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Assessment of Indigenous Soil Conservation Measures in Keffi LGA, Nasarawa State, Nigeria

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Abstract

The research assessed Indigenous Soil Conservation Measures in Keffi LGA, among farmers in Nasarawa State, Nigeria, Both Primary and secondary sources of data were used for the study. The result revealed that Investment in organic fertilizer as a soil fertility is a very beneficial one (96.02% of farmers) for farmers unlike inorganic fertilizers because they are readily available (85.80% of farmers). Many problems are associated with inorganic residue usage. Example include organic matter heaviness (68.18%); high transportation cost (76.70%); requires sorting (62.50%); filthy/ smelly (25.57%); requires burning (21.02%) and requires treatment. Framers admitted they preferred inorganic matter to organic matter because of its short term replenishment of depleted soil; if only it is available and less expensive. About (76.14%of farmers) admitted not receiving assistance of any sort on the purchase of fertilizer from government of any relevant body. Assistance in terms of subsidy of prices, loan to purchase fertilizer and if possible, free supply of fertilizer were among incentives farmers are demanding from the government. There is the need to evolve are integrated cooperation approach to soil fertility maintenance in the area that shall bring together the farmers, community leaders, local authorities, state and federal government. Leaving the farmer to tackle the problem alone can never be effective.

Keywords: Indigenous, Measures, Soil, Conservation, Fertility.

Introduction

In Nigeria, soil fertility maintenance has been widely recognized as a major problem that greatly affects agricultural land development. Consequently, extensive researches such as the works of Kolawole, O.D (2002), Ismaila Ct *et al.*, (2012) etc. have been conducted in many areas on the rate of soil changes under different fertility management practices in many areas of the country. Because of the severe on-site and offsite degradation trends resulting from soil fertility management problems, successive governments in the country have made effort to conserve and rehabilitate degraded lands in many parts of the country. As in many other African countries, despite the heavy capital and human resources investment, results remain disappointing. Soil fertility decline level are still occurring in many areas and most farmers are not making much effort to construct and maintain Soil and Water Conservation (SWC) measures, and continue to behave as if they have been defeated in this regard.

The quest for a solution to environmental problems like soil fertility decline might be approach by building on a foundation of what people already know and what they have been practicing since time immemorial. Just like in most developing countries, the paucity of documented information on fanner's soil fertility management strategies in Nigeria denies researchers and rural development practitioners a knowledge base from their activities.

One agricultural important community in Nigeria where farmers for several years have been carrying out agricultural activities with some significant use of indigenous soil conservation measures is in Lafia, Nasarawa state. This area is of particular important because it has a very long history of urban and pen-urban cultivation practices with the farmers having access to a number of governmental and non-governmental bodies having advisory on soil fertility maintenance. Because of the enormous strategic economic importance of this area to the agricultural economy of the country, information is no doubt required on the farmer's knowledge of the use of maintenance measures for soil fertility and the need for such information constitutes the problem of research interest this study.

Materials and Methods

Data collected from the administered schedules were analyzed, categorized and presented in a chart format. The contents from the interview schedules were summarized using simple descriptive statistical techniques (mean and percentages) providing a good appreciation of the farmer's knowledge and use of soil fertility maintenance measure in the area.

