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Imapcts Of Soil Erosion On Crop Productivity In Uganda Acase Study Of Kibuga Division Butambala District

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Abstract*: The investigation's objective was to ascertain how agriculture production in Butambala District's Kibuga Division was impacted by soil erosion. The research obtained data from 260 participants, and as a result, the goals of the study were accurately met by the findings. The purpose of the study was to determine how soil degradation influences agricultural yields, what effects it has on crop production, as well as how to measure soil erosion's effects on crop output. The study's findings revealed that the removal of top soil was among the main ways that soil degradation had a negative impact on crop yield, according to the majority of respondents. A minor number of participants told the investigator that soil degradation would also worsen soil drainage, and 10% of the respondents gave data demonstrating that soil erosion would also have an adverse effect on yields due to soil compaction. Some responses provided data demonstrating how soil erosion may lower garden soil fertility. According to the report's results, the majority of the participants said that mulching was the most effective method for reducing soil erosion. A tiny percentage of respondents additionally provided information demonstrating that farms also used covering crops as a method of reducing soil erosion. Finally, a couple of the responders provided data demonstrating that using natural manure also prevented soil erosion. Several of the respondents presented results showing that soil erosion will be eliminated in gardens by afforestation.*

Keywords: Soil Erosion On Crop Productivity

Background of the study

the study's history
Most people in East Africa are rural farmers who make their living from farming. One of the biggest problems facing agricultural areas today is depleted soils, which result in lower yields. Soil erosion, which is a product of both natural and cultural environments, is one explanation for this. When it happens in conjunction with nutrient loss, particularly when intensive farming is performed in humid settings, serious problems ensue (Lai 1995).
The biggest rates of productivity decline are found in hilly areas, along with cultivating dry land, irrigated land, and rangeland (Scherr & Yadav 1996). In this study, the major biophysical factors influencing soil formation were examined. Other factors, such as economic and sociopolitical ones, can also have an impact on soil productivity in different ways.

The provided parameters in this example also include human history and ecological factors like geology, soil type, permeability, height, rainfall, and warmth. Contrarily, a number of components, including workforce, capital, input, secure tenure, governance, cultural, information, demographics, and greenery, are prone to quick changes brought about by people. Through their influence on land use and soil erosion, all of these factors have an effect on soil production and agriculture.

Statement of the problem
Farmers and other agricultural operators in Uganda are very concerned about the issue of soil degradation and how it affects crop yield. Soil erosion can cause nutrient deficiency, the loss of healthy topsoil, reduced water retention, and poor crop quality by reducing soil fertility. The livelihood of farms, national food production, and the economy all stand to suffer significantly as a result of this. Furthermore, soil degradation can make global warming more severe and make Uganda's agriculture industry more susceptible to its effects. Soil erosion and its effects on crop yield in Uganda must thus be addressed urgently. This involves the execution of environmentally friendly land management methods, education and consciousness activities

Specific objectives

1. To examine the impacts of soil erosion on crop production.
2. To find out how soil erosion affects crop productivity
3. To establish the measures of soil erosion on crop production

Research questions

1. What are the impacts of soil erosion on crop productivity in Kibuga Division in Butambala district?
2. What are the effects of soil erosion on crop productivity?
3. What measures should be established on soil erosion in order to improve crop productivity?

Methodology

Research design

A descriptive research, according to Kothari (2003), is a set of conditions for gathering and analyzing information that seeks to combine the applicability of the study purpose with technique economy. A summary pass qualitative research using both the qualitative and quantitative approaches was employed to support the study's conclusions (Amin, 2005; Creswell, 2009). In ethnographic study, which aimed to understand social circumstances and instances in their sociocultural context, the subjective approach was used (Creswell, 2009; Neuman, 2011).

Sample size and sampling procedures

According to Kerlinger (1998), a sample is the community that the original study was conducted on. The process of selecting the ideal number of replies from a particular population to establish a sampling was known as sampling. A new specimen with the same size derived from the identical procedure would then produce results that are appropriate and comparable, according to Wiersma (1995), the appropriate sampling size ought to be such that the research scientist can be confident that.

The ideal sample is one that is simultaneously large enough to fairly represent the intended audience for generalizations and tiny enough to be cheaply selected in respect of accuracy.

