

An Assessment of the Impact of Urbanization on Agricultural Land Use in Juba City, Central Equatoria State, Republic of South Sudan

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Abstract Urbanization is an expected tendency in the development of human and it has been recognized as one of the crucial element of advancement achieved in science and technology. Juba city like others has experienced a rapid urbanization after the signing of the Comprehensive Peace Agreement (CPA) in 2005 and is responsible for increased demand for land. Consequently, the limited available land in Juba city is associated with loss of arable land, degradation of ecosystems, as well as social changes in the urban populations. Urbanization can significantly change land use types and their associated ecosystem services. In the South Sudanese perspective, and due to the political situation, urban development is taking over agricultural lands, which is the main source for food production and the second backbone of the South Sudanese economy after crude oil. The purpose of this study was to assess the impact of urbanization on agricultural land use in Juba city and to investigate factors that lead to this change. The specific objectives of this research study is to identify and highlight the major factors driving urbanization and the loss of agricultural land use in Juba city and to describe the spatial impacts of urbanization on agriculture by conducting qualitative interviews with the stakeholders in the city. The results revealed that Juba city had increased significantly along with an increase in urban population, a decrease in rural population, and an expansion of the overall urban area as well as loss of agricultural land use immediately after the signing of the CPA. The results agreed with the findings from the qualitative interviews, which supports that the economic situation, demographic factors, politics, planning and policies are the major factors that contribute to the urbanization and the loss of agricultural land use in Juba City.

Keywords: urbanization, agricultural land use, CPA, stakeholders, demographic factors

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1. Introduction

Urbanization is an expected tendency in the development of human and it has been recognized as one of the crucial element of advancement achieved in science and technology. Accordingly, more than half of the world's human population now lives in urban areas, than in rural areas confirming that the world has now entered the urban society age [1]. In 1900, worldwide, there were 6.7 rural dwellers to each urban dweller; now there is less than one and projections suggest close to three urban dwellers to two rural dwellers by 2025 [2]. This has been underpinned by the rapid growth in the world economy and in the proportion of gross world product and of the economically active population working in industry and services (since most industrial and service enterprises are in urban areas). Urbanization brings major changes in demand for

agricultural products both from increases in urban populations and from changes in their diets and demands. It can also bring major challenges for urban and rural food security. Normally, a sustainable city or town sustains the wellbeing of its populace without compromising its ability to maintain and enhance its ecosystem services [3]. Urbanization is defined as the tense presence of human population in a residential and industrial setting and its associated affects [4,5]. Prominently, the urban extent of most metropolitan areas is expanding into adjacent rural landscapes [6,7,8]. It is well known that urbanization usually leads to considerable changes in human society, such as the promotion of economic development, the expansion of an urban area, and an improvement in life's material conditions [9]. On the other hand, urbanization can also leads to many environmental issues and problems, such as climate change [10,11], environmental pollution [12] and loss of agricultural productivity [13,14,15], while also increasing the population's exposure to major risk

factors for disease, especially those linked to the deteriorating environmental conditions [16]. Urbanization is a major environmental problem throughout the world, including South Sudan. In South Sudan, urbanization became obvious in the period following the signing of the Comprehensive Peace Agreement (CPA) in 2011. Societies in South Sudan experienced a short period of economic recovery and growth, which was clearly reflected in the rapid development and expansion of South Sudanese cities and towns. In physical terms cities extended into the surrounding agricultural lands and natural landscapes. The political instability has an impact on existing and future urban expansion trends of South Sudanese cities, which will lead to loss of more agriculture lands.

