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EFFECT OF NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT LIVELIHOOD ENHANCEMENT ACTIVITIES ON THE BENEFICIARIES' POVERTY STATUS IN ENUGU STATE, NIGERIA

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ABSTRACT

This study investigated the effect of Nigeria Erosion and Watershed Management Project (NEWMAP) livelihood enhancement activities on the beneficiaries' poverty status in Enugu State, Nigeria. Primary data were collected from a sample of 120 respondents using a well-structured questionnaire/interview schedule. Descriptive statistics such as frequency distribution, mean scores, and poverty profile model were employed in data analysis; while Z-test was used to test the null hypothesis at a 5% level of significance. The result showed that most of the community interest groups (CIGs) were livestock based (31.03%), crop farming (31.03%), and trading (20.69%). The result of the mean score analysis revealed that the project livelihood activities met the beneficiaries felt needs ($\bar{x}$ = 3.75), and improved their crop farming technical knowledge ($\bar{x}$ = 3.75) and livestock farming knowledge ($\bar{x}$ = 3.43). However, the mean per capita expenditure of the households increased from ₦ 10,004. 65 to ₦16, 946.12. Also, the core poverty line, moderate poverty line, and non-poor benchmark established at ₦3, 334.88; ₦ 6,669.76 and > ₦ 6,669.76 before participation was enhanced to ₦ 5,648.71; ₦ 11, 297.42 and > ₦ 11, 297.42 respectively. Further analysis revealed a 37% increase, 34.8% decrease, and 21.7% decrease in non-poor, moderately poor, and extremely poor beneficiaries due to the intervention. The result of the null hypothesis showed that the monthly mean per capita household expenditure was different by ₦4, 089.36 indicating a significant increase in income after participation. There was also a significant difference in poverty incidence, intensity, and severity. It was concluded that diversification of the rural economy through viable livelihood options could facilitate rural and agricultural development in the post-pandemic era. Necessary recommendations such as effective dissemination of innovations to CIGs, effective communication, and collaboration of NEWMAP stakeholders, line ministries, and universities in the region could enhance the effective implementation of livelihood enhancement activities in the area.

Keywords: *Livelihood Activities, Community Interest Groups, Beneficiaries, Poverty Profile, Enugu State, Nigeria.*

INTRODUCTION

The Federal Republic of Nigeria is a lower-middle-income country situated in the West African region with a coastline on the Atlantic Ocean forming the country's southern border with about 78 percent of the land used for agricultural purposes. Regardless of the importance of oil exports, agriculture remains the cornerstone of the Nigerian economy, employing 36.5 percent of the entire labour force, thus being a meaningful source of livelihood for the majority of the population. Despite the economic contraction in recent years, the value added of the agricultural sector remains relatively high with 21 percent of GDP (FAO, 2018)

Among Nigeria's farmers around 88 percent are considered small family farms. They depend on a diverse range of crops, livestock, and fish. Despite their importance for the domestic economy and due to the sector's productivity limitations, more than 72 percent of Nigeria's smallholders live below the poverty line of USD 1.9 a day (FAO, 2018)

Rural dwellers face a lot of problems that reduce their yield, income, and productivity and as well threaten their existence. Some of these problems include environmental constraints such as erosion and flooding. But soil erosion is one of the most threatening environmental hazards in Nigeria (Albert et al., 2006). The erosion menace remains a major problem in Southeastern Nigeria and has a negative effect on many people's lives, destroying essential infrastructures in rural and urban areas. It disconnects communities, divides roads, and destroys drinking water supplies, health centers, schools, markets, religious facilities as well as government or community-owned facilities.

As a result, the Federal Government of Nigeria (FGN) sought the support of the World Bank (WB) to tackle the problem of erosion and by extension improve the living conditions of those living in the degraded watershed in seven southern states of Nigeria namely: Abia, Anambra, Ebonyi, Edo, Enugu, Cross River, and Imo states. The support was sought through an eight-year state-led erosion land degradation intervention project titled "Nigeria Erosion and Watershed Management Project'' (NEWMAP, 2012a). The project which started in 2012 with seven first-mover states has recently scaled up to 23 states in Nigeria.

