

Effects Of Soil Erosion On Agricultural Productivity In Uganda. A case Study Bwanswa Sub County, Kabale District.

Aharikundira Anthony¹, Mayanja Moses²

1,2 Metropolitan International University

Abstract

The study aimed at the effects of soil erosion on agricultural productivity in Uganda with a case Study of Bwanswa Sub County, Kabale District and it was guided by the following objectives; To find out the effects of soil erosion in Kabale district Kihumuro hills, to find out the forms of soil erosion in Kabale district, Kihumuro hills and to find out the main causes of soil erosion Kabale district, Kihumuro hills. A correlation research design was used in this study to enable the researcher to find out the relationship between the studies effects of soil erosion on agricultural production. The study population consisted of all 80 residents of Bwanswa Sub County these people were selected using interview guide and questionnaire. These were chosen because they are expected to have sufficient knowledge about the study problem. From the findings, it was evidenced by 56.7% of the respondents agreed that there was topography, 53.5 % of the respondents agreed that there was climatic conditions that led to soil erosion, 44.5% of the respondents agreed that there was thick vegetation, 57.7% of the respondents revealed that excessive cutting of trees was also a causative of soil erosion 76.9 of the respondents disagreed with the statement of monoculture, 88.4 % of the respondents agreed that Bulambuli district experience soil erosion through mining. Local people should adapt and be encouraged to practice crop rotation and mulching. Through these practices, soil texture and nutrients will be kept intact and damages that would occur from rainfall and wind are avoided hence good agricultural production. People should all be encouraged to plant trees like eucalyptus that tend to grow up in a period of short time. This will enable the local people to stop abusing forests around especially as fuel for their bricks and tobacco cure. Local government should set some bye-laws that can enable people both in town and rural to plant some trees before they start construction work.

Keywords: Soil Erosion, Agricultural and Productivity

Background of the Study

According to (Kazaara et al., 2023) Soil erosion simply refers to the removal or wearing away of the soil surface by agents such as wind, running water and glacier, beet. TOILET. (2020). Soil erosion was considered a form of soil degradation along with soil compaction, low organic matter content and loss of soil structure, poor internal drainage, salinization and soil acidity problems. However, (Musa et al., 2023) reported in his study that these other forms of soil degradation are serious and contribute to accelerated soil erosion. Barbier (1994) defined the term soil erosion as the removal of topsoil by the combined action of human activities and natural processes at a rate greater than would occur as a result of the natural process alone. In this case, it can therefore be said that any natural process or human activity that wears down the soil surface can be described as a factor of soil erosion. (Grace et al., 2023) formulated in their

Received: 06.03.2024

Accepted: 09.03.2024

Published on: 30.03.2024

research that soil erosion can be a slow process that continues relatively unnoticed, or it can occur at an alarming rate and cause serious loss of topsoil. Soil loss from agricultural land can be reflected in reduced crop production potential, lower surface water quality and impaired drainage. As soil erosion has detrimental effects on agricultural production, a worrisome concern to find strict solutions or curb aspects of soil erosion is rapidly spreading across the country. the African continent and as such many African countries have taken the challenges seriously and started looking for ways to combat this phenomenon (Emmanuel et al., 2023). Currently, many authorities are coordinating and have initiated the development of a database of soil erosion research activities and have produced a set of guidelines for surveying, assessing and monitoring soil erosion, including early warning indicators (F.A.O 2001). (Jimmy et al., 2023), Bwanswa County, Kabale District, the phenomenon of soil erosion is at its peak. This led to poor agricultural production and related problems. Thus, within this framework, the objective of this research is to analyze the effects of soil erosion on agricultural productivity in Uganda. The researcher chooses the study because he will have all the necessary information and the area is favorable for the study. However, the influence of grazing on vegetation development and soil erosion processes is rarely quantified in the literature on this topic (Musa et al., 2023). The specific objectives of the current research will be to determine the effects of soil erosion on land use in Kabale district. The six investigated land uses and vegetation types (cereals, fallow land or short-term abandonment, shrub land or long-term abandonment, regenerating autochthonous vegetation or very long-term abandonment, arable land with Pinus pinaster forest and arable land converted to pasture) represent situations that often found in central and northern Portugal as well as other Mediterranean systems. The main objective was to obtain consistent conclusions for ecosystem management in marginal areas of Portugal. This information on hydrogeomorphic response could be useful as a guide for regional soil conservation planning in the future

