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LAND DEGRADATION, SOIL CONSERVATION AND POVERTY STATUS OF FARMERS IN OSUN STATE, NIGERIA

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Abstract: This study deals with Land degradation and Poverty Status of farmers in Osun State, Nigeria. Data were collected from 105 randomly sampled respondents in the study area. The methods employed in analyzing the data were, Descriptive statistics, FGT poverty index and Probit regression model. The study revealed that averagely they were aged 51.66 years. Majority 79.05% were male, 73.33% were married and 46.67% had household size of 6-10 members with a mean household size of 8 members in the house. The mean farm size was 9.70ha58.48% of the respondents had between 0.5-2ha of land subjected to fallowing. 9.52% of the respondents had between 0.5-2ha of land subjected to livestock farming. 78.10% of the respondents had between 0.5-2ha of degraded cash crop land. 74.29% of the respondents had between 0.5-2ha of degraded food cropland. 47.62% of the respondents had between 0.5-2ha of degraded fallow land. 86.67% of the respondents did not use dung of livestock kept on the farm. 72.38% of the respondents used bush burning on their farm. 65.71% of the respondents used mulching on their farm. 85.71% of the respondents practiced clean clearing on their farm. 63.81% of the respondents practiced crop rotation on their farm. 66.67% of the respondents did not use organic manure on their farm. 62.66% of the respondents did not practice zero tillage on their farm. The study further revealed that poverty incidence (P_0) was 51%, poverty depth (P_1) was 17% and poverty severity (P_2) was 8%. The determinants of poverty in the study area are; marital status, household size and land area under livestock farming.
Keywords: Degraded land, zero tillage, poverty incidence, clean clearing, livestock farming.

1. STATEMENT OF PROBLEM

Over exploitation of land resources through over grazing, over use of fertilizer, soil erosion, soil acidification and Stalinization, overload of soil nutrients and loss of agricultural land to other users. Under investment in land which includes the degradation of existing components of land that are not maintained such as terrace, irrigation work as well as land improvement that are not made due to lack s of investment incentives (Oyekale, 2008). The impact of land degradation on the local population includes crop failure and famine, shortage of water, soil erosion, shortage of pasture for livestock and prolong drought (Subair, 2009). In

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all parts of Nigeria, there is noticeable evidence of land degradation. This varies from place to place in terms of the types, duration, severity, and socio-economic impact (Aruleba, 2004; Senjobi, 2007). There is need for a scientific study to discover the particular cropping pattern or system that will give its highest productivity. The importance of this cannot be underestimated given an economic condition that we faced with the problem of acute shortage of food and an over increasing population (Oyekale, 2008).

Communal ownership of land in Nigeria has been associated with such problems as limited tenure security, restrictions or farmers' mobility, and the inevitable fragmentation of holdings among future heirs. In addition, group ownership restricts access rights community members outside the owning group, a situation that limits the use of land as collateral for agricultural credit. But communal ownership has also been credited with preserving traditional land use practices such as bush fallowing, which has helped retard problems of land degradation. (Food and Agriculture Organization, FAO, 2003). To solve the problems of land degradation and its linkage, to agricultural productivity and poverty, we need to take a broader perspective both in how the problem is defined and in the set of possible solution. It may be that despite reported high erosion rates, soil erosion is not the most important land degradation problem to farmers; the nature of land degradation problem their causes likely varies from place to place (Fitsum et al, 2009). This leads to consideration of a broader set of possible solutions than simple conservation programmes. It may be that other area of policy intervention such as land tenure policy; infrastructure and market policies have much greater impact than conservation programme (Subair, 2009). The specific objectives are to: identify land degradation/use categories, type of cultural/soil conservation practices adopted and poverty status of farmers in the study area.

2. THEORETICAL FRAMEWORK

The importance of natural resources, especially land to agriculture and rural development is well recognized. Land is the basic natural resource that provides habitat and sustenance for living organisms. Africa is endowed with enough land to undertake small and large scale activities to strengthen household security, national development, trans-boundary cooperation and regional integration to transform trade, and create new opportunities for sustainable development that is sensitive to the environment and social and economic issues (Bangladesh, 2001). The economic fortune of most developing countries, including Nigeria, however, revolves, largely around the exploitation and use of land resources especially in the

primary industry such as, agriculture (Titilola and Jeje, 2008). Busari, (2010) explained that land degradation is the process of decay in the land's physical and biological resources, which continues until it reduces the lands advantage. According to Dixon and Peter, (2001) the process of land degradation can be natural but usually ends with a new natural balance. In most recent cases, land degradation reflects imbalance between man and environments. Man is always seen not as the higher but the acceleration of the land degradation process so that land becomes truly unproductive and difficult to rehabilitate, limited to time and cost. Senjobi and Ogunkunle, (2010) explained that land, being limited in supply is pressured and competed for by several uses. The intensification of cultivation resulting in the opening up of new lands exposes the top soil to the elements of degradation and alters the natural ecological conservatory balances in the landscape.

According to Eniola et al., (2010) Land degradation, a decline in land quality caused by human activities, will remain high on the international agenda in the 21st century. In the developing countries like Nigeria where a large proportion of human population depends almost entirely on land resources for their sustenance, there is increasing competing demand for land utilization such as grazing, fish pond construction, quarrying, crop farming amongst others. People can be major asset in reversing trend towards degradation. According to Sara and Satya, (2009) Land degradation is the most important environmental problem currently challenging the nation of sustainable development in many parts of the world. The problem is most acute where the environment is intrinsically vulnerable and where the population is losing control of its own resource, unless some local actions are being taken. The willingness of all involved parties to take appropriate local action therefore must be put as the important measure for perceiving the readiness to take control measure against land degradation.

