

Full Length Research

Participation Assessment and Constraints of Farmers in Fadama III Development Programme in Edo and Delta States, Nigeria

¹Oratokhai, R. A.(PhD), ²Onemolease E.A.(Prof) and ³Eweka, K. I.

¹Tayo Akpata University of Education, Ekiadolor

²Department of Agricultural Economics and Extension, Ambrose Alli University, Ekpoma, Edo State, Nigeria.

³Tayo Akpata University of Education, Benin City. E-mail: kayuze95@gmail.com

Corresponding author's email: rudolfratokhai@gmail.com

Accepted 1 February 2021

The study assessed the participation and constraints of farmers in Fadama III development programme in Edo and Delta States, Nigeria. Specifically, it examined the level of farmers' participation, characterized their participation in the project and also examined the constraints to their participation in the project activities. To achieve these objectives, validated instruments (questionnaires) were distributed to 308 members of the Fadama Users Group (FUG) in the study area, selected using proportional random sampling (146 from Edo and 162 from Delta). The data collected were analysed using frequency distribution, chi-square Goodness-of-fit tests and Friedman test. From the result of the analysis, FUG characteristics revealed that group cohesion (mean = 3.06%) and leadership integrity (mean = 3.07%) were high, while the leadership style exhibited by the FUG leadership (mean = 3.30%) and the FUG facilitator (mean = 2.73%) was democratic. The study established that both Edo and Delta States faced little or no constraints in participation in the Fadama III projects, although, relatively, Delta State FUGs were more constrained. There was significant difference in participation in Fadama III activities by FUGs in Edo and Delta States, with Edo State showing a significantly ($p \leq 0.050$) higher participation in many of the activities, such as selection of FUG Management committee ($z = 8.497$), identifying group need ($z = 2.096$), preparation of development plan ($z = 7.406$) and preparation of sub-project proposal ($z = 9.005$). There was significant difference ($\chi^2 = 233.19, p \leq 0.050$) in participation in Fadama III project among the respondents, with most (93.1%) respondents participation classified as collaborative while few fell under the collegial class (6.49%). The study concluded that the farmers participation in the Fadama III project activities was generally high and characterized as largely collaborative in which the farmers and the Fadama facilitators collaborate as partners in the planning and implementation of project process. It recommended fostering group cohesion, encouraging democratic leadership style among the FUGs and facilitators and organizing trainings for FUG members on the procedures for project implementation to boost understanding and participation in decision making regarding Fadama projects.

Keywords: Participation, constraints, FADAMA III, Farmers, Edo and Delta states.

Cite this article as: Oratokhai, R. A., Onemolease E.A., Eweka, K. I. (2021). Participation Assessment and Constraints of Farmers in Fadama III Development Programme in Edo and Delta States, Nigeria. Acad. Res. J. Agri. Sci. Res. 9(2): 55-62

INTRODUCTION

From inception to date, Nigeria's rural economy is driven by agriculture. Until the early 1960s, when Nigeria first discovered oil popularly called the 'Black gold', at Oloibiri, in Ogbia Local Government Area of Bayelsa State, agriculture was the mainstay of the economy, accounting for over 60% of global export of palm oil, 30% of groundnut, and 15% of cocoa. However, present estimate, as at 2016 show that the petroleum sector now generates over 95% of Nigeria's external earnings while agriculture contributes less than 5% (Uwagbae et al, 2017).

Over the last decade, Nigeria's domestic food production has consistently lagged behind national food demand. The increasing pattern of annual shortfall is a dangerous pointer to the fact that the nation may be on the threshold of food insecurity. In fact, Food and Agricultural Organisation (FAO) (2010) reported that about 60.8% Nigerians are malnourished. According to Esobhawan (2007), Nigerians consume 9.3gms of animal protein per person per day as against the recommended minimum daily requirement of 35gms. Many institutional programmes in agriculture were undertaken to address the food crisis and increase agricultural intensification in Nigeria. Some of these were the National Accelerated Food Production Programmes (NAFPP) in 1972, River Basin Development Authority (RBDA) in 1974, Operation Feed the Nation (OFN) in 1976, Rural Integrated Agricultural Development Programme (ADP) in 1976, and Green Revolution Programme, (GRP) in 1980. Many of these efforts failed, for various reasons, to provide enough food for the teeming population of the country. Some of the reasons include poor funding leading to poor performance of many of the institutional reforms, misappropriation of funds, under-investment in the sector and multiple political considerations in otherwise technical agricultural issues (Idrisa, 2010).

