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EROSION CONTROL MEASURES ADOPTED BY RURAL FARMERS IN IKEDURU LOCAL GOVERNMENT AREA OF IMO STATE, NIGERIA

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ABSTRACT

The study assessed erosion control measures adopted by rural farmers in Ikeduru local government area (LGA) of Imo State, Nigeria. Two-stage sampling procedure was used to select 120 rural farmers. Data were gathered on erosion prevalence and control measures in the study area. Data collection was through a structured questionnaire and analyzed using mean and percentage. Findings revealed that water erosion ($\bar{x} = 4.09$), wind erosion ($\bar{x} = 3.25$) and gully erosion ($\bar{x} = 3.08$) were the most prevalent forms of soil erosion. Furthermore, planting trees on the farm to serve as windbreaks ($\bar{x} = 3.61$), planting trees on the farm to serve as shade against harsh temperatures ($\bar{x} = 3.53$), planting of cover crops ($\bar{x} = 3.45$), mulching ($\bar{x} = 3.27$) and using improved crop varieties ($\bar{x} = 3.22$) were the erosion control measures adopted by rural farmers. The study recommended that extension agents should continuously educate rural farmers on the need for the consistent adoption of appropriate erosion control measures that would assist farmers in coping with the high prevalence of soil erosion in the study area.

Keywords: Rural farmers, Soil erosion, Control measures

INTRODUCTION

Soil erosion is a global environmental problem that reduces the productivity of all natural ecosystems and agriculture Ewetola *et al.* (2021). The most pressing challenge of Nigerian agriculture in the new millennium is how it can meet the food needs of an ever-increasing population in the face of the myriads of social, cultural, economic and environmental problems that negate sustainable land management (Saheed and Isa, 2017). Soil erosion is a well-known environmental problem with a multiplicity of social and economic consequences in various parts of Southeast Nigeria, Ikeduru local government area inclusive. It has also been identified as a disastrous form of environmental degradation whose effect is multi-dimensional (Nwobodo, Otunwa, Ohagwu and Enibe, 2018). Akinbile, Aminu and Kolade (2018) asserted that disasters caused by erosion affect the livelihoods of rural people through its effects on their farming activities and sustenance. These effects on the livelihood of rural farmers include loss of arable lands, poor crop yields, loss of residential homes, and loss of income (Okorafor, Akinbile and Adeyemo, 2017). The threat to sustainable environmental and agricultural productivity has led to considerable interest in soil conservation measures that aid in the control of soil erosion. Such erosion measures include tillage, mulching, alley farming, ridge-furrow systems, contour farming, contour bunds, terraces and vegetative barriers (Ewetola *et al.*, 2021). Farmers are thus expected to adopt these erosion control measures to reduce the effects of erosion on their livelihoods. However, Ewetola *et al.* (2021) and Prosdocimi *et al.* (2016) noted that some erosion control measures are

associated with one or more problems that makes it difficult for rural farmers to adopt. An example is the use of terracing which requires high labour and investment costs for smallholder farmers (Chapagain and Manish, 2017). Ewetola, Babarinde, Omirin and Ojewole (2017) also noted that certain erosion control measures adopted by farmers were not well suited to their environmental conditions. It is in this regard that the study sought to assess the adoption of erosion control measures by rural farmers in Ikeduru LGA Imo State using the following objectives to guide the study.

- i. To examine the prevalence of soil erosion in the study area,
- ii. To determine the erosion control measures adopted by rural farmers

METHODOLOGY

The study was carried out in Ikeduru LGA of Imo State, Nigeria. The Local Government area is one of the twenty-seven local government areas and is located in the western part of Imo State. It covers a total area of 179 square kilometres with an estimated population of 199,316 persons (National Population Commission, 2006).

A two-stage sampling procedure was adopted for the study. In the first stage, (12) communities were randomly selected from the LGA using a simple random sampling technique. The second stage involved the random selection of (10) respondents from each of the selected communities using a simple random sampling technique. This gave a total of (120) respondents for the study. Data collection was through a structured questionnaire and analysed using descriptive statistics such as mean and percentage.

