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CONTRIBUTION OF SOIL CONSERVATION PRACTICES TO SUSTAINABLE LIVELIHOOD IN EGBEDA LOCAL GOVERNMENT AREA OF OYO STATE

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ABSTRACT

Reduced agricultural productivity due to soil depletion affects farmers' incomes and livelihood, perpetuating the cycle of poverty and food insecurity in rural communities. This study therefore examined the contribution of soil conservation practices to sustainable livelihood among farmers in Egbeda Local Government Oyo State. Specifically, the study examined the soil conservation practices used, factors influencing the use of soil conservation practices, agricultural related livelihood activities engaged in and constraints to the use of soil conservation practices. Multistage sampling technique was used to select 96 respondents in the study area. Data collected using interview schedule. Descriptive analytical tools such as frequency counts, percentage were used to analyze the data results. Application of manure and leaving of crop residue on the field to decay was the highest soil conservation practices used with a percentage of 94.8%. Long-term continuity of yield from the farm, contribution to long-term sustainability and productivity of farmland and contribution to increase in crop yields was ranked first as the major contributions of soil conservation practices with the weighted mean score (WMS) of 3.9. The knowledge about soil conservation practices was the highest factor influencing the use of soil conservation practices with a percentage of 100.0%. Crop farming was the highest agricultural related livelihood activities engaged in with a percentage of 100.0%. Poor/ inadequate government support, lack of relevant skills and knowledge and inadequate extension service was ranked first as the major constraints to the use of soil conservation practices with the weighted mean score (WMS) of 2.8. Knowledge about soil conservation practices was the highest factor influencing the use of soil conservation practices by the respondents, poor/ inadequate government support, lack of relevant skills and knowledge and lack of adequate extension service were the major constraints faced by the respondents to the use of soil conservation practices.

Keyword: Contribution, Soil Conservation, Practices, Sustainable Livelihood

INTRODUCTION

Soil conservation is an important step for increasing productivity and ensuring sustainability in agriculture and meeting basic human needs, particularly food (Savari, *et al.,* 2022). A continuously growing pressure to increase food, fiber, and fuel production to meet worldwide demand and achieve zero hunger has put severe pressure on soil resources. The continued use of degraded lands for agricultural production requires ever-increasing management interventions to enable high-yielding food production (Mosier *et al.,* 2021). There is a need to conserve the soil since it is the medium for plant growth and all agricultural and other related primary production activities depend on the soil. As noted by Ahuchaogu, *et al.* (2022), soil erosion, soil toxicity, soil pollution and depletion of soil nutrients resulting from agricultural and non-agricultural practices cause soil degradation.

Agricultural practices such as soil conservation appear to be a step in the right direction to meet global food demands in a more environmentally sustainable manner (Fontes, 2020). Productivity would continue to decline, and thereafter it would continue to reduce agricultural export revenues and increase food insecurity (Darkwah *et al.,* 2019). Therefore, there is a need to augment the soil back. Hence one of the ways to ensure this is by effectively utilizing conservation practices. Studies have explored and recommended conservation measures which can enhance soil fertility and increase crop yield sustainably in the wake of climate change (Kimaru-Muchai, *et al.,* 2020).

Soil conservation practices are those farming operations and management strategies conducted with the goal to control soil erosion by preventing or limiting soil particle detachment and transport in water or air. It is a combination of approaches which influence the physical, chemical, and biological status of the soil (Food and Agricultural Organization 2019).

Wall *et al.* (2013) defined soil conservation as a management system that excludes the degradative components existing in conventional management systems by; removing practices that destroy the soil structure and which break down soil organic matter, the inadequate return of organic matter to the soil and lack of protection of the surface soil, and monoculture.

The practices conserve soil fertility and allow continuous soil regeneration for current and future cropping with the potential for achieving the highest agricultural yield through the most economic means. Experience from the past showed that the farmers practice according to their current knowledge and that it is an important factor relating to their decision-making in sustainable practices. Farmers' knowledge of soil conservation practices also differs, so farmers may practice different soil conservation techniques depending on their level of perception and knowledge (Himanen *et al.*2016,). In an effort to maintain optimum crop productivity, farmers are encouraged to adopt different production technologies that would conserve the soil. In relation to this effect Onwudike *et al.* (2016) suggested adoption of many soil conservation practices aimed at improving soil productivity and crop yield. Specifically, the objectives identified the soil conservation practices used by the respondents, examined the contribution of soil conservation practices to sustainable livelihood among the respondents, identified the factors that influence the use of soil conservation practices by the respondents, identified the agricultural related livelihood activities the resThe specific objectives:i. identified the soil conservation practices used by the respondents

ii. examined the contribution of soil conservation practices to sustainable livelihood among the respondents

iii. identified the factors that influence the use of soil conservation practices by the respondents

iv. identified the agricultural related livelihood activities the respondents in the study area engage in

v. investigated the constraints to the usage of soil conservation practices among the farmers in the study area