Fadama projects represent a more recent approach by the Federal Government to increase agricultural production in the country. Fadama is a Hausa name for irrigable land, flood plains and low lying areas underlined by shallow aquifers found along Nigerian water system. In other words, Fadama is a word in Hausa Language which means seasonably flooded or floodable flood plains along major Savannah Rivers and depressions on the adjacent low terraces. The Fadama project has passed through three phases in the country: the first phase lasted between 1993-1999, (Adedoyin, 2011), the second phase was from 2001-2007 (Ajuwon, 2008), while the third phase under the sponsorship of the World Bank lasted from 2007-2013 (Omonona, 2009). Presently, the Fadama project in the country is anchored by the Federal and State governments (Delta State Fadama III Coordinating Office-DSFCO, 2013). The Third National Fadama Development Project (NFDP-III) is a nationally implemented World Bank assisted agricultural

intervention project aimed at improving livelihood and incomes of rural users of land and water resources on a sustainable basis.

The Fadama programme nationwide is domiciled at the state ADP. The ADP is the major provider of public sector agricultural extension services in Nigeria.

Agricultural Development Projects, (ADPs) these projects were rightly tagged as World Bank projects because of its heavy financial and technical commitment to them. The ADPs began as an enclave programme tagged integrated Agricultural Development Project which dated back to 1972. It started in the North and extended to few areas in the South, although the project started failing when the World Bank counterpart funding expired. As at today it is linked to the Federal Government Agricultural Transformation Agenda.

Farmers' participation in this programme plays an essential and long-standing role in promoting their quality of life such as improved yield, income and welfare. An effective agricultural extension programme must be one that encourages farmers' participation in the programme development process and implementation. Farmers' participation is also considered necessary to get community support for agricultural development projects (Titilola, 2014). It equally promotes an understanding of farmers' priorities, management strategies and resource constraints, identification and subsequent shaping of solutions, including improved technologies (Simonya and Omolehi, 2012). Effective farmers' participation is crucial to the success of agricultural development programmes in developing countries such as Nigeria (Oakley, 2014 and Lawenstein, 2010).

OBJECTIVES OF THE STUDY

The overall aim of the study was to assess the participation and constraints of farmers' in the Fadama III project in Edo and Delta States, Nigeria. The specific objectives were to:

- a) Examine the level of farmers' participation in the Fadama III project in the study area.
- b) characterize farmers' participation in the Fadama III project in the study area.
- c) examine the constraints limiting farmers' participation in the Fadama III project activities.

HYPOTHESES OF THE STUDY

The following hypotheses were tested in this study:

Ho1: There is no significant difference among farmers in their level of participation in the Fadama III project in the study area.

Ho2: There is no significant difference among the constraints to farmers' participation in the Fadama III project.

METHODOLOGY

This study was carried out in Edo and Delta States. Edo State was created from the defunct Bendel State on 27th August 1991. The state has eighteen (18) Local Government Areas distributed across three (3) senatorial districts namely, Edo south, Edo central and Edo north. The State has a land area of 19,281.93 square kilometers and is situated between Latitude 50 North and longitude 5' south, 6' West and 52' East (Federal Ministry of Aviation, 1996). Delta state of Nigeria was created in 1991 and has 25 local government areas which are divided into three agricultural zones of Delta north, Delta south and Delta central. The state covers a landmass of about 18,050 km² of which more than 60% is land. The state has an estimated population of 6,098,391 composed of 3,074,306 males and 3,024,085 females (Ojeikere and Olowo, 2014). Delta State lies roughly between longitudes 5°00' and 6°45' East and Latitude 5°00' and 6°30' North. It is bounded on the North by Edo State, on the East by Anambra State and on the South-East by Bayelsa State. On the southern flank is the Bight of Benin which covers approximately 160 km of the State's coastline.