Result and Discussion

Soil Conservation Practices Employed by Respondent within Study Area

Types of Indigenous Soil Conservation Measures

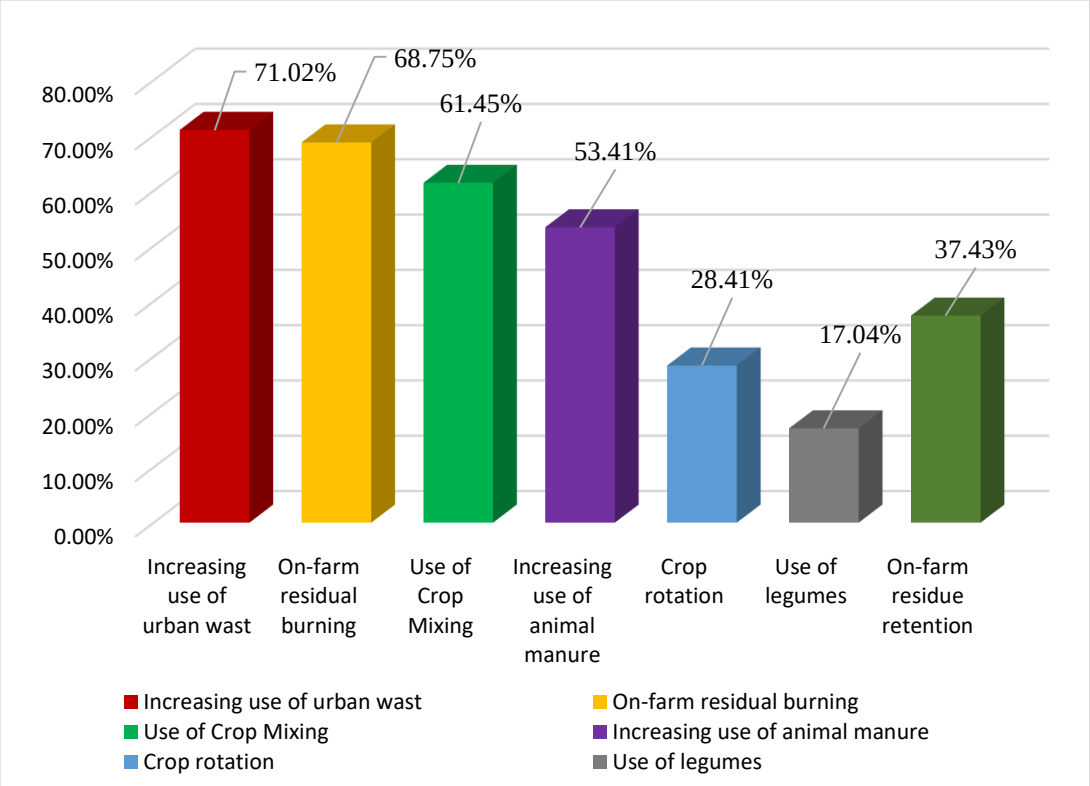
To improve soil fertility and crop yield on their farmlands, indigenous soil conservation practices were highly used by most of the farmers. Popularly of this practice are crop rotation, using crop mixtures, on farm residue retention, on-farm residue burning, use of legumes, use of animal manure, and increasing use of urban waste, measures which Hudson (1991) observed are being very effective.

Fig 4.18 below shows that 71.02% of the farmers were increasing their use of urban waste; 68.75% were patronizing no-farm residue burning; the use of crop mixture (61.45%); increasing use of animal manure (53.14%); crop rotation (28.41%) and use of legumes (17.04%). Further investigation revealed that farmers perceived these practices as the measures that have been used by their ancestors, passed down generations after generations and have proved to be very effective in soil fertility maintenance. This supports the view of Diala (1994) which states that, farmers trust practices they have used to for years and that they are likely to keep away from new techniques that requires investment of resources and time. Other conservation farming techniques such as hillside terraces, stone-line and bunds, trash-lines, sand-bag line, earth-contour bunds, rice-bran mulch and vegetation-barriers which utilize natural ecological processes to conserve moisture,

improve soil structure, curtail soil erosion and enhance soil fertility as outlined by Morgan, (1986) were also employed at some point within the study area.

Little investment in term of capital is required in the patronage of these measures of soil conservation, as such; they are cheap and accessible to farmers. These practices have been observed to be effective in maintaining soil fertility gradually over a considerable length of time thus increasing crop yield and thus scored a good point on the use of inorganic fertilizer which is costly, scarce and its misuse could be harmful to the ecosystem. Inorganic fertilizer, could be harmful to the ecosystem in the sense that waste soluble nitrogen content of fertilizer doesn't provide for long term need of plant, they leach out nutrient into surrounding area thereby creating water pollution.

