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## EVALUATION OF FADAMA III PROJECT IN THE NIGER DELTA AREA OF NIGERIA: CONSTRAINTS AND STRATEGIES PERCEPTIONS

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### ABSTRACT

The study evaluated the constraints to the Fadama III project in some Niger Delta areas; namely, Akwa Ibom, Bayelsa, and the Delta States of Nigeria. A multistage sampling process was engaged to choose a sample of 420 respondents for the study. Data analyzed was done using means and ANOVA. Results obtained revealed that some constraint such as inadequate fund ( $\bar{x}=3.78$ ), inadequate inputs support ( $\bar{x}=3.35$ ) and high bureaucracy of donor agencies ( $\bar{x}=3.31$ ) were identified as serious constraints by the respondents. The pooled mean constraints of respondents in the study area were Bayelsa, 2.40; Akwa Ibom, 2.32; and Delta, 2.24 accordingly. High values were placed on proposed strategies to overcome Fadama III constraints such as the conduct of regular farmers training sessions (mean=3.36) and improved FUG management team (mean = 3.30). The study concluded that some constraints are serious and others not serious; and accepted the null hypothesis ( $p>0.05$ ) that there was no significant variation in the constraints facing the Fadama III project among the selected Niger Delta States. The study noted that there should be more support in the provision of farm inputs and assets to catapult productivity and timely delivery of advisory support.

### Contribution/ Originality

The study contributed to exposing the constraints facing farmers and employed strategies to encourage best management practices and sustainability in agricultural productivity in the Niger Delta area.

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## 1. INTRODUCTION

Constraints to agricultural productivity in Nigeria, according to Dayo *et al.* (2009) include poor agricultural pricing policies, low use of fertilizer and improved crop varieties, poverty and women's limited access to inputs/assets, low access to agricultural credit, low public expenditure on agricultural research, poor funding of agricultural technologies, poor funding and coordination of Agricultural Extension. Ike (2014 and 2016) buttressed the fact that over time, low-income levels constitute constraints in agricultural productivity. Other problems are land tenure system and land degradation, poor post-harvest management system, poor market access/marketing efficiency, and poor road conditions. Ajieh and Uzokwe (2007) in a study on Adoption of Cassava Production Technologies among Women Farmers, identified five important constraints to the adoption of cassava production technologies. These are inadequate funds, the huge cost of technologies, low volume of land space, insufficient of appropriate technologies, and low extension contact. Poor participation in agricultural production was also seen as factors contributing to constraints in farming ventures (Inoni *et al.*, 2017).

Agricultural activities are entangled with many challenges; varying from social to economic factors particularly among the undeveloped nations (Ovwigbo, 2014a; Ajieh and Okoro, 2015). Ovwigbo (2014b) advocated that effective advisory services are useful strategies in overcoming constraints facing agricultural development in Nigeria. In a similar note, Gani *et al.* (2019) expatiated on the need to diversify in livelihood activities as part of strategies to reduce the challenges in food security. Strategies adoptions are way forward to the amelioration of poor productivity in agriculture as a result of constraints. Gbigbi *et al.* (2019) viewed cooperative financial support as part of strategies to reduce the numerous constraints plaguing farm practices as typified in the aquaculture sector. This applies to Fadama III. Fadama III operationalization is based on group dynamics as displayed in a cooperative society mechanism.

Fadama fundamentally originated from a Hausa word connoting low land, alluvial deposit cropland farming. A chronicle trend in the development of Fadama in partnership with the World Bank has this sequence: Fadama I (1993 - 1999), Fadama II (2003 -2007), and Fadama III project (2009 - 2014). Thereafter, the Fadama III project integrated with State Employment and Expenditure for Results (SEEFOR) to reach the unreached areas of the Niger Delta states with the same mandate (2015 - 2017). The Fadama activities cover agricultural production, livelihood potentials, infrastructural interface, marketing, and community felt needs across registered cooperative members such men, women, widows, and youths (Ovwigbo, 2013; Chukwuji, 2013; Ovharhe, 2017). The Fadama administration is a bottom-top approach where registered farmers known as Fadama Users' Groups (FUGs) and Fadama Community Association (FCAs) pass through Fadama Local Facilitator to the Fadama management team and State Project Coordinator (SPC). Fadama III project has rendered many technical innovations to farmers to boost their yields and income generation. In recent times, Blewitt (2008) stressed that technological advancements help provide farmers with tools and resources to make farming more sustainable. Fadama III project is focused on group participation as designed and community-based.