RESEARCH METHODOLOGY

This study was conducted in Egbeda Local Government Area (LGA) of Oyo State, which is one of the thirty-three LGAs in Oyo State, a suburban located in the rainforest agro-ecological zone. Its headquarters is in the town of Egbeda Town. It lies between latitudes 7°21'N4°3E' and 8°N of the equator. The LGA is bounded in the North by Lagelu LGA, in the West by Ibadan North East, in the East by Osun State and in the South by Ona-Ara LGA. It has a land area of 420 square kilometers and a population of 398, 500 (2006 census). There are about 195 settlements in the LGA while over 60% of the settlements are rural in nature. The annual mean temperature and rainfall in the area are about 28°C and 2650mm respectively. The people of the LGA are predominantly farmers. Arable crop production is one of the major sources of income in the LGA (Aminu et al 2020).

The target population of this study included both male and female arable crop farmers in Egbeda Local Government Area of Oyo State. Multi-stage sampling technique was used in selecting the respondents for this study. The first stage involved the random selection of 37% of the total number of wards, which was four (4) wards out of the eleven (11) four wards out of the eleven wards in the LGA. The second stage involved the random selection of two villages in each of the selected wards making a total of 8 villages. The third stage involved the selection of 12 farming households from the selected villages. making a total of 96 respondents used for the study.Descriptive Statistical Tools such as frequency counts, percentage and mean. were used to describe the socioeconomical characteristics of the respondents. As well as other objectives of the research work.

RESULTS AND DISCUSSION

Soil conservation practices used Table 1 shows the distribution of the respondents by soil conservation practices used. The results showed that almost all (94.8%) of the respondents indicated application of animal manure and leaving crop residue on the field to decay as the soil conservation practices used while 79.2% and above half (53.1%) of the respondents indicated mixed cropping and intercropping respectively as the soil conservation practices

used. Furthermore, 40.6%, 35.4%, 12.5% indicated crop rotation, ridging, and mulching while 7.3% indicated cover cropping as the soil conservation practices used, 5.2% indicated each of conservation tillage, contour farming, zero tillage and planting cover crops as the soil conservation practices used. Lastly 2.1% indicated agroforestry as the soil conservation practices used in the study area.

Summarily, this result implies that farmers in the study area used various soil conservation practices though the usage of the soil conservation varies, and this might be attributed to the various necessity they have towards it. The result is in line with the findings of Iliyasu *et al.,* (2020) who reported that residue retention, crop rotation, crop mixing, use of animal manure and use of legumes as soil conservation measures used by the respondents.

Contribution of the soil conservation practices used

Table 2 shows the distribution of the respondents according to the contribution of soil conservation practices. Using the Weighted Mean Score (WMS), contribution to long-term continuity of yield from the farm, contribution to long-term sustainability and productivity of farmland and contribution to increase in crop yields were all ranked first with the weighted mean score (WMS) of 3.9. This result affirmed that soil conservation practices was a major contributor to food sufficiency in the study area. This finding is also supported by the finding of Savari et.al., (2022) that conservation is an important step to increase productivity and ensuring sustainability in agriculture. Also, the finding corroborates the result of Akinnagbe and John (2023), who reported that long-term continuity of yield, long-term sustainability and productivity of farmland and increased yield were the utmost reasons why soil conservations were used by farmers. This was closely followed by contribution to the promotion of soil and water conservation, contribution to the recycling of soil nutrients, contribution to the improvement of soil organic matter content, contribution to the reduction of soil degradation and contribution to the enhancement of soil microbial activities with WMS of 3.8 which were all ranked 4th.

Next is contribution to the prevention of insects, pests and diseases, contribution to the reduced production cost for arable crop production and contribution to control of erosion with WMS of 3.4 and the contribution in higher soil water storage with the WMS of 3.2. This result implied that contribution to long-term continuity of yield from the farm, contribution to long-term sustainability and productivity of farmland and contribution to increase in crop yields were the major contributions of soil conservation practices.The indication of the result is that agricultural production had been on a steady improvement with contribution made with the application of the various soil conservation practices, this aided the sustainability of the means of livelihood of the arable crop farmers. The finding is in agreement with the findings of Barrera *et al.,* (2019) that, conservation in agriculture increases yields. Conservation practices also help to replenish soil nutrient thereby aiding productivity and sustainability.