Table 1: Sample Size

Respondents	**Target Population**	**Sample Size**
Farmers	300	260
Agriculture officers	80	50
Total	**380**	**310**

The researcher used a sample size of 260 farmers and 50 Agriculture officers in all the different villages in Kibuga Division using stratified sampling technique because it was the most effective when handling heterogeneous populations. Respondents from different villages will then be selected using simple random sampling technique to make the results objective.

Research instruments

In this section, the various tools utilized for data collection were named and discussed. Data collection methods included surveys and interviews. These technologies were selected based on the type and caliber of the data that was gathered.

Questionnaires and structured interview guides were the main methods used in this study to gather data. The researcher produced results using these two various instruments in accordance with the study's objectives for the triangulate process. Researchers (Tashakkori & Teddlie, 2013; Bryman, 2016) recommend using a variety of instruments to provide a wealth of data that fits the study's aims and enhances the degree to which generalizations may be formed from the study's findings.

Data analysis techniques

It appears that this section established the methods to be used to assess and analyze the data collected, corroborate the primary research issues, and reach a suitable conclusion. This included outlining the procedures followed and arguing that the statistical techniques

used were reasonable. This was done meticulously to avoid conclusions that relied on insufficient sets of facts. Both qualitative and quantitative approaches had to be used to evaluate the information.

RESULTS

Response rate of respondents

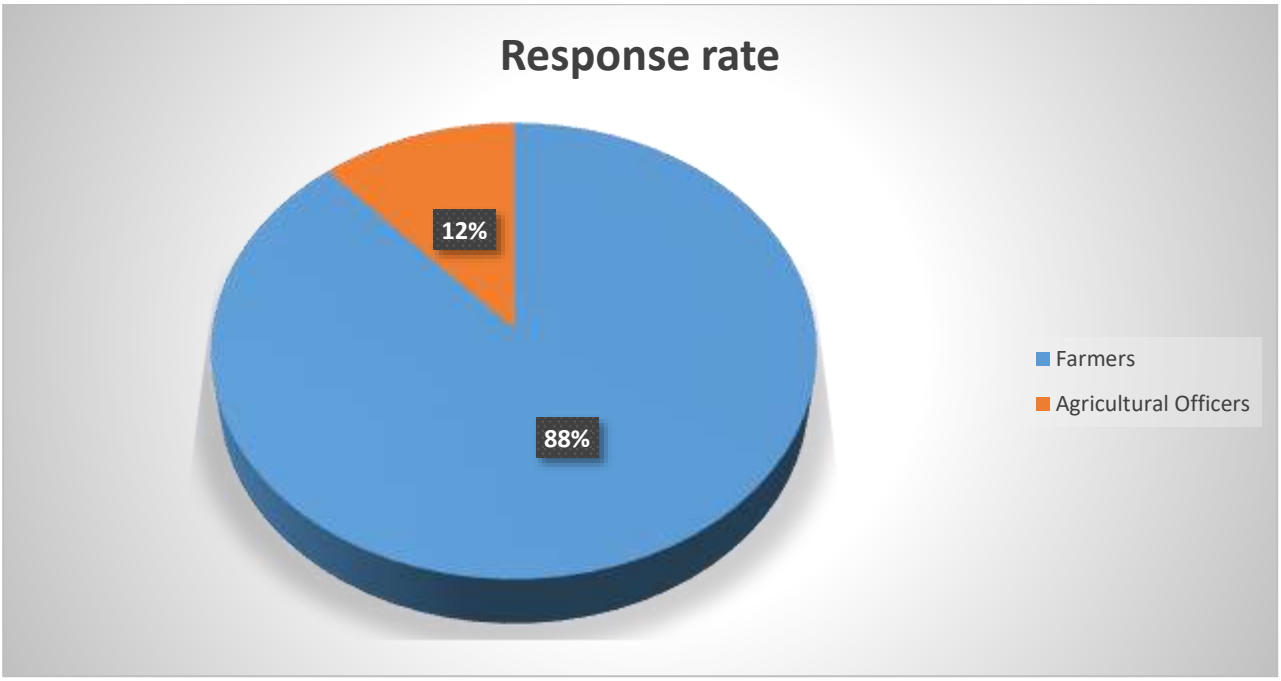
The response rate of the respondents is explained in the table below:

Table 2: Response rate

Respondent Groups	Number of Questionnaires Distributed	Retrieved Questionnaires	Percentage (%)
Farmers	**260**	**230**	**88**
Agriculture officers	**50**	**30**	**12**
TOTAL	**310**	**260**	**100**

Source: Primary data (2022)

Figure 1: Response rate



Demographic profile of respondents

Gender composition of respondents

Table 3: Gender Composition of respondents

Response	Frequency	Percentage
Male	**170**	**65**
Female	**90**	**35**
Total	**260**	**100**

Source: Primary Data 2022

From table 3, it can be seen that the majority of respondents were males that was (170) representing 65% of the total number of respondents, 90 respondents were female representing 31% of the respondents. This is an indication that gender sensitivity was taken care off so the findings therefore cannot be doubted on gender grounds; they can be relied for decision making.

