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Land use intensification pattern among rural farming household in the derived savannah agro ecologies in Southwestern Nigeria

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Abstract

This study was carried out to determine the impact of the land-use intensification pattern among farmers in the derived savanna agro ecologies in Southwest Nigeria. The methodologies employed include the use of primary data and multi-stage clusters sampling techniques to select 144 respondents and were interviewed with well structured questionnaires. The analytical techniques used include descriptive statistics and inferential tools. The results show that majority (74%) of the farmers were males while 25% were females. Also, about 95% were married, and the average age of the farmers was 52 with years of farming experience estimated at 28years. Average size of total land holding was 10.23ha and there was no significant difference between the total size of land holding in the selected villages. Majority of the farmers (66%) are indigenes while 34% were non-indigenes. The vast dependence on farming by majority of the farmers was however justified with an average monthly income of ₦36, 596.15 which was higher than the estimated average monthly non-farm income of N15,666.67. Therefore, soil fertility depletion is possible under high land-use intensity and there is need to supplement available soil nutrient with fertilizer application to boost agricultural productivity.

Keywords

Land Use, Intensification, Farming Household, Derived Savannah, Southwestern Nigeria

1. Introduction

Agricultural development has been identified as a virile platform for pro-poor development agenda of developing nations. This recognition is not unconnected with the central role that the sector has played over the years in food security, employment generation and poverty alleviation especially in the rural sector of the economy. Agricultural growth is however a fundamental necessity for development of the sector and this is in turn predicated on increased productivity of farmland committed to production of different kind of crops (Olayide and Falusi, 1977; Okuneye, 2002; Olayide *et al*, 2009).

Land use intensification refers to the extent of use of land and how the availability of resources have been put to use to achieve desire goal. Intensification may cause conversions of marginal lands, such as grasslands or rangeland, to crop production (Li *et al*., 2013). While research systems have over the years committed enormous human and material resources to the development of improved crop varieties and complementary technologies, modest achievement have been recorded in the task of raising crop yield through improved varieties. One of the prominent limiting factors in the manifestation of the full potential of the crop varieties is the declining condition of the resource base especially in the face of increasing pressure on land and declining capabilities of the dominant smallholder farmers to access and procure inorganic fertilizer (Okoruwa *et al*, 2006; Yusuf *et al*, 2010). Various reports have over the years identified declining soil fertility as a major constraint on the quest for agricultural growth through increase productivity of arable land (Henao and Baanante, 2006).

Although, use of inorganic fertilizer has ordinarily been extensively recommended in raising productivity, the attendant problem of scarcity and the associated implication on the sustainable environment has widened the scope of recommendation in soil fertility maintenance (Makinde *et al*, 2007; Saka *et al*, 2011). In addition, research system now places greater attention in matching specific soil condition with crop requirement and farmers preferences as regards crop production for appropriate recommendations concerning soil fertility maintenance practices or choice of fertilizer by farmers. Following this, greater emphasis has been place on soil testing and periodic assessment of the condition of farmlands for appropriate projections and recommendations on soil fertility maintenance. Therefore, efforts to achieve this study, the following objectives were elicited; Examine the land use pattern and crop production practices of food crop farmers in the two Local Government Areas; determine the impact of the land-use pattern on farmland productivity from the perception of the farmers; identify the soil fertility maintenance practices of the farmers and the associated constraints and; identify the training needs of the farmers and other possible areas of intervention.

2. Methodology

2.1. Sampling Technique

Data for this study were generated through a farm survey conducted in farming communities of Iddo and Iseyin LGAs of Oyo State. A total of Seventy two farmers were selected from each of the LGAs through multi-stage Cluster sampling technique. Six villages were selected from each of the LGAs using clusters representative of the pre determined land use systems in the study areas while a total of 72 farmers were selected across the villages using probability proportional to the number of farming households in each of the villages. Villages selected in Iddo Local Government Area are Aba Oke, Onikanga, Idiya, Akufo farm settlement, Aba Odo and Jarija. In Iseyin Local Government areas, the selected villages are Odo ogun, Ajepero, Otaadu-Ado awaye, Ajegunle, Arowomole, and Otiri farm settlement.