The city of Juba like others has experienced a rapid urbanization that is responsible for increased demand for land. Consequently, the limited available land in Juba is associated with loss of arable land, degradation of ecosystems, as well as social changes in the urban populations. The current urbanization process in Juba is indicative of planning processes that need considerable attention concerning transformation of societies and sustainable development. Urbanization can significantly change land use types and their associated ecosystem services. In the South Sudanese perspective, and due to the political situation, urban development is taking over agricultural lands, which is the main source for food production and the backbone of the South Sudanese economy. In the South Sudanese context, a prominent feature of this global trend of urbanization is forced displacement triggered by armed conflict, violence, political instability or slow and sudden onset of disaster or a combination of other factors. To accommodate the natural growth and the influx of people from other areas, more and more agriculture land is being converted to non-agriculture uses. As a result, research on forces driving urban expansion on agricultural lands is needed. Despite the current trend in urbanization, there has been limited comprehensive documentation on the impact of urbanization on agricultural land use in South Sudan in general and Juba in particular. Therefore, a study to document the impacts of urbanization on agricultural land use with the existence of unstable political conditions is needed. Thus, the purpose of this study was to assess the impact of urbanization on agricultural land use in Juba city and to investigate factors that lead to this change. The specific objectives of this research study is to identify and highlight the major factors driving urbanization and the loss of agricultural land in Juba city after the signing of the Comprehensive Peace Agreement in 2005, to describe the spatial impacts of urbanization on agriculture by conducting qualitative interviews with the stakeholders in the city, to highlight the importance of agricultural land uses for the local society and to provide suggestions and recommendations for urban laws, policies, and plans that emphasize sustainable agricultural land conservation and management.

1.1. Urbanization and the Loss of Agricultural Land

Urban expansion inevitably covers some agricultural land while changes in land values and land markets

around Juba city often result in some land left vacant as the owners anticipate the gains they will make from selling it or using it for non-agricultural uses. In most urban areas in low- and middle-income nations, the absence of any land-use plan or strategic planning framework to guide land-use changes means that urban areas expand haphazardly. This expansion is determined by where different households, enterprises and public sector activities locate and build, legally or illegally. In most instances, there is little effective control over land-use conversions from agriculture to non-agricultural uses. There may be regulations that are meant to limit this but these are often avoided by politicians and real estate interests [17]. This unregulated physical expansion brings many serious consequences. These include the segregation of low-income groups in illegal settlements on the worst-located and the most hazardous sites (they would not be permitted to settle on better-located and safer sites) and a patchwork of high and low-density land uses to which it is both expensive and difficult to provide infrastructure and services. However, the loss of agricultural land to the spatial expansion of urban areas is often exaggerated; one study suggested that only West Europe among the world's regions has more than 1 per cent of its land area as urban [18]. In addition, a declining proportion of land used for agriculture around a city may be accompanied by more intensive production for land that remains in agriculture [19] or intensive urban agriculture on land not classified as agricultural. In most locations, governments could and should restrict the loss of agricultural land to urban expansion. But this can also bring serious social consequences if it pushes up land and house prices and reduces still further the proportion of households that can afford a legal housingplot with infrastructure.

2. The Study Area

Juba is the capital and the largest city of the Republic of South Sudan. It also serves as the capital of Jubek sate, one of the 32 states of South Sudan. It is a river port on the Bahr Al-Jabal (Mountain Nile), about 87 miles (140km) south of Bor. Juba capital has an area of 52 km² (20 sq. miles), and the metropolitan area 336 km² (130 sq. miles). Juba is a commercial center for agricultural products produced in the surrounding area. It is a southern station for river traffic in South Sudan, and it is a highway hub with roads radiating into Uganda, Kenya, and the Democratic Republic of Congo. It has an international airport and several branch banks. The town is the headquarters of the University of Juba, founded in 1975 (Encyclopedia Britannica, Amy McKenna). Prior to March 2011, the area administered by Juba City Council was divided into Juba, Kator and Munuki Payam which are now referred to as Town Blocks. The City is managed by the Juba City Council under Mayoral Leadership. It is now a standalone subdivision of Juba County, founded in 1922, of which it is the county seat. Juba has a tropical wet and dry climate (Köppen: AW) and as it lies near the equator, temperatures are hot year-round. Besides little rain, rain falls from November to March, which is also the time of the year with the hottest maximum temperatures reaching 38°C (100°F) in February. From April to October,

more than 100 millimeters (3.9 inch) of rain falls per month. The annual total precipitation is nearly 1000 mm (39 inch) (World Meteorological Organization, UN 2013). Juba's population was 163,442 in 2005. Based on analysis of aerial photos, the best estimate of some donors working in Juba calculated the 2006 population at approximately 250,000. The 5th Sudan Population and Housing Census took place in April/May 2008, stating the population of Juba County to be 372,413 (the majority residing in Juba City, which dominates the county), but the results were rejected by the Autonomous Government of Southern Sudan. Juba is developing very rapidly due to oil money and the Chinese coming for work and development. In 2011, the population of the city of Juba is estimated at approximately 372,410, but may potentially be more. As of 2013, the city's population was growing at a rate of 4.23%.

