



SOIL CONSERVATION, A NECESSITY FOR SUSTAINING SOIL FERTILITY AND REDUCING SOIL WASTE

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ABSTRACT

The rate at which Nigerians complains of poverty, hunger, diseases etc. calls for examining our system of agricultural production in the rural areas which produce about 85% of the food feed and fibre crops in Nigeria. This implies that farmers must have good and rich soil in fertility to boost massive food production. Then, this calls for conservation of soil as a necessity for sustaining soil fertility and reducing soil waste to achieve positive agricultural production in Ebonyi State. To achieve this noble objectives the researcher randomly selected 120 registered and non-registered rural farmers that participate in farming activities daily. Three research questions were answered by the respondents in the study. Mean and standard deviation were used to analyses the data collected for the study. Findings revealed that environmental factors were responsible for conserving soil, and make it rich in fertility, such as, stop bush burning, encourage ploughing during new planting season to improve soil structure, soil texture, soil profile, colour etc. biological and management practices were also responsible for good and rich soil in fertility. It sustains soil nutrients and reduces waste as well. Recommendations were made based on the findings of the study.

KEY WORDS: Soil, Conservation, Necessity, Sustaining, Fertility, Waste, Reducing.

INTRODUCTION

According to Nwite (2005) soil is a very important resource for Agricultural production. Since most of our crops are grown using soil as a medium for growth apart from few crops cultivated by aquaculture (*i.e.* in water floating rice). He stressed that serious factors which affect land utility agriculturally is the fertility and management. Apart from physical, economic, and social factors which only effect availability of land for agricultural production in Nigeria, Ebonyi State inclusive. Then Eze (2006) stressed that soil conservation is primarily a matter of determining correct form of land use and management practices inherent in that particular soil. He added that productivity of any land depends on the mineral balance, good soil structures, textures, profile, and management practices existing in that particular soil. However, the ability of land in sustaining fertility of the soil emanate from correct form of land use. This is the reason why Ogba, (2005) is of the view that soil conservation is the combination of appropriate land use, and good management practices that promote the production and sustainable use of soil in the process of minimizing soil erosion, soil waste, mineral imbalance, and other forms of land waste Nwankwo (2003) is of the view that the problem of land degradation is an environmental factors, which posed a serious threat to agricultural production. It includes erosion, poor soil structure, texture, profile, salinity, acidification and other related land problems. However, Mbagwu (2000) stressed that soil conservation is a holistic approach in order to reduce land wastage for agricultural production and maintain the soil nutrient at normal level. Nweke (2003) is of the view that the problem of land degradation is more pronounced in agricultural production than other land users like

engineers, miners, town planners, among others. He contested that this is as a result of man's need to feed himself and provide raw material for his domestic industries. He maintained that conservatives measures required to reduce degradation include contour, bond, silt trap, gully control measures and avoiding bad land management practices. Olaitan (2006) opined that effective biological measure in conserving soil to reduce wastage include good land tillage, use of cover cropping, avoid bush burning, constant ploughing into the soil, mulching among other measures to increase the fertility of the soil. The benefit of these activities is to protect the soil from actions of wind, water and avoid vegetative breakdown to improve the physical, chemical and good management of the soil. This is to enhance water absorbent capacity to reduce run-off. Ogba (2008) is of the view that traditional system of soil conservation measures in Nigeria as used by farmers include crop rotation, use of organic matter, use of cover crops and others to enhance agricultural production in the rural areas he maintained the objectives and policy of soil conversation to sustain fertility, crate mineral balance, reduce erosion, acidifications, and other related soil problems to save the future generation which become the sense of worries to the researcher for effective agricultural production to feed the nation.

Statement of the problem

Agricultural production has become a challenging sector to reduce hunger, poverty, disease, unemployment among others, which is a serious threat to humanity in this 21 century. However, soil conservation becomes a necessity to sustain soil fertility for maximum crop production. Then the need to conserve soil to maintain soil fertility and reduce soil wastage becomes necessary to save future

generations from such challenges. This has motivated the researchers to investigate the way out for conserving soil.

