



Effect of Nigeria Erosion and Watershed Management Project Livelihood Enhancement Activities on the Beneficiaries' Poverty Status in Anambra State, Nigeria.

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Abstract: The study analyzed the effect of Nigeria Erosion and Watershed Management Project (NEWMAP) livelihood enhancement activities on the beneficiaries' poverty status in Anambra State, Nigeria. Primary data were collected from one hundred and twenty (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 null hypothesis at 5% level of significance. Result showed that most of the community interest group (CIGs) were livestock based (45.15%) followed by trading (12.98%). The result of mean score analysis revealed that the project livelihood activities met the beneficiaries felt needs ($X = 3.59$), improved their crop farming technical knowledge ($X = 2.48$) and livestock farming knowledge ($X = 3.34$) among others. However, the mean per capita expenditure of the households increased from ₦12, 111.36 to ₦15, 453.27. Also, the core and moderate poverty line and non-poor benchmark established was at ₦14,037.12; ₦8,074.24 and $> ₦8,074.24$ before participation were enhanced to ₦5,151.09; ₦10,302.18 and $> ₦10,302.18$ respectively. The result of null hypothesis showed that the monthly mean per capita household expenditure was different indicating significant increase in income after participation ($Z = -10.119^{***}$) at 1% level of significance. Also, significant difference exists in poverty incidence, intensity and severity of poverty respectively ($Z = 16.101^{***}$; 17.028^{***} and -14.150^{***}) at 1% level of significance. The study concludes that viable livelihood activities were successfully implemented by Anambra State NEWMAP as alternative means of reducing poverty profile of the project beneficiaries through additional income generation, wealth creation and sustainable livelihood. Necessary recommendations such as: effective dissemination of innovations to CIGs, effective communication and collaboration of NEWMAP stakeholders, in-line ministries and universities in the region could facilitate implementation of livelihood enhancement activities to achieve project goals.

Keywords: Livelihood Activities; Community Interest Groups; Beneficiaries; Poverty Profile; Anambra State.

INTRODUCTION

The Federal Government of Nigeria (FGN) sought the support of the World Bank (WB) to tackle the problem of erosion and by extension improve living conditions of those living in degraded watershed in seven States of Nigeria namely: Abia, Anambra, Ebonyi, Edo, Enugu, Cross Rivers 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, 2021a). The

project which started in 2012 with seven first mover states have recently scaled up to 23 states in Nigeria selected from different geopolitical zones of the country.

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 state pay counterpart fund to enable participation. Thus, state, local governments, local communities, Civil Society Organizations (CSOs), in-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 is being implemented under component 1 (one) of the project. The core objective of 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, 2012).

Many rural populations in Africa including Nigeria have been suffering poverty (Oyinbo & 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 (Osuafor *et al*, 2020). In Southeast Nigeria, the increasing rate of rural poverty has become a source of major concern to many rural households (Odoh & Nwibo, 2017).

Rural households continue to face poor economic conditions which impact negatively on their living standards. Some of these problem include environmental constraints such as erosion and flooding. Erosion menace still remains a major problem in Nigeria especially in Southeast Nigeria. This is caused by heavy rainfall in the area which change landscape forms; creating deep gullies that cut into the soil and deteriorate soil properties (Osuafor *et al*, 2021; Ajibade *et al*, 2014). Gullies expand quickly destroying arable lands, crop, livestock, economic trees, homes, lives, valuable properties and infrastructures among others (Umudu, 2008). Also, the World Bank (2006) estimates that soil degradation caused by erosion affect more than 50 million Nigeria and cause loss of resources amounting to US 3,000 million annually (Igwe & Fukuoka, 2010).

However, NEWMAP adopts a holistic watershed management approach; which include; use of the state of the arts designs of the engineering/structural and flexible structures at targeted gully complexes; bio-remediation use of vegetation to complement civil works in treated gully areas to enhance regeneration; introduction of proper and well terminated drainage systems at targeted gully complexes and other erosion sites which reduce severity level after treatment; adequate safeguards measure to strengthen disaster risk reduction, community ownership and participation for adoption of sustainable land and water management practices by the beneficiaries in sub-watersheds, and where necessary implement local resettlement action plans (RAP); and improve livelihoods of direct project beneficiaries in and around the project states and sites (NEWMAP, 2012).

