

Enhancing the Capability of Rural Farmers towards Effective Soil Management in Amucha Community, Imo State, Nigeria

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ABSTRACT

With the continuous prevalence of climate change impacts, the areas suitable for agriculture, length of growing season and with potentials of high yield for staples food are all projected to decline. Some African Countries may experience decrease in agricultural yields by 50 percent by 2050 with the possibility of net revenue falling by 90 percent during the 21st century (IPCC, 2007 and Rutashobya, 2008). To guard against this projected doom, this study is initiated to examine ways rural farmers can be empowered to facilitate effective soil management for sustainable crop productivity in Amucha community of Imo State, Nigeria. A total of 480 respondents comprising farmers and stakeholders were systematically selected for study using survey instruments (checklist, questionnaire and interview). Data were analyzed descriptively using percentages and the use of multivariate tables. Results revealed generally that gender and age have strong influences on farmers' attitude towards soil management; also, low capital/poverty 113(24%), climate variability 112(23%) and local geomorphology (slope, soil) 61(13%) which rank 1st, 2nd and 3rd were identified as the three most outstanding factors militating against farmers effectiveness towards soil management. Again, agricultural loan insurance/health services and agricultural/extension services were farmers' major preference of capability enhancement variables constituting a total of 662(68.9%) in the series. This paper recommends that (1) training local farmers should be geared towards change negative attitudes and enhancement of youths to embrace farming; (2) emphasis must be laid on building the capital and technological capabilities of farmers and; (3) enabling local farmers to be adapted to the local geomorphology and climate variability of their areas. Enhancing the capabilities of these local farmers will in turn influence their soil management abilities and boost soil capabilities for sustainable agriculture.

Keywords: soil management; farmer's capability; climate variability; local geomorphology

INTRODUCTION

Soil management represents the coordination of soil resource in an area through the process of planning, directing, controlling and other activities directed towards the prevention, mitigation or eradication of damages on the soil to enhance its sustainable productivity. Building capacity for effective soil management encompasses promoting legal, institutional, leadership, partnership, training and supportive framework; depending on the degree of degradation that have set in (UNEP, 2002; Majule, 2008). The degradable state of soils over space is one of the most serious environmental challenges confronting man in the 21st century, especially in developing countries. This emanates from the persistent population increase and the resultant increase in demand for land, crop production and built-up areas which together increase pressure compounded by climate change and

related issues. In Africa and Nigeria in particular where the rural economies are based on agriculture, such demands are further complicated by poverty, mismanagement, size of holdings, level of education and others. World Bank (2005), Hazzel and Wood (2008) revealed that approximately 1.2 billion people across the globe live in abject poverty while 160 billion children under the age of five years are malnourished. Similarly, about 75 percent of the African poor reside in rural areas. The scenarios for agricultural development and indeed soil management differ considerably among regions and countries across the globe. Rural farmers in most cases play central role in soil and farm management practices and food production in any area where expanse of lands abound.

According to Nyagah (2012), most African countries had directed their efforts towards soil management and conservation since 1970s and huge amount of money have been invested in an attempt to introduce efficient and sustained soil and other resources management measures particularly in the areas where the problem of soil erosion are threatening and food deficit is widespread. In whatever perspective, most of the agronomic and engineering efforts put forward to improve farmers capability enhancement for effective soil management seem to have had limited success in achieving sustained use and widespread adoption and more or less failed to meet the anticipated objectives (Ofomata, 1985, Duru, 2012). Such limitations according to Antle (2009); Paustian et al., (2006); Sunding and Zilberman (2001) could be attributed to farmers' attitudes, perceptions, and characteristics such as education, experience and age.

The limited successes of those past efforts highlighted the need to better understand the factors that encourage or discourage the adoption, and sustainable use of introduced management measures. Indeed, enhancing the capabilities of rural farmers is very crucial in advancing capacity for crop productivity, boost food security, diversify employment opportunities and check the extreme effect of climate variability/change issues on land resources (UNEP, 2002). Yet, farmers may possess divergent views on how to improve their capabilities for both crop production and soil management.

Discounting for the efficacies of rural farmers' empowerment in general, most users of soil in the rural areas probably tend to possess little or no relevant expertise that could enhance appropriate adaptation to extreme weather and climatic events which have instigated the degradation of the soil resource in various areas within the Tropics. It is within this perspective that this work is based to explore the following

OBJECTIVES

1. To identify the major factors militating against enhancing the capabilities of farmers for effective soil management in Amucha Community of Imo State.
2. To determine if variation in age/gender have any influence on farmers' attitude towards adoption of soil management practices in Amucha community of Imo State.
3. To determine the perspective of empowering farmers for effective soil management in Amucha Community of Imo State.

