Effects of Land Management Practices on Crop Productivity of Farming Households in Osun State, Nigeria.

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Abstract-
The agricultural productivity of farmers have been adversely affected due to the current invasion of bandits on farms across Nigeria. Studies have shown that effective land management practices can enhance crop productivity thereby improving food security. The objective of this study was therefore to determine the effects of land management practices on crop productivity of farming households in Osun State, Nigeria. Multi-stage random sampling technique was used to select three hundred and seventy nine households in nine local government areas (constituting 30% of the total LGAs), spread across the three ADP zones of Osun State. Data were collected with the aid of structured questionnaire. Among the types of land management practices available to the farmers included crop rotation, multiple cropping, planting cover crops, mulching, use of fertilizer, use of green manure and compost. The average Total Factor Productivity (TFP) index was 1.6 and productivity increased with increased usage of agronomic and cultivation practices. The cultivation practices index (p=0.057), years of education (p=0.010), extension contact (p=0.000) and hired labour (p=0.005) for land preparation were all (at 5%) positively significant to productivity.

Key words: Land Management Practices, crop productivity, Farming Households, Osun State.

1.0 INTRODUCTION

Even though Nigeria relies mostly on the oil industry for its budgetary revenue, it is assumed that if the agricultural sector is well managed and improved, it would significantly increase the country's gross domestic product and even substitute oil on the top of the list taking into consideration the vast area of fertile land that is unused in Nigeria [9]. [1] affirmed that of the 98.3million hectares of Nigeria's arable land mass, 72 percent has cultivation potential but only 35% of the arable land is under cultivated. Land management is the process of managing the use and development of land resources in both urban and rural communities. Land resources are put into different uses which include organic agriculture, reforestation, arable and permanent crops production, building construction, water resource management and eco-tourism projects. Sustainable land management (SLM) is the adoption of appropriate land management practices that affords land users to maximize the economic and social benefits from the land while enhancing the ecological support functions of the land resources [5]. According to [7], Nigeria ranked sixth in the world and first in Africa in farm productivity. Agriculture has suffered from years of negligence, inconsistent and government policies conceived haphazardly, neglect and the lack of adequate and sufficient infrastructure. There has been a significant decline in national domestic food production which is made up by importation of food items from other countries. Nigeria's total food and agricultural imports are rising and estimated to be more than $10 billion in 2015. Wheat, rice, brown sugar, frozen fish, dairy products, vegetable oil, transitional and consumer-oriented products are the leading imports [4]. The huge importation of food was persistent and unrestricted to the disadvantage of local production since the contributions of the local farmers are becoming negligible.

Using the approach of [13] and [2], the common land management practices (LMPs) in Nigeria are generally categorized as follows;

1. Structural and Mechanical Erosion Control Practices (SMECP) including contour bund/terraces and construction of ridges across the slope, soil erosion control
2. Agronomic Practices (AP) including multiple cropping, mulching, cover crop and crop rotation, agro-forestry, shifting cultivation, land fallow.
3. Soil Management Practices (SMP) including fertilizer application, compost and farmyard manure.
4. Cultivation Practices (CP) including minimum tillage, conservation tillage and zero tillage, and complete tillage of farmland.

   The persistent hike in staple food prices being experienced in the country in recent times is the proof that food production needs urgent attention.

The objectives of this study are to:

1. Identify the land management practices in use farming households in Osun state?
2. Determine the agricultural productivity level of farming households in Osun state?

3. Examine the effects of land management practices on food crop productivity of farming households in Osun state?

2.0 RESEARCH METHODS

This study was carried out in Osun State which is an inland state in south-western Nigeria with Osogbo as its capital. Osun State, which was carved out of the old Oyo State is standing on a land mass of about 8,602 square kilometers. The state is having a population of 2,203,016[10].

