for fish farming.
SOP	Extent to which the respondent participated in the activities of formal social organization.
EXC	Frequency of contact of a respondent with any extension personnel.
YLD	Total quality of yield/output in kg/m <sup>2</sup> .
HHS	Household or family size.

**RESULTS AND DISCUSSION**

Results in table 4.1 reveals that majority of the fish farmers (85.0 % ) were within the age range of 20 – 50 years.

This indicates that young and middle aged people are involved in fish farming. This is because fish farming requires adequate attention and a lot of sense of responsibility. The result agrees with the findings of Ofuokuet *al.*, (2008) who reported that people above the age of 50 years were less involved in fish farming because they lack adequate stamina required in the management of the business.

The male dominance of this source of livelihood might be due to the laborious nature of fish farming operations right from pond construction to management. The finding obtained is in agreement with that of Basorun and Olakunleyin (2007) that stated that fish farming is male oriented.

87% of the respondents had secondary education and above which implies that majority of the respondents are educated. Farmers' education level has been found to positively influence the adoption of improved production technologies (Obukosia, *et al.* 2004). The fish farmers' level of education encouraged the adoption of improved production technologies.

81% of the respondents had a household size of between 6 – 10 persons implying that the respondents had moderate household size.

Household size is an important factor in agriculture because to a large extent, it determines the extent of labour supply available. The results obtained is in line with that of Olanipekun and Ajinwa (2009) who said that large family size is an incentive for engaging in livelihood diversification in order to meet family obligations.

**Table 4.1: Socio- Economic Characteristics of Sampled Fish Farmers**

Kogi State ( n=80)	
Variables	Frequency Percentage

**Age (years)**

Below 21	1	1.3
21 – 30	6	7.5
31 – 40	14	17.5
41 – 50	48	60.0
Above 50	11	13.7
Total	80	100.0

**Sex**

Male	72	90.0
Female	8	10.0
Total	80	100.0

**Marital Status**

Single	6	7.5
Married	74	92.5
Divorced/Separated	-	-
Total	80	100

**Level of Education**

No form of Education	-	-
Quranic/Adult Education	-	-
Primary	9	11.3
Secondary	61	76.2
Tertiary	10	12.5
Total	80	100.0

**Household Size**

< 6	48	60.0
-----	----	------



6 – 10	7	8.7
11 – 15	-	-
16 and above	80	100.0

Total

**Fish Farming(years)**

< 6	36	45.0
6 – 10	38	47.5
11 – 15	6	7.5
16 and above	-	-
Total	80	100.0

Source: Field survey 2012

The reason of high adoption rate for stocking, fish feeding and pond drainage is because it will ultimately determine the yield (output). Stocking implies the number of fish put in water, feeding is the quantity and quality of nutrients needed by fish as well as the timing of giving feed to the fish. Maintenance is also paramount because it will prevent outbreak of diseases as well as reduce retarded growth in fish.

The technologies that had low adoption which include pond fertilization, earthen pond and plastic/fibre pond may be due to economic reasons as plastic/fibre ponds are expensive and may not be affordable by the fish farmers.

Table 4.11: Distribution of Fish Farmers' Awareness, Trial and Adoption of Improved Technologies in Kogi State.

Variables	Aware (100 %)	Trial (100 %)	Adoption (100 %)
-----------	---------------	---------------	------------------

Stocking method	80 (100.0)	80 (100.0)	75 (93.8)
Fish feeding technique	80 (100.0)	80 (100.0)	73 (91.2)
Pond fertilization method	80 (100.0)	80 (37.5)	16 (20.0)
Maintenance	76 (95.0)	69 (86.2)	45 (56.2)
Pond draining method	80 (100.0)	74 (82.5)	55 (68.8)
Harvesting	80 (100.0)	80 (100.0)	65 (81.3)
Concrete Pond	80 (100.0)	75 (93.8)	49 (61.3)
Earthen Pond	80 (100.0)	40 (50.0)	20 (25.0)
Plastic/Fibre Pond	80 (100.0)	20 (25.0)	11 (13.8)

Source: Field Survey, 2012

**Educational Status of the fish farmers:** Educational status has a positive and significant relationship with the adoption of improved technologies at 1 % probability level. This implies that the more educated the fish farmers, the more the chances of their ability to access information and hence they have capacity to analyse such information and make valid decisions that will enhance their fish farming activities when compared to their illiterate colleagues. This agrees with the findings of Tologbonse (2004) who stated that education affects the speed with which new technologies are diffused and accepted by the farmers.

**Extension Visit:** Extension visit had a positive influence on the adoption of improved technologies at 1 % probability level. Extension contact offer support services to the farmers as well as teaching them on how to improve upon their present practice and this will enhance the process of adoption. This implies that the more contact the fish farmers have with extension agents, the more likely they will adopt improved technologies. This is in agreement with the findings of Tadesse (2008).

**Output:** The output (yield) of the fish farmers positively and significantly influenced the probability of adoption of improved technologies at 5 % significant level. The output of farmers

also determines the income of the farmers. This implies that as the output increases, the financial status of the fish farmers is enhanced and they are likely to adopt improved technologies.

Table 4.29: Binomial Logit Regression showing the Factors Affecting the Adoption of Improved Technologies by Fish Farmers in Kogi State.