Problem statement

Soil erosion can affect agricultural productivity. The main problem is the off-site influence, the movement of sediments and agricultural pollutants into waterways, leading to sedimentation in rivers and disruption of ecosystems (Collins et al., 2023). The on-site effect is directly produced by the loss of soil nutrients. This effect is particularly critical on agricultural land as there is a loss of soil stability, soil quality and structure. Although the issue of soil erosion in relation to agricultural productivity has been explored several times, an inquiry from some residents of Kabale district revealed that knowledge on soil erosion regarding its causes, effects and possible solutions has not been well propagated at the grass roots level. (Allan et al., 2023). Many people in the field have little knowledge of this phenomenon using existing parameters. Moreover, many residents of the district continued to practice activities that lead to soil erosion. It is because of this background that this research has attempted to uncover aspects of soil erosion in the area, particularly in relation to land use activities in the underground of Bwanswa, kabala. district.

Objectives of the study

- To find out the effects of soil erosion in Kabale district Kihumuro hills.

Received: 06.03.2024

Accepted: 09.03.2024

Published on: 30.03.2024

- To find out the forms of soil erosion in Kabale district, Kihumuro hills.
- To find out the main causes of soil erosion kabale district, Kihumuro hills.

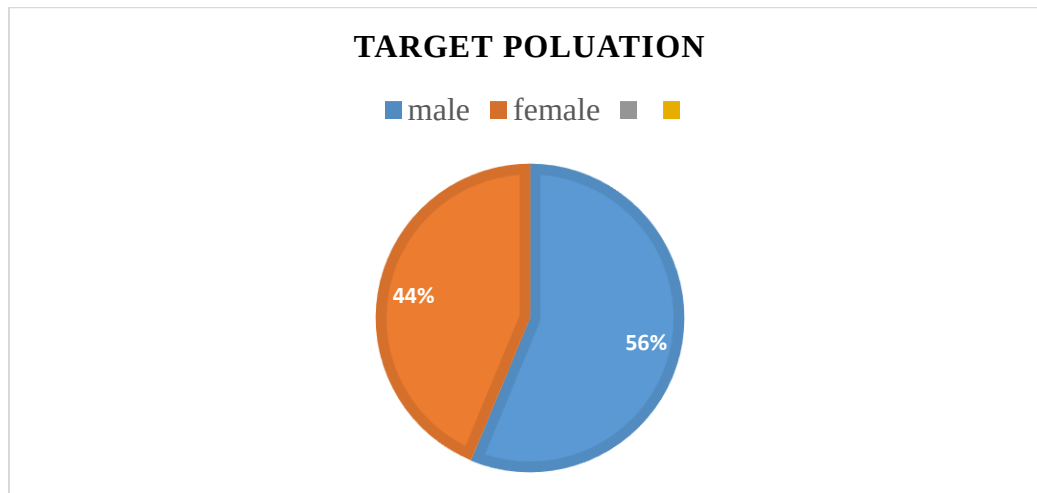
Methodology

This study adopted a correlation research design (Saris and Revilla, 2015). A correlation research design refers to a quantitative research design involves two or more quantitative variables from a similar group of subjects and it tries to establish the relationship between the two variables as to whether they had anything in common (Sekaran, 2003). Theoretically, any 2 quantitative variables can be correlated (Amin, 2005). A correlation research design was used in this study to enable the researcher to find out the relationship between the studies effects of soil erosion on agricultural production (Sekaran, 2003). In addition, the study used a triangulation approach that includes both qualitative and quantitative approaches. Some causes of soil erosion in Bwanswa Sub County are, like deforestation, bush burning land fragmentation, though content may be viewed on websites. For purposes of this study, the study population consisted of all 80 residents of Bwanswa Sub County these people were selected using interview guide and questionnaire. These were chosen because they are expected to have sufficient knowledge about the study problem

Table 1: Categories of the target population.