Education level of the respondents

Table 4: Education level of respondents

Education level	Frequency	Percentage
O Level	40	15
A Level	80	31
Diploma	120	46
Degree and above	20	8
Total	**260**	**100**

Source: primary data 2020

Figure 2: Education level of respondents

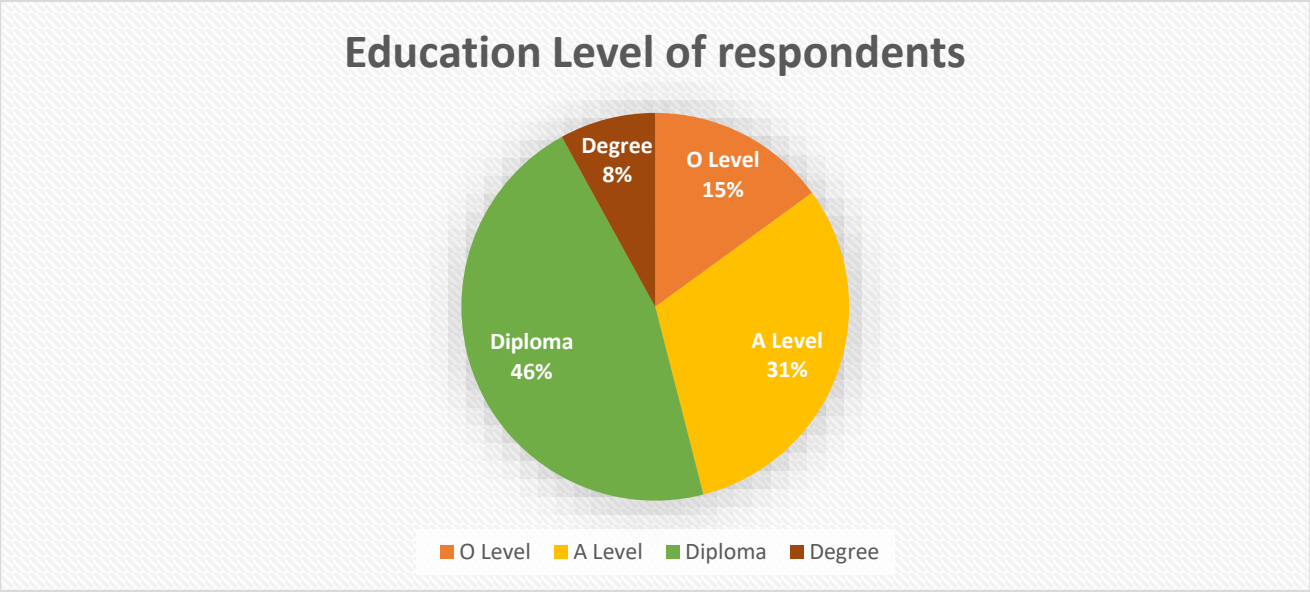


Table 4 above clearly indicates that 40 respondents were O level certificate holders with a percentage of (15%) of the sample size followed by 80 respondents who presented results showing that they finished A level and they had (31%) of the sample size, 120 respondents had diplomas and they had a percentage of (46%) of the sample size and finally 20 respondents presented results indicating that they had Degrees and other qualifications which were above and they had a percentage of (20%) of the sample size.