The research design was based on survey. Data for this study was generated from primary source, which in this study, were the participating farmers in the Fadama III project in Edo and Delta States. Multi-stage sampling was employed to select samples for the study. Given the population of six thousand five hundred and thirty (6,530) (ADP, 2013), the recommended sample size is three hundred and sixty-six (366), based on the Table of sampling proportion with a 95% confidence interval and 5% margin of error (Ingawa, Oredipo, Idefor and Okafor, 2004). Descriptive statistics, comprising of frequency distribution, percentage and mean, were used in analysing the data. Inferential statistics used in this study were Friedman test and chi-square Goodness-of-fit tests

Variable Operationalization

Constraints to Participation in Fadama Activities

This was measured using Likert scale as follows: very serious (coded 4), serious (3), little serious (2) and not serious (1). The weighted means score of 2.50 was used to determine if a constraint is serious or not. This score was obtained as follows: $4+3+2+1 = 10 \div 4 = 2.50$. Similar approaches have been used by Onemolease and Omorogbee (2004). Decision as to the seriousness of a constraint was reached if the mean score of the constraint is 2.50 and above. If less than 2.50, the constraint was considered not serious.

Characterization of respondent's participation in Fadama activities

The essence of characterization of programme

beneficiary participation is to enable a thorough determination of the degree of involvement of the participants in decision-making regarding the overall implementation of the programme operational components/activities. Respondents were asked to score the operational components of Fadama project on the basis of their participation or involvement using a four-point Likert-type scale weighted as follows: - contractual = 1; consultative = 2; collaborative = 3; collegial = 4. Their level of involvement for the purpose of characterization was operationalized as follows in line with Blum (2015) and Paul (2010):

Contractual Participation: Project development workers/facilitators make contract with farmers to provide inputs, land or services for the programme. The farmers' role is passive and the development worker/facilitator make decisions (e.g. investment type, leadership selection etc.) alone regarding programme activities without seeking opinion of the farmers. In other words they tell the farmers/programme participants what to do. This has a code of 1.

Consultative Participation: development workers or facilitators consult farmers about problems and then develop solutions. They involve farmers mostly in the diagnosis and later in the evaluation of proposed solutions. This has a code of 2.

Collaborative Participation: development workers or facilitators actively draw on farmers' knowledge and experimentation in seeking solutions to identified constraints. The decisions are made jointly; neither the workers/facilitators nor farmers make them on their own. No party has a right to revoke the shared decision. This was assigned a code of 3

Collegial Participation: The emphasis is on increasing the ability of farmers to carry out research on their own, as well as request information and services from the formal research system. In this type of participation the farmers take decisions alone without input from the development worker or programme facilitator. This was assigned a code of 4.

Respondents mean scores was computed for each operational activity. The values obtained were used to characterize farmers' participation in the particular activity using the following decision rules as proposed by Biggs (1989).

Mean = 1.00 - 1.49 (Contractual)
 Mean = 1.50 - 2.49 (Consultative)
 Mean = 2.50 - 3.49 (Collaborative)
 Mean = 3.50 - 4.0 (Collegial).

Also, to determine the Respondents overall participation level or type, their mean scores was computed for the total operational activities were summed. The values obtained was used to characterize farmers' participation using the following decision rules as proposed by Biggs (1989) above and as have been applied by Agwu (2008) and Abah (2010) in Imo State, in studying farmers' participation in Fadama activities.