Oyekale, (2008) suggested two broad types of land degradation, which are: Overexploitation of land resources through over use of fertilizer, soil acidification, pan information, terrain deformation, soil erosion, overgrazing, eutrophication, over load of soil nutrients and under investment in land which includes degradation of existing components of land that are not properly managed such as irrigation terraces, pollution tree alleys as well as load improvement that are not made due to lack of investment incentives. According to Akamigbo (2005), land degradation assumes varying dimensions depending on one's location. In Nigeria, for example, inhabitants of the coastal areas are not as worried by the fear of desert encroachment as those who reside in Bornu, Sokoto, Katsina and Kano states of Nigeria, just as they worry about oil pollution and spillage, coastal erosion and flooding in

Niger Delta of Nigeria. Sheet erosion is nation-wide while gully erosion is most severe and dense in certain southern states of Anambra, Imo, Abia, Enugu, Ondo, Delta and Akwa Ibom. Flooding occurs throughout Nigeria.

According to Busari (2010) Land degradation caused by agriculture takes many forms and has many causes. Some of the most causes of land degradation include: degradation related to overgrazing by livestock, degradation attributable to soil Stalinization a buildup of salts in soil that result from irrigation in certain situations, degradation related to soil erosion, here related to inappropriate cultivation practices, degradation attributable to water logging another problem related to irrigation and diversion of tropical forests to agriculture (crop or pasture). Nkonya, et al, (2011) revealed that the immediate causes of land degradation include biophysical causes and unsustainable land management practices. Contributing biophysical causes include topography, which determines soil erosion hazard, and climatic conditions, such as rainfall, wind, and temperature. Overgrazing by livestock can lead to land degradation .Unsustainable land management practices, such as deforestation, forest degradation, soil nutrient mining, and cultivation on steep slopes, are also direct contributors to land degradation.

Estwaran, et al., (2001) revealed that Land degradation is a global problem, largely related to agricultural use. The major causes include: Land clearance, such as clear cutting and deforestation, agricultural depletion of soil nutrients through poor farming practices, livestock including overgrazing and over drafting, inappropriate irrigation land over drafting, Urban sprawl and commercial development oil contamination including, Vehicle off-loading ,Quarrying of stone, sand, ore and minerals, increase in field size due to economies of scale, reducing shelter for wildlife, as hedgerows and copses disappear, exposure of naked soil after harvesting by heavy equipment, monoculture, destabilizing the local ecosystem, dumping of non-biodegradable trash, such as plastics. Lan and Ragnar, (2007) explained that Patterns of degradation vary according to agro-ecological conditions, farming systems, levels of intensification, and resource endowments, but these also interact in important ways with social and economic systems. Temperate lands, for example, are generally more resilient to degradation, but are also associated with societies that have more resources for investing in maintaining and rehabilitating land quality – and for developing alternative sources of livelihood for their citizens. Basic goods are nutrition, shelter/housing, water, and healthcare, access to productive resources including education, working skills and tools and political and

civil rights to participate in decisions concerning socio-economic conditions (Steeten and Burki, 2008).

3. METHODOLOGY

The study was conducted in Ilesha West Local Government Area of Osun State, Nigeria. Its headquarter is in Oja Oba (Ereja square) on the outskirts of the city of Ilesha. It has an area of 114km^2 of land and size and it is located on $19^0 30^L$ south of the equator and 5^0-57^0 West of the Greenwich meridian. Ilesha which is 30km from Oshogbo, Osun State shares boundaries with Obokun LGA of Osun State in the North. Ilesha west has a contending home based population commission which was conducted at the last 2006 census by Nigerian Population Census (NPC, 2006) to be 103,555. Primary data were used for the study. The data were collected through the use of a structured questionnaire. The population of the study consists of farmers in Ilesha West Local Government Area of Osun State. Multi-stage random sampling was used to select farmers within the Local Government Area. The villages in Ilesha West Local Government Area are as follows; Ilaje, Ibala, Ilo, Ayegunle, Isokun, Omi iru, Omi eran, Ereja, Ita ofa, Igbogi, Idasa, Omi oko, Odo esira, Egbe idi, Ijoka, Itakogun, Biladu, Omofe and Odo iro. The first stage involves selection of some villages from the above villages. The last stage involved random selection of farmers from each village, 15 farmers from Ilaje, 10 farmers from Ibala, 13 farmers from Ilo, 6 farmers from Ayegunle, 14 farmers from Omi iru, 8 farmers from Omi eran, 12 farmers from Igbogi, 5 farmers from Idasa, 7 farmers from Odo esira, 6 farmers from Ijoka, and 9 farmers from Biladu. Thus, 105 farmers were interviewed in the study area. Three different analytical techniques were employed in analyzing the data which are; Descriptive Statistics, FGT 1984 poverty index and Probit regression model. Following Foster et al (1984), poverty line was computed as the 2/3rd of the mean per capita annual income of all the members of the sampled households. The FGT index allows for the quantitative measurement of poverty status among subgroups of a population (i.e., incorporating any degree of concern about poverty) and has been widely used (Kakwani, 1990). The headcount ratio measures the ratio of the number of poor individuals or simply measures the poverty incidence (i.e., the percent of the poor in the total sample). The analysis of poverty incidence using FGT measure usually starts with ranking of expenditures in ascending order $Y_i \leq Y, \leq ... \leq; Y_n$:

$$P_{\alpha} = \frac{1}{N} \sum_{i=1}^{q} \left(\frac{Zi - Yi}{Zi} \right)^{\alpha}$$

1-1

σ = Non-negative poverty aversion parameter, which can be 0 for poverty incidence, one for poverty gap or two for poverty severity.

