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Poor Farming Practices and Environmental Degradation in Central Senatorial District of Cross River State, Nigeria

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ABSTRACT

The study is aimed at investigating various farming practices that propagate environmental degradation in the study area. The design adopted for the study is survey inferential research. This design is appropriate for data collection and analysis. The area studied is the Central Senatorial District (CSD) of Cross River State, Nigeria. This district is made up of six (6) Local Government councils: Abi, Boki, Etung, Ikom, Obubra, and Yakurr Local Government Areas. The population of the study is 687 farmers, which comprises of 344 male and 343 female, who were randomly selected. The instrument for data collection is a well-structured questionnaire titled Farmers' Assessment Questionnaire (SAQ). It is divided into four (4) point scale ranging between Very adequate (VA), Adequate (A), Faire Adequate (FA), and Inadequate (IA). The questionnaire was made up of fifteen (15) items arranged in a four (4) point Likert scale. One-way Analysis of Variance was used for the data analysis, and the result revealed that continuous cultivation has a significant influence on environmental degradation. It was also revealed in the second hypotheses that poor tillage practices influence environmental degradation in the study area. It was recommended that Agricultural Extension Officers should educate the farmers on how to improve on their mode of farming; and they should also alert them on the ills of unsustainable farming practices of continuous cultivation and poor tillage system. It was also recommended that environmental education outline should be introduced into the primary and secondary school curriculum.

Keywords: *Farming practices, environment, degradation*

INTRODUCTION

It has been estimated that subsistence farmers in developing countries account for more than 60 percent of tropical forest loss annually. This estimate includes a regional variation estimate of deforestation caused by agriculture put between 5.9 to 7.5 hectares, which is usually converted to farmlands (Mayer, 1990). Farming practices are one of the greatest agents of forest destruction that in turn leads to environmental degradation in Nigeria and the world at large. The existence of a forest is fundamental to human survival. Thus, this is necessary because forest offers farmlands, plant food resources, and promote the absorption and containment of carbon and the release of oxygen among many other biological functions. Nevertheless, today the critical disappearance of the forest due to poor farming practices generally affects all these benefits. This could be traced to continuous crop cultivation, and excessive tillage practices etc.

Cuningham (2004) asserted that a sustainable agricultural practice involves ecologically sound, economically viable, socially just, and humane agricultural system that emphasizes stewardship, soil conservation and integrated pest management. Therefore, due to population explosion and limited availability of land in some communities, most farmers make effective use of a given portion of land for a period of 4 to 5 years without taking into cognizance the effect or the danger it has on the soil. This practice is commonly found in areas of high population, where there is excessive rainfall, and where the soil has a high storage capacity (Omoogun, 2004).

One of the farming practices that reduce environmental quality is continuous crop cultivation. Omoogun (2004) noticed that continuous cultivation involves the cropping of a piece of land year-in-year-out. He further stated that the process leads to leaching of essential minerals. According to Agboola (1979), continuous cultivation is one of the major farming practices that lead to soil depletion. For man to meet the challenge of food demand, he had to be able to decipher different ways of farming practices in all seasons to know which is suitable for a given crop.

Tillage practices can be seen as another influential agent of environmental degradation. Excessive tillage on the surface breaks up the crust, increases run-off and the erosive transport of soil particles, and reduces the surface roughness that could lead to less infiltration. This thereby increases erosive effect due to the increase in kinetic energy of water running over the surface. Cabeda (1984) stated that excessive tillage or tillage undertaken when the soil moisture content is not appropriate causes adverse effect. Omoogun (2004) opined that tillage practice is the loosening up or breaking up of the soil surface layer. Tillage alters many aspects of the physical environment including soil, water, aeration, compaction, porosity, and temperature (Philips et al., 1980; Unger, 1990). Wood and Edwards (1992) observed that tillage renders the soil susceptible to wind and water erosion, and the soil losses can be quite substantial. When applied in intensive agricultural cultivation, it leads to de-vegetation and desertification. Poor tillage practices often lead to physical degradation of the soil structural quality which exposes the earth crust to infiltration by water, thereby resulting to erosion and the loss of essential soil particles. Giasson (2002) said that incorrect tillage practices is one of the causes

of erosion and physical degradation of the soil. Abam (2004) viewed physical degradation of the environment as a compaction owing to the increase in size and the weight of farm machinery. Consequently, this could limit the extent to which plant roots can exploit the soil for moisture and nutrients and the free movement of gases between soil and atmosphere.

However, these farming practices are not environmentally compatible with food production. This is because they lack sustainable practices that involve social, economic, and ecological sound/viability that agitates for environmental stewardship. Therefore, this study seeks to identify the relationship between continuous crop cultivation/poor tillage practices and environmental degradation in Cross River State central of Nigeria.