The project is financed by the World Bank (WB), Global Environment Facility (GEF), Special Climate Change Fund (SCCF), and the Federal Government of Nigeria. The states pay counterpart funds to enable participation. Thus, states, local governments, local communities,

Civil Society Organizations (CSOs), line Ministries, Departments, and Agencies (MDAs) are involved in the implementation of the project at the community level.

The development objective of NEWMAP is to rehabilitate degraded lands and reduce longer-term erosion vulnerability in targeted areas. The project has four different components which include: erosion and watershed management institutions and information services, climate change response, and project management. The livelihood enhancement activities are being implemented under component 1 (one) of the project. The core objective of the NEWMAP livelihood component is to improve the socio-economic conditions of the project beneficiaries and reduce poverty through active engagement in viable livelihood options for poverty reduction, wealth creation, and sustainable livelihood (NEWMAP 2012b, PIM and PAD).

Many rural populations in Africa including Nigeria have been suffering from poverty (Oyinbo and Olaleye, 2016). Reduction of poverty is one of the most difficult problems facing any country in the developing world, where most of them are considered poor. The incidence of poverty is very high in the country and hardly bearable by the citizens. In Southeast Nigeria, the increasing rate of rural poverty has become a source of major concern to many rural households (Odoh and Nwibo, 2017). Rural households continue to face poor economic conditions which negatively impact their living standards.

It is expected that the active engagement of rural households in NEWMAP facilitated livelihood enhancement activities in Enugu State Nigeria would improve their socio-economic conditions. But the extent to which this has happened in Enugu State to justify the huge amount of funds spent on the project activities is not yet known. As a result, this study was undertaken to unravel the effect of Nigeria's erosion and watershed management project on the poverty profile of the beneficiaries in Enugu State, Nigeria.

Objectives of the study

The specific objectives were to:

(i) examine livelihood enhancement activities implemented by NEWMAP in the area;

(ii) ascertain the perception of the respondents about NEWMAP livelihood enhancement activities; and

(iii) examine the poverty profile of the beneficiaries before and after participating in livelihood enhancement activities.

Hypothesis: There was no significant difference between the poverty profile of the respondents before and after participation in NEWMAP livelihood enhancement activities.

METHODOLOGY

This study was carried out in Enugu State, Southeast Nigeria. The study population comprised 800 (eight hundred) beneficiaries from twenty (20) Community Interest Groups (CIGs) formed; ten (10) each from the two participating communities (Ameke Ngwo and Ugwuto Nzude); all in Udi L.G.A of Enugu State. Multi-stage purposive and random sampling techniques were used to select two Newmap communities first. Secondly, ten (10) Community Interest Groups (CIGs) were randomly selected. Thirdly, six (6) CIGs members were randomly selected from each CIG to make a total of 120 respondents used for the study. Primary data were collected directly from the beneficiaries with the aid of a well-structured questionnaire and interview schedule. Descriptive statistics such as percentage distribution, mean scores, and poverty profile model were employed in data analysis. The null hypothesis was tested using Z-test at a 5% level of significance.

Model Specification

The poverty index was achieved using the method proposed by Foster- Greer-Thorbecke (FGT) which computed the poverty index by using the mean per capita household's expenditure on food (MCHE). This was used to determine the poverty status of the beneficiary households represented using descriptive statistics. It is computed with the mathematical formula stated as follows:

$$P = \frac{1}{N}\sum_{i=1}^{q} \quad \frac{(z-Y_i)\alpha}{z}$$

Where:

P = Foster, Greer and Thorbecke index ($0 \leq P \leq 1$)

N = total number of respondents i.e farm households sampled

q = number of respondents below the poverty line i.e poor people

z = the poverty line

Yi = per capita household expenditure of the i^{th} respondent.

α = non-negative poverty aversion parameter (0, 1, or 2).

Analysis of the poverty status of the households was decomposed into three indicators i.e. prevalence of poverty (P_0), poverty depth (P_1), and severity of poverty (P_2). If $\alpha = 0$, the index becomes $P_0 = q/n$. This gives the headcount ratio or the incidence of poverty which is the percentage of respondents in poverty, that is, whose per capita expenditure is below the poverty line. If $\alpha = 1$, it reflects both the incidence and depth of poverty or the proportion of the poverty line that the average poor will require to attain the poverty line. If $\alpha = 2$, the index measures the severity of poverty which is the mean of the square proportion of the poverty gap. When multiplied by 100, it gives the percentage by which a poor household's per capita expenditure should increase to push them out of poverty.