It is expected that active engagement of rural households in NEWMAP facilitated livelihood enhancement activities in Anambra State of Nigeria would improve the socio-economic well being of the project beneficiaries. But, the extent to which this has happened in Anambra State is not yet certain. As a result, this study was undertaken to ascertain the effect

of Nigeria erosion and watershed management project livelihood enhancement activities on the poverty profile of the beneficiaries. The following research questions were addressed:

- What are the livelihood enhancement activities implemented by NEWMAP in Anambra State?
- What is the perception of the respondents about NEWMAP livelihood enhancement activities?
- What is the poverty status of the beneficiaries before and after participation in NEWMAP livelihood enhancement activities?

Objectives of the study

The broad objective of this study was to evaluate the effect of Nigeria erosion and watershed management livelihood enhancement activities on the poverty status of the beneficiaries in Anambra State, Nigeria. The specific objective 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 participation in livelihood enhancement activities.

Hypothesis:

H0: There is no significant difference between poverty profile of the respondents before and after participation in NEWMAP livelihood enhancement activities.

METHODOLOGY

This study was carried out in Anambra State, Southeast Nigeria. The study population comprised of 900 (nine hundred) beneficiaries selected from fifty five (55) Community Interest Groups (CIGs) formed; eighteen (18) from Neros Plaza/Aquinas; fourteen (14) from Abagana and twenty three (23) from Omagba in Awka South, Njikoka and Onitsha North L.G.As of Anambra State respectively. Multi-stage sampling techniques were adopted. Firstly, three (3) NEWMAP communities were purposively selected for the study due to predominance of NEWMAP in these areas. Secondly, ten (10) most active communities Interest Groups (CIGs) were randomly selected from each NEWMAP Community. Thirdly, four (4) 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 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 means per capita household's expenditure on food (MCHE). This was used to determine the poverty status of the beneficiaries' households represented using descriptive statistics. It is computed with the mathematical formula stated as follows:

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

Where:

- P= Foster, Greer and Thorbecke index ($0 \leq P \leq 1$)
- N= total number of respondents i.e farm households sample
- q= number of respondents below the poverty line i.e poor people
- z= the poverty line
- Y_i= per capita household expenditure of the ith respondent.
- a= non- negative poverty aversion parameter (0, 1 or 2).

Analysis of poverty status of the households were decomposed into the three indicator i.e prevalence of poverty (P0), poverty depth (P1) and severity of poverty (P2). If a =0, the index become P0=q/n. this gives the head count 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 a = 1, it reflects both incidence and depth of poverty or the proportion of the poverty line that the average poor will require to attain to the poverty line. If a = 2, the index measures the severity of poverty which is the mean of 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

H0₁: There is no significant difference between the poverty status of the respondents before and after

implementation of livelihood activities was tested using 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:

- X_i = mean per Capita Household Expenditure (MPCHE), poverty intensity or poverty depth of NEWMAP beneficiaries before participating in the project;
- X_j= mean MPCHE, poverty intensity or poverty depth of NEWMAP beneficiaries after participating in the project;

S² x_i =Squared standard deviation of MPCHE, poverty intensity or poverty depth NEWMAP beneficiaries before participating in the project.