Y_i = The per capita income of ith poor household.

n, = The total number of sample households,

q = The number of households below the poverty line.

Z = Poverty line.

The Probit model that was estimated using the LIMDEP 7.0 statistical package can be stated as:

$$P_i=\beta_0+\beta_1X_1+ \beta_2+X_2 +\beta_3+X_3+ \beta_2+X_4+ \beta_5+X_5 + \beta_6+X_6+ \beta_7+X_7+ \beta_8+X_8+ \beta_9+X_9+ \beta_{10}+X_{10} + \beta_{11}+X_{11}+ \beta_{12}+X_{12}+ \beta_{13}+X_{13}+ \beta_{14}+X_{14}+ \beta_{15}+X_{15}+ \beta_{16}+X_{16}+ \beta_{17}+X_{17}+ \beta_{18}+X_{18}+ \beta_{19}+X_{19}+e_i$$

P_i = Poverty status dummy (poor = 1,0 otherwise).

X_1 = Sex (male =1,0 otherwise).

X_2 = Marital status dummy (married = 1, 0 otherwise).

X_3 = Size of the household.

X_4 = Education dummy (formal education =1,0 otherwise).

X_5 = Land area under livestock farming (ha).

X_6 = Land area under vegetable production (ha).

X_7 = Fertile food cropland areas (ha).

X_8 = Fertile fallow cropland areas (ha).

X_9 = Degraded cash cropland areas (ha).

X_{10} = Degraded food cropland areas (ha).

X_{11} = Harrowing (yes = 1,0 otherwise).

X_{12} = Mulching (yes - 1, otherwise = 0).

X_{13} = Clean clearing (yes = 1, otherwise= 0).

X_{14} = Crop rotation (yes = 1, otherwise = 0).

X_{15} = Organic manure (yes = 1, otherwise = 0).

X_{16} = Zero tillage (yes = 1,0 otherwise).

X_{17} = Fertilizer application (yes = 1, otherwise= 0).

X_{18} = Cover crop (yes = 1, otherwise 0)

X_{19} = Number of time sick during cropping season

e_i = Error term.

4. RESULTS AND DISCUSSION OF THE FINDINGS

4.1 Distribution of farmers according to their socio economic characteristics in the study area

Table 1 revealed that 40.95% were between ages 30-49 years, 40% were between 50-59 years, 14.29% were between 60-69 years and 4.76% were between 70 years and above which means that most of the respondents were between 30-59years. The mean age is 51.66 years. This result is in line with the findings of Umukoro and Akinnagbe, (2011) in their work titled Farmers Perception of the Effects of Land Degradation on Agricultural Activities in Ethiope East Local Government area of Delta state, Nigeria with mean age of 53.17years. Table 1 revealed that 79.05% were male while 20.95% constituted the female out of 105 farmers sampled which means that most of the respondents were male involved in farming and female in farm produce processing. This result corroborated with the findings of Oyekale (2008) in his work titled Land Degradation, soil conservation practices and poverty incidence in South Western Nigeria with the majority being male. Table 1 showed that 73.33% of the respondents were married, 10.48% were divorced, 10.47% were widow/widower and 5.72% were separated which means that most of the respondents in the study area were married having the highest percentage of 73.33%. This result tally with the work of Umukoro and Akinnagbe (2011) in his work titled "Farmers Perception of the Effects of Land Degradation on Agricultural Activities in Ethiope East Local Government Area of Delta State, Nigeria. Table 1 showed that farmers household with less than or equal to 5 members had a percentage of 25.71%, household farmers with members had a percentage of 46.67 and farmers with household size between eleven and fifteen members had a percentage of 26.67, this implies that majority of the respondents had a large household family size, which could however be used as family labour. The mean household size was 8 members.

This conforms to Adetunji and Raufu (2012) in their work titled "Determinants of land management practices among crop farmers in south-western Nigeria with a mean household size of 8 members. Table 1 showed that 16.19% of the farmers had no formal education, 20% with primary education, 49.52% with second any education while 14.29% of the farmers had tertiary education. This implies that more than half of the farmers may have access to information associated with land management. This result is in line with the work of Adetunji

and Raufu (2012) in their work titled" Determinants of land management practices among crop farmers in South –Western Nigeria, which stated that larger percentage of respondents acquired secondary education.

Table 1: Socioeconomic Characteristics of the Respondents in the Study Area

Age	**Frequency**	**Percentage**
≤29	0	0.00
30-49	43	40.95
50-59	42	40.00
60-69	15	14.29
> 70	5	4.76
Total	**105**	**100.00**
Sex		
Male	83	79.05
Female	22	20.95
Total	**105**	**100.00**
Marital Status		
Married	77	73.33
Single	0	0.00
Divorced	11	10.48
Widow/widower	11	10.47
Separated	6	5.72
Total	**105**	**100.00**
Household size		
≤ 5	27	25.71
6-10	49	46.67
11-15	28	26.67
>15	1	0.95
Mean=8		

Total	**105**	**100.00**
Educational level		
No formal	17	16.19
Pry	21	20.00
Sec	52	49.52
Tertiary	15	14.29
Total	**105**	**100.00**

Source: Field Survey, 2012.