2.1 Population, Sampling Procedure and Sample Size

All the farming households in Osun state, Nigeria constituted the population of the study. Multi-stage random sampling technique was used to select the respondents. Osun State has three agricultural development project (ADP) zones, Osogbo, Iwo and Ife/ Ijesha. The ADP headquarters is at Iwo. All the three OSSADEP zones in Osun State (Osogbo, Iwo and Ife/Ijesha) were chosen at the first stage. At the second stage, simple random sampling technique was used to select one- third of the local government areas (LGAs) out of the LGAs found in each zone. Then, given the population of the farmers in the LGAs proposed for the study, the required sample size was determined using [6] with the population proportionate factor stated as:

$$S = \frac{X^2 NP(1-P)}{d^2(N-1) - X^2 P(1-P)} \quad \text{.....(1)}$$

Where S = required sample size, N = the population size, X^2 = the table value of chi- square for 1 degree of freedom at the desired confidence level (95%), normally (1.96 x 1.96 = 3.841).
P = the population proportion (assumed to be 0.50), since this would provide the maximum sample size, d = the degree of accuracy expressed as a proportion (0.05).
At the last stage, forty two (42) farmers were selected from each of the LGAs chosen except from Iwo where forty three (43) farmers were selected. This then gave a total of 379 respondents.

2. 2 Method of Data Analysis

For objective 1, Descriptive statistics was employed.
For objective 2, Total Factor Productivity Index was used.
For objective 3, two stage Least Square Model was employed.

2.3 Model Specification

Total Factor Productivity

$$TFP = \frac{Y}{\Sigma PiXi} \text{.....(2)}$$

Where,
Y = quantity of crop produced in kg,
TVC = Total Variable Cost in naira (N),
$TVC = \sum P_i X_i$
P = unit price of ith variable input and i
X = quantity of ith variable input.
X_1 = Farm size in hectare
X_2 = Labour (mandays)
X_3 = Capital input (naira) (made up depreciation of fixed assets)
X_4 = Quantity of seed/stems used in production
X_5 = cost of fertilizer used
X_6= Cost of herbicides
X_7 = Cost of pesticides
This method does not account for the role of Total Fixed Cost (TFC) as it does not affect both the profit maximization and the resource-use efficiency conditions. In addition, it is fixed and as such regarded as a constant [3].
From cost theory;

$$AVC = \frac{TVC}{Y} \text{.....(3)}$$

Where AVC = Average variable cost in naira (N).
Hence,

$$TFP = \frac{Y}{TVC} = \frac{1}{AVC} \text{.....(4)}$$

TFP is therefore the inverse of the AVC.

Two Stage Least Square

This model was specified mainly to analyse the effect of land management practices on crop productivity. Two-stage least square regression model involves two successive application of ordinary least square (OLS). It is very relevant in the estimation of a model in which the variables (both dependent and independent variables) show simultaneity effect on one another. In other word, 2sls regression is usually run to eliminate the effect of endogenous explanatory variable(s) model which can cause the parameter estimates to be biased and inconsistent in the model. Thus, the estimation of 2sls requires the use of IVs (Instrumental Variables) which are acceptable to be included in the model based on two assumptions; firstly, the IVs must correlate with the endogenous variable and secondly, values of the IVs and exogenous variables are unrelated to error values in the structural model. In essence, the relationship between LMPs and crop productivity based on the economic perspective runs in both directions. Empirical studies have linked low and declining agricultural yield or productivity to soil erosion [12] [14].

Following the framework of [8], this study developed four models model A, model B, model C and model D based on four groups of LMPs Instrumented. Model A was estimated with Structural and Mechanical Erosion Control Practices (SMECP) as a regressor. Model B was estimated with Agronomic Practices (AP) as a regressor; Model C was estimated with Soil Management Practices (SMP) and lastly Model D estimated with Cultivation Practices (CP) as a regressor

3.0 RESULTS

3.1 Land Management in Use by Farmers in Osun state: According to Table 1, all the land management options were used by the farmers though at varying degrees. Some of the farmers. Some farmers still don't use some particular land

management practices but in all, the farmers are familiar with all the land management practices as the percentage of non- users in each case are relatively low to those of the users.

Table1: Land Management Practice in Use by the farmers

	Frequency		Percentage	
LMP	Users	Non-users	Users	Non-users
SMECP				
Terraces	332	47	87.60	12.40
Contour bunds	217	162	57.26	42.74
Ridge across slope	326	53	86.01	13.99
AP				
Crop rotation	361	18	95.25	4.75
Multiple cropping	292	87	77.04	22.96
Planting cover crops	215	164	56.73	43.27
Mulching	260	119	68.60	31.40
Agro-forestry	321	58	84.70	15.30
Bush fallow	326	53	86.02	13.98
Shifting cultivation	347	37	91.56	8.44
SMP				
Use of fertilizer	369	10	97.36	2.64
Use of green manure	354	25	93.40	6.60
Compost	326	53	86.02	13.98
CP				
Conservation tillage	312	67	82.32	17.68
Minimum tillage	284	95	74.93	25.07

Source: Field Survey, 2020

3.2 Productivity level of farming households in Osun state

The TFP indices of the farmers generally fall between 0.55 – 4.14. From the table, 15.04 percent fell between 0.55- 1.0, 61.48 percent of the farms fell between 1.1 – 2.0, 22.96 percent fell between 2.1- 3.0, and 0.53 percent between 3.1 – 4.14 TFP levels. The average TFP is 1.6. This implies efficient resource-use by the farmers, such that their total farm output is, on the average, two times the total input used in farm production.