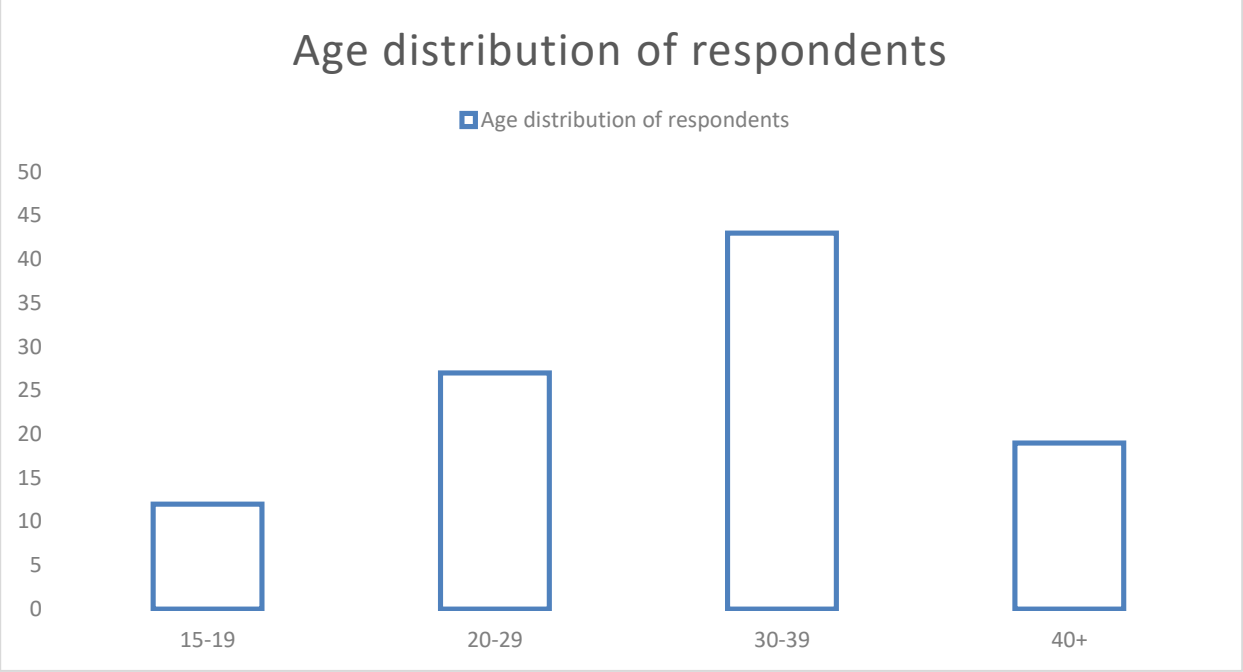
Age distribution of respondents

Table 5: Age distribution of respondents

Respondents age	Frequency	Percentages
15-19	30	12
20-29	70	27
30-39	110	43
40+	50	19
Total	**260**	**100**