RESULTS AND DISCUSSION

Participation in Fadama Operational Activities

The result of Table 1 shows that farmers level of involvement in decision making was contractual in only one activity namely, decision to use experts to prepare sub-projects proposal with a mean of 1.14. Respondents level of involvement was collaborative in eight of the Fadama activities namely; keep records and other information for project supervision (mean=3.43) selection of representative to the Local Fadama Development Committee (LFDC) meetings (mean=3.31), identifying what the needs of the group are (need assessment survey), (mean=3.09) preparation list of constraints and opportunities to be addressed through advisory services with respect to Fadama enterprise production and marketing (2.93), planning of or determination of type of training the group should undergo (2.90), preparation of local development plan (2.87), preparation of sub project proposals for investment (2.77), developing monitoring and evaluation indicators (2.53), with a mean value of between 2.50- 3.49. The level of involvement in decision making regarding other activities of the Fadama III project was collegial in six activities namely; selection of FUG management committee (mean=3.75) opening of bank account to receive sub- project funds (3.95), choosing the type of farm enterprise the group should engage in (3.78), collection of user fee for sustainability of projects (3.66), selecting and contracting service providers for technical assistance in sub-projects execution (3.57). Based on the result of the table, it is clear that farmers were highly involved in the project and in the decision making and execution.

Table 1: Level of Participation in Fadama operational activities

	Edo		Delta		Total		Remark
	Mean	Sd	Mean	Sd	Mean	Sd	
Selection of FUG Management committee	3.51	.59	3.96	.223.75	.49	Collegial	
Opening of Bank account to receive subproject funds	3.96	.20	3.95	.243.95	.22	Collegial	
Choosing the type of farm enterprise the group should engage in	3.90	.32	3.93	.263.92	.29	Collegial	
Managing group financial resources	3.56	.50	3.98	.163.78	.42	Collegial	
Collection of user fees for sustainability of projects.	3.29	.53	3.98	.143.66	.51	Collegial	
Selecting and contracting service providers for technical assistance in sub-projects execution.	3.38	.49	3.75	.453.57	.50	Collegial	
Keep records and other information for project supervision.	2.90	.84	3.90	.363.43	.81	Collaborative	
Selection of representative to the LFDC meetings	2.66	1.073.90	.413.31	1.00	Collaborative		
Identifying what the needs of the group are/is (needs assessment survey)	3.05	.28	3.13	.343.09	.31	Collaborative	
Preparation list of constraints and opportunities to be addressed through advisory services with respect to Fadama enterprise production and marketing	2.81	.46	3.03	.232.93	.38	Collaborative	
Planning of or determination of type of training the group should undergo	2.71	.76	3.06	.242.90	.58	Collaborative	
Preparation of local development plan	2.69	.49	3.02	.192.87	.40	Collaborative	
Preparation of sub-project proposals for investment.	2.50	.68	3.01	.082.77	.53	Collaborative	
Developing monitoring and evaluation indicators	1.93	.81	3.07	.302.53	.82	Collaborative	
Use of experts to prepare sub-projects proposal	1.80	.97	1.05	.371.41	.81	Contractual	

*High (mean > 2.50)

Note: some of the above activities are one-off activities, while others are continuous Field survey data, 2016

Characterization of respondents' participation in Fadama III

Table 2 categorized the respondents based on their level of participation in the decision making process regarding Fadama project activities. The pooled results are shown in Figure .Based on the results most respondents fell under the collaborative class (93.15%) while only few (6.95%) were collegial. None were under contractual or consultative class in decision making. Being collaborative in participation means that they are empowered with the decision making authority and this is shared between farmers and scientists. The decisions are made jointly, neither the scientists nor farmers make them on their own and no party has the right to revoke the shared decision. Being collegial, farmers make the decision collectively in a group process or through individual farmer who are involved in organized communication with scientists.