S² x_j= Squared standard deviation of MPCHE, poverty intensity or poverty depth 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 & DISCUSSION

Livelihood Enhancement Activities Implemented by NEWMAP in Anambra State

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

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

S/No	CLASSIFICATION	CIGS ACTIVITIES	FREQ.	PERCENT
1.	Livestock	Poultry	8	12.90
		Piggery	4	6.45
		Fishery	7	11.29
		Snailery	5	8.06
		Grass cutting farming	4	6.45
2.	Crop farming	pepper/cucumber	1	1.61
3.	Information and communication Technology (ICT)	Computer Business Centers	1	1.61
4.	Artisan/hand craft	Fashion & Designing/Tailoring	3	4.84
		Decorations	1	1.61
		Event Planning & Management	2	3.45
5.	Trading	Provision	2	3.23
		Food stuff	2	3.23
		Small retails	6	6.52
		Welding/Gabion box Fabrication	1	1.61
6.	Construction/mechanic repairs			
7.	Rental Business	Canopy & chairs renting	1	3.45
		Plates & pots renting		
		Cassava Processing	1	3.45
8.	Agro-Processing			
Grand Total			29	100

Source: Field Survey, 2019.

Table I showed that most of the CIGs established in Anambra State were livestock based (45.16%), followed by trading (9.68%) and agro-processing (9.68%). Others were artisans/hand crafts (6.45%), small scale manufacturing (6.45%), construction/mechanic repairs (4.84%) and confectionaries/catering/restaurants services (4.84%). The result above shows that NEWMAP livelihood enhancement activities were diversified into various sectors of the economy with agricultural based activities followed by trading taking lead in the area. This implies 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) who reported that piggery, snailery, goat rearing, horticulture, poultry and fishery were some of the livelihood activities that were made available to youth through the youth-in-Agriculture programme in Ondo State, Nigeria. Mathews-Njoku and Nwaogwugwu (2014) identified livestock rearing as the most embraced livelihood strategies adopted by rural households in Southeast Nigeria.

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

The result of the respondents' perception on the benefits of the project is shown in Table 2

Table 2: Mean scores of Respondents Perception on the Benefits of NEWMAP Livelihood Enhancement Activities

S/N	Perception Statement	Mean Scores (X)
1.	NEWMAP livelihood activities met the felt needs of the beneficiaries	3.59
2.	It improved our crop farming technical Knowledge	2.48
3.	It improved our livestock farming knowledge	3.34
4.	It enhanced our knowledge of agro-processing	2.55
5.	It enhanced our engagement in non-farming activities	3.08
6.	It improved our leadership roles	3.08
7.	It improved our business and entrepreneurial skills	3.49
8.	It created employment for our unemployed youths	3.51
9.	It created employment and income for our physically challenged persons	3.43
10.	It increased business opportunities in our community	3.55
11.	It improved the income generating power of the beneficiaries	3.52
12.	It enhanced income generating ability from agriculture	3.59
13.	It enhanced social network in my community	3.47
14.	It enhanced my propensity to save	3.49
15.	It enhanced cooperative operation in my community	3.29
16.	It enhanced craft making in my community	2.60
17.	It increased petty trading in my community	2.91
18.	It led to marriages between us and visitors from other cultures	1.75
19.	It led to friendship between us and visitors from other cultures	2.59
20.	It enhanced our knowledge of the environment and built our capacity on environmental conversation	2.72
21.	It enable me to adopt environmentally friendly agricultural practices	3.20
	Grand Total	3.17

Source: Field Survey, 2019. Keys >2.50 position perception; less than 2.50 Negative perception

Result showed that in Anambra State of Nigeria, most of the items enumerated were accepted as positive factors because they scored above the decision cut-off point of 2.50. The items include the following: NEWMAP livelihood activities met felt needs of the beneficiaries (X= 3.59), improved our crop farming technical knowledge (X=2.48), improved our livestock farming knowledge (X=3.4), enhanced our knowledge of agro-processing (X= 2.55), improved our leadership roles (X= 3.34), improved our business and entrepreneurial skills (X= 3.48), created employment for our unemployed youth (X= 3.49), created employment and income for our physically challenged persons (X= 3.51), improved business opportunities in our community (X= 3.43), improved the income

generating power of the beneficiaries (X= 3.55), enhanced my income generating ability from agriculture (X= 3.52), enhanced social network in my community (X= 3.29), enhanced cooperative operation in my community (X = 3.47), increase craft making in my community (X = 3.49), increased petty trading in my community (X= 3.29),It led to friendship between us and visitors from other culture (X= 59),It enhanced our knowledge of the environment and built our capacity on environmental conversation (X= 3.72), and the project livelihood activities enabled me to adopt environmental friendly and improved agriculture practices (X= 3.20). The grand mean was 3.17 and is greater than the cut-off point of 2.50. This implies that most of the items are positive factors. However, the projects livelihood

activities led to marriage between us and visitors from other culture ($X= 1.75$) 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 Fadama III agricultural project among beneficiaries in Bayelsa State, Nigeria.