Source: Primary Data 2020

Figure 3: Age of respondents

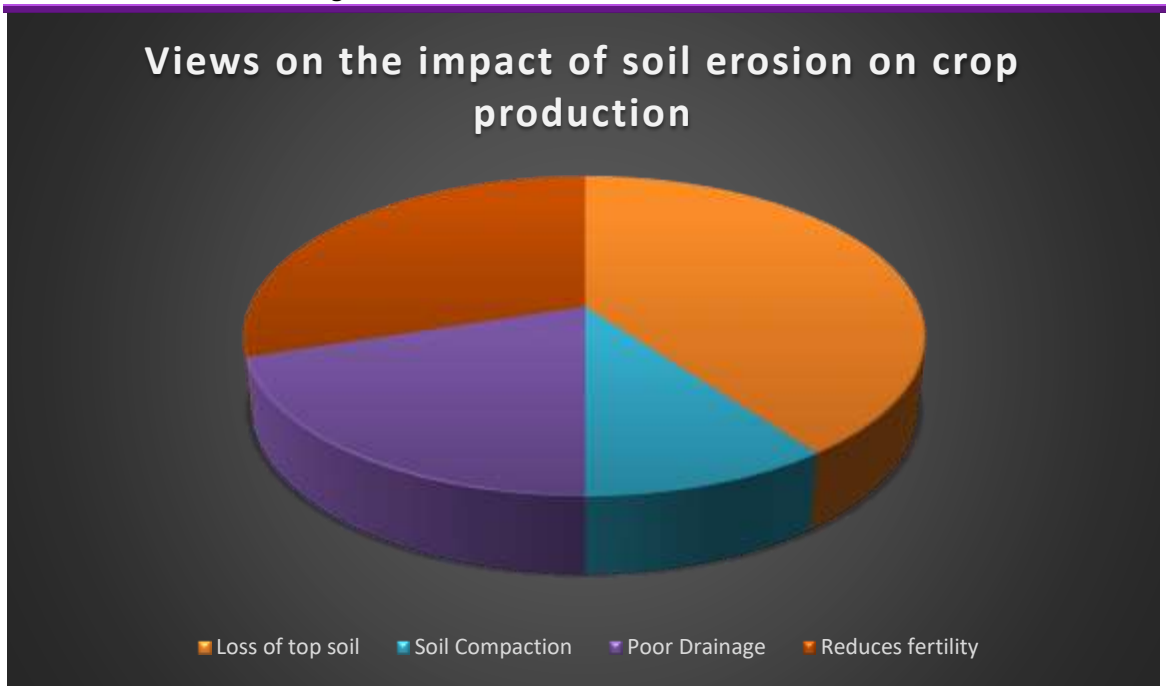


According to the table 5 above, 30 respondents with a percentage of (12%) of the respondents had their age ranging from (15-19) followed other respondents who had their age ranging from (20-29) with a percentage of (27%), 110 were the majority and their age was in the range of (30-39) with a percentage of (43%) of the respondents and finally respondents who had the age bracket of 40+ years were 50 with a percentage of 19% of the respondents

Data Presentation, Analysis and Interpretation of findings

Impacts of soil Erosion on Crop Production

Figure 4: Impcts of soil erosion on crop production

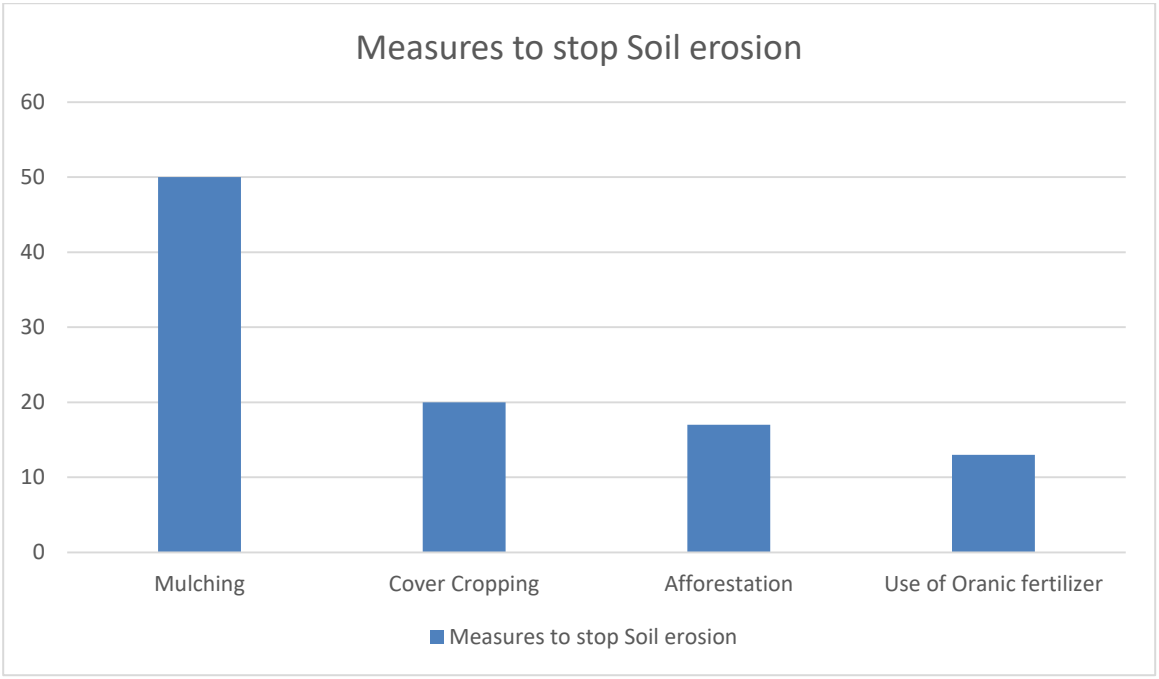


Research Data: 2022

According to the figure above, the findings of the study presented results indicating that 40% of the respondents informed the researcher that soil erosion would lead to loss of top soil was one of the major negative impact of soil erosion on crop productivity. 30% of the respondents presented results indicating that soil erosion would reduce soil fertility in the gardens, 20% of the respondents informed the researcher that soil erosion would also lead to poor drainage of the soil and finally 10% of the respondents presented results indicating that soil erosion would also lead to soil compaction reducing on the yields.