4.2 Distribution of Respondents by Sources of Initial Capital and household income

Table 2 showed that the various sources of initial capital available are personal, friends/ Relatives, loan from bank and cooperative borrowing which had the percentages of 40.95%, 32.38%, 3.81% respectively this indicated that the respondents source for their capital from a wide range of sources. This contradicted the findings of Ogunleye, et al (2010) in their work titled Marketing Extension Needs for Sustainable Extension Practices in Surulere Local Government Area of Oyo State with majority (90.35%) owning their initial source of finance. Table 2 revealed that 10.48% of farmers earn less than or equal to ₦ 15000 as income, 26.67% of farmers' earn between ₦ 16 000 and #40000, 23.81% of farmers earn between ₦ 71000 and

₦ 100 000 while only 4.76% of farmers earn more than 1 ₦ 00 000 as income. This implies that majority of the farmers earn between the range of ₦ 16000 and ₦4 0000. The mean household income was ₦ 42342.86. This contradicted the findings of Olatinwo and Adewumi (2012), in their work titled Energy Consumption of Rural Farming Households in Kwara State, Nigeria with 72% of the household earning between the range of ₦ 9000 and #18000 as an income.

Table 2: Frequency distribution of respondents by sources of initial capital and household income

Sources of capital	**Frequency**	**Percentage**
Personal	43	40.95
Friends/relatives	34	32.38

Bank	4	3.81
Cooperative	24	22.86
Total	**105**	**100.00**
Household income(₦)		
≤15000	11	10.48
1600 -25000	28	26.67
2600 -40000	28	26.67
41000 – 70000	25	23.81
71000 – 10000	8	7.62
>100 000	5	4.76
Mean= 42342.86		
Total	**105**	**100.00**

Source: Field Survey, 2012.

4.3 Distribution of Respondents by Primary Occupation, farmers association and Years of Farming Experience

Table 3 revealed that 68.57% of the respondents claimed that farming is their major occupation, 31.43% of the respondents claimed that farming is their secondary occupation. By implication, it implies that majority of the respondents didn't have any other business as their means of livelihood apart from farming. This corroborated with the findings of Umeh et al (2012) in their work titled Analyzing the Determinants of Poverty Severity among Rural Farmers in Nigeria with a percentage of 70.57% were engaged in farming as their primary occupation. Table 3 showed that 78.10% of the respondents belongs to one farmers association or the other while 21 .90% of the respondents did not belong to any farmers association. This result corroborated with the work of Okoruwa, et al (2009) in their work titled The Structure and Determinants of Land – use intensity among food crop farmers in South Western, Nigeria with majority of the farmers being in one farmers association or the other. Table 3 showed that11.43% of the farmers had farming experience between 1-10years, 25.71% had farming experience between 11-20years, and 39.05% had farming experience between 21-30years while 23.81% had more than 30years of farming experience. The mean of farming experience was 27.01years. Years of farming experience of a farmer contributed to his ability to manage his holding efficiently through trial and error. Thus, the higher the experience of a farmer, the higher the adoption rate of new technology will be. This result is

in line with Subair (2009) in his work titled "Environment-productivity relationship in the South West Nigeria's Agriculture with a mean of 29.07years of farming experience.

Table 3: Frequency distribution of respondents by primary occupation, Farmers Association and Years of farming experience

Occupation	**Frequency**	**Percentage**
Farming	72	68.57
0thers	33	31.43
Total	**105**	**100.00**
Farmers association		
Yes	82	78.10
No	23	21.90
Total	**105**	**100.00**
Years of farming experience		
1 – 10	12	11.43
11-20	27	25.71
21-30	41	39.05
> 30	25	23.81
Mean = 27.01		
Total	**105**	**100.00**

Source Field Survey, 2012.

4.4 Distribution of respondents by Farm Size and Number of Times sick per annum

Table 4 revealed that 32.38% of farmers had farm size that lesser or equal to five hectare, 32.38% of farmers had farm size between six to ten hectares 34.29% of farmers had farm size between eleven to twenty hectares while only 0.95% of the farmers had more than twenty hectare. This can be said that majority of the farmers had access to large farm size, because most of the farmers had access through inheritance because 76.19% of farmers were native while the large farm size enables the farmers to practice bush fallowing on their farmland at their respective farm. This contradicted the findings of Umukoro and Akinnagbe (2011) in their work titled Farmers Perception of the Effects of Land Degradation on

Agricultural Activities in Ethiope East Local Government Area of Delta State, Nigeria with 96.60% owning less than 5ha of land.

Table 4: Frequency distribution of respondents by farm size and Number of Times sick during Cropping Season.

Farm Size (ha)	**Frequency**	**Percentage**
1-5	34	32.38
6-10	34	32.38
11-20	36	34.29
> 20	1	0.95
Mean= 9.70		
Total	**105**	**100.00**
Number of Times sick		
None	8	7.62
1-5	92	87.62
> 5	5	4.76
Mean = 2.72		
Total	**105**	**100.00**

Source: Field Survey,(2012.)