Figure 1: Types of Indigenous Soil Conservation Measures



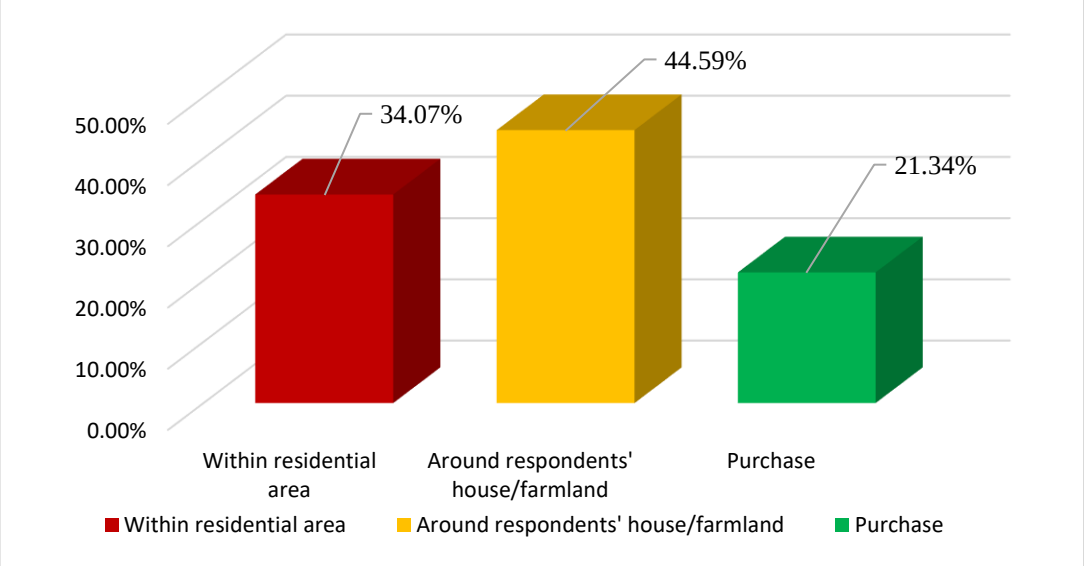
Source: Field Survey (2021)

Use of Organic Fertilizer by Respondent Farmers

Source of Organic fertilizer

Result from fig 4.19 below shows that majority (44.59%) of the framers admitted that organic fertilizer was sourced near their houses, (34.07%) said they sourced them form residential area while (21.34%) them were purchasing the organic fertilizer.

Figure 2: Source Organic Fertilizer

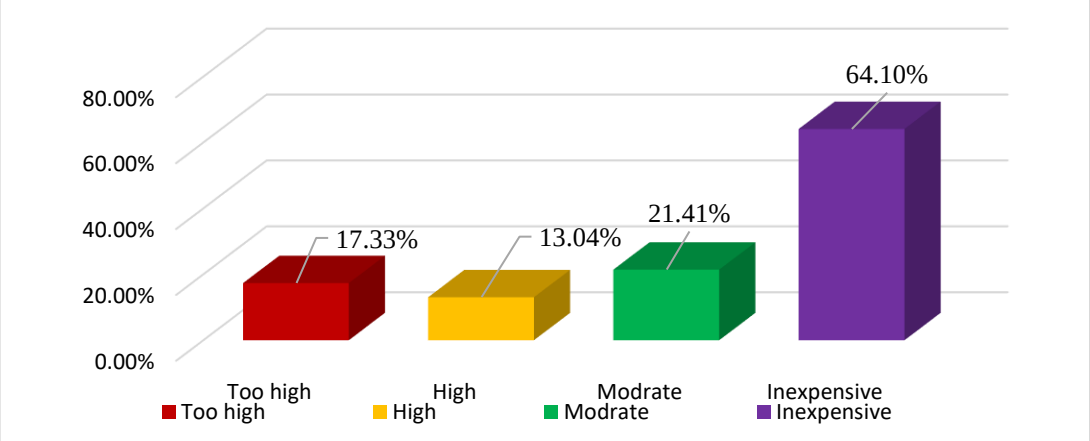


Source: Field Survey (2018)