Factors that Influence the use of Soil Conservation Practices

Table 3 shows the distribution of the respondents by factors that influence the use of soil conservation. The result showed that all (100.0%) of the respondents indicated knowledge about soil conservation practices as the factor that influence the use of soil conservation practices while almost all (99.0%) indicated information about available soil conservation practices and skills and expertise of the farmers as the factor that influence the use of soil conservation practices.

Furthermore, 97.9%, 96.9%, and 87.5% indicated land availability and farmers experience, availability of labor and availability of funds respectively while 83.3%, 43.8%, 42.7% indicated education, climatic condition, farm size respectively. In addition, 38.5%, 25.0%, 10.4% indicated land tenure system, government policy and age as soil conservation practices used respectively. Lastly 5.2% indicated gender as the factor that influenced soil conservation practices used in the study area.

This result implied that the use of soil conservation practices is dependent on socio-economic characteristics of the arable crop

farmers such as enabling environment and favorable policies from the government. This study is in line with the findings of Akinnagbe and John (2023), who reported that availability of funds, labour, knowledge of the practices, information about the practices and skill of the farmers were all indicated as factors that influenced the use of coil conservation.

Agricultural Related Livelihood Activities Engaged

In Table 4 shows the distribution of the respondents by agricultural related livelihood activities engaged in. The result showed that all (100.0%) of the respondents indicated crop farming as the agricultural related livelihood activities engaged in while 92.7% and 89.6% of the respondents indicated farm produce processing and livestock farming respectively as the agricultural related livelihood activities they engaged in. Furthermore, 71.9%, 17.7%, 13.5% indicated poultry farming, plantation farming and cash crop farming respectively, while 6.3%, 5.2% indicated nursery operation, organic farming and seed operation as the agricultural related livelihood activities engaged in. Lastly 3.1% indicated aquaculture as the agricultural related livelihood activities engaged In in the study area.

Summarily, this result implied that agricultural enterprise is a major source of livelihood for habitats in the study area though their engagement in other livelihood activities contributed a lot to the economy of the study area and improvement on their standard of living.

Constraints to the use of Soil Conservation Practices

Table 3 shows the distribution of respondents by their constraints to the use of soil conservation practices. Using the generated Weighted Mean Score (WMS) for the ranking of the constraints it was revealed that poor/ inadequate government support, lack of relevant skills and knowledge and lack of adequate extension service were ranked highest with the weighted mean score of 2.8. This was closely followed by insufficient human capital, limited access to input and inadequate/ absence of mechanization with WMS of 2.6. Next is destruction of farm by grazing cattle (WMS= 2.5). Others are in the following order: inadequate farmland availability (WMS= 2.4), indiscriminate bush burning and insufficient resources to plant cover crops (WMS=2.3). The result implied that poor/inadequate government support, lack of relevant skills and knowledge and lack of adequate extension service were the major constraints faced by the respondents in usage of soil conservation practices. This result is an indication that lack of stakeholders in agriculture and support is a major setback for the use of soil conservation practices in the study area. This result does not conform with the report of Dimelu *et al.,* (2013) who reported increase pest infection, unavailability of raw materials, high cos of materials and environmental pollution as major constraints to the use of soil conservation practices.

CONCLUSION AND RECOMMENDATION

Based on the findings of the study, farmers in the study area used various soil conservation practices. Poor/inadequate government support, lack of relevant skills and knowledge were one of the most significant constraints hindering the use of soil conservation practices. Therefore, government should make available extension agent that will ensure proper teaching on soil conservation practices, the usage of soil conservation practices and the contributions of soil conservation practices. Government should grant farmers access to loan to enable farmers to farm on a large scale and have access to mechanization. Government should provide the necessary infrastructure that will encourage more rural dwellers to go into farming.