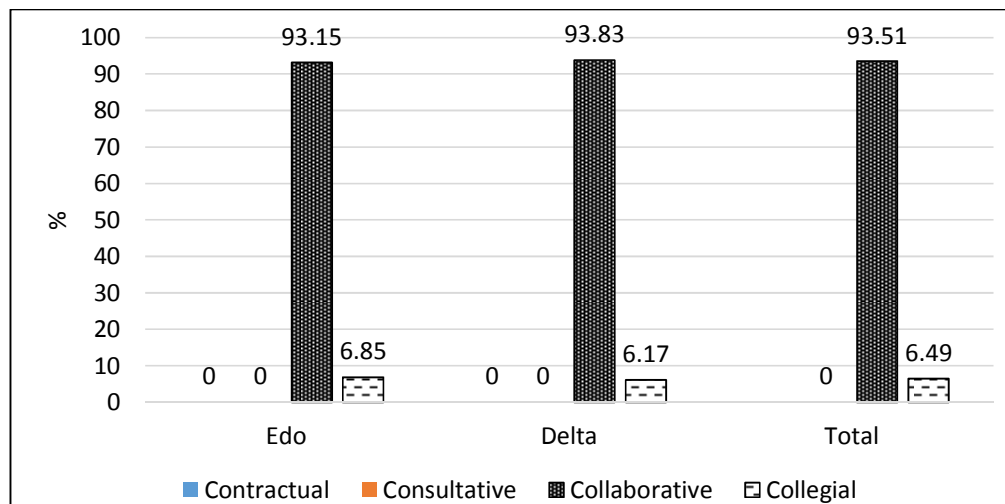


Figure 1: Characterization of respondents' participation in Fadama III (Pooled)

The general results suggests or further confirms that the ADP or Fadama Management in Edo and Delta States were farmer-driven and not institution-driven, since the farmers were highly involved. This established a significant fact that the farmers themselves make decisions and execute projects appropriately without undue interference. This corroborates the findings of Simonya and Omolehin (2012), who reported that collaborative participation approach is advocated for Agricultural management in order for the entire segment of the society to have a say in their affairs and encourage the bottom-up approach as against the top-down approach that has not been effective in addressing farmer's constraints and interest. This implies that the higher the involvement of the farmer in project decision making and implementation, the higher the possibility of project sustainability, since their stake is guaranteed and are carried along.

Table 2: Characterization of respondents' participation in Fadama III

Level	Edo		Delta		Total	
	Freq	%	Freq	%	Freq	%
Contractual	0	0	0	0	0	0
Consultative	0	0	0	0	0	0
Collaborative	136	93.15	152	93.83	288	93.51
Collegial	10	6.85	10	6.17	20	6.49
Total	146	100.00	162	100.00	308	100.00

Field survey data, 2016

Fadama Group Characteristics

The study examined respondents' perception of the FUG cohesion, leadership style and integrity as well as the FUG facilitator leadership style. The results are presented in Table 3. Respondents agreed that the FUG had internal cohesion (mean=3.06). Such cohesion, Ovwigho (2014) noted, can lead to high participation among the FUGs. This is because the group members become united in purpose cooperates towards achieving a common goal. The result for FUG leadership integrity reveals that respondents agreed that the leadership had integrity (mean=3.07) Allen (2015), pointed out that leadership aligns with a person's value, words and actions and the extent to which promises are kept, it depicts or reflects honesty and trust. When members perceive the leaders to have integrity, they are likely to trust these leaders and consider them dependable, which will encourage them to participate more in the group activities. The leadership style was also rated to be democratic (mean = 3.30). Being democratic means that the leaders were open to the opinions of members (Aref, 2011). When members opinion are sought by the leader, the members are likely to have a sense of ownership of the activities and therefore likely to participate more in the activities.

The mean score for facilitators leadership style was high (mean = 2.73), which implies it was democratic, as opposed to autocratic. In the views of Schultz and Schultz (2010), this leadership style is capable of influencing the activities of a group towards attainment of a set goal, some group members are carried along in the sense that their opinions are sought. The grand mean suggest that Edo State FUGs (mean=3.17) had a more positive group characteristics than Delta State FUGs (mean=2.93), such higher level is to likely promote greater participation in group activities.