Cost of Manure its Availability and whether it's Investment is Beneficial

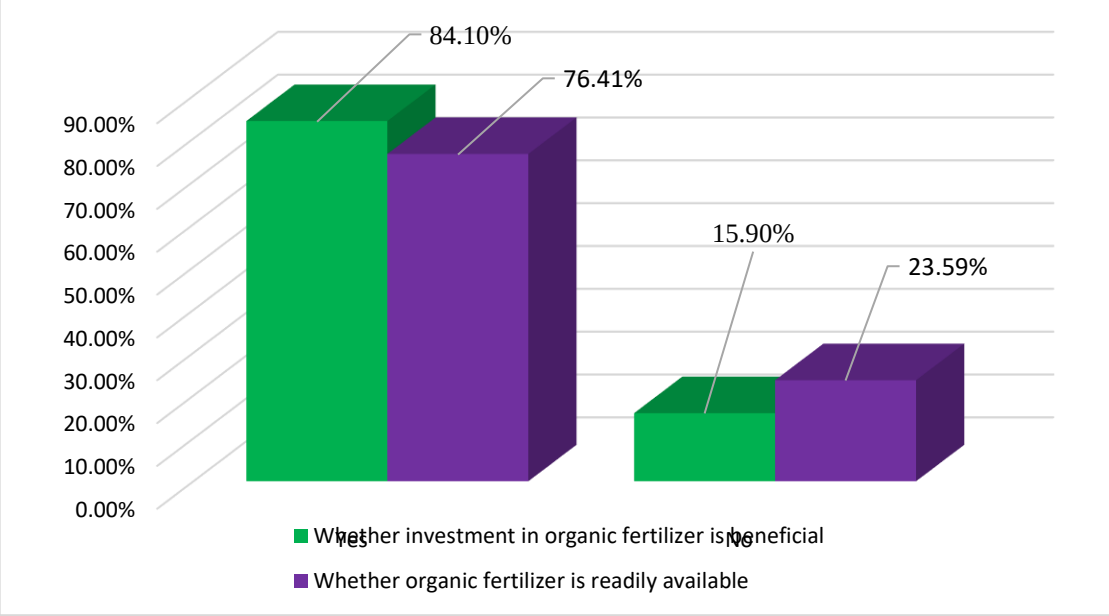
Organic manure is realty available around the farmers house, farmland and within residential area. The increase in demand of organic residue in agriculture as a substitute to the limited inorganic fertilizer has resulted in an emerging business, whereby people collect in polythene bags manure from houses, night soil from dug-out toilets and urban waste from waste dumps and sell to interested farmers at relatively cheap prices, most farmers therefore view these commodities as being inexpensive to purchase when compared to the inorganic fertilizer (Ismaila K.I *et al.*, 2012). Form fig 4.20a below, majority (48.22%) of the respondents agreed to the fact that organic fertilizer come at a very cheap rate (85.80%) of respondents also confirms organic matter availability and (96.02%) said the investment in organic fertilizer on their farmlands has been very beneficial (fig 4.20 below).