This is in support of a study conducted by [11] when the total factor productivity of rice farms in Kwara state was estimated.

Table 2: Distribution of Respondents by Total Factor Productivity (TFP) Indices

TFP Indices	Frequency	Percentage
≤1	57	15.04
1.1-2	233	61.48
2.1-3	87	22.96
>4	2	0.53
Total	379	100.00
Minimum	**0.55**	
Maximum	**4.14**	
Mean	**1.6**	
Standard deviation	**0.6**	

Source: Field Survey, 2020

3.3 Effects of land management practices on food crop productivity of farming households in Osun state

3.3.1 2SLS regression result for Agronomic Practices

This model was specified mainly to analyse the effect of Agronomic Practices (AP) on crop productivity. The result of the first stage regression in Table 3 describes the variables that are crucial in determining agricultural productivity of farmers using AP in which land management index is included while the second stage regression described the effects of AP on productivity.

For the first stage regression, result of the findings revealed that age (5%), marital status (5%), hired labour (1%) and land management practices index (1%) variables are all significant to the productivity of the farmers. The age of the farmers was significant with positive coefficient which implied agronomic practices are positively related to age of the farmers. The number of land management practices that the individual farmer practices increases with increase in age.

However, marital status, hired labour and land management index exhibit negative relationship with agronomic practices which means that agronomic practices are inversely related to marital status, hired labour and land management index.

Furthermore the results in Table 3 shows that agronomic index, years of education, contact with extension agents and hired labour were significant. The variable instrumented which is Agronomic practices has the expected signs and were consistent with theoretical expectations. From this finding, it indicates that the index of agronomic practices was significant at 10% and has a positive relationship with crop productivity. This means that productivity increases with increased usage of agronomic practices which includes crop rotation, multiple cropping, planting cover crops, mulching, agro- forestry, bush fallow and shifting cultivation.

It was further revealed that the years of education has a positive relationship with crop productivity. It was significant at 5% meaning that the more educated a farmer is, the more productive he is by adopting agronomic practices which will increase his productivity. The contact with extension agent is positively significant at 1% which means that the more they receive extension services, the more agronomic practices adopted which will lead to productivity. This is also in line with a priori expectation.

Hired labour has a positive relationship with crop productivity. It was significant at 1% and this could be explained that the more labourers hired, the more area of land able to cover and the more agronomic practices they will be able to adopt and use. This will lead to increased productivity and this result is in line with a priori expectation.

Table 3: 2SLS regression result for Agronomic Practices (AP)
Agronomic Practices

First stage

Variables	Coefficient	Standard Error	t- value	P-value
Age	0.0656719	0.0300716	2.18**	0.030
Sex	-0.0275312	0.0370889	-0.74	0.459
Marital status	-0.0608935	0.0294706	-2.07**	0.040
Years of Education	0.005147	0.0033496	1.54	0.126
Years of farming	0.0001709	0.0022476	0.08	0.939
Household size	-0.0000239	0.0044064	-0.01	0.996
Farm size	0.0057302	0.0067716	0.85	0.398
Contact with extension agents	-0.0835953	0.0725952	-1.15	0.251
Membership of Organisation	0.0367799	0.0410121	0.90	0.371
Hired labour	-0.0092145	0.0033987	-2.71***	0.007
Land management index	-0.3043751	0.0367631	-8.28***	0.000
Constant	-0.279119	0.6656591	-0.42	0.675
Number of observations	**379**			
F- value	**10.189(0.0000)**			
R- squared	**0.3757**			
Adjusted R- squared	**0.3388**			