Purpose of the Study

The main purpose of this study is to determine the ways of conserving soil to reduce land wastage for massive agricultural production in the rural areas of Ebonyi State. Specifically the study sought to:

1. Find out the environmental procedure required for effective soil conservation and land use to reduce wastage.
2. Find out the ecological/biological issues required to conserve soil and reduce land degradation.
3. Find out the management practices needed to maintain soil fertility, conserve soil and reduce mineral imbalance.

Research Questions

The following research questions were posed to guide the study.

1. What are the environmental procedures required to conserve soil fertility, and reduce soil wastage.
2. What are the ecological issues required to maintain soil nutrient and reduce degradation.
3. What are the management practices needed to conserve soil fertility, and reduce wastage.

METHODOLOGY

The area for the study is Ebonyi State of Nigeria, which was located in the south-east geopolitical zone of the country. This study adopted descriptive survey research design. According to Nworgu (2005) survey is a study where peculiar characteristic of a known or identified

population are studied through a sample which is deemed to be the representation of the population in other words, this study used representation. Sample to determine the opinion of registered and un-registered farmers in relation to conserving soil to maintain soil fertility for massive agricultural production. Random sampling technique was used in selecting 120 registered and none-registered farmers out of the total population of five hundred and twenty eight (528) registered farmers in the state. The instrument used for data collection was structured questionnaire developed by the researcher with 31 item statements it was structured with four point rating scale of strongly agree (SA) Agree (A) strongly disagree (SD) Disagree (D) with the weight value of 4.3.2 and 1 respectively. The instrument was administered; all the copies of the questionnaire were returned with the help of two research assistants, the instrument was face validated by three experts, and their corrections were properly affected by the researcher. The reliability of the instrument was determined using cronbach alpha reliability-coefficient which yielded 0.78 mean and standard deviation was used to analyses the three research questions. The decision rule was that item with mean value below 2.50 were indicated as disagreed. While 2.50 and above were agreed. It was discovered that soil conservation is a viable method in maintain soil fertility since all the three research question item statements were accepted by the respondents. It was recommended that farmers should make use of the biological, environmental and management factors outlined to sustain soil fertility.

TABLE I: Sort information on environmental factor items is on floral decomposition which is basic nutrient supplies, 2 item is on rainfall, which assist decomposition humidity which encourage grass growth and fall of the leaves. Temperature which favour covering crops for fixing nitrogen in the soil, mixed farming which add organic manure in the soil, bush fallow increased nutrient in the soil texture structure, Ph. Level help in soil mineral arrangement and mineral release to plant. When these are accepted soil is conserved for plant yield.

S/N	CONSTRUCT ON ENVIRONMENTAL FACTORS	X	SD	Remark
1	Climate modifies range flora composition for decomposition	2.84	0.22	Accepted
2	Rainfall helps in fast growth of grassland, shrubs, for the leaves to fall.	2.51	0.26	Accepted
3	Humidity erect enabling environment for pastureland establishment.	2.65	0.25	Accepted
4	Temperature favours covers crops in creeping and covering ground.	2.59	0.24	Accepted
5	Light help in full photosyntential process in growing grass shrubs, plant.	2.50	0.20	Accepted
6	Bush burning are properly discouraged to reduce bad action of erosion.	3.4	0.27	Accepted
7	Land clearing should take form of ploughing to incorporate leaves.	2.76	0.21	Accepted
8	Mixed farming encourages usage of animal drugs by the plant for fast growth.	3.05	0.25	Accepted
9	Overgrazing of the pasture grassland, herb cages mid shrubs should be discouraged.	2.80	0.21	Accepted
10	Soil structures and texture favour plant growth and normal plant yield.	3.53	0.28	Accepted
11	Soil PH indicate three different sections for different crop growth.	8.10	0.23	Accepted
12	Colour of soil is indicated mineral reaction and dominant for plant growth.	2.50	0.20	Accepted
13	Mineralization is managed by all these environmental factors.	2.54	0.20	Accepted

TABLE II: The biological factors favoring soil conservation outlined in the study were generally accepted by the respondents as appealing, responding to effective sustaining fertility in the soil which farmers should adopted to keep nutrient available in the soil.