Figure 3a: Cast of Manure if Purchased



Source: Field Survey (2021)

Figure 3b: Whether Investment in Organic Fertilizer is Beneficial and if it is readily available



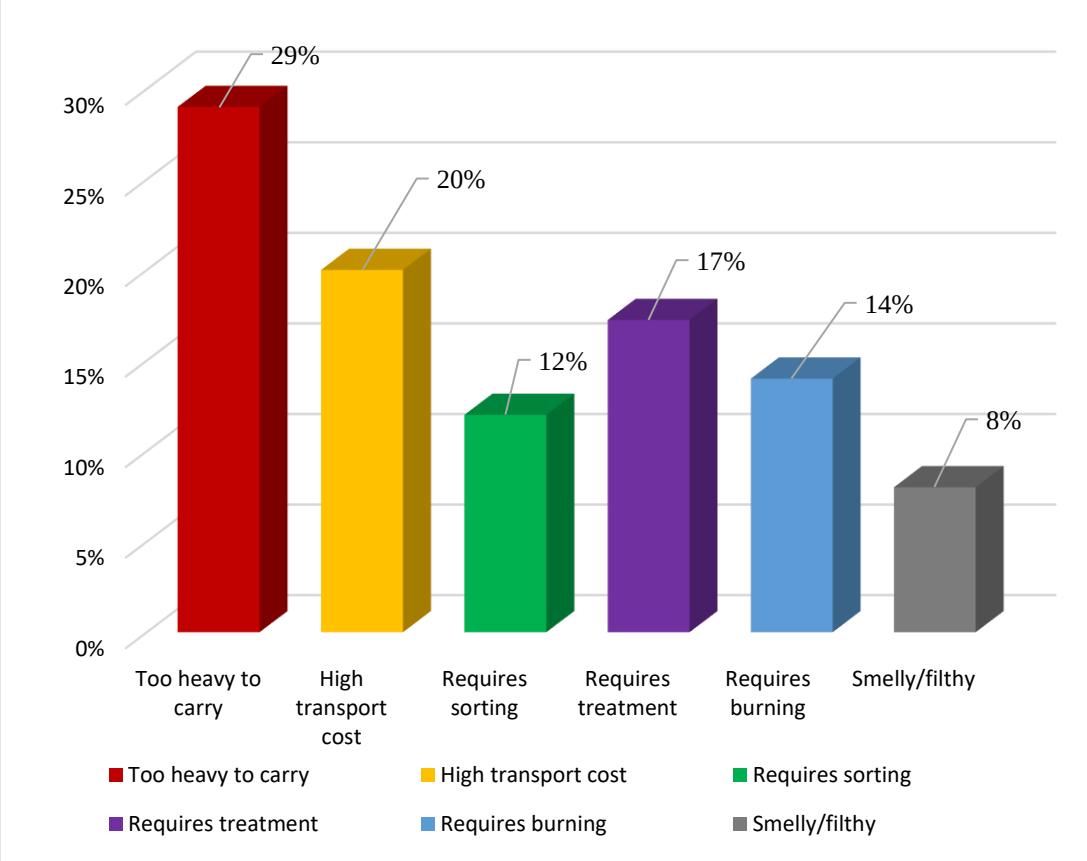
Source: Field Survey (2021)

Problem in the Use Organic Fertilizer

Indigenous conservation practices are those aimed at improving soil fertility of which organic residue make up the major measure use by most farmers. Organic fertilizer usage is not without problem. Common problem farmers encounter in the patronage of organic fertilizer are show in fig 3 below. These are organic matter being too heavy to carry by self (29%), about (20%) of them expressed it requires high transportation cost, (12%) said it requires sorting before it could be put to use, other problem in could, organic matter being filthy and smelly (8%), requires burning (14%) and requires treatment before being put to use (17%). Not minding the fact that organic matter is readily available and an efficient measure to the farmers, they could also pose serious health problem if not carefully handled, because of its pollution of air, water bodies, farmlands and even household.

Majority of the farmers expressed their concern that inorganic fertilizer is a better option to organic manure especially when abundantly available and inexpressive because it offers steady short term replenishment for effective soil fertility management. Organic fertilizer is however, a nature way of which fertility is returned back to the soil through a gradual process.