Second stage (Instrumental variables- Agronomic practices)
Crop Productivity

Agronomic Index	0.6814016	0.3639734	1.87*	0.063
Age	0.0430072	0.0917921	0.47	0.640
Sex	-0.0230884	0.1115034	-0.56	0.836
Marital status	0.0545584	0.0900915	0.61	0.545
Years of Education	0.0240237	0.010156	2.37**	0.019
Years of farming	-0.0040564	0.0067759	-0.60	0.550
Household size	0.009275	0.0132778	0.70	0.486
Farm size	-0.0303988	0.0205411	-1.48	0.140
Contact with extension agents	0.6404954	0.2108727	3.04***	0.003
Membership of Organisation	0.0363512	0.1234687	0.29	0.769
Hired labour	0.0399225	0.0117788	3.39***	0.001
Constant	-0.7292144	2.010843	-0.36	0.717

Source: Field Survey, 2020

Where *, **, *** means statistical significant at 10%, 5%, and 1% level of significance respectively

3.3.2 2SLS regression result for Cultivation Practices (CP)

The model was specified mainly to analyse the effect of Cultivation Practices (CP) on crop productivity. The result of the first stage regression in Table 4 describes the variables that are crucial in determining agricultural productivity of farmers using CP in which land management index is included while the second stage regression described the effects of CP on productivity.

For the first stage regression, result of the findings revealed that household size, contact with extension agents, membership of organisation and the number of males hired for land preparation variables are all significant to the productivity of the farmers. Based on estimates of the result, farmers with large household size are more likely to use many land management practices and farmers who have contacts with extension agents are more likely to have higher productivity as well as those that practice land management practices.

Furthermore, the result in Table 4 shows that membership of organisation is significant with positive coefficient which means that the more involved the farmers are with their organisations, the more they are likely to use land management practices especially cultivation practices. Hired labour is significant with positive coefficient which means that the more the hired labour, the more the land management practices to be used especially cultivation practices. Land management index exhibit positive relationship with cultivation practices which means that cultivation practices for the farmers are directly related to land management index. This means any increase in the use of cultivation practices will increase the overall number of land management practices that will be used by the farmer which in turns increase productivity.

The study further revealed that cultivation practices index, years of education, contact with extension agents and the number of hired labour are all positively significant to productivity. The result means that the more cultivation practices the farmer uses, the higher the productivity. The years of education is also of importance as education helps farmers to decide on the type of land management practices they want to practice and that will bring about productivity. The contact with extension agents by the farmers will also positively increase their productivity because they will be able to practice all they are told

as new innovation and techniques. The more the hired labour, the higher the productivity of the farmers.

Table 4: 2SLS regression result for Cultivation Practices (CP)

Cultivation Practices

First stage

Variables	Coefficient	Standard Error	t- value	P-value
Age	-0.446144	0.0470189	-0.95	0.344
Sex	0.004882	0.579909	0.08	0.933
Marital status	-0.0660772	0.0460791	-1.43	0.153
Years of Education	0.0043066	0.0052373	0.82	0.412
Years of farming	-0.0014219	0.0035142	-0.40	0.686
Household size	0.01259	0.0068896	1.83*	0.069
Farm size	0.0053402	0.0105878	0.50	0.615
Contact with extension agents	0.4074971	0.1135073	3.59***	0.000
Membership of Organisation	0.1233654	0.0641251	1.92*	0.056
Hired labour	0.0159889	0.0053141	3.01***	0.003
Land management index	2.521062	1.040801	2.42**	0.016
Constant	-0.279119	0.6656591	-0.42	0.675
Number of observations	**379**			
F- value	**10.189(0.0000)**			
R- squared	**0.3757**			
Adjusted R-squared	**0.3388**			

Second stage (Instrumental variables- Cultivation practices)

Crop Productivity

Cultivation Index	0.4061467	0.2125599	1.91*	0.057
Age	0.1058761	0.0900678	1.18	0.241
Sex	-0.043831	0.1095856	-0.40	0.690
Marital status	0.0399025	0.0872131	0.46	0.648
Years of Education	0.0257818	0.0098777	2.61***	0.010
Years of farming	-0.0033625	0.0066303	-0.51	0.613
Household size	0.0041453	0.0134754	0.31	0.759
Farm size	-0.0286631	0.0200415	-1.43	0.154
Contact with extension agents	0.7490371	0.2034873	3.68***	0.000
Membership of Organisation	0.0113087	0.1222691	0.09	0.926
Hired labour	0.0271499	0.0094771	2.86***	0.005
Constant	-1.943328	2.025217	-0.96	0.338

Source: Field Survey, 2020

Where *, **, *** means statistical significant at 10%, 5%, and 1% level of significance respectively

4.6.3 2SLS regression result for Structural and Mechanical Erosion Control Practices (SMCEP)

This model was specified mainly to analyse the effect of Structural and Mechanical Erosion Control Practices (SMCEP) on crop productivity. The result of the first stage regression in Table 5 describes the variables that are crucial in determining agricultural productivity of farmers using SMCEP in which land management index is included while the second stage regression described the effects of SMCEP on productivity.