THE STUDY AREA

Amucha is an agrarian community located within the Njaba Local Government Area in Imo State, Southeast Nigeria. It comprises of eight major villages (Umuoma, Umuopkoko, Umuzika, Umuokwara, Ezerie, Duruewuru, Umuzike and Umuezealibe) which together have a total population of 22,334 people (National Population Census, 2006).

The climate of the study area is Humid Tropics (Af) based on Koppen classification scheme with the rainy season duration of more than seven months and less than five months dry season on the average. It is located within the coastal plains sands of sedimentary (tertiary) deposits with low percentage of saturation, less than 40 (Oweremadu, 2007; Ojinma, Umo and Egbe, 2014). Similarly, the soils within the study area are dominantly ferrallitic in nature and would seem to resist erosion. It contains small amount of humus due to intense leaching. This makes the soil low in fertility. Some physio-chemical and geomorpho-climatic attributes especially excess rainfall/temperature, topography, and land use often induce it to succumb to certain soil and climatic hazards. The area is drained by Njaba River, while the major land use types in the area are primarily for crops production, settlement and rearing of animals at the semi-extensive scale.

METHODOLOGY

This study is empirical in nature supported with secondary data. The investigation focuses on how farmers' capabilities are enhanced with a view to improving soil management for sustainable crop productivity. Data are generated from field survey using checklist, interview, and structured questionnaire instruments, and analyzed descriptively using tables, means and percentages. From a total population of 22,334 people that make up the study area; a sample size of 480 (comprising of 400 farmers and 80 stakeholders in the community are systematically selected for study.

Issues in Capabilities Enhancement for Sustainable Soil Management

It is often agreed that capacity building is central to the quest for sustainable soil management and use. Therefore a community, civil society, nation and/or region may adequately address the principal challenges of sustainable soil management if capacity building becomes a core and explicit priority of rural development. This is evident as UNEP (2002) posited that capacity enhancement is the hallmark for sustainable future of mankind in the fragile environment. Farmers and other rural soil users are assumed to know why they may have to take different

decisions toward sustainable soil management, how it may affect them, and what they can do to prepare and protect the soil especially in areas of tree planting, conservative farming and other soil protection programs. Unfortunately, most rural communities seem to be either ignorant about the alternative strategies or are starved of this basic support system which makes them highly susceptible to soil degradations.

Within the Amucha community of Imo State, certain variables militating against effective soil management were identified by respondents using checklist and the result is presented as Table 1. The Table reveals that low capital/poverty and climate (rainfall), each representing 113(24%) and 112(23%) are the major factors militating against effective soil management in Amucha rank (1st and 2nd) respectively. Local geomorphology 61(13%); varying type of land use 57(12%) and inadequate level of awareness 53(11%) are ranked 3rd, 4th and 5th in the series. These strengthens Okafor (1988) observation that basic education and other supports should be provided and awareness raised in rural areas on climate change and adaptation using appropriate communication tools such as radio, drama, flyers, posters, seminars, workshops, video, town criers and other traditionally based awareness strategies.

Table 1: Perceived Challenges to Effective Soil Management in Amucha Area

Militating Factor against Soil Management	Total	Percent	Rank
Land use type	57	12	4
Inadequate awareness	53	11	5
Population pressure	33	7	7
Government policies	4	1	9
Land fragmentation	36	8	6
Culture & tradition	00	0	10
Low capital/poverty	113	24	1
Illiteracy	11	2	8
Climate variability (rainfall)	112	23	2
Local geomorphology(soil, slope)	61	13	3
Total	480	100	

Source: Authors' Field Survey, 2015.

Other factors in the ranking are land fragmentation 36(8%); population pressure 33(7%); high level of illiteracy 11(2%) and government policy 4(1%) (6th; 7th; 8th and 9th) while culture/ tradition which rank 10th has no influence on the state of degradation on soil in Amucha community.

Capacity Investment and Attitude on soil for Sustainable Crop Productivity

Majule (2008) has observed that there is currently a shortage of integrated approaches for evaluating and

making adaptive decisions relating to soil, water and other resources in various regions across Africa. Poor capability investment and low level of awareness to enhance effective soil management may directly associate with poverty and negative attitudes on the part of farmers toward soil management. Such poor capability is often linked with information accessibility, health facilities, illiteracy and over dependency. Apart from these factors highlighted above, such others as attitude, gender and age of rural farmers in soil management have not been well known in most areas.

