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Impact of Government Empowerment Schemes on the Growth of Aquaculture in Delta State, Nigeria

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Abstract
The impact of several government empowerment schemes on beneficiaries have been scarcely reported in Nigeria. This study determined impact of government empowerment schemes on the growth of aquaculture in Delta State. A two-stage sampling procedure was used to pick the respondents for the study. A total of 119 farmers responded in the study. Results show that majority (75.6%) of the fish farmers in the study area knows about empowerment schemes, out of which only about 41.2% have participated in one scheme or another. About 8.4% benefited through trainings/enlightenment programmes, 3.4% through provision of fish feed, 1.7% financial assistance and 0.8% subsidized fish feeds. Most of the beneficiaries also had increased scale of production (34.5%), improved production system (36.1%), improved quality of culture facilities used (33.6%), increased number of culture facility used (35.3%), number of fish harvested per pond (36.1%) and increased average weight of fish harvested per pond (36.1%). Most fish farmers know about the schemes but fail to participate due to delayed transmission and execution of the schemes leading to inadequate faith in the programmes, not enabling the farmers accept accessed information on the schemes. It is therefore, recommended that governments should avoid delays in implementing these schemes so that the fish farmers have faith and participate in the programmes.

Keywords; empowerment schemes, aquaculture, impact, beneficiaries

Introduction
The total demand for fish in Nigeria outweighs domestic production. To achieve the goal of self-sufficiency in fish production, domestic production needs to be encouraged. The deficit in fish production can be met through local production by engaging the youths, women and local fish farmers in aquaculture production in a more sustainable manner. Delta state government, in line with the Federal Government of Nigeria directives, had earlier established various strategies of agricultural empowerment to alleviate and eradicate poverty through increased agriculture production in the state (Aphunu, and Nwabeze, 2012). The state has plans for regular visits and training by the Agricultural Development Programme (ADP) extension agents as well as by the officers of the Department of Fisheries of the State ministry of Agriculture as part of efforts to support the needed growth in the sector. The Federal Government of Nigeria has also packaged the presidential initiative on fisheries and aquaculture development in 2003 to provide financial and technical assistance to government programs and projects encouraging fish production. Despites these efforts by

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government, Nwokedi *et al*. (2020), noted that with a national fish demand of 2.1 million metric tonnes per annum and a domestic production estimated at about 800,000 metric tonnes, Nigeria has a shortfall of about 1.3 million metric tonnes in fish production. Factors contributing to low production in the aquaculture sector, according to Nwanbueze *et al*., (2009) include, shortage of inputs (fingerlings and feed), inadequate technical knowhow resulting in poor management practices, inadequate funding, and theft. Use of low-quality fish seeds and low capital investment are also factors limiting the growth of aquaculture in Nigeria (Nwanbueze *et al*., 2009). Oluwasola and Ajayi (2013) arranged the constraints to catfish production in descending order of severity as high cost of feeds, lack of capital, scarcity of fingerlings, lack of modern technologies, high cost of transportation, high cost of labor, lack of land, poaching, inadequate water supply, mortality of fish and poor storage facilities. These constrains have led to the establishment of several empowerment programmes by the government of Nigeria at all level. For example, Olapade and Adeokun (2005) conducted a study on fisheries extension services in Ogun State, while Aphunu, and Nwabeze, (2012) studied fish farmers in Delta State. Adelotun, (2015) evaluated the participation of Youth in Aquaculture with reference to several empowerment schemes in the western Nigeria. All these authors have provided useful information in the area of impacts of extension services and government intervention on the growth of fish farming in the studied locations. There is paucity of information on such studies in Delta State necessitating studies such as this. Thus the aim of this study was to determine the impact of some Federal Government Empowerment Scheme on the growth of aquaculture in Delta State.

Materials and Method

Area and scope of study

The study was carried out in Delta State ($5^{0}30'00''$N and $6^{0}00'00'$E) situated in the south-south geo-political zone of Nigeria with a population of 4,112,445 (Aphunu, and Nwabeze 2012). The major occupation of the people is farming, hunting, fishing and oil exploration. In almost all the Local Government Areas (LGAs), fresh fish, crabs, shrimps and dried fish abound. Due to anthropogenic activities (mainly from oil exploration) in the state, fishing in the wild is reducing as catch depletes by the day leading to reduction in fish production.