Particulars	Target population	Percentage (%)
Male	45	56%
Female	35	44%
Total	80	100%

The pie-chart showing the categories of the target population and target response population



The researcher employed purposive sampling on effects of soil erosion on agricultural productivity. Bwanswa sub county people who were equipped with knowledge about the study. This suggested that all the information needed

Received: 06.03.2024

Accepted: 09.03.2024

Published on: 30.03.2024

was got from the people in the sub-county as they are well versed with the area. The researcher selected a total of 80 respondents in the sub-county using questionnaires. This sampled respondent was composed of both men and women of different positions, age and education background. The target groups included the local councils, sub-county administrators, NGO staff, students and farmers in the sub-county. Data was analyzed qualitatively using the following methods; In analyzing quantitative data, the data was sorted as per its allocated codes and will be entered into a statistical package known as Statistical Package for Social Scientists (SPSS) to generate both descriptive and inferential statistics that created the mean, mode and median; the variance, standard deviation, frequencies and percentages (Nelson et al., 2022).

Results

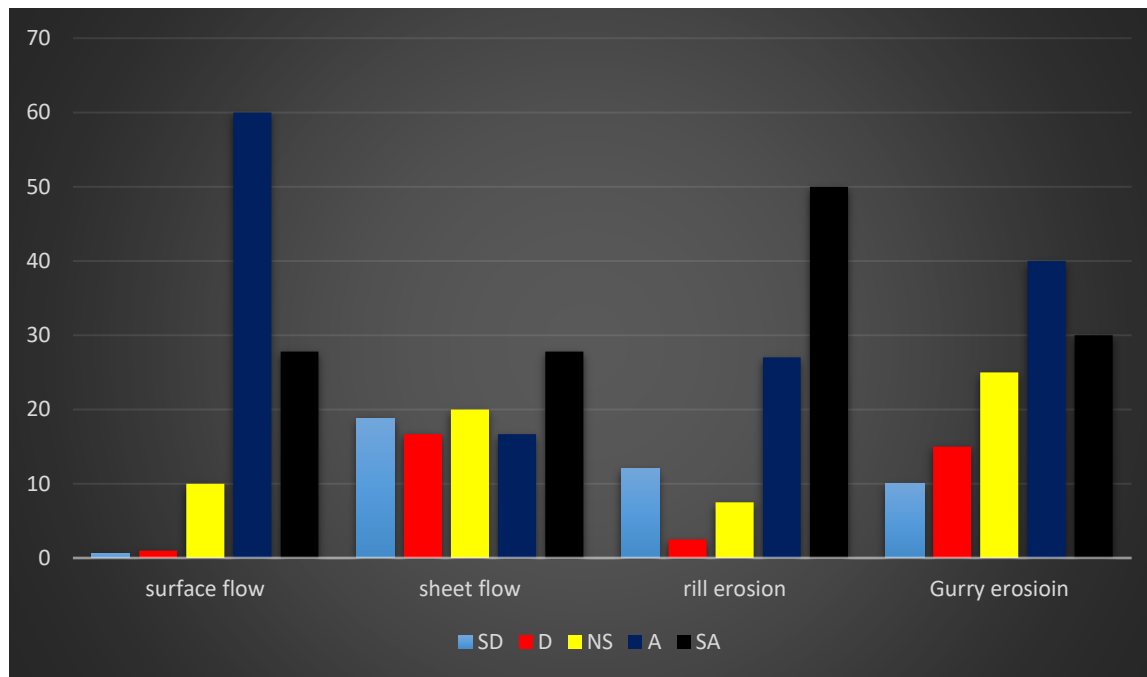
Forms of soil erosion in Bulambula district Bwanswa Sub County.

Table 2: Distribution of the respondents on Forms of soil erosion in Bulambula district Bwanswa Sub County

NO	STATEMENT	SD %	D %	NS %	A %	SA %	TOTAL %
1	Surface flow	0.6	1.0	10.0	60.6	27.8	100
2	Sheet erosion	18.8	16.7	20.0	16.7	27.8	100
3	Rill erosion	12	2.5	7.5	27	50	100
4	gurry erosion	10	15	25	40	30	100

Source primary data 2023

Bar graph 2 shows Distribution of the respondents on the Forms of soil erosion in Bulambula district Bwanswa Sub County



Source primary data 2023

SA-strongly agree, A- agree, NS- not sure, D- disagree, SD- strongly disagree

This is from the fact that: 0.6% of the respondents agreed that there was surface erosion, 1% disagreed, 10% were not sure, 60% agreed, 27.8 % strongly agree. 18.8% strongly disagree with sheet erosion, 16.7 disagreed, 20% not sure, 16.7% agreed, 27.8 % strongly agreed. 18.8 % strongly disagreed that there was sheet erosion, 16.7% disagreed, 20% not sure, 16.7% agreed, and 27.8% strongly disagreed. 12% disagreed that there was rill erosion, 2.5% disagreed, 7.5 not sure, 27% agreed, 50 % strongly agreed. 10% strongly disagreed there was gurry erosion, 15% disagreed, 25% not sure, 40% agreed, 30% strongly agreed.