S/N	CONSTRUCT ON BIOLOGICAL FACTORS	X	SD	Remark
1	Parasitic organisms both plant and animals discourage favourable growth, production of crops.	3.52	0.28	Accepted
2	Predators create imbalance in the biological eco system in crop production which lead to poor soil (soil water)	2.58	0.21	Accepted
3	Pest destroy both crops, shrubs, herbage, which create poor soil conservation.	3.18	0.24	Accepted
4	Disease condition is a maladjusted condition for both plant and animal for conservation of soil.	2.54	0.21	Accepted
5	Micro-organism help in reformation of top soil surfaces and conserve soil increase, aeration.	3.10	0.23	Accepted
6	Establishment of compact seed range flora help to control erosion and conserve soil.	2.81	0.21	Accepted
7	Parasites establish symbiosis and conserve soil, reduce wastage.	2.63	0.20	Accepted

TABLE III: The management factors listed in table III. Which was responded to by the farmers indicates that all the item statement was appealing to them since all were accepted, as conservative factors, necessary for equipping soil with its nutrient and need to be maintained to reduce soil waste, and increase high productivity agricultural output to keep Nigerian population.

S/N	CONSTRUCT ON MANAGEMENT FACTORS	X	SD	Remark
1	Planning and orderliness of farming pattern help in conserving soil and prevent erosion.	2.77	0.21	Accepted
2	Crop rotation for allowing grass to regrow and fall sown conserve the fertility of the land.	2.73	0.21	Accepted
3	Contour bound in ridges, and beds prevent wind and water run-off and prevent soil waste.	2.54	0.20	Accepted
4	Clean-clearing is total removal vegetation for crop production predisposes to erosion.	2.51	0.20	Accepted
5	It leads to oxidation and loss of natural element which causes soil waste.	3.10	0.23	Accepted
6	Tillage of land and removal of stump	2.81	0.21	Accepted
7	Tillage encourages infiltration and discourage soil waste	2.77	0.21	Accepted
8	Tillage exposes insects, nematodes and weed seeds to heat of sun to encourage soil conservation.	2.73	6.21	Accepted
9	Fertilizer application to crops encourages soil conservation increased.	3.34	0.27	Accepted
10	Increased acidity (Lowers soil Ph.) and reduces potassium, calcium and magnesium which encourage soil waste.	2.80	0.21	Accepted
11	Organic manure binds soil particles and encourages soil conservation.	2.84	0.22	Accepted

DISCUSSION

The study revealed that all the environmental items statement was responsible for conserving soil, that farmers should encourage such to create enabling condition for positive crop production and reduce soil wastage. The findings is line with Agbo (2003) who outlined conservative measures similar to the above for reducing soil wastage in terms of poor fertility for crop growth and production. Research question II which sought information on the biological factors responsible for conserving soil has 7 item statements, which all were accepted by the respondent as a desired fact about real soil conservation. It stressed to the farmers for its full adoption for over haling soil and create normal soil condition and to create normal soil condition for agricultural production and to get reasonable harvest. In other development, the findings is in line with Aleke (2000) who maintained that soil conservation required a wholistic approach to maintain soil agriculturally to boost massive food supply to the demanding of population (environmental, biological and management functions). Research question III sought to identify all the necessary management practices required for positive soil conservation. It has ten item statements,

which the respondents accepted all as necessary ingredient, practices and systems for conserving soil in its form best for agricultural production and motivate farmer's intention to maintain soil for its proper utility. The finding is in line with the study of Odo (2005) who stressed that utility of land depends on its management and fertility in terms of agricultural productivity. He outlined similar item statement as issues to be addressed by the farmers to the availability of land since farmers depend on land for their agricultural activities.

CONCLUSION

The basic need of any living organism is food for survival. Men supposed to organize his environment maintain skill, which his crops depends on for maximal production. The only alternative is to maintain good environment for crops growth and for production of food to feed and crops for domestic industries equally depends on soil fertility. Therefore, the environmental factors, biological and management practices indicated above, should be faced holistically to achieve the desired goals, save future generation, terrible condition.

RECOMMENDATION

1. Government and non-governmental agencies should assist farmers to checkmate such environmental factors to conserve soil.
2. Farmers with little available land for cultivation of crops which is his only sources of income should strictly maintain the major factors of (environmental, biological and management) for survival.
3. The government should assist in controlling erosion and other ecological problem which is beyond the scope of the farmers.

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