2.2. Data Collection and Analysis

Data were collected through personal interview conducted with the aid of interview schedule designed to elicit information on the socio-economic characteristics of the farmers, land area and allocation pattern, cropping system and crop combinations as well as their perception about the fertility condition of farmland and soil fertility maintenance practices. Data were analyzed mainly by descriptive statistics using frequency distribution, percentages and means. Two measured of land use intensity (Continuous cultivation intensity and cropping intensity indexes) were used to describe the land use intensity pattern of the farmers using Rothenberg (1980) classification of fallow rotation pattern while the cropping intensity classification was developed from the exposition of Dayal (1974). These two approaches produces classification of the use intensity indexes into Low, medium and high which were then assigned Likert point Scale of 1 – 3. The summation of the scores based on the intensity indexes gave a composite land-use intensity index which was then used to classify the farmers into composite land-use intensity categories as shown:

Composite Intensity Score	Land-use Intensity Category
1 – 2	Low
3-4	Medium
5-6	High

3. Results and Discussion

3.1. Demographic and Socio-Economic Characteristics of the Farmers

Table 1. *Distribution of Farmers by their Socio-economic Characteristics*

Characteristics	Ido	Iseyin	Pooled
Sex			
Male	48 (67.61)	58 (81.69)	106 (74.70)
Female	23 (32.39)	13 (18.31)	36 (25.35)
Marital Status			
Single	02 (2.82)		02 (1.42)
Married	67 (94.37)	69 (95.83)	136 (95.10)
Widowed	02 (2.82)	03 (4.17)	05 (3.50)
Age Group (years)			
Up to 20			
21 – 40	19 (27.54)	16 (22.54)	35 (25.00)
41- 60	35 (50.72)	32 (45.07)	67 (47.86)
Above 60	15 (21.74	23 (32.39)	38 (27.14)
Major Occupation			
Farming	69 (95.83)	68 (94.4)	137 (95.14)
Artisan	01 (1.39)	01 (1.39)	02 (1.38)
Clergy		01 (1.39)	01 (0.69)
Trading	02 (2.78)	02 (2.78)	04 (2.78)
Farming Experience (Years)			
Up to 10	11 (15.28)	10 (13.89)	21 (14.58)
11 – 20	22 (30.56)	22 (30.56)	44 (30.56)
Above 20	39 (54.17)	40 (55.56)	79 (54.86)

Source: Field Survey Data, 2012
*Values in parenthesis are percentages

There is a plethora of socio-economic research findings on the influence of socio-economic and demographic attributes of farming populations on access to production incentives, managerial capabilities, and productivity of farmers. Consequently, this study examines the distribution of the farmers by their demographic and socioeconomic attributes like sex, age, marital status, major occupation, years of formal education, farming experience, group participation and contact with extension. The distribution of the Farmers in Table 1 shows that farmers in the two LGAs were predominantly male (74.7%) while 25.4% are female. This pattern was similar across the two LGAs. Similarly, most of the farmers were married (95.1%) while 1.4% and 3.5% were single and widowed respectively. The distribution also showed that majority of the farmers (47.9%) were between the age of 41 and 60years while 25% were between the age 21 and 40years. About 27% of the farmers were above 60years of age while none of the farmers were below 20years of age. Most of the farmers 91.4% had farming as their major occupation with years of farming experience spanning above 20years for majority of the farmers (54.9%) while 30.6% had their farming experience spanning between 11 and 20years.