Fadama III project participants are like stakeholders in agribusiness who cannot function if their farming and post-harvest activities are hampered by excessive bureaucracy. The prevalent-present issue of corruption and setbacks can seriously have an impact on agricultural marketing efficiency as constraints in many nations by increasing the transaction costs faced by stakeholders in the marketing chain (Reardon *et al.*, 2003). Inefficient agricultural marketing is perceived as a constraint

Fadama III project upholds food security views. A major constraint to food security is a setback in agricultural communication of the latest technology to farmers which involves the unavailability of relevant agricultural information in most communities. Ugboma (2009) pointed out that most

farmers visit local extension advisers community offices find it difficult to get materials, literature, and information on contemporary agriculture. This gap was confirmed by Ovharhe (2014) in a survey of food production in Delta State, Nigeria. Fadama III project in a bid to alleviate these constraints, set up outreach offices in proxy for local facilitators. The issue is how effective are they? It is effective or not is one of the purposes of assessing their status in this study. The decline in agricultural productivity is partly tied to the negligence in addressing prevalent limitations or constraints to food security in the Niger Delta area.

To address any perceived constraints, a management team of both internal staff and external stakeholder experts conduct Participatory Rural Appraisal (PRA), Need Assessment (NA), and Baseline Studies which form templates to strategic planning and implementation of mandates. Many Fadama operational areas work with mandates that are component-based. Both internal and external stakeholders provide counterpart funding for project implementation across various FCAs. Advisory services include activities to identify new or improved agricultural and marketing opportunities to eliminate perceived constraints (National Fadama Development Office, 2007 and 2008; State Fadama Coordinating Office (SFCO, 2010). Ovharhe (2017) opined that there is a need to critically examine the different constraints and challenges that affected the Fadama III project in the Niger Delta to provide meaningful interventions for increasing farm productivity.

Importantly, to breach the gaps posed by perceived constraints, the study was motivated by this interrogation: to what extent did the envisaged constraints affect the Fadama III project across the selected Niger Delta States? Hence, this study aimed to assess the causal factors to Fadama III project constraints and propose strategies to overcome Fadama III constraints in the Niger Delta area. The study was guided with a null hypothesis that:

Ho: There is no significant variation in the constraints facing Fadama III farmers among the Niger Delta States.

## 2. METHODOLOGY

The population of the study comprised Fadama III farmers involved in cassava, poultry and fisheries production in Akwa Ibom, Bayelsa and Delta States of Nigeria. The three States were *purposefully* selected. The reason for the selection of three states from the nine states of the Niger Delta area is because Fadama operations are homogenous in design from the central, Federal Capital Territory, Abuja. A multistage sampling procedure was used to select respondents *randomly* from the study area. The lists of registered cassava, poultry, and fisheries FCAs and FUGs were obtained from the State Fadama Coordinating Offices (SFCOs). From the list of registered farmers groups with the three States Fadama Coordinating Offices (SFCOs), a baseline of 28 functional FUGs (25%) were selected from 112 FUGs across the LGAs respectively. This resulted in 84 FUGs from three States. Furthermore, 70 cassava farmers, 40 poultry farmers, and 30 aquaculture farmers were *randomly* selected to achieve a sample size of 140 farmers per state and 420 respondents on the whole (Table 1). It should be noted that each FUG has a range of 10 - 15 members hence a baseline of five farmers was selected from each group.

**Table 1: Sampling distribution of respondents in the study area**

State Stage 1	LGAs Stage 2	FUGs Stage 3	5 Farmers/ Group	Total
Akwa Ibom	6	14C 8P 6F	70C 40P 30F	140
Bayelsa	6	14C 8P 6F	70C 40P 30F	140
Delta	6	14C 8P 6F	70C 40P 30F	140
3	18	84	420	420 respondents

**Note:** C = Cassava; P = Poultry; F = Fisheries enterprises

## 2.1. Method of data collection

A well-designed questionnaire was used to collect information from Fadama III farmers in the various States. A total of 420 questionnaires (93.3%) were used for the study; while 30 were discarded.

## 2.2. Measurement of variables

### 2.2.1. Constraints facing the Fadama III Project

The instrument designed measured a list of 25 factors as constraints. These were participants' interest, group registration mode, administrative cost, land acquisition problems, training needs provision, communication system, timely inputs supply, timely assets supply, adoption rate, local facilitators availability, service providers support, storage facilities provision, market outlets, transport provision, feeder roads situation, saving system, and ADP extension workers support. Respondents were asked to specify any other constraint(s) not provided. The Likert-type scale was used to gauge each of the constraints; a score of 4 = very serious; 3 = serious; 2 = fairly serious; 1 = not serious constraints with a mean score of 2.5 and above was regarded as serious constraints, while those with a mean score below 2.5 were regarded as not serious constraints. A similar measurement was used by Akwiwu *et al.* (2000).

