

Full Length Research Paper

Soil erosion control practices for climate change adaptation in Etche Local Government Area of Rivers State

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The study examined soil erosion control practices for climate change adaptation in Etche Local Government Area of Rivers State. The elders and youths in the area made up the population for the study .Data were analyzed using descriptive statistics. Results of the study revealed that water (100) is the agent of soil erosion in the study area and it was mainly caused by continuous cropping (80.4%). The effect of the soil erosion on agriculture and social activities were destruction of land, high cost of food crops, lowered soil fertility, poor access road and high cost of transportation. The measures adopted were reforestation, construction of check dams, making of ridges, terracing, ploughing and planting of cover crops. However, these adaptation practices were affected by low levels of awareness, method of farming and lack of support from government and private agencies.

Key words: Soil Erosion Control Practices, Climate Change, Adaptation.

INTRODUCTION

Soil erosion is the washing away of the soil by rain water or wind. According to Mecklenburg (2004), soil erosion is one form of soil degradation along the soil compaction, low organic matter, loss of soil structure, poor internal drainage, salinization and soil acidity problems. Soil erosion is a naturally occurring process on all land. The agents of soil erosion are water and wind, each contributes a significant amount of soil loss each year in Etche Local Government Area..

The impact of rain drops on the soil surface can breakdown soil aggregate materials such as very fine sand, silt clay and organic matter that can be easily washed-off and might be required to remove the layer and sand grand particles(Roseville ,2000). The loss of soil occurs in a slow process that continues relatively unnoticed and it may occur at an alarming rate causing serious loss of top soil (Baver and Gardner, 20009). The loss of soil from the farm land in the study area may be reflected in reduced crop production potential, lower

surface water quality and damage drainage networks..

Both rainfall and run-off water must be considered in assessing a water erosion problem (Emiehi, 2002). The causes of climate change are both natural and human (William and Joseph, 2000). The human causes include burning of fossil fuels, changes in land use on agriculture and deforestation. While the natural factors are ocean current, volcanic eruptions, earth orbital and solar radiation

Good and fertile soil is the bedrock for agricultural and social activities. Therefore, there is the need for the people of Etche LGA and the government to partake in good methods of erosion control practices. According to Isirimah (2001), when soil is eroded the nutrient is also washed away which will result in poor yield of agricultural products hence resulting in food shortages and high cost of farming and living. Apart from the farm land, places for social activities such playgrounds, village square, market square, school etc. are also affected by erosion. It is therefore necessary for good methods of soil erosion control practice to be carried and adaptation measures to climate change be put in place. It is for this reason that this research was proposed to address the following

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Table 1: Distribution of agents of soil erosion

Agent	Frequency	%
Water	100	100
Wind	0	-
Total	100	100

Source: Field survey, 2014.

Table 2: Causes of Soil Erosion

Causes	Frequency	%
Continuous cropping	74	80.4
Deforestation	18	9.6
Overgrazing	-	-
Total	100	100

Source: field survey, 2014

research questions. What are the causes of soil erosion? What are the control practices used? And What is the level of awareness of the soil erosion control practices in the study area?

PURPOSE OF THE STUDY

The specific objectives were to;

- i. Identify the agent of soil erosion and it's causes;
- ii. Examine the level of awareness of soil erosion control measures;
- iii. Ascertain the effect of soil erosion on agriculture and other social activities; and
- iv. Examine the extent of adoption of soil control measure in the study area.

METHODOLOGY

Traditionally, the people of Etche LGA are farmers and almost all the households in Etche LGA have large hectares of land for agricultural production and soil activities. The LGA is made up of five (5) clans namely; Mba, Okehi, Umuselem, Igbo and Ozuzu and each clan is made up of five villages. Two (2) Villages were randomly selected from each clan making a total of ten (10) villages. From each village, six (6) elders and six (6) youths were randomly selected. A total of 120 respondents were surveyed for the study. Structured questionnaire and interview schedule was the research instrument used to collect data from the respondents. Data collected were analyzed using descriptive statistics. A four point likert-type scale with options: "very aware" (4), "aware"(4), "moderately aware" (2) and "not aware" (1); very effective (4), effective (3); less effective (2) and

not effective (1); and very serious factors (4), serious factors (3), less factors (2) and not a factor (1) were used to determine the level of awareness of the respondent, the effect of soil erosion on agricultural and social activities and ascertain factors affecting the control measures.

RESULTS AND DISCUSSION

Table 1 shows that the agent of soil erosion was water (100%). This indicates that the major agent of soil erosion is water. Wind does not cause erosion in the study area. This confirms Roseville (2002) who reported water and wind are major agents of soil erosion.

Causes of soil Erosion

Table 2 shows that soil erosion was caused by continuous cropping (80.4%) and deforestation (19.8%). This implies that the major cause of soil erosion in the study area was continuous cropping. This is in line with Micheal (2001) who stated that deforestation of the natural environment as one of the major courses of soil erosion in the sub-Sahara region.

Effect of Soil Erosion on Agricultural and Social Activities

The effects of soil erosion on agriculture and other social activities are shown in Tables 3 were the destruction of land (2.70), lower soil fertility (2.60) and poor harvest (2.60). This indicates that the major effect of soil erosion in the study area was the destruction of large hectares of farmlands in the area. This agrees with Mecklenburg (2004) who stated that soil erosion has reduced productive farmland in some communities.

Table 3. Effect of Soil Erosion on Agricultural and Social Activities

Effect	Mean score
Destruction of Land	2.61
High cost of food crops	2.60
Lower soil fertility	2.70
Scarcity of agricultural products	2.58
Poor access road	2.65
Poor harvest	2.55
High cost of transportation	2.60

Source: field survey, 2014

Tables 4: Mean Distribution of the Adoption of Soil Control Measures

Measures	Mean score
Mulching	2.55
Reforestation	2.70
Planting cover crop	2.55
Crop rotation	2.50
Making ridges	2.60
Terracing	2.60
Construction of check dams	2.62
Ploughing	2.60

Source: field survey, 2014.

Table 5. Factors Affecting Adoption of Soil Erosion Control Measures

Measures	Mean score
Low level awareness	2.60
Misinformation	1.73
Lack of funds	1.79
Method of farming	2.62
Lack of support from government	2.55
High technology involved	1.74
Inability to understand methods	1.64
Lack of extension workers	1.64

Source: field survey, 2014.

Adoption of soil erosion control measures

Table 4 shows that terracing (2.60), planting of cover crop (2.55), reforestation (2.70), ploughing (2.60) and mulching (2.55) were the soil erosion control measures practiced by the respondent in the study area. Mecklenburg (2004) listed methods of soil erosion control measures by water. According to him, they include the deforestation, leaching, contour ploughing, planting of cover crops, fallowing, construction of check-dams, mulching and adoption of rotation-cropping system.

Factors affecting the adoption soil erosion control measures.

Entries in Tables 5 revealed that the factors affecting the

adoption of soil erosion control measures in the study area were lack of support from government and the other agencies (2.42), method of farming (2.32) and low level of awareness of the soil erosion control measures (2.15). The people in the study area have to be aware of the soil erosion control measures before they would be able to adopt them. Since they are not aware of the measures, adoption becomes very difficult. This is in line with Ozor and Madukwe (2005) who opined that lack of awareness is the major obstacle to adoption of innovation in agriculture.

CONCLUSION AND RECOMMENDATION

The levels of awareness of soil erosion control measures in the study area was low, it is therefore recommended

that extension workers should be sent to the area to educate the people on the causes and control measures to be adopted in order to reduce or even stop soil erosion in the area.

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