Average age of the farmers was 52 and 54years for Iddo and Iseyin LGAs respectively with years of farming experience estimated at 27.7 and 27.1 years for the two LGAs respectively (Table 2). Average year of formal education was estimated as 8.5years. The vast dependence on farming by majority of the farmers is however justified with an average monthly income of ₦36, 596.15 which was higher than the estimated average monthly non-farm income of N15,666.67. Also, the average monthly farm income of farmers in Iseyin LGA (N49,236.36) was significantly higher than the estimated farm income of N22,408.16 for farmers in Iddo LGA (Table 2).

Male dominance has severally been attributed to the laborious nature of peasant farming due to high dependence on manual labour. Also, limited access of women to production incentives has also made men the major actors. This is mostly the case in developing agriculture where the farming system is predominantly patriarchal in nature with both males and females contributing their labour input, but males playing dominant role due to their greater access to farm resources, production technologies and influence in decision making process (Okoruwa *et al,* 2009).

However, with an average age of 53 years, the population of food crop farmers in the study area depicts that of an ageing population with greater possibility for decline in supply of physical strength and mental alertness. These are capable of undermining the potential for improved productivity. In addition, the low level of education (8.5years) depict a scenario which is capable of undermining the potential for adoption of productivity improving but technically demanding incentive packages and production practices although the farmers year of experience in farming spanned over 20 years. However, the average years of education is considered substantial enough to enhance the capabilities of reading and understanding extension information written in their local languages and this combined with their long years of experience in farming points to existing potential for enhancing managerial capabilities of the farmers through extension messages written in local languages.

Table 2. *Descriptive of Socio-economic Characteristics.*

Variable	Ido	Iseyin	Pooled	F-Value
Age (Years)	51.59 (14.57)	53.80 (13.81)	52.71 (14.18)	0.85
Farming experience (Years)	27.73 (16.21)	27.08 (14.61)	27.41 (15.38)	0.06
Years of Formal Education	8.9 (4.01)	7.94 (4.05)	8.48 (4.03)	1.00
Household Size	7.36 (4.17)	6.61 (3.34)	6.99 (3.39)	1.36
Household member assisting in farm work	3.52 (2.15)	3.60 (2.52)	3.56 (2.36)	0.02
Average Monthly income from Farming (₦)	22,408.16	49,236.36	36,596.15	5.48**
Standard Deviation	40,009.85	70,736.07	59,584.57	
Average monthly non-farm income (₦)	11,062.5	18,500	15,666.67	2.46
Standard Deviation	5,495.07	18,383	15,181.29	

Source: Field Survey Data, 2012
Values in parenthesis are Standard Deviation
**Significant at $P<0.05$

3.2. Land-Use Pattern and Crop Production Practices

3.2.1. Tenure Security and Land Allocation Pattern

Table 3. *Distribution of Farmers by Tenure System*

	Iddo	Iseyin	Pooled
Native of Village			
Non Indigene	26 (37.14)	22 (30.99)	48 (34.04)
Indigene	44 (62.86)	49 (69.01)	93 (65.96)
Tenure System			
Inheritance	33 (45.83)	40 (55.56)	73 (50.69)
Purchased	14 (19.44)		14 (9.72)
Rent/Lease	21 (29.17)	24 (33.33)	45 (31.25)
Gift	04 (5.56)	08 (11.11)	12 (8.33)

Source: Field Survey Data 2012.
Values in parenthesis are percentages

Table 3 shows the distribution of the farmers by the indigeneship of the community within which their farm is located and the attendant influence on tenure security. The results showed that majority of the farmers (66%) are indigenes while 34% were non-indigenes of the communities where their farmlands were located and the pattern of distribution was similar across the two LGAs. Consequently, inheritance was the commonest mode of land acquisition (50.69%). However, a substantial percentage of the farmers (31.25%) acquired their farmland through rent or lease and this included farmers in the Akufo and Otiri Farm Settlement of Iddo and Iseyin LGAs respectively. In addition to the acquisition of farmland through rent/lease especially in the farm settlements, outright purchase of farmland was also prominent in Iddo LGA (19.4%) although this mode of acquisition was not common in Iseyin LGA. The prominence of acquisition of land through lease/rent could be attributed to the presence of Government-owned farm settlements in the two LGAs. In addition, the fact that Ido is located within the cocoa producing area could have attracted outright purchase of the farmland by migrant farmers.