4.5 Distribution of respondents by number of hectares of land subjected to cash crop

Table 5 showed that number of hectares subject to cash cropland by the farmers in the study area, which shows that 20% of the respondents did not have cash cropland, 30.48% of the respondents had between 0.5 and 2 hectares while 49.52% of the respondents have more than two hectares for cash crops production. This conformed to the findings of Oyekale (2008), in his work titled Land Degradation, Soil Conservation practices and poverty incidence in South Western, Nigeria. Table 5 showed that 4.76% of the respondents did not have food crop land at all, 40% of the respondents had between 0.5 and 2 hectares while 55.24% of the respondents have more than two hectares for food crop production. This implies that majority of the farmers were mainly into food crop production. This result is in line with the findings of Olatinwo and Adewumi (2012) in their work titled Energy

Consumption of Rural Farming Households in Kwara State, Nigeria with 60.02% having more than 2ha of land for food crop production.

Table 5: Frequency distribution of respondents by hectares of land subjected to cash and food crop

Cash cropland (ha)	**Frequency**	**Percentage**
Nil	21	20.00
0.5 – 2	32	30.48
> 2	52	49.52
Mean = 2.25		
Total	**105**	**100**
Food crop land (ha)		
Nil	5	4.76
0.5-2	42	40.00
> 2	58	55.24
Mean = 2.60		
Total	**105**	**100**

Source Field Survey, 2012.

4.6 Distribution of respondents by number of hectares of land subjected to fallowing, livestock and vegetable

Table 6 showed that 30.48% of the farmers did not have any land under fallow, 58.10% of the farmers had between 0.5 and 2 hectares while 11.42% of the farmers had more than two hectares of land under fallow. This implies that majority of the respondents had between the range of 0.5- 2ha of land under fallow. This corroborated the findings of Umukoro and Akinnagbe (2011) in their work titled Farmers Perception of the Effects of Land Degradation on Agricultural Activities in Ethiope East Local Government Area of Delta State, Nigeria with majority 60.05% having between 0.5-2ha of land under fallow. Table 6 revealed that 86.67% of farmers in the study area did not have any hectares subjected to livestock, 9.52% of farmers in the study area had between 0.5 and 2 hectares of land for livestock production while 3.81% of farmers had more than two hectares for livestock production. This implies that majority of the respondents in the study are did not own a livestock farm. This contradicted the findings of Nkonya (2002) in his work titled Soil Conservation Practices and Non Agricultural Land Use in the South Western Highlands of

Uganda with 35.45% owning between 1-2ha of land for livestock farming. Table 6 revealed that 65.72% of farmers in the study area did not have any hectares for vegetable production, 9.52% had between 0.1-0.5hectare for vegetable production and 24.76% of farmers had more than 0.5 hectares of farm land for vegetable production. This implies that majority of the respondents did not own a vegetable farm. This contradicted the findings of Ajayi and Aruleba (2010) in their work titled Use of Models in Assessing the Impact of Cropping System, Land Types and Sustainability on Land Degradation in South Western, Nigeria with majority 35.25% owning a vegetable farm.

Table 6: Frequency distribution of respondents by hectares of land subjected to fallowing, livestock and vegetable

Fallowing land (ha)	**Frequency**	**Percentage**
Nil	32	30.48
0.1-2	61	58.48
> 2	12	11.42
Mean = 1.27		
Total	**105**	**100**
Livestock land area		
Nil	91	86.6
0.5 – 2	10	9.52
> 2	4	3.81
Mean = 0.26		
Total	**105**	**100**
Vegetable land area		
Nil	69	65.72
0.1-0.5	10	9.52
> 0.5	26	24.76
Mean = 0.35		
Total	**105**	**100**

Source: Field Survey, 2012.

4.7 Distribution of Respondents by number of fertile cash and food crop land (ha)

Table 7 revealed that numbers of hectares of fertile cash crop land owned by farmers in the study area, 62.86% of farmers had between 0.5 and two hectares of fertile cash cropland, 17.14% of farmers own more than two hectares of cash cropland while 20% of farmers did not have cash cropland at all. This implies that majority of the respondents owned between the range of 0.5-2ha of fertile cash crop land. This result is in line with the findings of Oyekale (2008) in his work titled "Land degradation, soil conservation practices and poverty incidence in south western Nigeria with 62.05% owning between the ranges of 0.5-2ha of fertile cash crop land.

Table 7 indicated the numbers of hectares of fertile food cropland owned by farmers in the study area, 52.38% of farmers had between 0.5 and 2 hectares of fertile food cropland, 42.86% of farmers had more than 2 hectares of fertile food cropland while 4.76% of farmers did not have food cropland at all. This implies that majority of the respondents owned more than 2ha of fertile food crop land. This contradicted the findings of Olatinwo and Adewumi (2012) in their work titled Energy Consumption of Rural Farming Households in Kwara State, Nigeria with 65.70% 0f the respondents owning more than 2ha of fertile food crop land. Table 7 revealed that 34.29% of farmers had less than or equal to 0.49 hectares of fallow land, 62.86% of farmers had between 0.5 and 2 hectares of fallow land, while 2.86% of farmers had more than 2 hectares of fallow land. This implies that majority of the respondents owned between the range of 0.5-2ha of fertile fallowing land. This contradicted the findings of Umukoro and Akinnagbe (2011) in their work titled Farmers Perception of the Effects of Land Degradation on Agricultural Activities in Ethiope East Local Government Area of Delta State, Nigeria with 96.60% owning more than 2ha of fertile fallow land.