Sampling procedure

The first stage of the two-stage sampling procedure was random selecting of two communities from six different Local Government Areas from the 3 Agricultural Zones of the State. The selected LGAs were Aniocha North, Warri North, Warri South, Ughelli, Oshimili South and Sapele. The next stage was the random selection, from the two selected communities, of 20 farmers; representing over 65% of the fish farmers in each community, such that assumption of normal population is very high as it representing over 95% confidence level and ±5% precision level (Yamane 1967). Thus a total number of 120 fish farmers were targeted for the analysis (only 119 responded).

Data collection

Data were collected using primary and secondary instrument. Primary data was collected with the use of well-structured questionnaires administered by trained enumerators. The questions were divided into four sections. Section i: Socio-economic characteristics of farmers; Section ii: level of awareness of the respondents to availability of Government Empowerment Scheme; Section iii: Impact of some Government Empowerment Scheme; Section iv: Challenges faced in accessing the schemes.

Analysis of Data

Data collected were analyzed using Statistical Package for the Social Sciences (SPSS) version 17. Descriptive and inferential statistics such as mean, percentages and frequency were used to analyze the objectives (Oluwasola and Ajayi, 2013).

Results and Discussion

Table 1, shows the socio-economic characteristics of respondents majority(37.8%) of the correspondents are between the age of 31-40. Majority of the fish farmers were still in their active age which implies that they are still energetic and vibrant. This agrees with Sikiru *et al.*

Table 1; Socio-economic Characteristics of respondents

	Variables	Frequency (N)	Percentage (%)	Mean
Age (years)	≤30	3	2.50	
	31-40	45	37.8	
	41-50	27	22.7	23.8
	50-60	26	21.8	
	≥60	18	15.1	
	Total	119	100	
Gender	Male	82	68.9	
	Female	37	31.1	
	Total	119	100	
Marital status	Single	13	10.9	
	Married	98	82.4	
	Widowed	8	6.7	
	Total	119	100	
Educational status	No formal Education	8	6.7	
	Primary school	20	16.8	
	Secondary school	36	30.3	
	Tertiary education	55	46.2	
	Total	119	100	
Level of involvement	Full time	74	62.1	
in fish farming	Part time	25	21.0	
	Sub total (respondents here)	99	83.1	
	System	20	16.8	
	Total	119	100	
Source of labour	Family labour	9	7.6	
	Hired	28	23.5	
	Family and hired	82	68.9	
	Total	119	100	
Source of capital	Personal savings	78	65.5	
	Friends and relative	11	9.2	
	Bank loans	9	7.6	
	Co operative	1	0.8	
	Sub total	99	83.2	
	System (no response)	20	16.8	
	Total	119	100	
Years of experience	≤5	27	22.7	
	5 – 10	41	34.5	
	10 – 15	21	17.6	20
	≥20	4	3.4	
	Sub total	93	78.2	
	System	26	21.8	
	Total	119	100	

Note= System refers to total number of persons who did not respond to the particular question but responded to other questions. This is applicable to all the tables.
Source: Field survey, 2019

(2009), that this age bracket is a productive age which predicts better future for fish farming. It also agrees with Akwu and Acheneje (2011) who found that most fish farmers are in their economic active years.The table further showed that majority (68.9%) of the respondents were male while 31.1% were female. This indicates that more males were involved in fish farming than female fish famers. This may be due to the strenuous nature of fish farming such and men are more energetic than women, similar to the assertion of Ekong (2003) that women play minimal roles in farming. Olayiwola (2013) posited that women are more into post cropping activities such as marketing and processing of fish into consumable products like smoked fish.

Majority of the farmers (82.4%) were married showing that fish farming is dominated by married farmers and this means that they have dependents to fend for; this confers sense of responsibility to them and makes them more dedicated to their work. Fakoya (2000) in the assessment of socioeconomic analysis of fish farming in Oyo State, Nigeria, observed that 46.1 % (the majority) of the farmers were married.

