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Adoption of Sustainable Land Use practices among Farmers in Cross River State, Nigeria.

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Abstract

The study assessed the adoption of sustainable land use practices among farmers in Cross River State. A structured questionnaire was used to obtain information from 210 respondents using a multi-stage sampling procedure. Percentages and mean score were used for data analysis. The most needed information on sustainable land use was soil erosion prevention ($\bar{X}$=3.69) while the least needed information was on tree planting. The most (68.08%) available sustainable land use practices were mulching while the least (3.08%) was integrated landscape management. Most (68.5%) of the respondents adopted between 1 and 3 sustainable land use practices. Adoption of sustainable land use practices mostly minimised soil erosion ($\bar{X}$=3.48). The major factors influencing the adoption of sustainable land use practices were cost and ecological factors. It is therefore recommended that extension agents should intensify efforts on awareness towards using integrated landscape management in sustaining agricultural land. Cost and ecological factors should be addressed in order to sustain the land for future production.

Keywords: Sustainable land use practices, adoption and farmers

Introduction

Land consists of not only the soil but also the associated natural resources such as water bodies, vegetation cover, landscape and microclimate which constitute a larger ecosystem making it, a great resource for agricultural production ((Kanianska, 2021, Godson, Uchenna, Philip and Romanus (2019))

Garcia- Vega and Newbold (2020) observed that over three-quarters of the earth's surface has been altered by human activities resulting to a decline in biodiversity. Nigeria where a larger proportion of the population in the rural areas deals mainly on

agriculture where land is put into use on a daily basis is not an exception, hence is a need to sustain it for future agricultural production.

Sustainable land use management involved established approaches geared towards conserving water and soil, managing natural resource and Integrated Landscape. By sustaining the land as opined by Lewoyewu, Alemu & Adgo (2020), human needs can be met while guaranteeing the long-term productive potential of the land. The main reason for managing the land according to Aminu, Rosulu, Balogun & Babawale (2018) is to protect as well as improve its execution to gainfully cultivate for a considerable length of period. Therefore the adoption of land use management practices can result in maximising the land while enhancing the ecological support functions of the land resource for increased production.

Increasingly usage of land has resulted to heavy pressure on land resources, leading to a decrease in agricultural production as well as deterioration in the quantity and quality of the land. This is because the land is threatened when man exploits without deliberate attempts to replenish what has been depleted. Land degradation according to Tilauhun and Ziwide (2021) can either be from direct or indirect causes. Land degradation from direct causes is mismanagement of land by man, examples are deforestation, overgrazing, soil nutrient mining, and cultivating steep slopes. Land degradation from indirect causes may be poor land tenure regulations, lack of rainfall, poverty, and inadequate extension services.

Although over the years rural farmers have long relied on bush fallow, bush burning, mixed cropping, shifting cultivation, mulching and fertilizer application as a means of maintaining soil fertility and ensuring a balance between socioeconomic and agro-ecological environment but this is not sustainable, because sustainable land use practices as observed involve technologies, policies and activities aimed at providing environmental, economic and social opportunities for the benefit of present and future generation while maintaining and enhancing the quality of the land. The major factors that influence the adoption of these sustainable land use practices are poverty, lack of knowledge, labour constraints needed to adopt the practice, the land tenure system, age, educational background and income (Agidew and Singh (2019).

Specifically, the study:

i. identified the information needs of respondents on sustainable land use practices;
ii. identified the various sustainable land use practices available;
iii. ascertained level of adoption of sustainable land use practices;
iv. assessed perceived influence of adoption of sustainable land use practices; and
v. identified factors influencing the adoption of sustainable land use practices.

Methodology

The study was carried out in Cross River State lies within the tropical rain forest belt of Nigeria, Longitude 5°45′N and Latitude 8°30′E (Nigeria Population Census(NPC), 2016). Data were collected using a questionnaire and two hundred and eleven (211) respondents were selected using a sampling procedure.The first stage involved the simple random selection of one block from each of the agricultural zones in the state. The second stage involved the random selection of two cells from the selected blocks. The third stage involved a proportionate (35%) selection of crop farmers in each of the cell. This resulted in a sample size of two hundred and eleven (211) respondents.

Results and Discussion

Information Needs for Sustainable Land Use Practices

Table 1 shows the distribution of respondents based on information needs for sustainable land use practices. The result revealed that the most needed information for land sustainability was soil erosion prevention and control ($\bar{X}$=3.69), control and management of water sources ($\bar{X}$=3.46) and soil fertility management ($\bar{X}$=3.21).The implication of this result is that soil erosion is a serious challenge to agricultural production, especially in areas where there is heavy rainfall resulting in washing off of soil fertility as such the knowledge on how to control and manage it, is an important aspect of improving yield as well as sustaining the land for future use. This result is in line with the research carried out by Kwizera, Ndihokubwayo and Basil (2020) which reported that erosion negatively affects agricultural production therefore knowledge of how to control it is very important

Table 1: Information needs for sustainable land use practices

Variables	Mean score	Rank
Soil erosion prevention and control	3.69	1st
Control and management of water sources	3.46	2nd
Soil fertility management	3.21	3rd
Soil moisture control	2.78	4th
Tree planting	2.14	5th

Sustainable Land Use Practices Available.