Table 4 shows the pattern of land allocation among the farmers. The results showed that farmers in Ido had their farm in approximately 3 locations while farmers in Iseyin had their farmland in 2 locations. Average size of total land holding was 10.23ha and there was no significant difference between the total size of land holding in Iddo and Iseyin LGAs. However, average plot size was significantly greater in Iseyin (6.25ha) than in Iddo LGA (3.82ha). Average land area cultivated was 8.02ha while 2.26ha representing (22.09 %) of the total land holding was left to fallow. Land area cultivated to food crop (6.02ha) represented 58.84% of the total land holding was cultivated to food crops while 2.00ha representing 19.55% of the total land holding was cultivated to tree crops. However, land area cultivated to food crop in Iseyin LGA (8.17ha) was significantly higher land food crop land area in Iddo LGA (3.87ha) while Land area cultivated to tree crop in Ido LGA (3.57ha) was significantly higher than 0.42ha cultivated to tree crops in Iseyin LGA.

The land allocation pattern shows that farmers in the two LGAs have almost exhausted their land holding with opportunity for expansion limited to 22% of their total land holding. The allocation of about 59% of the total land holding to food crops shows the economic importance of food crop to farmers in both LGAs, however, the location of Iseyin LGA in derived savannah is attributable to low level of land area cultivated to tree crops by farmers in the area compared to almost equal preference given to tree crop (39.53%) and food crop (42.86%) by farmers in Iddo LGA which is located in the forest belt. Also, average plot size of 6.25ha estimated for farmers in Iseyin LGA makes the use of tractor more economical in addition to flatter topography of derived savannah compare to smaller average plot size of 3.82ha estimated for Iddo LGA.

Table 4. *Average Size of Land holdings and allocation by LGA*

	Ido	Iseyin	Pooled	F-Value
No. of Farm Locations	2.56 (1.43)	2.01 (1.20)	2.31	4.36**
Total Size of landholding (ha)	9.03 (16.07)	11.53 (15.27)	10.23 (15.67)	0.92
Average plot size (ha)	3.82 (4.80)	6.25 (8,14)	5.04	4.73**
Land Area Cultivated	7.45 (15.41)	8.60 (13.67)	8.02 (14.53)	0.22
Land Area under fallow	1.59 (4.23)	2.94 (7.50)	2.26 (6.10)	1.78
Area cultivated to Food Crops	3.87 (5.40)	8.17 (13.39)	6.02 (10.40)	6.40**
Area cultivated to tree crop	3.57 (12.37)	0.42 (1.42)	2.00 (8.92)	4.62**

Source: Field Survey Data 2012.
Values in parenthesis are Standard Deviations
** Significant at $P<0.05$

3.2.2. Land-Use Intensification and Fallow Rotation Pattern

The description of land-use intensification pattern of the farmers in Table 5 shows that the average length of cropping cycle was estimated as 19.23 years out of which the land was continuously engaged in cultivation for 17.52 years and allowed to fallow for 1.69years. Consequently, Continuous Cultivation Intensity (Rothenberg) Index was estimated at 0.91 which by Rothenberg (1980) classification implies that farmers engaged their land in continuous cultivation which is the hallmark of increased intensity. The results also showed that cultivation intensity was significantly higher for farmers in Iseyin LGA (0.92) than the estimate for Iddo LGA (0.89). In addition, the estimate of cropping intensity index of 1.87 year/ha shows that farmland was left occupied with crop for an average of 1.87 years thereby showing that further intensification though multiple cropping is no longer feasible in the area. Dayal (1974) noted that cropping intensity index greater than 0.75year/ha forecloses opportunity for further intensification through multiple cropping especially in a predominantly rainfed agriculture. Consequently, efforts at increasing land productivity should be sought through yield increase and not through multiple cropping.