Test of Hypothesis

$H0_1$: There is no significant difference between the poverty status of the respondents before and after the implementation of livelihood activities was tested using a z-test as shown

The paired sampled z-test used to test the hypothesis that there is no significant difference in the poverty status of beneficiary households of NEWMAP livelihood enhancement activities before and after participating in the project across the states is fitted as;

$$Z_{cal} = \frac{\bar{X}_{i-\bar{x}_j-A}}{\sqrt{\frac{S^2\bar{x}_i}{n_i}+\frac{S^2\bar{x}_j}{n_j}}}$$

Where:

$\bar{X}_i$ = Mean Per Capita Household Expenditure (MPCHE), Poverty intensity or poverty depth of NEWMAP beneficiaries before participating in the project;

$\bar{X}_j$ = Mean MPCHE, Poverty intensity or poverty depth of NEWMAP beneficiaries after participating in the project;

$S^2\bar{x}_i$ = Squared standard deviation of MPCHE, poverty intensity, or poverty depth of NEWMAP beneficiaries before participating in the project.

$S^2\bar{x}_j$ = Squared standard deviation of MPCHE, poverty intensity or poverty depth of NEWMAP beneficiaries after participating in the project.

n_i = Number of sampled beneficiaries before participating in the project.

n_j = Number of sampled beneficiaries after participating in the project

RESULTS AND DISCUSSION

Livelihood Enhancement Activities Implemented by NEWMAP in Enugu State

The distribution of livelihood enhancement activities implemented by NEWMAP in Enugu State is shown in Table 1.

Table I showed that most of the CIGs established in Enugu State were livestock based (31.03%), followed by crop farming (23.53%) and trading (20.69%). Others were crop farming (10.34%) and ICTs (10.34%) artisans/handcrafts (6.89%) and construction/mechanic repairs (6.89%). The least CIGs were rental businesses (3.45%) and agro-processing (3.45%).

Table 1: Livelihood Enhancement Activities Implemented by NEWMAP in Enugu State

S/N	CLASSIFICATION	CIGS ACTIVITIES	ENUGU Freq	(%)
1	Livestock	Poultry	5	7.24
		Piggery	3	0.34
		Fishery	1	3.45
3.	Information and Communication Technology (ICTs)	Computer Business Centres	3	10.34
5.	Artisan/handcraft	Fashion & Designing/ Tailoring	1 2	3.45 6.89
		Decorations/Event Planning & management	1	3.45
6.	Construction/mechanic repairs	Welding/Gabion box fabrications	2	6.89
7.	Rental Business	Canopy & Chairs renting Plates & Pots Renting	1	3.45
8.	Agro-processing	Cassava processing	1	3.45
	Grand Total		29	100

Source: Field Survey Data, 2019.

The result shows that NEWMAP livelihood enhancement activities were diversified into various sectors of the economy with agricultural-based activities taking lead in the area. This implied that agriculture plays a critical role in providing better livelihoods for poor people as it continues to provide the primary basis for the beneficiaries' livelihoods. This finding is similar to those of Thomas and Eforuoku (2016). Mathews-Njoku and Nwaogwugwu (2014)

identified livestock rearing and crop farming as the most embraced livelihood strategies adopted by rural households in Southeast Nigeria.

Perception of the Respondents on the Benefits of NEWMAP Livelihood Enhancement Activities