Similar to the above-mentioned measurement, the proposed strategies to overcome Fadama III constraints were measured using a four point Likert-type scale based on the importance of strategies rated from one to four. Respondents were asked proposal statements to respond to.

### 2.2.2. Analysis of variance (ANOVA)

Analysis of Variance (ANOVA) was used to analyze the hypothesis of the study. The ANOVA and LSD equations mathematically involve the following stages:

- $\sum X^2_{ij}$  = summation of the square of the individual values
- $\sum \sum X^2_{ij} - T^2/rk$  = Total Sum of Squares (TSS) (where  $r$  = number of rows and  $k$  = number of columns),  $T^2$  = Square of the Grand Total
- $\sum X^2$  = Sum of Square Column (SSC)
- SSE = Sum of Square Error = TSS - SSC
- MSC = Mean Square Column = SSC /  $df_{\text{column}}$  (where  $df$  = degree of freedom)
- MSE = Mean Square Error = SSE /  $df_{\text{error}}$
- LSD = Least Significant Difference =  $t_{\alpha/2}(df_{\text{error}}) \sqrt{2MSE/r}$  (where  $r$  = degree of freedom column, and  $\alpha$  = interval level of the t-test).

## 3. RESULTS AND DISCUSSION

### 3.1. Constraints to Fadama III project

The beneficiaries of the Fadama III project, sampled for the study, were allowed to respond to the various degrees of constraints facing the project in the Niger Delta area of study. These constraints are displayed in Tables 2

The degree of constraints facing the respondents was dichotomized into serious and not serious constraints using a cut-off mean point of 2.5. The constraint means above 2.5 were considered serious and those below 2.5 were considered not serious. The inadequate fund was identified as a serious constraint ( $\bar{x} = 3.78$ ). This agrees with the findings of Odjebor *et al.* (2015) who reported that inadequate funds affect farmers in various agricultural ventures. Again, inadequate input support ( $\bar{x} = 3.35$ ), high bureaucracy of donor agencies ( $\bar{x} = 3.31$ ), untimely delivery of inputs ( $\bar{x} = 3.38$ ) and inadequate storage facilities provision ( $\bar{x} = 3.72$ ) were other serious constraints which align with Odjebor *et al.* (2015) that poor storage facilities are a contributing factor to low productivity among farming household.

Constraints identified not serious included poor group registration mode ( $\bar{x} = 1.58$ ), land acquisition problems for project implementation ( $\bar{x} = 1.49$ ), low adoption rate of recommended practices ( $\bar{x} = 1.53$ ), inadequate market outlets ( $\bar{x} = 1.52$ ) and lack of technical expertise by group members ( $\bar{x} = 1.72$ ) were identified as not serious. The pooled mean constraints of the respondents in the study area were 2.40 for Bayelsa; 2.32 (Akwa Ibom) and 2.24 (Delta). Dayo *et al.* (2009); Ajieh and Uzokwe (2007) and Ovharhe (2017) identified similar constraints to agricultural projects implementation in Delta State such as low fertilizer use, low use of improved crop varieties, poverty, women's limited access to inputs/assets, low access to agricultural credit, low public expenditure on agricultural research, poor funding of agricultural technologies and coordination of agricultural extension. Across the Niger Delta, fund embezzlement was not a serious constraint. This tally with the finding of Uzokwe *et al.* (2015) in project implementation by Community Based Organization in Delta State whose participants are partly Fadama III farmers.