Figure 4: Problem in the Use of Organic Fertilizer



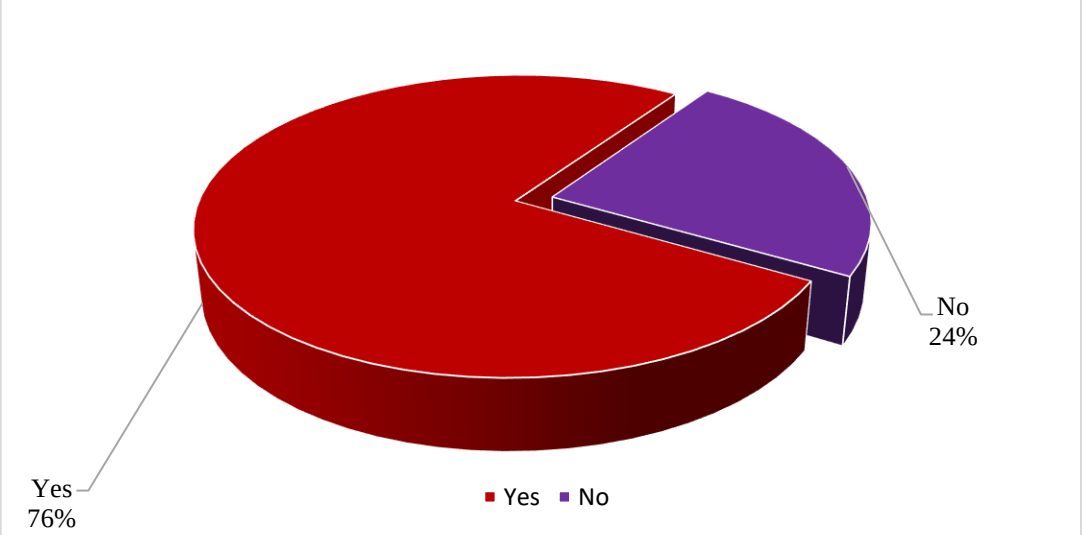
Source: Field Survey (2021)

Measures to Improve the Use of Fertilizer as soil Fertility Maintenance

Whether Receiving Assistance in the Procurement of Inorganic Fertilizer

Attempts were made to find out from farmers on whether they are currently receiving assistant in the procurement of inorganic fertilizer. (76%) indicated that they do not receiving any of such assistance. (24%) however said they had in the past receiving assistance in term of subsidy, free supplies, loans to purchase fertilizer etc. from state government, NGOs, community based organization, individuals and professional bodies but most of these assistances were never consistent, this is an major reason why most farmers find it difficult to use inorganic fertilizer in the area as a fertility maintenance measure. All those interviewed however agreed that assistance in inorganic fertilizer procurement would highly improve soil fertility maintenance and crop yields.

Figure 5: Whether Receiving Assistance in the Procurement of Inorganic Fertilizer