Table 7: Frequency distribution by hectares of fertile cash and food crop land

Fertile cash cropland	**Frequency**	**Percentage**
Nil	21	20.00
0.5-2	66	62.86
> 2	18	17.14
Mean= 1.39		
Total	**105**	**100**

Fertile food crop land		
0.1 – 2	5	4.76
> 2	55	52.38
Mean= 2.00		
Total	**105**	**100**

Source Field Survey, 2012.

4.8 Distribution of Respondents by numbers of degraded cash crop, food crop and fallow land (ha)

Table 8 showed that 20% of farmers had lesser or equal to 0.49ha of degraded cash cropland, 78.10% of farmers had between 0.5 and 2ha of degraded cash cropland, while 1.90% of farmers had more than 2ha of degraded cash cropland. This implies that majority of the respondents had between the range of 0.5-2ha of degraded cash crop land. This contradicted the findings of Oyekale (2008) in his work titled "Land degradation, soil conservation practices and poverty incidence in south western Nigeria with 62.05% owning between the ranges of 0.5-2ha of degraded cash crop land. Table 8 showed that 25.71% of farmers had not more than 0.40 ha degraded food cropland while 74.29% of farmers had between 0.5 and 2ha of degraded food cropland. This implies that majority of the respondents owned between the range of 0.5-2ha of degraded food crop land. This contradicted the findings of Nkonya (2002) in his work titled Soil Conservation Practices and Non Agricultural Land Use in the South Western Highlands of Uganda with 52.34% of the respondents owning less than 2ha of degraded food crop land. Table 8 revealed that 13.33% of farmers had not more than 0.49ha of degraded fallow land, 47.62% of farmers had between 0.5 and 1ha, 8.57% of farmers had more than 1ha of degraded fallow land while 30.48% of farmers did not have fallow land. This implies that majority of the respondents owned between the range of 0.5-1ha of degraded fallow land. This corroborated with the findings of Ajayi and Aruleba (2010) in their work titled Use of Models in Assessing the Impact of Cropping System, Land Types and Sustainability on Land Degradation in South Western, Nigeria with majority 49.25% owning more than 0.5ha of degraded fallow land.

Table 8: Frequency distribution by degraded cash crop, food crop and fallow land

Degraded cash crop land	**Frequency**	**Percentage**
0-0.49	21	20.00
0.5-2	82	78.10
> 2	2	1.90
Mean= 0.94		
Total	**105**	**100**
Degraded Food crop land		
0-0.49	27	25.71
0.5-2	78	74.29
Mean= 0.64		
Total	**105**	**100**
Degraded Fallow land		
0	32	30.48
0.01-0.49	14	13.33
0.5-1.00	50	47.62
> 1	9	8.57
Mean= 0.47		
Total	**105**	**100**

Source Field Survey, 2012.

4.9 Use of some cultural / soil conservation practices by the respondents in the study area.

Table 9 revealed that 13.33% of farmers in the study area had livestock farm and who thereby used the animal dung on their cultivation of crops plot while 86.67% of farmers did not own a livestock farm. This implies that majority of the respondents did not use dung of livestock kept on the farm. This corroborated with the findings of Aruleba (2004) in his work titled Influence of Cropping System, Land Type and Sustainability of Land Degradation in South Western, Nigeria with 85.50% that did not used dung of livestock kept on the farm. Table 9 showed that 72.38% of farmers used bush burning while 27.62% of farmers did not use bush burning on their farm. This implies that larger percentage of farmers used bush burning on their farm in the study area. This contradicted the findings of Busari (2010) in his

work titled the Economics of Land Degradation with 93.30% engaged in bush burning. Table 9 revealed that 22.86% could afford the use of tractor on their farmland while 77.14% could not afford it, this implies that majority of the farmers could not afford the use of tractor on their farm due to their poverty level. This contradicted the findings of Subair (2009) in his work titled "Environment-productivity relationship in the South West Nigeria's Agriculture with 35.65% of the respondents used tractor on their farm. Table 9 revealed that 32.38% could afford the use of harrowing / ploughing while 67.62% could not afford it, this implies that majority of the farmers could not afford the use of harrowing / ploughing for their farmland. This contradicted the findings of Adam (2009) in his work titled The Global Problem of Land Degradation and Desertification in the Rural Sector of South Africa with 45.33% of the respondents used either harrowing or ploughing.

Table 9: Frequency distribution by farmers who used livestock waste kept on the farm, bush burning, tractor and harrowing / ploughing

Use of livestock waste	**Frequency**	**Percentage**
Yes	14	13.33
No	91	86.67
Total	**105**	**100**
Bush burning		
Yes	76	72.38
No	29	27.62
Total	**105**	**100**
Use of tractor		
Yes	24	22.86
No	81	77.14
Total	**105**	**100**
Use harrowing / ploughing		
Yes	34	32.38
No	71	67.62
Total	**105**	**100**

Source Field Survey,2012.