Table 5. *Land use Intensification Pattern*

	Iddo	Iseyin	Pooled	F-value
Years of continuous cultivation	16.72 (9.59)	18.33 (12.35)	17.52 (11.04)	0.76
Years of Fallow	1.92 (1.76)	1.48 (1.74)	1.69 (1.76)	2.24
Length of Cropping Cycle	18.63 (9.85)	19.81 (12.78)	19.23 (11.39)	0.28
Continuous Cultivation Index	0.89 (0.10)	0.92 (0.09)	0.91(0.10)	4.51**
Cropping Intensity Index	2.41 (3.31)	1.35 (0.51	1.87	7.19***

Field Survey Data 2012.
Values in parenthesis are standard deviations

The distribution of the land use pattern of the farmers into fallow rotation pattern showed that shifting cultivation is no longer in existent in the study areas as land is predominantly engaged in continuous cultivation by (98.6%) of the farmers while 1.4% engaged in bush fallow (Table 6). The pattern of distribution of the fallow rotation pattern was similar across the two LGAs. In the same vein, the distribution of the farmers by cropping intensity categories showed that majority of the farmers (86/8%) cultivated their farmlands under high cropping intensities while 9.0% and 4.2%

cultivated their farmlands under low and high cropping intensities respectively. These classifications suggest that land-use in the two LGAs is characterized by continuous cropping under high cropping intensity. Further classification of farmers into composite (aggregate) Land-use Intensity categories (Fig. 1) show that about 91% of the farmers cultivated their farmland under high use intensity categories while 9.0% cultivated their farmland under medium intensity. None of the farmer was classified has having their farmland under low use intensity. The pattern of distribution was similar across Iddo and Iseyin LGAs.

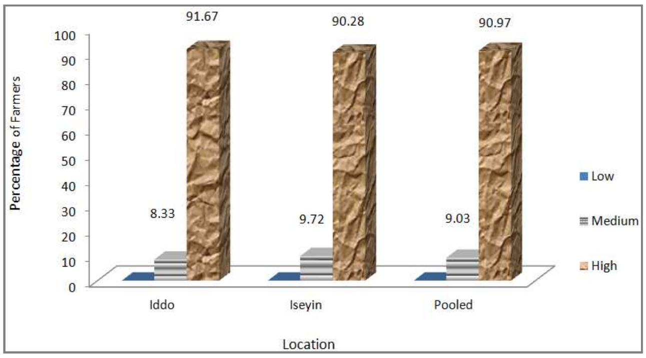

Fig. 1. *Distribution of Farmers by Composite Land-use Intensity Categories*

Table 6. *Distribution of Farmers by Fallow Rotation Pattern*

Land-use Intensity Categories	Ido	Iseyin	Pooled
Fallow Rotation Pattern			
Shifting Cultivation			
Bush Fallow	01 (1.39)	01 (1.39)	02 (1.39)
Continuous Cropping	71 (98.61)	71 (98.61)	142 (98.61)
Cropping Intensity Pattern			
Low	06 (8.33)	07 (9.72)	13 (9.03)
Medium	05 (6.94)	01 (1.39)	06 (4.17)
High	61 (84.72)	64 (88.89)	125 (86.81)

Field Survey Data 2012.
Values in parenthesis are percentages

3.2.3. Food Crops Grown, Cropping System and Crop Combination

Table 7. *Prominent Crop Combinations among the Farmers*

Crop Combinations	Ido	Iseyin	Pooled
Sole maize	02 (4.35)	15 (26.32)	17 (16.50)
Sole Cassava	02 (2.78)	11 (15.28)	13 (9.03)
Maize/Cassava	44 (61.11)	21 (29.17)	65 (45.14)
Maize/Cassava/Yam	01 (1.39)	18 (25.00)	19 (13.19)
Maize/Cassava/Plantain	09 (12.50)		09 (6.25)
Maize/Cassava/Leafy Vegetable	03 (4.17)	05 (6.94)	08 (5.56)
Cassava/Tomato	05 (10.87)		05 (4.85)
Cassava/Yam		04 (7.02)	3.88)
Cocoa/Plantain	03 (6.52)		03 (2.91)