For the first stage regression, result of the findings revealed that sex (1%), years of education (1%), years of farming (1%), household size (10%) and land management practices index (1%) variables are all significant to the productivity of the farmers. The sex of the farmers was significant with positive coefficient which implied Structural and Mechanical Erosion Control Practices are positively related to sex of the farmers. The number of land management practices that the individual farmer practices increases with the sex of the farmer. Since majority of the respondents are males and head of the house who takes decisions, they are free to use as many land management practices as they like without any interference. This is in line with a priori expectation.

However, years of education exhibit negative relationship with Structural and Mechanical Erosion Control Practices which means that the practices are inversely related to years of education. Furthermore the results in Table 5 shows that years of farming, household size and land management practices index were significant. Years of farming exhibit a positive relationship with SMECP meaning that as years of farming increases, the number of land management practices used by the farmers especially Structural and Mechanical Erosion Control Practices also increases. Household size also exhibit a positive relationship with SMECP and it means that as household size increases, the number of Structural and Mechanical Erosion Control Practices used by farmers also increases. The land management index which exhibits a negative relationship with SMECP suggests that as the farmers increase their use of Structural and Mechanical Erosion Control Practices, then there will be decrease in the use of other available land management practices.

Also from Table 5, the variable instrumented which is Structural and Mechanical Erosion Control Practices was not statistically significant. It was further revealed from this study that the years of education has a positive relationship with crop productivity. It was significant at 1% meaning that the more educated a farmer is, the more productive he is by adopting Structural and Mechanical Erosion Control Practices which will increase his productivity. The contact with extension agents is positively significant at 1% which means that the more they receive extension services, the more Structural and Mechanical Erosion Control Practices adopted which will lead to productivity. This is also in line with a priori expectation. Hired labour has a positive relationship with crop productivity. It was significant at 5% and this could be explained that the more labourers hired, the more area of land able to cover and the more agronomic practices they will be able to adopt and use. This will lead to increased productivity and it is in line with a priori expectation.

Table 5: 2SLS regression result for Structural and Mechanical Erosion Control Practices (SMECP)

First stage

Variables	Coefficient	Standard Error	t- value	P-value
Age	0.0203464	0.0382718	0.53	0.596
Age^2	-0.0003378	0.0003379	-0.79	0.433
Sex	0.1677386	0.0472419	3.55***	0.000
Marital status	0.032048	0.0375281	0.85	0.394
Years of Education	-0.0107082	0.0042691	-2.51***	0.013
Years of farming	0.0079601	0.0028636	2.78***	0.006
Household size	0.0096702	0.005616	1.72*	0.087
Farm size	0.0036365	0.0086262	0.42	0.674
Contact with extension agents	-0.1148845	0.0924471	-1.24	0.215
Membership of Organisation	0.0715032	0.0523594	1.37	0.174
Hired labour	0.0050097	0.00433	1.16	0.249
Land management index	-0.1573892	0.0459371	-3.43***	0.001
Constant	0.3155791	0.8481659	0.37	0.710
Number of observations	**379**			
F- value	**5.40(0.0000)**			
R- squared	**0.2420**			
Adjusted R- squared	**0.1972**			

Second stage
(Instrumental variables- Structural and Mechanical Erosion Control Practices)
Crop Productivity

SMECP Index	1.297758	0.8111685	1.60	0.111
Age	0.059332	0.106484	0.56	0.578
Age^2	-0.000569	0.0012053	-0.47	0.637
Sex	-0.2592891	0.1955459	-1.33	0.186
Marital status	-0.0276087	0.1090113	-0.25	0.800
Years of Education	0.0415806	0.0151691	2.74***	0.007
Years of farming	-0.0143194	0.0104746	-1.37	0.173
Household size	-0.0034591	0.018024	-0.19	0.848
Farm size	-0.0312294	0.0241967	-1.29	0.198
Contact with extension agents	0.7325095	0.2433441	3.01***	0.003
Membership of Organisation	-0.0247006	0.151646	-0.16	0.871
Hired labour	0.0271733	0.0113638	2.39**	0.018
Constant	-1.29621	2.363044	-0.55	0.584

Source: Field Survey, 2019

Where *, **, *** means statistical significant at 10%, 5%, and 1% level of significance respectively

4.6.4 2SLS regression result for Soil Management Practices (SMP)

This model was specified mainly to analyse the effect of Soil Management Practices (SMP) on crop productivity. The result of the first stage regression in Table 6 describes the variables that are crucial in determining agricultural productivity of farmers using SMP in which land management index is included while the second stage regression described the effects of SMP on productivity.