Tertiary education has a highest percentage of 46.2%. This shows that higher percentage of fish farmers are literates. Literacy is believed to have a positive implication on efficient use of productive resources, adoption of farm innovation and income diversification. This agrees with Boden and Nucci (2000) that entrepreneurs with 4 or more years of college/university education were less likely to fail.

Level of involvement in fish farming shows that majority (62.1%) were full time. This indicates that most fish farmers took fish farming as their main source of income. The affected respondents explained that they hardly have time for other forms of farm operations owing to the attention required to succeed in farming fish.
Family and hired labour is the major source of labour (68.9%), as most of the fish farmers hire labourers and combine it with their family labour. Affected farmers noted that it helps curb poaching and train family members as potential farm owners. Some operations in the farm requires trained hand who has to be hired to enhance production.

Personal savings (65.5%) served as the main source of capital for starting fish farming business in Delta state metropolis. This is because fish farming being a more recent animal husbandry enterprise is hardly able to attract loans from banks and other lending houses This justifies the assertion by Adewuyi *et al.* (2010) on analysis of profitability of fish farming in Ogun State, Nigeria who reported that 82.9% of the fish farmers financed their farms from their personal savings.

Most of the farmers had about 5 -10 years of aquaculture practice making up 34.5% of the respondents. This shows that the fish farmers will be able to adopt new farming technologies as against those that are new in the farming business who will be reluctant in adopting new technologies. This result agrees with Kudi *et al* (2008) who reported that farming experience is a major element in understanding and knowing the practice of farming. This assertion was also supported by Oluwasola and Ajayi (2013), that the ability to manage fish pond efficiently depends on the dynamism of the farmer and this is directly related to the level of experience of fish farming. This is also supported by the findings of Akinrotimi *et al.* 2010), in their survey of brackish water aquaculture status in Rivers state.

Table 2, shows the level of awareness of the respondents to availability of Government empowerment scheme. From the table, about 40.3% of information was accessed from other

farmers. Another 75.6% of the farmers indicated that they were aware of government empowerment scheme extended to the farmers. However, only 41.2% of these farmers participated in these empowerment schemes of the government. Delta state youth empowerment scheme and CBN Anchor Borrowers Scheme were the most famous of the schemes in the study area. Majority (63.9.1%) of the farmers did not have any empowerment scheme in their locality even though they are aware of the existence of such schemes in other places. The highest contribution of government empowerment scheme to fish farmers, was in the area of enlightenment programmes (8.4%). Duration of various empowerment scheme was highest in Delta State youth empowerment scheme with about 15years. Type of aquaculture practiced was mainly monospecies (69.7%). More farmers practiced integrated aquaculture with fish cum pig as majority (11.8%).

Majority of the fish farmers receives information about the empowerment scheme through other farmers while a few farmers got the information from newspaper, extension agents, television broadcast, and friends and relation. The effect of extension workers is certainly not effectively felt in this locality. It was observed that most of the farmers knew about some existing scheme. That is why so many cooperatives existed in the study area. Being member of a cooperative society is a major requirement to benefit from such empowerment programmes. FADAMA 111 advised farmers on the need for cooperative formation even with as many as 25 members in each cooperative. Low participation in the various empowerment schemes was largely due to inadequate information on the application formalities for the various programme. This inadequate information on empowerment scheme, and inadequate aquaculture extension services have been reported by Adewumi and Olaleye (2011) to be among the prominent problems that hinder the growth of aquaculture in Nigeria. Umeh and Odo (2002) stated that various states in Nigeria have designed and executed several self-empowerment schemes to help the youths. Among the programmes are FADAMA which was initiated in 1992 to enhance food self-sufficiency, reduce poverty and create opportunities for employment. Fish cum piggery was the most practiced type of integrated Aquaculture. The reason is that pork is highly relished in the study area.