**Table 2: Extent of constraints to Fadama III project across the selected Niger Delta states (n = 420)**

S/N	Parameters	Akwa Ibom	Bayelsa	Delta	Total	Pooled mean	Rank	Remark
1	Inadequate fund	3.83	3.85	3.7	11.38	3.79	1 <sup>st</sup>	Serious
2	Inadequate storage facilities	3.75	3.83	3.58	11.16	3.72	2 <sup>nd</sup>	Serious
3	Absence of ADP advisory services	3.63	3.42	3.6	10.65	3.55	3 <sup>rd</sup>	Serious
4	Untimely delivery of inputs	3.01	3.7	3.43	10.14	3.38	4 <sup>th</sup>	Serious
5	Inadequate Inputs support*	3.36	3.6	3.08	10.04	3.35	5 <sup>th</sup>	Serious
6	Inadequate Assets support*	3.19	3.63	3.14	9.96	3.32	6 <sup>th</sup>	Serious
7	High bureaucracy of Donor agencies	3.07	3.54	3.32	9.92	3.31	7 <sup>th</sup>	Serious
8	Poor publicity of new information	3.48	2.57	3.12	9.17	3.06	8 <sup>th</sup>	Serious
9	Non-chalant attitude of service provider(SP)	2.7	2.98	2.71	8.39	2.8	9 <sup>th</sup>	Serious
10	Poor feeder roads situation	2.13	2.88	1.85	6.86	2.29	10 <sup>th</sup>	Not serious
11	Inadequate transport provision**	1.79	2.92	1.86	6.57	2.19	11 <sup>th</sup>	Not serious
12	Poor communication system	2.1	2.33	1.87	6.3	2.1	12 <sup>th</sup>	Not serious
13	Lack of technical know-how by group members	2.05	1.53	1.6	5.18	1.73	13 <sup>th</sup>	Not serious
14	Poor group registration mode	1.51	1.34	1.9	4.75	1.58	14 <sup>th</sup>	Not serious
15	Lack of commitment by group members	1.76	1.45	1.41	4.62	1.54	15 <sup>th</sup>	Not serious
16	Low adoption rate	1.5	1.48	1.62	4.6	1.53	16 <sup>th</sup>	Not serious
17	Inadequate market outlets	1.7	1.44	1.41	4.55	1.52	17 <sup>th</sup>	Not serious
18	land acquisition problems	1.38	1.38	1.69	4.45	1.49	18 <sup>th</sup>	Not serious
19	Leadership tussle/inefficiency	1.41	1.44	1.25	4.1	1.37	19 <sup>th</sup>	Not serious

20	Diverting group input to personal use	1.35	1.25	1.46	4.06	1.35	20 <sup>th</sup>	Not serious
21	Non-chalant attitude of local facilitator (LF)	1.11	1.36	1.09	3.56	1.19	21 <sup>st</sup>	Not serious
22	Embezzlement of fund	1	1	1.1	3.1	1.03	22 <sup>nd</sup>	Not serious
	Total	55.75	56.88	53.81	166.44			
	Pooled Mean	2.32	2.37	2.24				

Note: Cut off mean = 2.5 ( $\geq 2.5$  = Serious constraints;  $< 2.5$  Not serious constraints)

SP = Service Providers. They are Fadama contractors at the grassroots level.

LF = Local Facilitators. They are Fadama extension advisers.

\*Example of input is fertilizer and asset is wheelbarrow

\*\*Example of Fadama transport provision is Tricycle (Keke)

### 3.2. Proposed strategies to overcome Fadama III constraints

Table 3 shows that 87% of the proposed strategies employed to overcome Fadama III constraints were above the cut-off mean score of 2.5 which indicates an important strategy. They were conduct of regular farmers training sessions (mean = 3.36), improved FUG management team (mean = 3.30), inclusion in M&E (mean = 3.00), exposure to other projects success story (mean = 3.05), market products linkage (mean = 2.92) and external partnership (mean = 2.85). Only insurance scheme activation (mean = 2.48) had below 2.5 mean score which implies that respondents may not be fully aware of the importance of insurance over agricultural projects. Thus, this is an identified gap to be abridged by capacity building. Mwangi (2008) reported that most challenges of fish farmers can be addressed when farmers are exposed to training programmes on problem-solving issues.

With the pooled mean = 3.00, it implies that all the strategies to overcome Fadama III project implementation constraints are important.

**Table 3: Respondents' strategies employed to overcome Fadama III constraints (n = 420)**

Parameter	SA	A	D	SD	Total	Mean
Conduct of regular farmers training sessions	210 (840)	168 (504)	25 (50)	17 (17)	1141	3.36
Improved FUG management team	214 (856)	147 (441)	29 (58)	30 (30)	1385	3.30
Inclusion in M&E	143 (572)	160 (480)	92 (184)	25 (25)	1261	3.00
Exposure to other projects success story	170 (680)	120 (360)	111 (222)	19 (19)	1281	3.05
Market products linkage	155 (620)	104 (312)	135 (270)	26 (26)	1 228	2.92
External partnership	146 (584)	114 (342)	114 (228)	46 (46)	1200	2.85
Insurance scheme activation	90 (360)	83 (249)	186 (372)	61 (61)	1042	2.48
Pooled mean = 3.00						