4.10 Distribution of Respondents by use of mulching, clean clearing, crop rotation and Organic manure

Table 10 indicated that 65.71% of farmers used mulching while 34.28% of farmers did not use mulching; this implies that majority of farmers used mulching which could help in improving soil nutrients and thereby reducing land degradation. This corroborated with the findings of Umukoro and Akinnagbe (2011) in their work titled Farmers Perception of the Effects of Land Degradation on Agricultural Activities in Ethiope East Local Government Area of Delta State, Nigeria with 67.03% used mulching on their farms. Table 10 revealed that 85.71% of farmers used clean clearing while 11.29% did not use it, this implies that majority of the farmers did not allow crop residues and plants cleared from a farm to decompose on the farm but are either gathered at some points outside the farm for decomposition or burning. This contradicted the findings of Oyekale (2008) in his work titled "Land degradation, soil conservation practices and poverty incidence in south western Nigeria with 67.00% of the respondents used clean clearing. Table 10 indicated that 63.81% of farmers used crop rotation while 36.19% of farmers did not practice it; this implies that majority of the farmers practiced crop rotation which could help in enhancing soil nutrients and thereby reduce land degradation. This result contradicted the findings of Adetunji and Raufu (2012) in their work titled" Determinants of land management practices among crop farmers in South –Western Nigeria, with 75.34% practiced crop rotation on their farm. Table 10 revealed that 33.33% of farmers used organic manure while 66.67% of them did not used it, thus implies that majority of the farmers could not afford the use of organic manure. This result corroborated the findings of Umukoro and Akinnagbe (2011) in their work titled Farmers Perception of the Effects of Land Degradation on Agricultural Activities in Ethiope East Local Government Area of Delta State, Nigeria with 35.01% of the respondents used organic manure on their farm.

Table 10: Frequency distribution of farmers by use of mulching, clean clearing, crop rotation and organic manure

Mulching	**Frequency**	**Percentage**
Yes	69	65.71
No	36	34.28
Total	**105**	**100**
Clean clearing		

Yes	90	85.71
No	15	11.29
Total	**105**	**100**
Crop rotation		
Yes	67	63.81
No	38	36.19
Total	**105**	**100**
Organic manure		
Yes	35	33.33
No	70	66.67
Total	**105**	**100**

Source Field Survey, 2012.

4.11 Distribution of Respondents by use of zero tillage and cover crops

Table 11 indicated that 37.14% of farmer used zero tillage while 62.86% of farmers did not used zero tillage, this implies that majority of the farmers did not practice the use of zero tillage due to their ignorance of its advantage. This contradicted the findings of Olatinwo and Adewumi (2012) in their work titled Energy Consumption of Rural Farming Households in Kwara State, Nigeria with 45.04% of the respondents used zero tillage on their farms. Table 11 showed that 40% of farmers planted cover crops while 60% of farmers did not engage in planting of cover crops, this implies that majority of the farmers were not involved in planting of cover crops which could help them in improving soil nutrients. This contradicted the findings of Oyekale (2008) in his work titled "Land degradation, Soil Conservation Practices and Poverty Incidence in South Western, Nigeria with 26.07% of the respondents planted cover crops on their farm.

Table 11: Frequency distribution of farmers by use of zero tillage and cover crops

Zero tillage	Frequency	Percentage
Yes	39	37.14
No	66	62.66
Total	**105**	**100**
Cover crops		
Yes	42	40.00

No	63	60.00
Total	**105**	**100**

Source Field Survey, 2012.

4.12 Analysis of poverty status of the respondents using FGT Poverty Index

There are 2 broad ways in measuring poverty; there are establishment of poverty line and choice of an index to measure poverty. In addition to the measurement of poverty line, an appropriate measurement of poverty must reflect three basic elements namely; head count ratio or poverty incidence (P_0), depth or gap of poverty (P_1), poverty severity or intensity(P_2).This is reflected on the degree to which the per capital income of the household or individuals falls below the poverty line. The total per capita income for the 105 respondents was ₦ 8187508.80; mean per capita income was ₦ 81833.42 per annum. The poverty line was computed as 2/3 of the mean per capita income of the household which was ₦ 54828.39. However, any household income below the amount in the poverty line was described as being moderately poor while any household income above or exact amount in the poverty line is described as being non poor.

Therefore, with a poverty line of ₦54828.39, the head count ratio or poverty incidence (P0) was 0.51. This implies that 51%of the respondents in the study area were below the poverty line and were relatively poor. The poverty depth or gap (P1) was 0.17. This value indicated that 17% of the respondents were below the poverty line and therefore required an improvement in their income to reach the poverty line. The poverty severity or intensity (P2) was 0.08. This value indicated that poverty was severe in the study area. However, this contradicted the findings of Omonona (2010) which indicated that poverty incidence (P_0) was 0.61. Poverty depth or gap (P_1) was 0.23 and poverty severity and intensity (P_2) was 0.12 in his work titled Knowledge Review of Poverty and Rural Development in Nigeria.

Table 12: Summary of the Poverty Indices for the Respondents in the Study Area.

	Farmers
Poverty	**Index**
P_0(%)	51
P_1(%)	17
P_2 (%)	8

Source: Field Survey, 2012

4.13 Determinants of Poverty among Respondents in the Study Area.

Table 13 showed the determinants of poverty in the study area using Probit regression model. The following variables had a positive and a direct relationship: Sex (X_1) of the respondents which implies that as they move from male to female there is probability of being poor, Household size (X_3) of the respondents, which implies that as the household size increases the greater the probability of being poor among the farmers, Educational qualification (X_4), which implies as the level of education increases the greater the probability of being poor, Land area under livestock farming (ha) (X_5), which implies that increasing land areas devoted for livestock production increases the probability of being poor, Degraded cash cropland(ha) (X_9),which implies an increase in the hectare of degraded cash cropland increases the probability of being poor, Clean clearing(X_{13}),Zero tillage(X_{16}),which implies an increase in the practice of zero tillage increases the probability of being poor in the study area. This contradicted the findings of Oyekale (2008) in his study of Land Degradation, Soil Conservation Practices and Poverty Incidence in South Western, Nigeria where educational qualification had a negative coefficient and an inverse relationship.