The result of the respondent's perception of the benefits of the project is shown in Table 2. The result showed that in Enugu State, most of the items enumerated were accepted as positive factors because they scored above the decision cut-off point of 2.50. The items regarded as positive factors include the following: NEWMAP livelihood activities met the felt needs of the beneficiaries ($\bar{x}$= 3.75), improved our crop farming technical knowledge ($\bar{x}$= 3.33), improved our livestock farming knowledge ($\bar{x}$= 3.43), enhanced our knowledge of agro-processing ($\bar{x}$ = 3.31), improved our leadership roles ($\bar{x}$= 3.38), improved our business and entrepreneurial skills ($\bar{x}$ = 3.44), created employment for our unemployed youth ($\bar{x}$ = 3.43), created employment and income for our physically challenged persons ($\bar{x}$=3.57), improved business opportunities in our community ($\bar{x}$= 3.56), improved the income generating power of the beneficiaries ($\bar{x}$= 3.53), enhanced my income generating ability from agriculture ($\bar{x}$= 3.58), enhanced social network in my community ($\bar{x}$= 3.38), enhance cooperative operation in my community ($\bar{x}$= 3.37), increased craft making in my community ($\bar{x}$= 3.18), increase petty trading in my community ($\bar{x}$= 3.20), it led to friendship between us and visitors from other culture ($\bar{x}$= 2.57), it enhanced our knowledge of the environment and has built our capacity on environmental conservation ($\bar{x}$= 2.97) and the project livelihood activities enabled me to adopt environmental friendly and improved agricultural practices ($\bar{x}$= 3.19). The grand mean was 3.26 and is greater than the cut-off point of 2.50. This implies that most of the items are positive factors. However, the project's livelihood activities led to marriages between us and visitors from other cultures ($\bar{x}$= 1.63) was regarded as a negative factor since it scored below the cut-off point of 2.50 and was not accepted. This finding is similar to that of Ominikari (2017) who reported a positive perception of the Fadama III agricultural project among beneficiaries in Bayelsa State, Nigeria.

Table 2: Mean scores of Respondents' Perceptions of the Benefits of NEWMAP Livelihood Enhancement Activities

S/N	Perception Statement	Mean Scores ($\bar{x}$)
i.	NEWMAP livelihood activities met the felt needs of the beneficiaries	3.75
ii	It improved our crop farming technical knowledge	3.33
iii	It improved our livestock farming knowledge	3.43
Iv	It enhanced our knowledge of agro processing	3.31
v	It enhanced our engagement in non-farming activities	3.29
vi	It improved our leadership roles	3.38
vii	It improved our business and entrepreneurial skills	3.44
viii	It created employment for our unemployed youths	3.43
ix	It created employment and income for our physically challenged persons	3.57
x	It increased business opportunities in our community	3.56
xi	It improved the income generating power of the beneficiaries	3.53
xii	It enhanced my income generating ability from agriculture	3.58
xiii	It enhanced the social network in my community	3.46
xiv	It enhanced my propensity to save	3.38
xv	It enhanced cooperative operation in my community	3.37
xvi	It enhanced craft making in my community	3.18
xvii	It increased petty trading in my community	3.20
xviii	It led to marriages between us and visitors from other cultures	1.63
xix	It led to a friendship between us and visitors from other cultures	2.57
xx	It enhanced our knowledge of the environment and built our capacity for environmental conservation	2.19
xxi	It enabled me to adopt environmentally friendly agricultural practices	3.19
	Grand mean	**3.19**

Source: Field Survey, 2019. Keys > 2.50 positive perception; less than 2.50 negative perception

Poverty Profile of NEWMAP livelihood Enhancement Activities Beneficiaries in Enugu State

The result of the poverty profile of the project beneficiaries is presented in Table 3.

The result of the poverty profile for NEWMAP beneficiaries in Enugu State showed that the beneficiaries with a mean household size of 7 persons per household had their mean Per capita expenditure increased from ₦10, 004. 65 before NEWMAP intervention to ₦ 16, 946.12 after benefiting from the NEWMAP intervention project representing a 69.38% increase in the mean per capita expenditure status of the beneficiaries in Enugu State. Before the intervention of NEWMAP, the core poverty line, moderate poverty line, and the non-poor benchmarks for the respondents were established at ₦ 3, 334.88; ₦ 6, 669.76 and > ₦6,669.76 respectively.

Table 3: Poverty Profile of NEWMAP livelihood Enhancement Activities Beneficiaries in Enugu State

Poverty Profile	Before	After
Number of respondents	120	120
Mean household size	6.66	6.66
Mean Per capita expenditure (₦)	10,004.65	16, 946.12
Core poverty line (₦)	3, 334.88	5, 648.71
Moderate poverty line (₦)	6, 669.76	11, 297.42
Non-poor (₦)	6, 669.76	11, 297.42
Poverty incidence	0.450	0.617
Poverty intensity (gap)	0.234	0.176
Poverty depth (Severity)	0.055	0.031
Non-poor number (%)	54 (45)	74 (61.7)
Moderately poor number (%)	43 (35.8)	28 (23.3)
Extremely poor number (%)	23 (19.2)	18 (15)

Source: Field Survey, Data 2019.