Measures to stop Soil Erosion

Figure 5: Measures to stop Soil Erosion

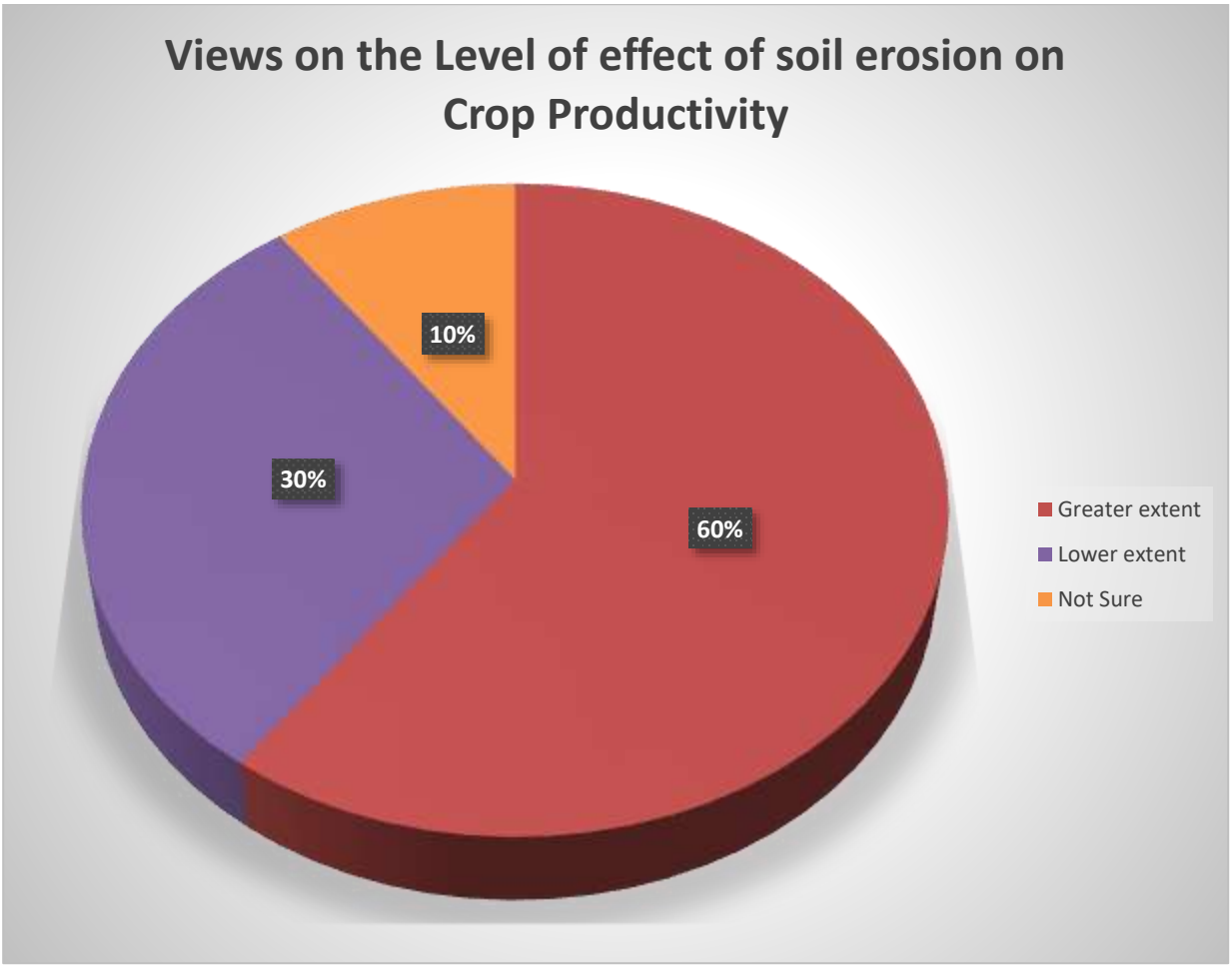


Research Data: 2022

According to the figure above, the findings of the study presented results indicating that 50% of the respondents informed the researcher that the main measure that was used to stop soil erosion was through mulching, 20% of the respondents also presented results indicating that cover cropping was another measure that was used by farmers as a measure to stop soil erosion. 17% of the respondents presented results indicating that through afforestation soil erosion would be abolished in gardens and finally 13% of the respondents presented results indicating that through use of organic fertilizers, soil erosion was also abolished.