For the first stage regression, result of the findings revealed that sex (10%) and marital status (10%) were significant to the productivity of the farmers. The sex of the farmers was significant with negative coefficient which implied Soil Management Practices are negatively related to sex of the farmers. The number of land management practices that the individual farmer practices decreases with the sex of the farmer. Since majority of the respondents are males and head of the house who takes decisions, they may not use any of the land management practices especially Soil Management Practices. This is in line with a priori expectation.

Marital status also exhibit negative relationship with Soil Management Practices which means that the practices are inversely related to marital status. As revealed in Table 6, the negative relationship between marital status and SMP means that

the marital status has a way of reducing the number of land management practices used by a farmer especially Soil Management Practices which includes use of fertilizer, use of green manure and compost.

Furthermore from Table 6, the variable instrumented which is Soil Management Practices was not statistically significant. It was further revealed from this study that none of the other variables were significant as well meaning that Soil Management Practices and the other variables has no effect on the productivity of the farmers in Osun state.

Table 6: 2SLS regression result for Soil Management Practices (SMP)

Soil Management Practices

First stage				
Variables	**Coefficient**	**Standard Error**	**t- value**	**P-value**
Age	-0.0207949	0.0233331	-0.89	0.374
Age^2	0.0002684	0.0002622	1.02	0.307
Sex	0.0545045	0.0288019	-1.89*	0.060
Marital status	-0.0396171	0.0228798	-1.73*	0.085
Years of Education	-0.0036656	0.0026027	-1.41	0.161
Years of farming	0.0015733	0.0017459	0.90	0.369
Household size	-0.0010315	0.0034239	-0.30	0.764
Farm size	0.0056059	0.0052591	1.07	0.288
Contact with extension agents	0.0056264	0.0563622	0.10	0.921
Membership of Organisation	0.0439718	0.031922	1.38	0.170
Hired labour	-0.0043477	0.0026399	-1.65	0.101
Land management index	-0.0148887	0.0280065	-0.53	0.596
Constant	1.396197	0.517101	2.70***	0.008
Number of observations	**379**			
F- value	**2.40(0.0064)**			
R- squared	**0.1242**			
Adjusted R- squared	**0.0724**			
Second stage (Instrumental variables- Soil Management practices) Crop Productivity				
SMP Index	13.71865	25.7891	0.53	0.595
Age	0.3710149	0.6434958	0.58	0.565
Age^2	-0.0046891	0.0080465	-0.58	0.561
Sex	0.7061237	1.433336	0.49	0.623
Marital status	0.5574754	1.050384	0.53	0.596
Years of Education	0.0779713	0.1032671	0.76	0.451
Years of farming	-0.0255723	0.0480379	-0.53	0.595
Household size	0.0232415	0.0520573	0.45	0.656
Farm size	-0.1034155	0.1624728	-0.64	0.525
Contact with extension agents	0.5062305	0.8310524	0.61	0.543
Membership of Organisation	-0.5351404	1.177598	-0.45	0.650
Hired labour	0.0933189	0.1286577	0.73	0.469
Constant	-20.0406	36.47762	-0.55	0.583

Source: Field Survey, 2020

Where *, **, *** means statistical significant at 10%, 5%, and 1% level of significance respectively

CONCLUSION

The common land management practices in the study area are structural and Mechanical Soil Erosion control practices, agronomic practices, Soil management practices and cultivation practices. The farmers efficiently use their resources such that their total farm output is, on the average, two times the total input used in farm production. The productivity of the farmers in the study area is dependent on their adoption of land management practices

Land which is the most important factor to farmers should be available for use at all times. Government should designate a large portion of land to farming activities in the state. Since majority of the farmers rely on the use of fertilizer for production, government should subsidize the price of fertilizer and ensure it gets to the users at the right time.

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