Poverty Profile of NEWMAP Livelihood Enhancement Activities Beneficiaries in Anambra State

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

Table 3: Poverty Profile of NEWMAP Livelihood Enhancement Activities Beneficiaries in Anambra State

S/No	Poverty Profile	Before	After
1.	Number of respondents	120	120
2.	Mean household size	7.65	7.65
3.	Mean per capital expenditure (₦)	12,111.36	15,453.27
4.	Core poverty line (₦)	4,037.12	5,151.09
5.	Moderate poverty line (₦)	8,074.24	10,302.18
6.	Non-poor (₦)	8,074.24	10,302.18
7.	Poverty incidence	0.425	0.550
8.	Poverty intensity (gap)	0.187	0.161
9.	Poverty depth (Severity)	0.035	0.026
10.	Non-poor number (%)	51 (42.55)	66 (55)
11.	Moderately poor number (%)	41 (34.2)	33 (27.5)
12.	Extremely poor number (%)	28 (23.3)	21 (17.5)

Source: Field Survey, 2019.

Figures in parentheses are percentages of the Respondents

The result of the poverty profile for NEWMAP beneficiaries in Anambra State showed that the beneficiaries with a mean household size of 7 persons per household had their mean per capital expenditure increased from ₦12,111.36 before NEWMAP intervention to ₦15,453.27 after benefiting from NEWMAP intervention; representing 27.6% increase in the mean per capital expenditure status of the beneficiaries in Anambra State. Before the intervention of NEWMAP, the core poverty line, moderate poverty line and the non-poor benchmarks for the respondents were established at ₦4,037.12; ₦8,074.24 and >₦8,072.24 respectively. After the intervention of NEWMAP, the core poverty line, moderate poverty line and the non-poor benchmarks for the respondents were enhanced and established at ₦5,151.09, ₦10,302.18 and > ₦10,302.18 respectively. The result of the study shows that 51 persons representing 42.5% 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 implementation, 41 of them representing 34.2% of the sampled beneficiaries were moderately poor; whereas 28 of them representing

23.3% of the sampled beneficiaries were extremely poor. After the NEWMAP intervention, 66 persons representing 55% of the sampled beneficiaries were non-poor; while 33 persons representing 27.5% of the sampled beneficiaries were poor. Among the poor rural households, 28 persons representing 23.3% of the sampled beneficiaries were moderately poor; whereas 21 persons representing 17.5% of the sampled beneficiaries were extremely poor.

This result shows that there is more inequality of 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 Nwachukwu *et al.*, (2016) who obtained 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 Anambra State

Poverty indicators	Mean	STD	SEM	Z-Value
Mean per capital 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	-10.119***
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	-16.101***
Depth 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	17.028***
Poverty incidence				
Before ^a	0.447	0.313	0.016	
After ^b	0.134	0.169	0.009	
(a-b)	0.134	0.144	0.008	-14.150***

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

The result shows that monthly mean per capita household expenditure was different by ₦4, 089.36 indicating significant increase in income after participation ($z = -10.119^{***}$) at 1% level of significance. Further analysis also revealed significant difference in poverty incidence, intensity and severity ($Z = 16.101^{***}$ and -14.150^{***}) at 1% level of significance.

CONCLUSION & RECOMMENDATIONS

The study concludes that viable livelihood activities were successfully implemented by Anambra State NEWMAP as alternative means of reducing poverty profile of the project beneficiaries through additional income generation. Recommendations such as: increased dissemination of improve 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 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 were made.

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