The following variables had a negative coefficient and an inverse relationship; Marital status (X_2), which implies that as the marital status increases the lower the probability of being poor, Land area under vegetable production (X_6),Fertile food cropland areas (X_7),(Fertile fallow land (ha) X_8), Degraded food cropland(ha) (X_{10}), Harrowing(X_{11}), Crop rotation(X_{14}),Organic manure(X_{15}), Fertilizer Application(X_{17}),Cover crops(X_{18}) and number of times sick during cropping season(X_{19}) which implies that the more the respondents engaged themselves in the above , the lower the probability of being poor. This contradicted the findings of Subair (2009) in his work titled “Environment-productivity relationship in the South West Nigeria’s Agriculture, where degraded food cropland and degraded cash cropland both had a positive coefficient and direct relationship. The following variables were significant at 1%, 5%, and 10% level: Marital status(X_2) was significant at 1% level; Household size was significant at 10% level, Land area under livestock production (ha) (X_5) was significant at 5% level and Mulching (X_{12}) at 5% level. This showed that all these variables were important factors that determined the level of poverty among the respondents in the study area. This contradicted the findings of Oyekale (2008) in his study of Land Degradation, Soil Conservation Practices and Poverty Incidence in South Western, Nigeria where mulching was not a significant factor in determining poverty in the study area.

Table 13: Parameter Estimate of Probit Regression Model for Farmers in the Study Area.

Variable	Coefficient	Standard Error	T- ratio
Constant	-1.6119	1.0102	1.596
(X_1) Sex	0.2947	0.5193	-0.567
(X_2) Marital status	-0.4423	0.9169	-4.824*
(X_3) Household size	1.3137	0.5069	2.592***
(X_4) Education level	0.2415	0.4526	-0.534
(X_5) Livestock land area	0.3665	0.3208	0.114**
(X_6) Vegetable land area	-0.8826	0.3692	-2.390
(X_7) Fertile food cropland	-0.2199	0.2225	-0.998
(X_8) Fertile fallow land	-0.2239	0.2830	-0.791
(X_9) Degraded cash cropland	0.3805	0.3046	1.249
(X_{10}) Degraded food cropland	-0.5685	0.5491	-1.035
(X_{11}) Harrowing	-0.1482	0.5062	-0.293
(X_{12}) Mulching	-1.0050	0.4722	2.129**
(X_{13}) Clean clearing	0.2811	0.5055	0.556
(X_{14}) Crop rotation	-0.4402	0.4253	-1.035
(X_{15}) Organic manure	-0.3238	0.3817	-0.848
(X_{16}) Zero tillage	0.2509	0.4033	0.622

(X_{17}) Fertilizer	-0.2420	0.4131	-
0.586			
(X_{18}) Cover crop	-0.1329	0.3707	-
0.359			
(X_{19}) Time sick	-0.1684	0.1755	-
0.959			

Source: Field Survey, 2012.

* 1% level of significance, ** 5% level of significance, *** 10% level of significance

5. CONCLUSION AND RECOMMENDATION

The study analysed Land Degradation, soil conservation and Poverty Status of farmers in Osun State, Nigeria. Primary data used for this study were obtained through structured questionnaire supplemented with oral discussion. However, 105 respondents were randomly sampled from the study area. Data collected were analyzed through the use of Descriptive statistics, FGT poverty index and Probit regression analysis.

Majority of the respondents were in their productive age. Male were more involved in farming than female in the study area. Majority of the farmers were married. The mean household size is 8 members. Majority of the respondents were educated up to secondary school level. Larger percentage of the respondents earned between the ranges of ₦16000 - ₦40000 as a household income. Majority of the respondents owned their source of initial capital. Larger percentage of the respondents had a farming experience ranging from 21-30years. Majority of the respondents had a farm size of 6-10ha. Most of the respondents had farming as their primary occupation. Larger percentage of the respondents fell sick between 1-5 times during cropping season. Majority of the respondents had cash crop and food crop land greater than 2ha. Majority of the respondents did not use livestock dung kept on the farm, tractor, harrowing/ ploughing, organic manure, zero tillage and planting of cover crops, instead they preferred the use of crop rotation, mulching, clean clearing and bush burning as their soil conservation practices. The total per capita household income of the sampled respondents was ₦8187508per annum while the mean per capita income was ₦81833.40 per annum. The poverty incidence P_0, P_1, and P_2 was 51%, 17% and 8% respectively. The determinants of poverty that were significant and positive were household size and land area under livestock farming, which implied that as these factors increases, the greater the probability of being poor. Moreover, the determinants of poverty those were significant and

negative were marital status and mulching, which implied that as these determinants increases the lower the probability of being poor among the respondents in the study area.

Based on the findings of this study; it was observed that an increase in household size will increase the probability of being poor. It is thereby recommended that efforts should be made to sensitize farmers in Osun State on the need and way of population control to yield positive results and also help reduce their poverty level. As it was observed from this study that respondents preferred food crop production which tend to increase their probability of being poor than cash crop production, it is thereby recommended that there should be diversification into cash crop production to increase their level of household income. As it was revealed in the course of this study that majority of the respondents preferred the use of crop rotation, mulching, clean clearing and bush burning, it is thereby recommended that agricultural extension officers should liaise with research institutes in order to disseminate proven soil management techniques to the farmers.

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