Table 3: Distribution of the respondents on the causes of soil erosion in Bwansa sub county Kabale district

No.	Statement	SD %	D %	NS %	SA %	A %	TOTAL %
1	Topography	11.1	15.5	16.7	27.8	28.9	100
2	Climate	10.9	13.4	22.2	39.4	14.1	100
3	Thick vegetation	60.6	27.8	10.0	0.6	1.0	100
4	Excessive cutting of trees	18.8	16.7	20.0	16.7	27.8	100
5	Mining	40.6		1.7	13.3	44.4	100
6	Monoculture	3.3	5.0	15.0	45.6	31.3	100

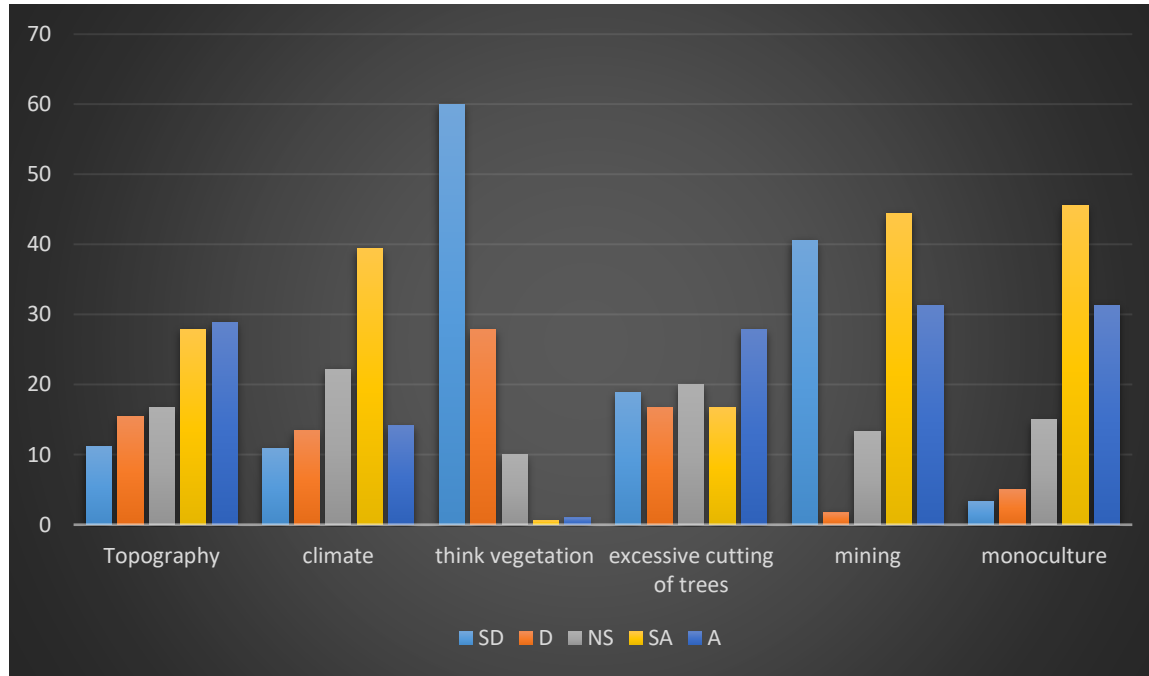
Source; primary data, 2023

Received: 06.03.2024

Accepted: 09.03.2024

Published on: 30.03.2024

Distribution of the respondents on the causes of soil erosion in Bwanswa sub county Kabale district.