Source: Field Survey Data, 2012
Values in parenthesis are percentages

Major factors influencing the degree of stress to which land is subjected to, fertility depletion, opportunity for soil fertility maintenance and regeneration include the choice of cropping systems and crop combinations. The influence of these factors is inherent in the nutrient requirement and uptake capabilities of the crops, the gestation period of the crops, the ability to balance nutrient uptake with replacement in the choice of crop combinations and the ensuing strength of competition between component crops. This sub-section examines pattern of land use as regards the production system, cropping system and crop combination.

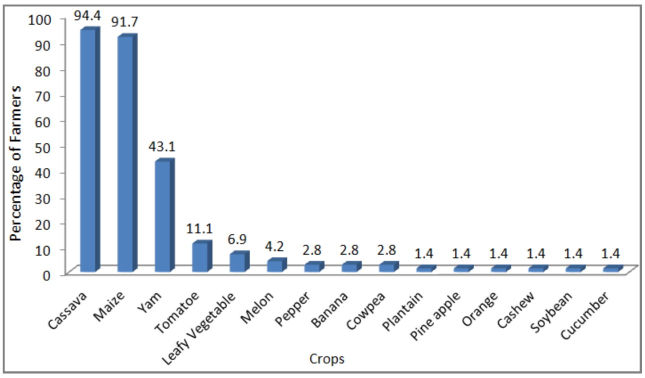

Fig 2. *Relative Prominence of Crop among Farmers in Iseyin Local Government Area*

The relative importance of the food crops in the farming system measured by the percentage of farmers cultivating each crop is presented in Figures 2 -3. Figure 2 shows that cassava and maize were the most prominent crops cultivated by 94.4% and 91.7% of farmers in Iseyin LGA respectively. Other crops cultivated by the farmers in the other of prominence include yam (41.7%), tomato (11.1%), leafy vegetable (6.9%), melon (4.2%) respectively. About 3% cultivated pepper, banana and cowpea while 1.4% each cultivated plantain, pineapple, orange, cashew, soybean and cucumber. In the same vein, Figure 3 shows that cassava and maize were the most prominent crop cultivated by 94.4% of the farmers each in Iddo LGA. Other crops in other of importance were tomato (16.7%), leafy vegetable, 12.5%, plantain (12.5%), yam 9.7% and cocoa (9.7%). Other crops include pepper (2.8%), banana (2.8%) and cowpea 2.8% while 1.4% cultivated plantain, pineapple, pawpaw and garden egg respectively.

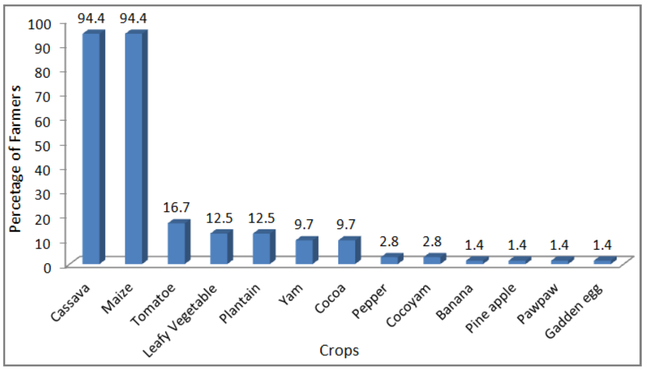

Fig 3. *Relative Prominence of Crops among Farmers in Iddo Local Government Area*