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Table 1: Distribution of respondents by soil conservation practices used

*Soil Conservation practices used	Frequency	Percentage
Conservation tillage	5	5.2
Contour farming	5	5.2
Zero tillage	5	5.2
Cover cropping	7	7.3
Mulching	12	12.5
Crop rotation	39	40.6
Mixed cropping	76	79.2
Planting cover crops	5	5.2
Inter cropping	51	53.1
Ridging	34	35.4
Application of animal manure	91	94.8
Leaving crop residue on the field to decay	91	94.8
Agroforestry	2	2.1

Source: Field Survey, 2024 *Multiple responses

Table 2: Distributions of the respondents by contributions of conservation practices

Contribution	Major contribution	Moderate contribution	Minor contribution	Slight contribution	No contribution	WMS	Rank order
It contribute s to long term continuity of yield from the farm	89(92.7)	7(7.3)	0(0.0)	0(0.0)	0(0.0)	3.9	1st
It contributes to long-term sustainability and productivity of farm land	82(85.4)	14(14.6)	0(0.0)	0(0.0)	0(0.0)	3.9	1st
It contributes to the prevention of insects, pests and diseases	42(43.8)	52(54.2)	2(2.1)	0(0.0)	0(0.0)	3.4	9th
It contributes in higher soil water storage	25(26.0)	69(71.9)	2(2.1)	0(0.0)	0(0.0)	3.2	12th
It contributes to control of soil erosion	38(39.6)	58(60.4)	0(0.0)	0(0.0)	0(0.0)	3.4	9th
It contributes to recycling of soil nutrients	80(83.3)	16(16.7)	0(0.0)	0(0.0)	0(0.0)	3.8	4th
It contributes to increase in crop yields	82(85.4)	14(14.6)	0(0.0)	0(0.0)	0(0.0)	3.9	1th
It contributes to the reduction of soil degradation	77(80.2)	19(19.8)	0(0.0)	0(0.0)	0(0.0)	3.8	4th
It contributes to the enhancement of soil microbial activities	73(76.0)	23(24.0)	0(0.0)	0(0.0)	0(0.0)	3.8	4th
It contributes to the improvement of soil organic matter content	80(83.3)	16(16.7)	0(0.0)	0(0.0)	0(0.0)	3.8	4th
It contributes to the promotion of soil and water conservation	81(84.4)	15(15.6)	0(0.0)	0(0.0)	0(0.0)	3.8	4th
It reduces production cost for arable crop production	40(41.7)	55(57.3)	1(1.0)	0(0.0)	0(0.0)	3.4	9th

Source: Field survey 2024; F: Frequency, **%:** Percentage. **WMS:** Weighted mean score

Table 3: Distribution of the respondents by factors that influence the use of soil conservation

Factors	Frequency	Percentage
Age	10	10.4
Education	80	83.3
Gender	5	5.2
Knowledge about soil conservation practices	96	100.0
Farm size	41	42.7
Climatic condition	42	43.8
Availability of funds	84	87.5
Availability of labor	93	96.9
Land availability	94	97.9
Farmers experience	94	97.9
Government policy	24	25.0
Information about soil conservation practices	95	99.0
Skills and expertise of the farmers	95	99.0

Source: Field survey, 2024 *Multiple responses

Table 4: Distribution of the respondents by agricultural related livelihood activities engaged in

Agricultural related livelihood activities	Frequency	Percentage
Crop farming	96	100.0
Cash crop farming	13	13.5
Aquaculture	3	3.1
Poultry farming	69	71.9
Livestock farming	86	89.6
Apiculture	3	3.1
Plantation farming	17	17.7
Organic farming	5	5.2
Seed production	5	5.2
Nursery operation	6	6.3
Farm produce processing	89	92.7

Source: Field survey, 2024 *Multiple responses

Table 5: Distribution of the respondents by constraints to the use of soil conservation practices

Constraints	Very severe constraints	Severe constraints	Mildly severe constraints	Not a constraint	WMS	Rank order
Destruction of farm by grazing cattle	49(51.0)	45(46.9)	2(2.1)	0(0.0)	2.5	7th
Poor/inadequate government support	82(85.4)	13(13.5)	1(1.0)	0(0.0)	2.8	1st
Lack of relevant skills and knowledge	76(79.2)	19(19.8)	1(1.0)	0(0.0)	2.8	1st
Inadequate farmland availability	42(43.8)	51(53.2)	2(2.1)	1(1.0)	2.4	8th
Insufficient human capital	57(59.4)	38(39.6)	1(1.0)	0(0.0)	2.6	4th
Lack of adequate extension service	76(79.2)	18(18.8)	2(2.1)	0(0.0)	2.8	1st
Indiscriminate bush burning	34(35.4)	60(62.5)	2(2.1)	0(0.0)	2.3	9th
Limited access to input	56(58.3)	38(39.6)	2(2.1)	0(0.0)	2.6	4th
Insufficient resources to plant cover crops	33(34.4)	61(63.5)	2(2.1)	0(0.0)	2.3	9th

Source: Field survey, 2024