Table 2: Level of awareness of the respondents to availability of Government empowerment scheme

Access to information	Variables	Frequency	Percentage
	Extension agents	1	0.8
	T.v broadcast	7	5.9
	Newspaper	1	0.8
	Telephone	17	14.3
	Friends and relation	6	5.0
	Farmer organizations	48	40.3
	Sub total	80	67.2
	System	39	32.8
	Total	119	100
Awareness of any empowerment scheme	Yes	90	75.6
	No	29	24.4
		119	100
Participation of fish farmers in government empowerment scheme	Yes	49	41.2
	No	70	58.8
		119	100

If yes list them	Delta state youth empowerment scheme	14	11.8
	FADAMA	7	5.9
	CBN Anchor Borrowers Scheme	14	11.8
	Fish Farm Clusters	7	5.9
	Sub total	48	40.3
	system	71	59.6
	Total	119	100
Existence of empowerment scheme in their locality	Yes	43	36.1
	No	76	63.9
	Total	119	100
Contribution of the government empowerment scheme to fish farmers	Financial contribution	2	1.7
	Provision of fish feed	4	3.4
	Enlightenment programmes	10	8.4
	Subsidizing fish seeds	1	0.8
	Sub total	17	14.3
	System	102	85.7
	Total	119	100
Duration of various empowerment scheme	Delta state youth empowerment scheme	15years	
	FADAMA 111	9years	
	CBN Anchor Borrowers Scheme (CBNABS)	4 years	
	Fish farm clusters	6years	
Type of aquaculture practiced	Monoculture	83	69.7
	Polyculture	13	10.9
	Integrated aquaculture	23	19.3
	Total	119	100
Type of integrated aquaculture practiced	Fish and pig	14	11.8
	Fish and vegetables	9	7.6
	Sub total	23	19.3
	System	96	80.7
	Total	119	100

Source: Field survey, 2019

Table 3, shows baseline information and whether or not the empowerment scheme was impactful. The response is arranged such that the first values represent a yes (farmers who responded in the affirmative). Majority (23.5%) of the farmers practiced semi-intensive systems of fish management. Scale of production was mainly small scale (32.8%). Type of culture facility was majorly plastic tank (10.1%). Majority of the farmers had between 5-10 rearing facilities (24.4 %). The major source of water was from borehole (32.8%). Most farmers (16.8%) harvested 300-500 per pond majority of which weighed average of < 1kg (29.4%). Majority (63.9%) of the respondents agreed that there was improvement in the

production system, like every other tested parameter, due to the interventions from the schemes.

Table 3 Baseline information and whether or not the empowerment scheme was impactful

Variable	Description	Frequency	Percentage	Frequency YES/NO	Percentage
Production system	Intensive	11	9.2	76	63.9
	Semi intensive	28	23.5	43	36.1
	Total	39	32.8	119	100
	System	80	67.2		
		119	100		
Scale of production	Small scale	39	32.8	78	65.5
	Large scale	4	3.4	41	34.5
	Total	43	36.1	119	100
	System	76	63.9		
		119	100		
Culture facility used	Earthen pond	17	14.3	79	66.4
	Tarpaulin	9	7.6	40	34.5
	Plastic tank	12	10.1	119	100
	Concrete tank	5	4.2		
	Total	43	36.1		
	System	76	63.9		
Number of facilities	≤5	9	7.6	77	64.7
	5-10	29	24.4	42	35.3
	10-15	2	1.7	119	100
	≥15	3	2.5		
	Total	43	34.5		
	System	78	65.5		
		119	100		
Source of water	Borehole	39	32.8	NA	NA
	River/stream	4	3.4	NA	NA
	Total	43	36.1	NA	NA
	System	76	63.9		
		119	100		
Harvested fish/pond	≤300	11	9.2	77	64.7
	300-5000	20	16.8	42	35.3
	500-800	6	5.0	119	100
	800-1000	5	4.2		
	≥1000	1	0.8		
	Total	43	36.1		
	System	76	63.9		
		119	100		
Average weight of fish harvested	≤1 kg	35	29.4	76	63.9
	1.1 - 1.5 kg	7	5.9	43	36.1
	1.6 – 2 kg	1	0.8	119	100
	Total	43	36.1		
	System	76	63.9		
		119	100		

Source: Field Survey, 2019

The empowerment schemes assisted in increasing productivity in all cases. More inputs, capacity building and advisory services were made available to beneficiaries. Farmers hitherto operating intensive fish farming where few (9.2%) with semi intensive more common. Cost of operation was the reason why the farmers preferred it so. These result corresponds with the findings of Oyinbo and Rekwot (2013), in their review of aquaculture production and management in Nigeria, they stated that 16.5% of fish farmers in Nigeria

operate intensive aquaculture which is relatively low as compared to the semi-intensive system. This result disagrees with Ideba *et al*. (2013), who stated that 100% of fish farmers in Calabar practiced intensive system because the major motive is to make profit.