Level of effect of soil erosion on crop productivity

Figure 6: Level of effect of soil erosion on crop productivity



Research Data: 2022

According to the findings of the study, the findings of the study indicated that 60% of the respondents informed the researcher that to a greater extent soil erosion created an impact on the crop productivity followed by 30% of the respondents who presented results to the researcher findings indicating that to a lower extent soil erosion would affect crop productivity and finally 10% of the respondents presented results indicating that they were not sure whether soil erosion created an impact on crop productivity.

Conclusions

The study's findings revealed that the majority of participants told the researcher that top soil loss was one of the main ways that soil erosion had an adverse impact on crop yield. 10% of the respondents provided data demonstrating that soil erosion would also result in soil compaction having a negative impact on yields. A minor number of participants informed the researcher that soil erosion

would also cause poor drainage of the soil. Several responders provided evidence indicating the soil fertility in gardens would decrease as a result of soil deterioration.

According to the study's findings, the majority of respondents indicated that mulching was the most effective method for reducing soil erosion. A tiny proportion of those polled additionally provided information demonstrating that producers also used cover crops as a method of reducing soil erosion. Finally, a couple of the respondents provided data demonstrating that using organic fertilizers also prevented soil erosion. A few of the presenters published findings demonstrating how afforestation will stop soil erosion in gardens.

Recommendations

The researcher recommends the farmers on Kibuga Division should emphasize the use of good farming methods like mulching.

The researcher also recommended that the farmers in Kibuga Division should attend agricultural seminars in order to learn more about modern farming.

The researcher also recommended the agricultural officials in Kibuga Division to always teach the farmers on the best ways how to prevent soil erosion.

The researcher also recommends the farmers of Kibuga Division to always work together in the fight against soil erosion in their community.

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APPENDICES

QUESTIONNAIRES:

FOR FARMERS AND AGRICULTURAL OFFICIALS

Dear Sir/Madam,

I am **MUBIRU MUSA** a student of **METROPOLITAN INTERNATIONAL UNIVERSITY**. I am currently conducting a study on the impacts of soil erosion on crop productivity in Mazimasa Kibuga division Butambala District. The study is purely for academic purposes and the information given will be treated with utmost confidentiality. I therefore, humbly request you to spare some time and answer the following questions.

SECTION A: Background information

Thank you.

Please tick

1. Sex: Female ☐ Male ☐

2. Age of respondent

(a) 18-25 ☐

(b) 26-35 ☐

(c) 36-45 ☐

(d) 46 and above ☐

3. Level of education

(a) Primary ☐

(b) Secondary ☐

(c) Tertiary ☐

(d) Graduate ☐

(e) Others specify……..

4. Marital status

(a) Married ☐

(b) Widowed ☐

(c) Separated / Divorced ☐

(d) Single ☐

(e) Others specify…….

5. Religion

(a) Christian ☐

(b) Muslim ☐

(c) Born again ☐

(d) Seventhday ☐

(e) Others specify…….

6. Has crop productivity decreased due to soil erosion impacts among farmers?

Yes ☐ No ☐

7. If yes **TICK** how soil erosion has impacted crop productivity

Positively ☐ Negatively ☐

Section B :

What is soil erosion?

What the main causes of soil erosion in area?

Natural causes ☐ Human activities ☐

Section C: impacts of soil erosion on soil productivity

8. Mention various impacts of soil erosion on crop productivity.

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9. What are the effects of soil erosion on crop productivity?

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SECTION D

10. What measures have been undertaken to reduce soil erosion so as to improve crop productivity KIBUGA DIVISON BUTAMBALA District?

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Appendix 2: Work Plan

S/N	ACTIVITY	DATE
1	Identification of the topic	May, 2021
2	Approval of the topic	May, 2021
3	Gathering the literature	June - September, 2021
4	Writing the literature	October, 2021
5	Writing the proposal	November, 2021
6	Typing the proposal	December, 2021

7	Submission of the Report	January, 2022

Appendix 3: Budget

S/N	ITEM	QUANTITY	PRICE @	TOTAL
1	Transport	5 times	4000	20000
2	Ream of papers	1	15000	15000
3	Calculator	1	15000	15000
4	Pens	5	500	2500
5	Ruler	1	500	500
7	Typing	26 pages	800	20800
8	Printing	26 pages	200	5200
9	Binding	1 copy	3000	6000
Total				**85,000**