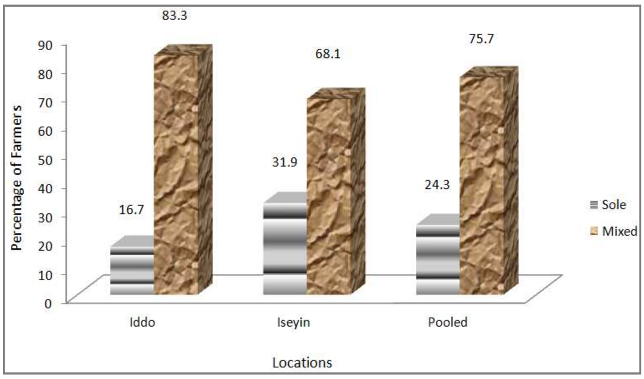

Fig. 4. *Cropping System Adopted by Farmers*

Figure 4 shows that these crops are mainly grown under mixed cropping by 75.7% of the farmers while 24.3% cultivated their crops mainly as sole crops. Mixed cropping was however more prominent in Iddo LGA (83.3%) than in Iseyin LGA (68.1%) with maize/cassava as the most prominent crop combination cultivated by 61.1% and 29.2% of farmers in Iddo and Iseyin LGAs respectively (Table 7). Other prominent crop combinations in Iddo LGA were maize/cassava/plantain (12.5%), cassava/tomato (10.9%) and cocoa/plantain (6.52%) while other prominent crop combinations in Iseyin LGA were maize/cassava/yam (25.0%), cassava/yam (7.0%) and maize/cassava/leafy vegetable (6.9%) respectively. However, maize and cassava were more prominently cultivated as sole crop in Iseyin LGA (26.3% and 15.3%) than in Iddo LGA (4.4% and 2.8%).

The predominance of intercrop and the crop combinations that are devoid of legume intercropping are pointers to the soil fertility maintenance challenges that farmers are likely to face considering the fact that the prominent crop combinations maize/cassava, maize/cassava/yam are heavy nutrient miners. The attendant competition for soil nutrient is expected to have a far reaching implication on crop yield and potential for fertility depletion in the face of low level of use of inorganic fertilizer attributable to scarcity. Following further classification into composite (aggregate) land use intensification categories.

3.2.4. Soil Fertility Maintenance Practices of the Farmers

The distribution of the farmers by the use of fertilizer (Table 8) shows that majority of the farmers (52.8%) use fertilizer across the locations. However, inorganic fertilizer was the most prominent type of fertilizer used solely by 13.9%, 44.4% of the farmers while 11.1% and 1.4% used organic fertilizer in Iddo and Iseyin LGAs respectively. About 10% and 1% of the farmers combined the use of both inorganic and organic fertilizers respectively. The distribution shows that sole use of inorganic fertilizer was more prominent in Iseyin LGA while farmers in Iddo LGA (11.1%) were more favourably disposed to the use or organic fertilizer than farmers in Iseyin LGA (1.4%). Table 8 also shows that majority of the farmers (65.52) combined the use of NPK and Urea fertilizers with similar distribution across the two LGAs while 16% and 36.4% use NPK fertilizers solely in Iddo and Iseyin LGAs respectively. However, sole use of Urea fertilizer was not practiced in Iddo LGAs while this was also less prominent among farmers in Iseyin LGA (12.1%). Also, Table 9 shows that the use of fertilizer was more prominent among farmers who cultivated their farmland under high land-use intensity (47.7%) than farmers who cultivated their farmland under medium land-use intensity (38.5%). Table 10 shows that fertilizer use intensity was higher in Iseyin LGA (31.65kg/ha than the use intensity in Iddo LGA (16.21kg/ha). However, there was no significant difference in fertilizer use intensity by composite land-use intensity categories.

Table 11 above shows the perception of farmers to land related constraints towards increasing their productivity. About 40% of the farmers in the selected villages claim that they have limited land which restricted their farming expansion vis a vis increasing their productivity. Also, hardpan formation was a serious threat which might not be unconnected to the trampling of cattle during grazing. Weed invasion is a common phenomenon in all agricultural land but spear grass has become a menace to the farmers as it increases the cost of production thereby devoid the farmers from cultivating large farms.