METHODOLOGY

The design adopted for this study is a survey research. This design is appropriate for collecting and analyzing data because it is aimed at investigating various farming practices that cause environmental degradation.

The area studied is Central Senatorial District (CSD) of Cross River State, Nigeria. The district is made up of six (6) Local Government councils: Abi, Boki, Etung, Ikom, Obubra, and Yakurr Local Government Areas. CSD is bound by Ebonyi State to the West; Yala, Ogoja, Obudu, and Obanliku Local Government Areas to the North; Akamkpa and Biase Local Government Areas to the South; and the Republic of Cameroun to the East (Figure 1). The population of the study consists of 687 farmers from six (6) local government councils. The farmers comprised of 344 male and 342 female. They were randomly selected, and a total of 687 farmers were finally realized.

The instrument used for data collection was a well-structured questionnaire and a transect walk. This was to ensure the authenticity of information given. It was titled Farmers' Assessment Questionnaire (SAQ). It was divided into a four (4) point scale ranging between Very adequate (VA), Adequate (A), Faire Adequate (FA), and Inadequate (IA). The questionnaire was made up of fifteen (15) items arranged in a four (4) point scale.

The instrument adopted and the one developed by the researcher were vetted by experts in test and measurement. In order to establish the reliability of the instrument, trial testing of the instrument was undertaken. Ninety (90) respondents were selected, fifteen (15) from each council, and copies of the questionnaires were distributed to them. After

completion, the data collected was coded, scored, and analyzed using Cronbach's Alpha formula.

Subsequently, data collected was subjected to a statistical analysis. The key was developed by the researcher, by which all information received were scored and coded. The scores obtained were analyzed using One-way Analysis of Variance.

DATA ANALYSIS AND DISCUSSION OF RESULT

Hypothesis One: Continuous cultivation does not significantly influence environmental degradation. The independent variable in this hypothesis is continuous cultivation which has the following categories: high, moderate, and low. On the other hand, the dependent variable is environmental degradation. To test this hypothesis, continuous cultivation was analyzed with One-way analysis of variance. The result of the analysis is presented in Table 1.

TABLE 1. Summary of One-way Analysis of Variance with the influence of Continuous Cultivation does not significantly influence Environmental Degradation

Level of Continuous Cultivation	**N**	**$\bar{X}$**	**SD**
High	105	15.32	3.15
Moderate	208	16.20	2.79
Low	374	16.32	2.92
Total	687	15.95	2.95

Sources of Variance	**Sum of squares**	**Df**	**Mean square**	**F-value**	**Sig.**
Between Group	82.80	2	41.40		
				4.86*	.008
With Groups	5825.41	684	8.52		
Total	5908.21	686			

*P<.05 df=2,684 F-critical =3.00

It is clearly evident from Table 1 that the descriptive statistics with a total of 687 respondents was used in the study with three levels of continuous cultivation; highly aware has a total of 105 respondents, with a mean and standard deviation of 15.32 and 3.15. Moderately aware are 208 respondents with a mean of 16.30 and standard deviation of 2.79,

while 374 respondents were sampled for lowly aware with a mean and standard deviation of 16.32 and 2.92, respectively.

The second part of Table 1 gives a summary of the inferential statistics with a One-way Analysis of variance. The result shows that between and within group, sum of squares are 82.80 and 5825.41; at 2 and 684 degrees of freedom, the mean squares between and within are 41.40 and 8.52. Thus, this was with a Fisher's calculated value of 4.86 that was found to be greater than the critical F-value of 3.00. Therefore, the null hypothesis is rejected (F=4.86; P=.008). This implies that continuous cultivation has significantly influenced environmental degradation. To further test the direction of the mean differences, Fisher's Least Significant difference (LSD) was performed and presented in Table 2.

TABLE 2. Post-hoc comparison with Fisher's Least Significance Different (LSD) of the influence of Continuous Cultivation on Environmental Degradation

Levels of Continuous Cultivation	N	High	Moderate	Low
High	105	15.32	-.88	-1.00*
Moderate	208	-3.83	16.20	-.12
Low	374	-5.56	-0.43	16.32
		MSW=8.52		

*<.05, critical t = 1.962, df = 685.

a = Group means are placed along the diagonal

b = Difference between group means are placed above diagonal

c = Fisher LSD are placed below the diagonal

The Post-hoc Mean Comparison with Fisher's Least Significant Difference (LSD) in Table 2 shows that the mean differences for high and moderate level of continuous cultivation is statistically significant as *P<.05; t=-3.83; P=.013, X= -.88. There is a significant mean difference for farmers who have high and low level of continuous cultivation thus: *P<.05; t=-5.56; P=.002, X= -1.00. For moderate and low level of cultivation, there is no statistical mean differences as P>.05; t=-0.43; P=.623, X= -.12.