Table 3: Fadama Group Characteristics

Characteristics	Edo		Delta		Total	
	Mean	Sd	Mean	Sd	Mean	Sd
Group cohesion	3.15	1.73	2.98	0.93	3.06	1.41
Group leadership integrity	3.18	1.91	2.96	0.8	3.07	1.5
Leadership style	3.53	1.29	3.09	0.84	3.30	1.4
Facilitator leadership style	2.81	0.7	2.67	0.91	2.73	0.84
Grand mean	3.17		2.93			

*Agreed (mean ≥ 2.50)

Field survey data, 2016

Constraints Affecting Members Participation in Fadama III Operational Activities

Aggregate wise, respondents in both Edo and Delta states were faced with little or no serious challenges or constraints in participation in the Fadama III activities given the mean scores of less than 2.50 (Figure and Table 14)

However, in Delta state, poor cooperation among members (mean= 2.61) was considered serious by the respondents. The grand mean per state suggest or indicate that Delta State FUGs (mean=2.19) members faced a higher level of constraints in their level of participation compared to Edo State FUGs (mean=1.92).

Poor cooperation among members will limit the extent to which members of a group can work together or participate in group activities. Several factors can account for poor cooperation among members. According to Nagel (2015), this could be due to poor understanding of group purposes, misunderstanding among members and/or poor leadership style.

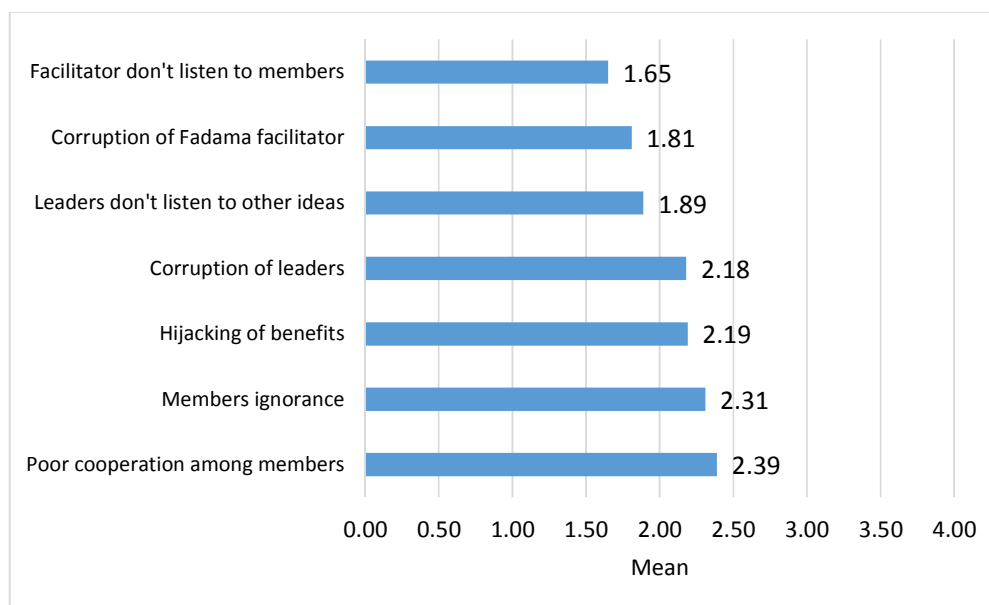


Figure 2: Constraints limiting respondents' participation in Fadama activities

Table 4: Constraints Affecting Members Participation in Fadama III Operational Activities

Constraints	Edo		Delta		Total	
	Mean	Sd	Mean	Sd	Mean	*Sd
Poor cooperation among members	2.14	.83	2.61	.53	2.39	.72
Members ignorance of how to go about the activities (lack of capacity)	2.47	.96	2.16	.38	2.31	.73
Hijacking of benefits by few privileged members	2.21	.87	2.19	.42	2.19	.67
Corruption of the FUG leaders	2.21	.85	2.15	.39	2.18	.65
FUG leaders does not like to listen to other people opinions/ideas	1.67	.51	2.09	.28	1.89	.46
Corruption of the Fadama facilitator	1.55	.54	2.05	.24	1.81	.48
The facilitator does not like to listen to members' advice	1.20	.40	2.05	.27	1.65	.54
Grand Mean	1.92		2.19			

*Serious (mean ≥ 2.50)

Field survey data, 2016

Difference among Farmers in Level of Participation in Fadama III Project (Chi-Square Test.)