Source; primary data, 2023

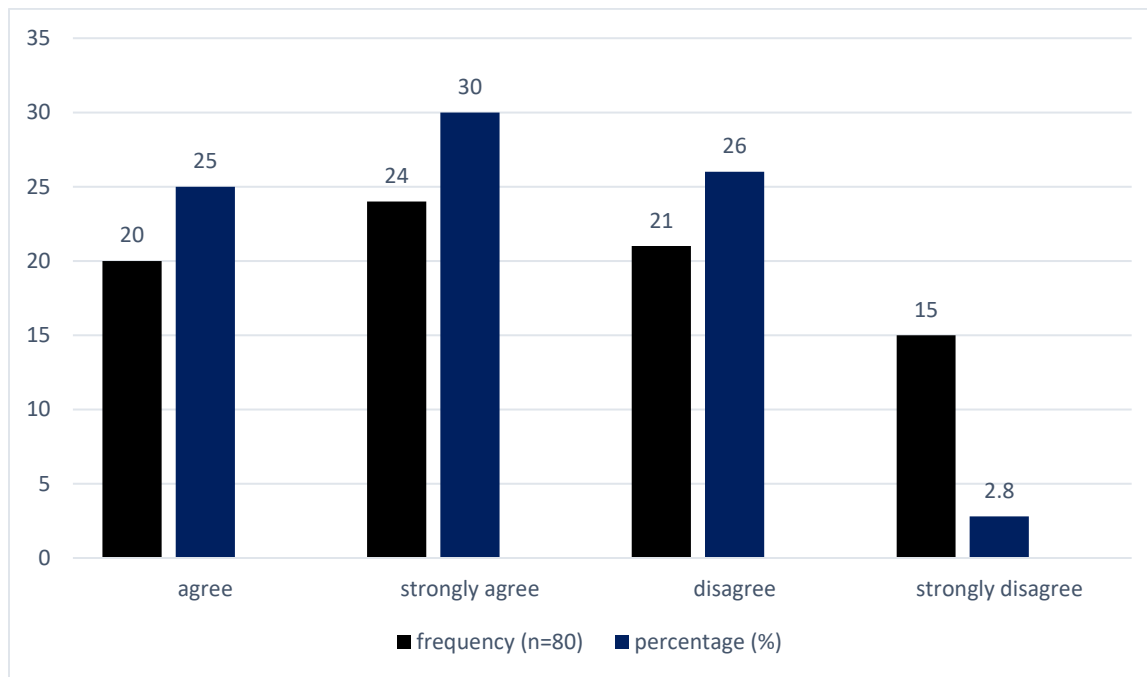
SA-strongly agree, A- agree, NS- not sure, D- disagree, SD- strongly disagree

Table 3 the causes of soil erosion. This is evidenced by 56.7% of the respondents agreed that there was topography, 53.5 % of the respondents agreed that there was climatic conditions that led to soil erosion, 44.5% of the respondents agreed that there was thick vegetation, 57.7% of the respondents revealed that excessive cutting of trees was also a causative of soil erosion 76.9 of the respondents disagreed with the statement of monoculture , 88.4 %of the respondents agreed that Bulambuli district experience soil erosion through mining

Table 4: perception of individual during the research soil erosion in Bwanswa subcounty Kabale district.

Option	Frequency (n=80)	Percentages (%)
Agree	20	25%
Strongly Agree	24	30%
Disagree	21	26%
Strongly disagree	15	18%
Total	80	100

The bar graph shows the effects of soil erosion in Bwanswa subcounty Kabale district.



Source primary data 2023

As shown in **Table 4** above, individuals had varying perception on soil erosion in Bwanswa sub county Kabale district according to the research, 25% of 20 respondents agreed, 30% of 24 respondents strongly agreed representing, 26% of 21 respondents disagreed, and 15 respondents of 18% representing poor perception when they strongly disagreed

Conclusion

A keen observation of analysis of this work draws a conclusion that the phenomenon of soil erosion in Nyadri Sub-County is rampant. Soil erosion in the sub-county manifests itself in different forms. However, the commonest and rampant forms of soil erosion in the sub-county are nil erosion and gully erosion constituting 28 % and 25 % respectively out of the total percentage of soil erosion occurrence in the area. Regarding the major causes of soil erosion in Nyadri Sub-county, it was noted that both natural and human induced activities are responsible for the cause of soil erosion in the Sub-county. However, human induced activities constitute more to the cause of soil erosion (55 %) than natural factors (45 %). The commonest cause of soil erosion in the area was deforestation, being 30 percent of the total percentage. The findings affirm that soil erosion is detrimental to agricultural activities in sense that it depletes the most top and fertile land leaving the soil particles that do not support agriculture, discouraging pasture growth to feed animals hence affecting milk and meat production, encouraging pests and diseases, enabling flooding through its channels that damage crop production (Jowin et al., n.d.), leading to harsh climatic conditions like drought, making crops stunt especially in ditches created by erosion from mining and construction activities. Since the danger of soil erosion to agricultural activities is real, more care to combat the phenomenon should be taken. This suggests

Received: 06.03.2024

Accepted: 09.03.2024

Published on: 30.03.2024

that massive sanitization and campaign regarding the phenomenon should be put in place. Additionally, involvement of different stakeholders in the protection of environment would be important.