A multivariate analysis of relationships between farmer's characteristics (age and gender) and their attitude toward effective soil management in Amucha community of Imo State was done and presented as **Table 2**. The result indicates that both age and gender exerted strong influence on farmers' attitude toward soil management. Whereas 74(62%) of females, aged 35 years and below exhibited positive attitude, about 61(51%) of males in the same age group also exhibited positive attitude toward soil management in the study area.

Table 2: Farmers Composition and Attitude toward Soil Management in Amucha Area.

Attitude	Female		Male	
	35 and Less	Above	35 and Less	Above 35
Positive	74 (62%)	77 (64%)	61 (51%)	90 (75%)
Negative	46 (38%)	43 (36%)	59 (49%)	30 (25%)
Total	120 (100%)	120 (100%)	120 (100%)	120 (100%)

Source: Authors Field Survey, 2015.

In the same vein, females from 35years and above have 77(64%) while their males counterpart recorded 90(75%). Hence in terms of farmers above 35 years, the males seem to exhibit more positive attitude towards soil management than the females in Amucha community. This strengthens the assumption that soil and indeed, agro-based practices in most rural communities within the southeast Nigeria are left for the adult and aged rather than the youth, and that gender varies in response to attitude toward soil management in the region.

Preference to Capability Enhancement among Farmers

Human interference within a given ecosystem often alters the balance of such space where the systems operate thereby creating new and dynamic equilibrium (Umo et al, 2014; Olofin, 1979). Such changes may manifest in form of erosion, flood and other process-induced hazards which require specialized training and other forms of empowerment programs to enhance

effective coping over a period of time. Amucha community is highly vulnerable to various types of soil erosion especially in this 21st century following the impact of climate variability/change and local geomorphology. We therefore examined the various areas the populace have been or want to be empowered in other to enhance adequate adaptation to the changing scenarios of the environment for sustainable soil use.

Each respondent was asked to identify two most preferred options that will facilitate sustainable soil management. Data generated from the field was presented as **Table 3**. Analysis using percentages indicate that agricultural loan 434(45.2%), insurance/health services 126(13.1%) and agricultural extension services 102(10.6%) are the three major variables that Amucha farmers preferred for the enhancement of effective soil management. Other variables in their ranking are adult education 88(9.3%), fertilizer/manure supply 60(6.3%), awareness creation 42(4.4%), environmental education 34(3.5%) (4th, 5th, 6th, and 7th respectively) while regular workshop 4(0.4%) attracts the least attention among the variables that can enhance their capabilities.

Table 3: Farmers' Preferred Variables towards Capabilities Enhancement

Variables of Capability Enhancement	No. of Response	Percent	Ranking
Regular workshop	4	0.4	11 th
Government subsidy	28	2.9	9 th
Agricultural Loan	434	45.2	1 st
Fertilizer/manure supply	60	6.3	5 th
Insurance/health Services	126	13.1	2 nd
Environmental Education	34	3.5	7 th
Awareness creation	42	4.4	6 th
Adult Education	88	9.3	4 th
Cooperative Society	32	3.3	8 th
Agricultural Extension Services	102	10.6	3 rd
Policies on land ownership/use	10	1.0	10 th
Total	960	100	

Source: Authors Fieldwork, 2015.

CONCLUSION AND RECOMMENDATIONS

From the foregoing analyses and discussion, it is clear that Amucha soil potentials are being dissipated by mismanagement, ignorance and poverty, given the fact that most of the desirable variables for the enhancement are still absent. As a result, most farmers still present attitude and actions that often manifest through erosion, pollution, deforestation and other hazards. The basic problem of balancing the present needs against the future prospect through effective soil management strategies must involve the attraction of more youthful males into rural farming system. Again, these farmers must be empowered through the injection of capital and eradication of poverty; education about variabilities in climate and local geomorphology (rainfall, soil nature

and slope types); establishment of insurance/health facilities and provision of extension services and programs. These factors, when they are incorporated into the system, better and effective strategies will be formulated for proper training of rural farmers to enhance their capacities for soil management in Amucha. Following from these findings therefore, we recommend thus:

1. Government-public partnership in enhancing capabilities through effective financial supports (agricultural loan); manpower training and awareness creation to enhance sustainable soil management and use in the study area. Such services according to Madu (2012) will improve farmers' knowledge of agricultural practices and environment in general within the various rural communities in the region and beyond.
2. Emphasis should be placed on enabling local farmers to be adapted to the local geomorphology and climate variability of their areas. Such enablement will boost their capabilities in sustainable soil management and enhanced agricultural productivity.

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