Chi-square goodness-of-fit test was used to analyse the hypothesis which states that, “there is no significant difference among farmers in their level of participation in the Fadama III project both in Edo and Delta states”. The result is presented in Table 5 and shows that 93.1% of the farmer’s level of participation was collaborative while for 6.49%, it was collegial. The chi-square test (233.195) is significant at 1% level, which means that there is a significant difference in the level of participation between these two groups of farmers, with a significant proportion of farmers participating in the project in a collaborative form.

Table 5: Difference among Farmers in the level of participation in Fadama III project (Chi-Square Test)

Participation categories	Observed N freq	Expected N freq
Collaborative	288	154.0
Collegial	20	154.0
Total	308	

Chi-Square = 233.195; df = 1; p ≤ 0.001

Field survey data, 2016

Test of Difference among constraints to farmer’s participation in Fadama III.

Table 6 shows the result of Friedman test used for hypothesis three, which states that, “There is no significant difference among the constraints affecting farmers’ participation in Fadama III project activities. “Since the calculated Chi-square (756.24, $p \leq 0.050$) is significant, it means there is significant difference among the constraints affecting farmers’ participation in Fadama III project operational activities. This means some constraints were significantly more serious than others. The post-hoc test reveals that low education of members (mean=6.93) was the most significant and more serious than other constraints\limitations. Such constraints as poor cooperation among members (5.90), and members’ ignorance of how to go about the activities (limited competence) (5.37) were not statistically different, meaning they were of equal seriousness. Leadership not listening to members (3.36) FUG facilitators not willing to listen to FUG members (4.02) and corruption among the facilitators (5.04) were the least significant constraints.

Table 6: Difference among constraints to farmers’ participation in Fadama III

Constraints	Mean Rank*
FUG facilitators don’t listen to FUG members’ advice (autocratic)	3.36 ^e
Corruption of the fadama facilitator	3.72 ^d
FUG leaders don’t listen to members opinions/ideas (autocratic)	4.02 ^d
Hijacking of benefits by few privileged members	5.01 ^c
Corruption of the FUG leaders	5.04 ^c
Members ignorance of how to go about the activities (limited competence)	5.37 ^{bc}
Poor cooperation among members	5.90 ^b
Low education of members	6.93 ^a

**Chi-Square = 756.24; df = 8; p ≤ 0.001*

Field survey data, 2016

CONCLUSION

Based on the findings of this study, it was concluded that farmer’s participation in Fadama III project activities were generally high, and characterized as largely collaborative, in which the farmers and facilitators collaborate as partners in the project implementation process. There are state differences in FUG member’s participation in Fadama III project, with Edo State having higher level of participation than Delta State FUGs. The Fadama III project participants faced little or no serious constraints in their participation in the project. However, poor co-operation among members were considered serious in Delta State.

RECOMMENDATIONS

- Fadama III facilitators should also be encouraged to be more democratic in their leadership and relationship with the FUGs.
- Given that there were state differences in level of project participation between Edo and Delta states, there may be need for Fadama III management to strengthen activities to encourage participants’ involvement in projects activities in the Delta state in particular.
- Given the positive influence of group cohesion on the members’ participation in project activities, Fadama III management/facilitators should continue to encourage cohesion/cooperation among FUGs.