Majority of the farmers uses plastic tanks because they are easier to use, easily affordable and movable from place to place. This result disagrees with Olaoye *et al.* (2014) in their assessment of socio-economic analysis of fish farming in Oyo, who reported that 75% of fish farmers used concrete tanks. This was the finding of Egwenomhe *et al*. (2020) in a survey of fish culture facilities (ponds, concrete tanks, tarpaulin and plastic vats) used by farmers in Edo South, Edo State. The highest number of facilities used ranges from 5-10 before the empowerment scheme but after the empowerment scheme the number of facilities increased. This result showed that aquaculture production in the study area was dominated by farmers with few production facilities before the empowerment. This may account for the low production rate as supported by Aphunu and Nwabeze, (2012), who reported that 73.8% in Delta State had culture facility of between 1 and 5. A large number of the farmers were using borehole (water from this source is less prone to pollution compared to water from rivers and lakes in the locality). There is also ease of accessing water through borehole as the water table is shallow in the study area. Before empowerment the number of fishes harvested was small but after the scheme the number of fishes harvested increased. Before the empowerment scheme the average weight of fish harvested was less than 1 kg but after the scheme the weight harvested increased.

Table 4 shows the impact of the empowerment schemes. Majority of the respondents (23.5%) agreed that they would not be better off without the scheme. They were able to acquire more assets mainly land (12.6%), and television set (12.6%). A higher percentage (73.7% of those who responded to this question) accepted that they were better off with the scheme. These respondents were able to acquire more properties from proceeds for the farm after the empowerment.

Table 4; Impact of the empowerment schemes

Variable	Description		
Do you think you will be better off without the scheme	Yes	10	8.4
	No	28	23.5
	Total	38	31.9
	System	81	68.1
		119	
What asset have u been able to acquire with the empowerment scheme	Land	15	12.6
	Car	6	5.0
	House	2	1.7
	Refrigerator	5	4.2
	Television set	15	12.6
	Sub total	43	36.1
	System	76	63.9
	Total	119	100

Source: Field survey, 2019

Table 5 shows the challenges faced by the fish farmers in accessing the empowerment schemes. The major challenges faced by the fish farmers in accessing the empowerment schemes was delayed transmission and execution of the scheme (mean=4.86). It was caused

by inadequate information and funds to execute the planned scheme. Nwabueze *et al,* (2009) reported that most times funds that are meant for Agricultural empowerment scheme do not get to the farmers at all or it gets to them late due to wrong timing of the intervention, or due to delayed execution of project.

Table 5: Challenges faced by the fish farmers in accessing the empowerment schemes

Challenges	Mean	Standard deviation
inadequate faith in the programmes	4.59	0.11
lack of awareness of the scheme	4.37	0.097
lack of information on how to apply the scheme	4.65	0.079
Delayed transmission and execution of the scheme	4.86	0.078

Source: Field Survey, 2019

Delayed transmission and execution of the scheme leading to inadequate faith in the programmes have been a huge problem affecting the assessment of government empowerment scheme because the farmers hardly trust the extension workers despite access to information and technologies (Nwabueze *et al,* 2009). On the whole, providing agricultural extension and advisory services using exclusively public sector approaches remains debatable in many developing countries. These countries are characterized by limited budgets to adequately support public agricultural extension. There is no persistence in governance mechanism and ineffective management cum information systems for getting speedy consistent feedback from the farmers and other stakeholders at the grass-root level (Nwabueze *et al,* 2009).

Conclusion

The findings show that most people in the study area knows about empowerment schemes but few have participated in any such schemes. The most challenging problem is delayed transmission and execution of the schemes, not enabling the farmers has faith in the progrrammes in order to accept accessed information on the schemes. It is therefore, recommended that governments should avoid delays in implementing these schemes so that the fish farmers have faith in the programmes and participate actively in such schemes.

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