Note: Figures in parentheses are scores from Likert-type scale. Cut off mean = 2.5

(>2.5 = important strategies; <2.5 unimportant strategies)

### 3.3. Test of hypothesis result

This section presents the ANOVA results on the constraints facing respondents across the three States selected. The hypothesis tested states that: *There is no significant variation in the constraints facing the Fadama III project among the selected Niger Delta States.*

The ANOVA showing the constraints for the three States are given in Table 3. Since the  $F_{cal}$  (0.05) is less than the  $F_{tab}$  (3.15) with ( $p>0.05$ ) the null hypothesis was accepted. This means there is no significant variation in the degree of seriousness of the constraints facing the Fadama III project among the selected Niger Delta States. Ovharhe (2017) reported that Fadama activities are homogenous in design across participatory states in Nigeria. This suggests that decisions on the management of constraints in the study area can be approached on a similar basis despite the peculiarities among States. Some of these serious constraints are similar to the findings of Ovharhe (2019). Who found that there were limitations in post-harvest handling and extension delivery processes at the exit of the World Bank from Fadama III activities in the Niger Delta area.

**Table 4: ANOVA Table showing constraints facing beneficiaries in the Niger Delta area**

States	Constraints Means SD	$F_{cal}$	$F_{tab}$	Decision	
Akwa Ibom	2.32				
Bayelsa	2.37	-	0.05	3.15	Not Significant
Delta	2.24				

NS= Not Significant @ 0.05 ( $p>0.05$ )

#### 4. CONCLUSION AND RECOMMENDATIONS

The study concludes that the Fadama III project in the selected States of Niger Delta is faced with several serious constraints. Except these constraints are resolved, the implication is that Fadama's goals of food security, livelihood standard improvement, increased income level for beneficiaries, and adoption of improved agricultural innovations will be hampered. Therefore, the strategies employed to resolve some of the Fadama III constraints were the conduct of regular farmers' training sessions (mean = 3.36) and improved FUG management team (mean = 3.30).

The study contributed to the existing literature as it revealed constraints facing farmers and employed strategies to reflect best management practices to ensure sustainability in agricultural productivity in the Niger Delta area of Nigeria.

Based on the findings from this study, the subsequent recommendations are apparent; there is a need for:

- i. More support in the provision of farm inputs and/or assets to catapult productivity.
- ii. Timely delivery of advisory support and increased capacity building programmes.
- iii. Adequate counterpart fund provision.
- iv. Satisfactory support of storage facilities
- v. Awareness creation of insurance policies in agricultural productivity.

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#### References

- Akwiwu, C. D., Nwayiba, C. U., & Nnadi, F. N. (2000). Effects of commercial banks' distresses on small scale rural livestock's enterprise in Imo state, Nigeria. *Journal of Technology and Education in Nigeria*, 5(1), 12-15.
- Ajieh, P. C., & Uzokwe, U. N. (2007). Adoption of cassava production technologies among women farmers in Aniocha south local government area, Delta State, Nigeria. *Global Approaches*