REFERENCES

- Abah, N.C. (2010) Development administration: A multidisciplinary approach, Enugu: John Jacobs Classic Publishers.
- Agricultural Development Project (ADP), (2013). Implementation and Completion Report. Agricultural Development Project, Annual Report, Abuja. pp. 4-5
- Agwu, A. E. (2008), Attitude of farmers towards the Fadama in Okigwe Agricultural Zone, Imo State, Nigerian Journal of Horticultural Science (NjHIS), 10: 65-74.
- Aref, F. (2011).Farmer's participation in agricultural development: The case of Fars province, Iran. Indian journal of science and technology, 4(2): 155 – 158
- Asikadi, E.E. (2010). Agriculture for Colleges,Blue Points Publ. Onitsha, p11-15, 394-414
- Biggs, S.D. and Farrington, J. (1991). Agricultural research and the rural poor; a review of Social Science Analysis. International Development Research Centre (IDRC), Ottawa, Canada, pp 133
- Clayton, A. Oakley, P. and Brain P.(2009). Empowering People: A guide to participation, New York; UNDP.
- Emerson, R. (1972) Power-dependence relations, American Sociological Review, 27(1): 31-41.
- Erie, A.P. (2010).Privatization and commercialization of agricultural extension services in Edo State, Nigeria. Rudel Publishers. Benin City Nig pp11-17
- Esobhawan, A.O. (2007). Efficiency analysis of artisanal fishery production in Edo State, Nigeria, Ph.D Thesis, Department of Agricultural Economics & Extention AAU Ekpoma.
- FAO (2010). Participation in practice: Lessons from the FAO people's participation programme, Rome: FAO.
- FOS (2004) Fed Min of Statistics - The Fifth National Development. National Development Plan, 2002 Federal Office of Statistics, Lagos.
- Lawenstein, R., (2010). Community participation, social development and the state, London: Methuen Pub. P. 166-172
- Nagel, U.J (2015). Institutionalization of knowledge flow; special issue. Journal of International Agriculture. 3 (3):90
- Oakley, P. and Marcden, D. (2014). Approaches to participation in Development, Geneva, Inter-Labour Organization(ILO).
- Ojeikere, O. and Olowo, A. (2014). Novel treatise on Nigeria economy.Rudel Publication, Benin City pp 44 – 49,
- Ojo, N.F, Omiregua, S.O and Oratokhai, R.A(2014) Agricultural Methodology and Research methods for Tertiary institutions. Rudel publishers Benin pp.92-98
- Onemolease, E.A. (2013). Technological and Social Change in Agriculture. Lecture delivered at Department of Agricultural Economic and Extension, Ambrose Alli University, Ekpoma, Edo State.
- Oratokhai, R.A and Onemolease, E.A. (2016) Needs Assessment of Fadama Farmers in Delta State, Nigeria. Journal of International Centre for Science, Humanities and Education Research (1): 40-49.
- Ovwigho, B.O. (2014). Effect of advisory service on attitude to innovations and fatalism. A case study of Fadama III participants in Delta State, The Nigerian Journal for Agriculture and Forestry (NJAF) 4(1): 11-20.
- Sabatelli, R. and Shechan, C.L. (2003).” Exchange and resource theories”; In: Sourcebook of family theories and methods: A contextual approach. New York: Plenum Press.
- Simonyan, J. B.,and Omolehin, R. A. (2012). Analysis of impact of Fadama II project beneficiary farmers' income in Kaduna State: A double difference method approach. International Journal of Economics and Management Sciences, 1(11): 1–8.
- Titilola. T. (2014). “Knowledge system and sustainable agricultural development in Africa; Essential Linkages”. Indigenous Knowledge and D
- Uwagbae, M. A.,El Sartasi, Richard Glory, Oratokhai, R A,and Agwu, J.(2017).”Upshot of age of oilspill and the influence of physico-chemical properties on the diversity of soil dwelling insects”.New Delhi (India) Env Book Series.Discovery Publ House Ltd.
- Wilson, A.G (1997). Factors Influencing Farmers Participation in the Environmentally Sensitive Area Scheme. Journal of Environmental Management. 50:67 – 93.