Figures in Parentheses are percentages of the Respondents

After the intervention of NEWMAP, the core poverty line, moderate poverty line, and non-poor benchmarks for the respondents were enhanced and established at ₦ 5, 648.71, ₦ 11, 297.42, and ₦ 11, 297.42 respectively. The result of the study shows that 54 persons representing 45% of the sampled beneficiaries were non-poor before the project, while 66 persons representing 55% of the sampled beneficiaries were poor. Among the poor beneficiaries, before the project, 43 of them representing 35.8% of the sampled beneficiaries were moderately poor; whereas 23 of them represented 19. 2% of the sampled beneficiaries were extremely poor. After the NEWMAP intervention, 74 persons representing 61.7% of the sampled beneficiaries were non-poor; while 46 persons representing 38.3% of the sampled beneficiaries were poor. Among the poor rural households, 28 persons representing 23.3% of the sampled beneficiaries were moderately poor; whereas 18 persons representing 15.0% of the sampled beneficiaries were extremely poor. Further analysis revealed that the number of non-poor beneficiaries increase from 54 to 74 persons representing a 37% increase due to the intervention. Also, the number of moderately poor beneficiaries decreased from 43 to 28 persons representing a 34.8 percent decrease due to the intervention; whereas the number of extremely poor beneficiaries decreases from 23 to 18 persons representing a 21.7% decrease

due to the intervention. Poor beneficiaries who extremely require attention to improve their standard of living. This result shows that there is more inequality in the standard of living among the beneficiaries before the intervention. This means that poverty was more severe among the beneficiaries before the intervention. This implies that NEWMAP had fulfilled its mandate of improving the socio-economic conditions of its beneficiaries through their active engagement in livelihood options for income generation, poverty reduction, and wealth creation. The result of this study corroborated those of Okringbo, Oduehie, and Ibeneme (2017) who reported that the National Root Crop Research Institute (NRCRI) positively influenced the poverty status of rural households through the dissemination of improved agricultural technologies in Abia State, Nigeria. This result was compared favourably with Nwachukwu, Okafor, Okafor, and Taiwo., (2016) who obtained a similar result for Fadama III participants in Anambra State, Nigeria

HYPOTHESIS TESTING

The result of hypothesis testing is shown in Table 4

Table 4: Test of difference between the poverty status of NEWMAP beneficiaries in Enugu State.

Poverty indicators	Mean	STD	SEM	DF	z-value
Mean Per Capita Household Expenditure (₦)					
Before[a]	14, 184.51	12482.51	379.83		
After[b]	18,273.87	16962.46	516.15		
(a-b)	-4,089.36	-4, 479.95	236.11	118	-17.319***
Intensity of Poverty (%)					
Before[a]	0.213	0.181	0.010		
After[b]	0.151	0.136	0.007		
(a-b)	0.062	0.045	0.002	118	26.141***
Dept of Poverty (%)					
Before[a]	0.045	0.032	0.002		
After[b]	0.023	0.017	0.001		
(a-b)	0.022	0.015	0.001	118	27.828***
Poverty incidence					
Before[a]	0.447	0.313	0.016		
After[b]	0.581	0.169	0.009		
(a-b)	0.134	0.144	0.008	118	-17.656***

*** represents a 1% level of significance. SEM= Standard error of the mean.

The result shows that the monthly mean per capita household expenditure was different by ₦4, 089.36 indicating a significant increase in income after participation (Z = -17.319***) at a 1% level of significance. Further analysis also revealed significant differences in poverty incidence, intensity and severity (Z= 26.141 ***; 27.828*** and -17.656***) at 1% level of significance.

CONCLUSION AND RECOMMENDATIONS

The study concludes that diversification of the rural economy through viable livelihood options especially in the off-season could be an alternative means of achieving the much-needed agricultural and rural development in this era. Necessary recommendations such as effective dissemination of the project's activities through radio and television stations to enable non-beneficiaries to know about the project; increased dissemination of improved package of practices taught by service providers to farmers in the project communities to facilitate adoption, increased income, wealth creation, and sustainable livelihood; increased communication between NEWMAP and line ministries especially the Ministry of Agriculture for effective linkage and delivery of extension services; enhanced collaboration and communication between research institutes, universities of Agriculture for knowledge sharing on innovative CIGs based activities.

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