Variables	Marginal Effect	Coefficient and Z-Values
Constant		-3.0278 (-1.61)
Age		-0.0246 (1.06)
Education(years)		0.1138 (2.24) ***
Experience		0.0367 (0.85)
Pond Size		0.0032 (0.75)
Cooperative Membership		0.1675 (0.29)
Extension Visit		0.6544 (4.37) ***
Training		-0.1980 (-0.29)
Output (Yield)		0.0007 (2.19)**
Household Size		-0.0102 (-0.11)
Average Marginal Effect: Extension Visit	0.0951	(7.71)
Education	0.0165	(2.41)
Output	0.0001	(2.39)

Number of Observation = 100 Numbers in Parenthesis are Z values

Log likelihood = -44.6846

LR Chi-Square = 46.00

Prob > Chi-square = 0.0000

Pseudo R<sup>2</sup> = 0.3341

\*\*\* = Significant at 1% level of probability

Source: Field Data Analysis 2012

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate, India as well as in Cabell's Directories of Publishing Opportunities, U.S.A.

International Journal of Physical and Social Sciences

<http://www.ijmra.us>

### Conclusion

From the study, majority of the fish farmers were aware of improved fish production technologies but stocking method, fish feeding technique, harvesting and pond draining method. Education, extension visit, and age were significant factors affecting adoption of improved technologies by fish farmers. In order to increase the level of fish production, extension visits should be improved upon both in the quality of information delivery and frequency of visit. Formal and informal education should be encouraged among the fish farmers in the study area.

### References

- Bandara, D. and Thiruchelvam, S. (2008). "Factors Affecting the Choice of Soil Conservation Practices Adopted by Potato Farmers in NawaraEliya District, Sri Lanka". *Tropical Agricultural Research and Extension*. 1: 49 –54.
- Basorun, Y. O. and Olakunleyin, J. O. (2007). "The Lagos State Fish Farmers Association". *Leisa*. 23(1):10-11
- Encyclopaedia Britannica (2013).
- Fagbenro, O. A. (2005). Aquaculture in Nigeria; History, Status and Prospects. A Report of Food and Agricultural Organization (FAO) World Fish Centre Workshop, Cameroon.
- Food and Agricultural Organization (FAO) (2010). The State of World Fisheries and Aquaculture 2010. Rome, FAO. 2010. Pp. 1-197.
- Food and Agricultural Organization (FAO) (2011). Aquaculture Farmer Organizations and Cluster Management Concepts and Experienced. Rome. Pp. 1- 104.
- Ingold, T. (2002). "The Perception of the Environment Essays in Livelihood Dwelling and Skill". Routledge Taylor and Francis Group, London and New York. Pp. 294 – 322.
- Ita, E.O. (1996). Enhancing Potential Fish Catch in Nigeria's Inland Water. In: 1996 FISON proceeding FISON Lagos
- Ladipo, O. L. (1994). General System Analysis and Simulation Approach. A Preliminary Application to Nigerian Fisheries.
- Nwuba, L.A. and E. Onuoha, 2006. Fish Farming in the Tropics: A Functional Approach. Maxi Prints, Awka, Nigeria.
- Obukosia, S. D.; Nyangio, H. O.; Waikhaka, K. and Nzuma, M. J. (2004). An Assessment of the Socio- Economic Factors Affecting the Adoption of Citrus Tissue Culture Technology in Kenya. Food and Agricultural Organization Report.

- Ofuoku, A. U.; Emah, G. N. and Itedjere, B. E. (2008). "Information Utilization among Rural Fish Farmers in Central Agricultural Zone of Delta State, Nigeria". *World Journal of Agricultural Science*. 4(5): 558-564.
- Olanipekun, A. A. and Kuponiyi, F. A. (2009). "The Contribution of Livelihood Diversification to Rural Household Welfare in Ogbomoso Agricultural Zone of Oyo State, Nigeria". *Nigerian Journal of Rural Sociology*. 11(2): 18-26
- Tacon, A. G. (2001). "Increasing the Contribution of Aquaculture for Food Security and Poverty Alleviation." *Technical Proceedings of the Conference in the Third Millennium*. Held at Bangkok, Thailand. Pp. 63 – 72.
- Tadesse, A. M. (2008). Farmers Evaluation and Adoption of Improved Onion Production Packages in Fogera, Ethopia. Unpublished Msc. Thesis.
- Tologbonse, E. B. (2004). Adoption of Improved Rice Technology by Farmers in the Upland Valley Swamps of the Middlebelt Zones of Nigeria. Unpublished Ph. D Thesis in the Department of Agricultural Extension and Rural Development, University of Ibadan, Nigeria.
- Williams, M. J. (1996). The Transaction in the contribution of Living Aquatic Resources to Food Security. Food and Agricultural Organization Discussion. Paper 13.
- World Fish Centre (2007). Successful Application of GIFT Technology in Ghana and Malawi. [www.worldfishcentre.org/pubs/corporate](http://www.worldfishcentre.org/pubs/corporate).
- [www.africanagriculture](http://www.africanagriculture) (2008). Fish Supply Falls Behind Demand in Nigeria; Input Outcompete Domestic Fisheries.