Recommendations

To Prevent Further Soil Erosion As a way to prevent further soil erosion from occurring, the researcher recommends that good and appropriate crop farming practices should be put in place. Farming practices such as terracing and contour plough along slopes should be emphasized by those in authority. This will help to stop soil particles from moving down and remain fertile to support agriculture. Furthermore, local people should adapt and be encouraged to practice

crop rotation and mulching. Through these practices, soil texture and nutrients will be kept intact and damages that would occur from rainfall and wind are avoided hence good agricultural production. People should all be encouraged to plant trees like eucalyptus that tend to grow up in a period of short time. This will enable the local people to stop abusing forests around especially as fuel for their bricks and tobacco cure. Local government should set some by-laws that can enable people both in town and rural to plant some trees before they start construction work. This will help to boost tree population in the area hence enhancing climatic condition. Farmers should also be discouraged from participating in some of the activities that are likely to cause disastrous effect on environment. This means that instead of people participating in tobacco growing and brick laying activities, they should be encouraged to grow coffee to earn money they are seeking for. To avoid further loss of soil particles occurring from over grazing, zero grazing should be encouraged among farmers. As ignorance among people regarding causes and effects of soil erosion has led many of people to get involved in destruction of environment, sensitizing the masses about the phenomenon would enable them to act and perform different activities with responsibility and this could help to reduce chances that are likely to endanger environment.

References

- Allan, K., Charles, N., Moses, N., Kazaara, A. G., & Nelson, K. (2023). *The Effect of Operation Wealth Creation on Youth Farmers Development : A Case Study of Labongo Layamo Sub County , Kitgum District*. 7(2), 50–63.
- Collins, A., Kazaara, A. G., & Kazaara, A. I. (2023). *Agricultural Loans and Farmer ' s Livelihood in Uganda a Case Study of Nyakayojo Sub County in Mbarara District*. 7(3), 40–46.
- Emmanuel, B., Richard, K., Kazaara, A. G., Deus, T., Nelson, K., Catherine, M., Benefansi, I., & Brighton, B. (2023). *The Impact Of Rice Growing To The Development Of People In Uganda A Case Study Of Kibimba Sub County-Bugiri District*. 7(2), 62–71.
- Grace, M., Kazaara, A. G., & Kazaara, A. I. (2023). *Factors Associated With Potato Yields ' Variations In*

Received: 06.03.2024

Accepted: 09.03.2024

Published on: 30.03.2024

South Western Of Uganda . Case Study : Kanungu and Kisoro Districts. 7(3), 198–205.

Jimmy, N., Flavia, N., & Nelson, K. (2023). THE EFFECT OF CROP DISEASE OUTBREAKS ON AGRICULTURAL TRADE, A CASE STUDY OF ARINYAPI SUB-COUNTY, ADJUMANI DISTRICT. In *METROPOLITAN JOURNAL OF BUSINESS & ECONOMICS* (Vol. 2).

Jowin, K., Charles, N., & Iumba, A. (n.d.). *IMPACT OF MICRO CREDIT FINACING ON AGRICULTURAL PRODUCTION. ACASE STUDY OF BUNDIBUGYO DISTRICT IN THE WESTERN REGION OF UGANDA.*

Kazaara, A. G., Kazaara, A. I., & Nelson, K. (2023). *Imapcts Of Soil Erosion On Crop Productivity In Uganda Acase Study Of Kibuga Division Butambala District. 7(3), 202–212.*

Musa, M., Moses, M., Ariyo, D., & Kazaara, G. (2023). *IMAPCTS OF SOIL EROSION ON CROP PRODUCTIVITY IN UGANDA ACASE STUDY OF KIBUGA DIVISION BUTAMBALA DISTRICT* (Vol. 2).

Nelson, K., Christopher, F., & Milton, N. (2022). *Teach Yourself Spss and Stata. 6(7), 84–122.*