- to *Extension Practice*, 3(2), 15-22. doi.org/10.4314/gaep.v3i2.34908.
- Ajieh, P. C., & Okoro, B. (2015). Constraints to adoption of yam miniset technology in Anambra state, Nigeria. *International Journal of Agriculture and Rural Development*, 18(2), 2246-2251.
- Blewitt, J. (2008). *Understanding sustainable development*. London: Earthscan. ISBN 9781844074549.
- Chukwuji, C. O. (2013). Increasing crop output through improved technology adoption: the Fadama II approach in delta state, Nigeria. *Asian Journal of Agriculture and Rural Development*, 3, 400-411.
- Dayo, P, Nkonya, E, Pender, J., & Oni, O. A. (2009). *Constraints to increasing agricultural productivity in Nigeria: Nigeria strategy support program (NSSP)*. Brief 4. Abuja, Nigeria: International Food Policy Research Institute (IFPRI). <http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/17749> Assessed 13<sup>th</sup> March 2018.
- Gani, B. S., Olayemi, J. K., & Inoni, O. E. (2019). Livelihood diversification strategies and food insecurity status of rural farming households in North-Eastern Nigeria. *Economics of Agriculture*, 66(1), 281-295. doi.org/10.5937/ekopolj1901281g.
- Gbigbi, T. M., Achoja, F. O., & Temile, S.O. (2019). Cooperative funding as driver of aquacultural development: evidence from Nigeria. *European Journal of Social Science*, 58(2), 124-133.
- Ike, P. C. (2014). Income level of Fadama III beneficiaries in delta state as at project closure in December 2013. *International Journal of Economics and Finance/Canadian Center of Science and Education*, 6, 176-181.
- Ike, P. C. (2016). Assessment of beneficiaries' satisfaction with FADAMA III/SEEFOR funded rural infrastructure and productive assets. *Nigerian Agricultural Policy Research Journal/Agricultural Policy Research Network*, 1, 60-74.
- Inoni, O. E., Ekokotu, P. A., & Idoge, D. E. (2017). Factors influencing participation in homestead catfish production in Delta State, Nigeria. *Acta Agriculturae Slovenica* 110(1), 21-28.
- Mwangi, P. (2008). Challenges facing fish farming development in western Kenya. *Journal of Agricultural Science* 13(5), 305-311.
- National Fadama Development Office (2007). *Fadama poverty reduction through empowerment. a publication of PCU - NFDO, Abuja, 2007.* [www.national\\_fadama\\_development/project/current\\_fadama\\_update.pdf](http://www.national_fadama_development/project/current_fadama_update.pdf).
- National Fadama Development Office (2008). *Fadama - A Publication of PCU - NFDO, Abuja, 2008.* [www.national\\_fadama\\_development/project/current\\_fadama\\_update.pdf](http://www.national_fadama_development/project/current_fadama_update.pdf).
- Odjebor, U., Ovwigho, B. O., Ovharhe, O. J., & Ifie, P. A. (2015). *Transforming the role of agricultural extension for poverty alleviation in Nigeria: a case study of delta state*. Proceedings of the 49<sup>th</sup> Annual Conference of the Agricultural Society of Nigeria held from 9<sup>th</sup> to 13<sup>th</sup> November 2015 at the Delta State University, Asaba Campus, Asaba, pp. 382-385.
- Ovharhe, O. J. (2014). *Fadama III beneficiaries agronomic production survey (FBAPS), Delta State*. Proceedings of the 28<sup>th</sup> Annual Conference of the Farm Management Association of Nigeria held from 15<sup>th</sup> to 18<sup>th</sup> November 2014 at the Delta State University Abraka, pp. 44-51.
- Ovharhe, O. J. (2017). *Evaluation of the performance of Fadama III agricultural projects in the Niger Delta Area of Nigeria*. A Ph. D. Thesis, agricultural extension, faculty of agriculture, delta state university, Abraka, Nigeria.
- Ovharhe, O. J. (2019). Post-Fadama III performance evaluation of beneficiaries in Niger delta area since the withdrawal of world bank's assistance to Nigeria. *FUW Trends in Science and Technology Journal* 4(2), 506-511.
- Ovwigho, B. O. (2014a). Effects of advisory services on attitude to innovations and fatalism: a case study of the Fadama III participants in delta central of delta central senatorial district of Delta state. *Nigerian Journal of Agriculture and Forestry, Faculty of Agriculture*, 4(1), 11-23.
- Ovwigho, B. O. (2014b). Social and economic challenges of small scale arable farming in delta

- central agricultural zone, delta state, Nigeria. *Journal of Biology, Agriculture and Health Care*, 4(7), 26-31.
- Ovwoh, B. O. (2013). *Monitoring and evaluation of Fadama III projects in delta south senatorial district*. A Report submitted to the Delta State Coordination Office of the National Fadama Development Project, Nigeria. 44pp.
- Reardon, T., Timmer, C. P., Barrett, C. B., & Berdegue, J. (2003). The rise of supermarkets in Africa, Asia, and Latin America. *American Journal of Agricultural Economics*, 85(5), 1140-1146. doi.org/10.1111/j.0092-5853.2003.00520.x.
- State Fadama Coordinating Office (SFCO) (2010). *Local development plans (LDPs)*. Delta State Fadama III Coordinating Office Document. pp321.
- Ugboma, M. U. (2009). *Access to agricultural information by fish farmers in Niger delta region of Nigeria*. A Ph. D Thesis, Library and Information Science, Faculty of Social Sciences, Delta.
- Uzokwe, U. N., Ogbekene, N., & Ovharhe, O. J (2015). Community based organization system and the development of rural communities in delta state. *Journal of Agriculture and Food Environment*, 2(3), 25-33. doi.org/10.1080/15575330.2012.734840.