Table 8. *Distribution of Farmers by Usage of Fertilizer*

Use of Inorganic Fertilizer	**Iddo**	**Iseyin**	**Pooled**
Used	38 (52.78)	38 (52.78)	76 (52.78)
Not Used	34 (47.22)	34 (47.22)	68 (47.22)
Type of Fertilizer used			
Inorganic	19 (13.89)	32 (44.44)	51 (35.42)
Organic	08 (11.11)	01 (1.39)	09 (6.24)
Both	07 (9.72)	01 (1.39)	08 (5.56)
Name of Inorganic Fertilizer Used			
NPK	04 (16.0)	12 (36.36)	16 (27.59)
Urea		04 (12.12)	04 (6.90)
NPK/Urea	21 (84.0)	17 (51.52)	38 (65.52)

Source: Field Survey Data, 2012
Values in parenthesis are percentage

Table 9. *Fertilizer use by Composite Land-use Intensity Categories*

Fertilizer Usage	**Land-use Intensity Category**	
	Medium	**High**
Used	05 (38.46)	62 (47.69)
Not Used	08 (61.54)	68 (52.31)

Source: Field Survey Data, 2012
Values in parenthesis are percentages

Table 10. *Fertilizer use Intensity by LGA and Composite Land-use Intensity Category*

LGA	**Fertilizer Intensity (kg/ha)**	**F-Value**
Iddo	16.21 (43.29)	4.35**
Iseyin	31.65 (47.38)	
Land-use Intensity Category		
Medium	11.74 (20.61)	1.01
High	25.16 (47.56)	

**Significant at P<0.05
Field Survey Data, 2012

Table 11. *Distribution of Farmers by other Land and Soil Related Constraints and Severity*

Soil Related problems	Occurrence			Severity		
	Iddo	Iseyin	Pooled	Iddo	Iseyin	Pooled
Limited land	28 (38.89)	30 (41.67)	58 (40.28)	03 (4.17)	10 (13.89)	13 (9.03)
Soil Erosion	35 (48.61)	35 (48.61	70 (48.61)	06 (8.33)	09 (12.50)	15 (10.42)
Hardpan Formation	29 (40.28)	20 (27.78)	49 (34.03)	03 (4.17)	01 (1.39)	04 (4.78)
Flood/Poor drainage	25 (34.72)	28 (38.89)	53 (36.81)	01 (1.39)	03 (4.17)	04 (2.78)
Weed Invasion						
Spear grass	26 (36.11)	24 (33.33)	50 (34.72)			
Tridax	25 (34.72)	18 (25.00)	43 (29.86)			
Impereta	01 (1.39)	01 (1.39)	02 (1.39)			
Elephant Grass	02 (2.78)	01 (1.39)	03 (2.08)			
Stubborn Grass	02 (2.78)	06 (8.33)	08 (5.56)			
Goat weed		01 (1.39)	01 (0.69)			

4. Conclusion

These empirical evidence shows that farmers in Iseyin LGA appreciated the need to use fertilizer and this could possibly be attributed to the more fragile nature of soil in the derived savannah agroecology. Similarly, farmers who cultivated their farmland under high intensity are probably more conscious of the need to supplement available soil nutrient with fertilizer application and this could have been heralded by sign of faster soil fertility depletion possible under high land-use intensity. However, there was no significant difference in fertilizer use intensity across the composite land-use intensity categories. The estimate of cropping intensity index shows that farmland was left occupied with crop for an average of 1.87 years thereby showing that further intensification though multiple cropping is no longer feasible in the area. The prominence fertilizer application on maize and leafy vegetable-based crop combinations however attested to these two crops as the most intensive crops in the study areas. Therefore, soil fertility depletion is possible under high land-use intensity and there is need to supplement available soil nutrient with fertilizer application to boost agricultural productivity.

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