The prevalence of soil erosion in the study area was measured using a 5-point Likert-type scale. A mean of 3.00 and above was regarded as a high prevalence of soil erosion, while a mean less than 3.00 was regarded otherwise. Soil erosion control measures adopted by farmers were also measured using a 5-point Likert-type rating scale. A mean of 3.00 and above was regarded as a soil erosion control measure adopted by the rural farmers, while a mean less than 3.00 was regarded otherwise.

RESULTS AND DISCUSSION

Prevalence of soil erosion in the study area

Results in Table 1 show that water erosion ($\bar{x}=4.09$), wind erosion ($\bar{x}=3.25$) and gully erosion ($\bar{x}=3.08$) were the prevalent types of soil erosion in the study area. This finding conforms with that of Nnamdi (2022) who reported that gully erosion was one of the most prevalent forms of soil erosion in various parts of Imo State. This finding is also in agreement with those of Igboekwe, Nwankwoala and Orluchukwu (2022) who reported a high prevalence of gully erosion in various parts of Anambra and Imo States.

Table 1: Distribution of farmers based on the prevalence of soil erosion in the study area

Prevalence of soil erosion	Mean
Water erosion	4.09*
Wind erosion	3.25*
Tillage erosion	2.80
Gully erosion	3.08*
Rill erosion	2.40
Sheet erosion	2.65
Grand mean score	3.05*

Source: Field survey data, 2017

Erosion control measures adopted by rural farmers in the study area

Results in Table 2 reveal that planting of trees on the farm to serve as windbreaks ($\bar{x}=3.61$), planting of trees on the farm to serve as shade against harsh temperatures ($\bar{x}=3.53$), planting of cover crops ($\bar{x}=3.45$), mulching ($\bar{x}=3.27$), using improved crop varieties ($\bar{x}=3.22$), using minimum tillage operations ($\bar{x}=3.16$), intercropping ($\bar{x}=3.14$), early planting ($\bar{x}=3.11$), applying organic manure ($\bar{x}=3.08$), late planting ($\bar{x}=3.07$), and digging ridges across slopes in the farm against erosion ($\bar{x}=3.02$) were the main

erosion control measures adopted in the study area. The grand mean score of the mean responses of farmers on the erosion control measures adopted in the study area is 3.23 which is greater than the benchmark mean score of 3.00, implying that the rural farmers in the study area were actively involved in adopting erosion control measures. This finding is in agreement with that of Umeh and Igwe (2019) who reported that crop rotation, reduced tillage, application of compost manure, cover cropping, planting of tolerant varieties and agroforestry were the sustainable agricultural practices adopted by rural farmers in Ebonyi State.

Table 2: Erosion control measures adopted by rural farmers

Erosion control measures	Mean
Using improved crop varieties	3.22*
Intercropping	3.14*
Mulching	3.27*
Planting of cover crops	3.45*
Applying organic manure	3.08*
Early planting	3.11*
Late planting	3.07*
Using minimum tillage operations	3.16*
Full tillage operation	2.75
Digging ridges across slopes in the farm against erosion	3.02*
Planting trees on the farm to serve as shade against harsh temperature	3.53*
Planting trees on the farm to serve as windbreaks	3.61*
Grand mean score	3.23*

Source: Field survey data, 2017. Key: * indicates ≥ 3.0 .

CONCLUSION

The study concluded that water, wind and gully erosion were the most prevalent forms of soil erosion in the study area. The study further concluded that planting trees on the farm to serve as windbreaks, planting trees on the farm to serve as shade against harsh temperatures, planting of cover crops, mulching, using improved crop varieties, using minimum tillage operations, intercropping, early planting, applying organic manure, late planting and digging ridges across slopes in the farm against erosion were the major erosion control measures adopted by rural farmers in the study area.

RECOMMENDATIONS

Farmers are encouraged to continuously adopt the practice of proper soil and water conservation methods in controlling water erosion occurrences. The use of terraces on steeply sloped farmlands and the creation of proper drainage channels to conduct large runoffs to safe outlets will also help in the control of the high prevalence of water erosion in the study area.

Extension agents should continuously educate rural farmers on the need for the consistent adoption of appropriate erosion control measures through the dissemination of proven soil management techniques that would assist farmers in coping with the high prevalence of soil erosion occurrences in the study area.

Cropping techniques such as bush burning, clean weeding, over-grazing and deforestation that contribute to soil erosion should be reduced.

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