The result of hypothesis one is in consonance with Agboola (1979), who observed that continuous cultivation is one of the major farming practices that lead to soil depletion, and Omoogun (2004), who noticed that continuous cultivation process leads to leaching of soil essential minerals.

Hypothesis Two: There is no significant influence of poor tillage practices on environmental degradation. The independent variable in this hypothesis is poor tillage practices which have the following categories: high, moderate, and low. On the other hand, the dependent variable is environmental degradation. To test this hypothesis, poor tillage practices were analyzed with One-way analysis of variance. The result of the analysis is presented in Table 3.

TABLE 3. Summary of One-way Analysis of Variance with the influence of Poor Tillage Practices on Environmental Degradation

Levels of Poor Tillage Practices	**N**	**$\bar{X}$**	**SD**
High	141	15.29	2.32
Moderate	222	15.84	2.61
Low	324	16.38	2.61
Total	687	15.84	2.51

Sources of Variance	**Sum of squares**	**df**	**Mean square**	**F-value**	**Sig.**
Between Group	123.72	2	61.86		
				9.49*	.000
With Groups	4461.10	684	6.52		
Total	4584.82	686			

*P<.05 df=2,684 F-critical =3.00

It can be discerned from Table 3 that the descriptive statistics of 687 farmers were utilized for the study. Those who highly adapted poor tillage practice were a total of 141 respondents, with a mean and standard deviation of 15.29 and 2.32. Those who moderately adapted poor tillage practice were 222 respondents, with mean of 15.4 and

standard deviation of 2.61, while 324 respondents were sampled for low adaption of poor tillage practice and had a mean and standard deviation of 16.38 and 2.92, respectively.

The inferential statistics is presented in the second part of Table 3 with One-way Analysis of variance. The result showed that between and within group, sum of squares are 123.72 and 4461.10; at 2 and 684 degrees of freedom, the mean squares between and within are 61.86 and 6.52. This was with a Fishers calculated value of 9.49 that was found to be greater than the critical F-value of 3.00. Therefore, the null hypothesis is rejected (F=9.49; P=.000). This implies that there is a significant influence of poor tillage practices on environmental degradation. To further test the direction of the mean differences among the groups, a post hoc multiple comparison was executed with Fisher's Least Significant difference (LSD) as presented in Table 4.

TABLE 4. Post-hoc comparison with Fisher's Least Significance Different (LSD) of the influence of Poor Tillage Practices on Environmental Degradation

Levels of Poor Tillage Practices	**N**	**High**	**Moderate**	**Low**
High	141	15.29	-0.55*	-1.09*
Moderate	222	-1.964	15.84	-.54*
Low	324	-4.19	-2.35	16.38
		MSW=6.52		

*<.05, critical t = 1.962, df = 685.

a = Group means are placed along the diagonal

b = Difference between group means are placed above diagonal

c = Fisher LSD are placed below the diagonal

With Multiple Comparisons using Fisher's Least Significant Difference (LSD) in Table 4, the result shows that the mean differences for high and moderate utilization of poor farming practice is statistically significant as *P<.05; t=-1.964; P=.045, X= -0.55. For farmers who highly and lowly utilized poor farming practice, there is a significant mean difference as *P<.05; t=-4.19; P=.000, X= -1.09, while for moderately and lowly utilized poor farming practice, there is also a statistical

mean differences as *P<.05; t=-2.35; P=.015, X= -.54.

Thus, the result of the second hypothesis is also in agreement with Wood and Edwards (1992), who observed that tillage renders soil to be susceptible to wind and water erosion. As a result, soil losses can be quite substantial. They further stated that when applied in intensive agricultural cultivation, it leads to de-vegetation and desertification. The result of the second hypothesis also aligns with Unger (1990), who observed that tillage alters many aspects of the physical environment including soil, water, aeration, compaction, porosity, and temperature.

CONCLUSION

On the basis of the above result, the following conclusion was made. Continuous cultivation and poor tillage practices influence environmental degradation. However, there are some mitigation strategies to this problem such as: sustainable agricultural practices, environmental sustainability awareness creation, environmental education, and conservation clubs among other practices. It was further recommended that Agricultural Extension Officers should educate the farmers on how to improve on their mode of farming. Also, farmers should, in turn, alert them on the ills of unsustainable farming practices of continuous cultivation and poor tillage system. It was also recommended that environmental education outline should be introduced into the primary and secondary school curriculum to make the children develop and grow up with environmental ethics or interest.

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