Table 2 reveals that most (68.09%) of the respondents used mulching for sustaining the land while only 3.80% used integrated landscape management. The implication of this result is that the most available land use practice in the study area is mulching, this could be as a result of inadequate land, so respondents adapt to practices that will enable them continuously use the land while sustaining it. This result is similar to the research carried out by Kayode,Oladipo and Daudu(2017) which observed that mulching improve soil fertility as such encourage usage while sustaining the soil.

Table 2: Sustainable land use practices available.

Sustainable land use practices	Percentage (%) n=210
Mulching	68.09
Cover cropping	65.23
Fertilizer application	64.28
Inter cropping	58.09
Conservation tillage	56.19
Terracing	14.30
Shifting cultivation/bush fallow	11.42
Integrated Landscape Management (ILM)	3.80

*Multiple responses

Level of Adoption of Sustainable Land Use Practices

Table 3 shows the distribution of respondents based on level of adoption of sustainable land use practices. The Table reveals that the majority (68.5%) adopted between 1-3 sustainable land use practices while only a few (11.4%) adopted more than 6 sustainable land use practices. The implication of this result is that most of the sustainable land use practices were not being utilised as such respondents may not be able to attained land sustainability as it involved integrated approach. The reason could be that the land is rented as such not personal property, in the case of this; respondents are reluctant to commit so much in sustaining the soil since they may lose it in future. Land fragmentation as a result of acquiring land through inheritance could also discourage respondents from adopting many land management practices this is because sustaining a small-scale land without the neighbour doing the same may not have much impact. This result is similar to the study carried out by Slaisook, Fysse and Tsusaka (2020) which reported that inadequate arable land limit farmers in adopting sustainable land management practices.

Table 3: Level of adoption of sustainable land use practices

Level of adoption of sustainable land use practices	Percentage (%) n= 210
Low adopters	68.5 (1-3)
Medium adopters	20 (4-6)
High adopters	11.4 (>6)

Note: Figures in bracket indicate number of sustainable land use practices adopted

Perceived Influence of Adoption of Sustainable Land Use Practices

Table 4 shows the distribution of respondents based on perceived influence of adoption of sustainable land use practices. The result revealed that use of sustainable

land use practices minimised soil erosion and kept the surface soil moist with mean score of 3.48 and 3.45 respectively. The implication of this result is that adoption of sustainable land use practices can be used to control erosion. This result is similar to the research undertaken by Mosbahi and Benabdallah (2020) which revealed that the use of land management practices minimise run off.

Table 4: Perceived influence of adoption of sustainable land use practices

Perceived influence of adoption of sustainable land use practices	Mean score
Minimise soil erosion	3.48
Keep the surface soil moist	3.45
Increase soil organic matter	3.34
Increase yield	3.27

Factors Influencing Adoption of Sustainable Land Use Practices

Table 5 shows the distribution of respondents according to factors influencing adoption of sustainable land use practices. The result revealed that cost, ecological factors and socio economic factors were the major factors influencing the adoption of sustainable land use practices with mean score 3.45, 3.30 and 3.20 respectively. This implies that, the major challenge in sustaining land use practice in the study area is cost. Since the area is a rain forest zone associated with heavy down pour the soil is easily degraded resulting to deep gullies as such large fund is required to reclaim the land for agricultural production. This research is similar to the study carried out by Agidew and Singh (2019) which revealed that income is one of the major factor influencing adoption of sustainable land use practices.

Table 5: Factors influencing the adoption of sustainable land use practices

variables	Mean score	Rank
Cost	3.45	1st
Ecological factor	3.30	2nd
Socio-economic factor	3.20	3rd
Complexity	2.20	4th
Accessibility	2.08	5th
Compatibility	2.02	6th

Conclusion and Recommendations

The major factors influencing sustainable land use practices such as cost and ecological factors are being addressed, land degradation resulting from soil erosion will drastically reduce in the study area resulting in increase in crop production.

Since the adoption of sustainable land use practices in the study area only minimised soil erosion, extension agents should create awareness on the use of integrated management practices which can be used to completely control it.

Since cost and ecological factors were the major determinants of adopting sustainable land use practices government should assist farmers financially in order to sustain land for future agricultural production.

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