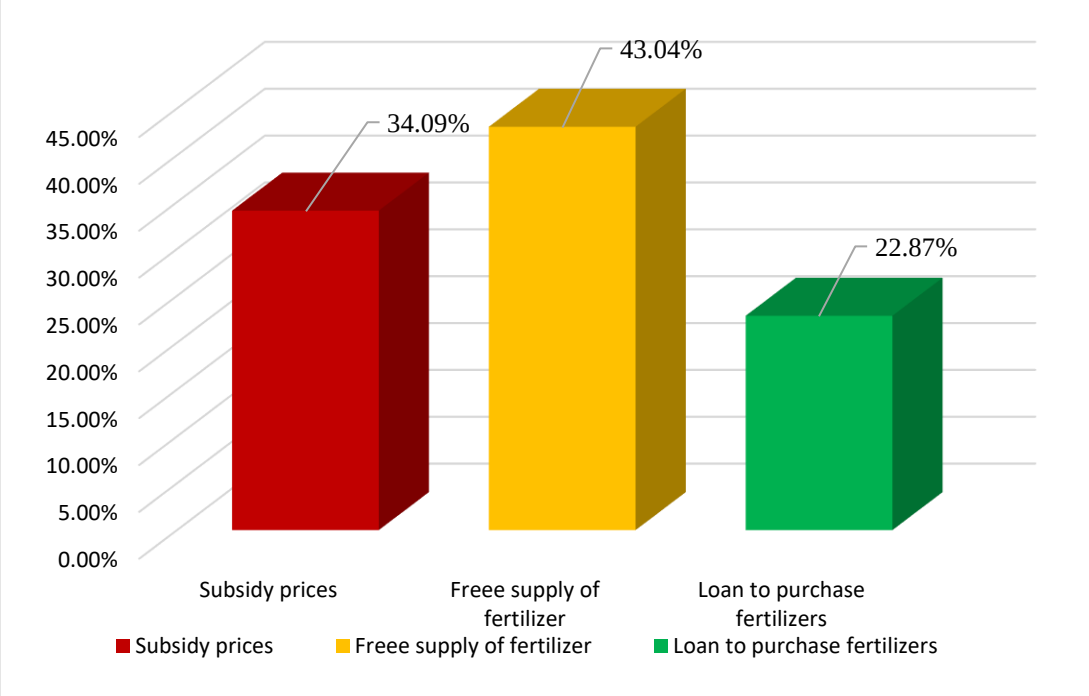


Source: Field Survey (2021)

Suggestions by Farmers on the Type of Subsidy to Encourage the Use of Inorganic Fertilizer

The farmers suggested that assistance of different forms such as prices subsidy (34.09%); free supply of fertilizer (43.04%) and loans to purchase fertilizer (22.87%) are all measures that are likely to raise the adoption of inorganic fertilizer usage. This therefore indicates that should government, NGOs and commercial institution assist the farmers by making the price of this commodity affordable, there is likely to be a shift from their high dependence on organic fertilizer. On further investigation most farmers were of the opinion that inorganic fertilizer produces immediate positive effects in the soil resulting in high crop yields. They also express the belief that the product is much health to use and may reduce the health hazards associated with the use of organic fertilizer.

Figure 6: Suggestion by Farmers on the type of Subsidy to Encourage the Use of Inorganic Fertilizer



Source: Field Survey (2021)

Conclusions

In conclusion, result obtained from this study has supported the theory that farmers are to be given consideration by government and relevant stake holders in future planning and design of interventions to combat soil fertility and land degradation problem in Nigeria. This result has kicked against the assertion that majority of the farmers are resource poor, illiterate and are reluctant to implement government policies on soil conservation rather it has been discovered that farmers are resource person with a stock pile of effective indigenous conservation knowledge that has been put into beneficial practices. Government therefore in collaboration with relevant stake holders in the agriculture sectors and the farmers in particular should seek to develop indigenous soil and water conservations measures known to the local farmers for years to combat soil degradation on a large scale rather than always depending on borrowed technology which most time may not be effective in our region.

This study has shown that farmers are actively employing soil conservation measure to ensure fertility of farmers because of its numerous advantages and because of the lack of inorganic fertilizer of farmers. Organic fertilizer on the other hand is associated with low productivity when put into commercial farming. If agriculture is to keep pace with the increasing population demand for agriculture produce, then effective soil fertility maintenance has to be provided of which the inorganic fertilizer may be a better option.

As it stands presently there is a near absence of external intervention to help framers overcome crisis associated with the use of inorganic fertilizer in this area, thereby the loss of interest to its use. To raise their interest once again the following suggestions should be taken into considerations; subsidy in prices, provision of loan and free distribution of the commodity. There should also be the need of government, NGOs, commercial institutions and relevant authorities to invest heavily in the procurement of inorganic fertilizer so as to make it cheap and available to farmers.

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