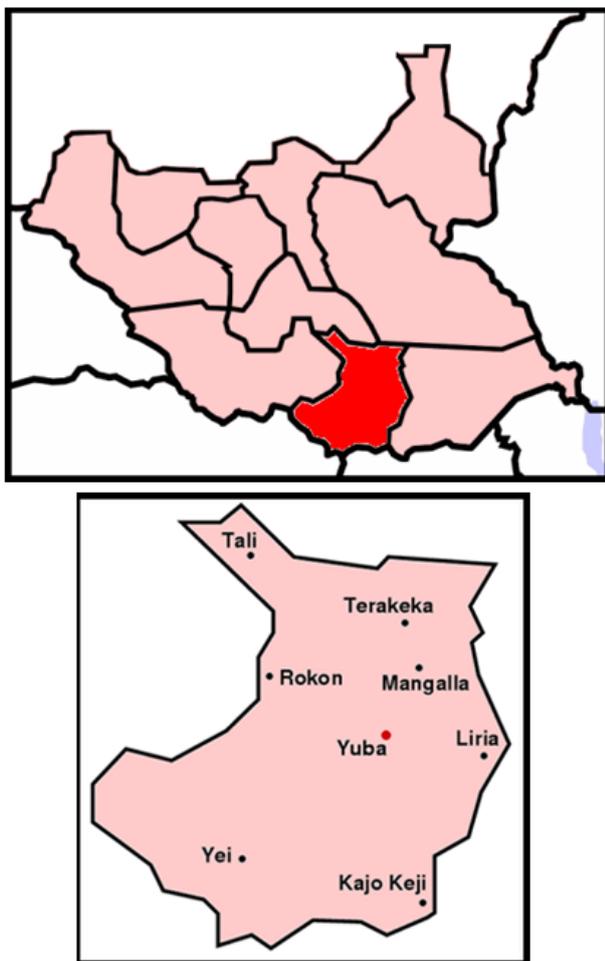


Figure 1. Location of Juba, Central Equatoria State

2. Materials and Methods

2.1. Sources of Data

This study used combination of participatory, qualitative and quantitative method to collect the necessary data. The sources of data are divided in to two categories; the primary data through interviews, questionnaire and observations and the secondary data which were collected from relevant books, journals, conferences, and previous research papers.

2.2. Sampling Size

The sample size taken for this study was 30 respondents who were expected to provide representative information and view of all other people in Juba County. Approach to study was based largely on primary data collection from field visits.

2.3. Sample Design and Analysis

The sample design used for the collection of the data was randomized system and the data was analyzed by the use of excel sheets to produce results which were then presented in tables, graphs, and charts.

3. Results and Discussions

According to the case study, the data were classified into categories that identify the study subjects and the results were structured based on the research questions obtained from the questionnaires responses.

3.1. Demographic Information

The majority of the participants were males (73%) compared to females (27%). The women refused to respond to the questionnaire due to the culture of male dominance and Males are viewed as the heads of household and family representatives. Some independent women have though responded to the questionnaires (Table 1). More than half of the participants (53%) were aged between 20-35 years, 30% were aged between 36-51 years, and 17% were aged between 52-67 years. There was no participant of either below 20 years or 68 years above (Figure 2). Only 30% of the participants had attained university education, 33% had attained secondary education, 10 % had attained primary education and 27% had attained vocational education, mostly in agriculture, with a few in other fields (Table 2).

Less than half (33%) of the participants interviewed had lived in Juba for more than 10 years, (27%) had lived between 7-9 years, (20%) had lived between 4-6 years and another (20%) had lived for less than 3 years. These participants interviewed came from different parts of South Sudan and neighboring countries such as Kenya and Uganda (Table 3).

Table 1. Sex (Gender) of the participants

Sex (Gender) of Participant	Frequency	Percentage (%)
Male	22	73%
Female	08	27%
Total	30	100%

Source: Fieldwork (2019).

Table 2. Education level of the participants

Education Level	Frequency	Percentage (%)
Secondary	10	33%
University	09	30%
Others (vocational)	08	27%
Primary	03	10%
Total	30	100%

Source: Fieldwork (2019).

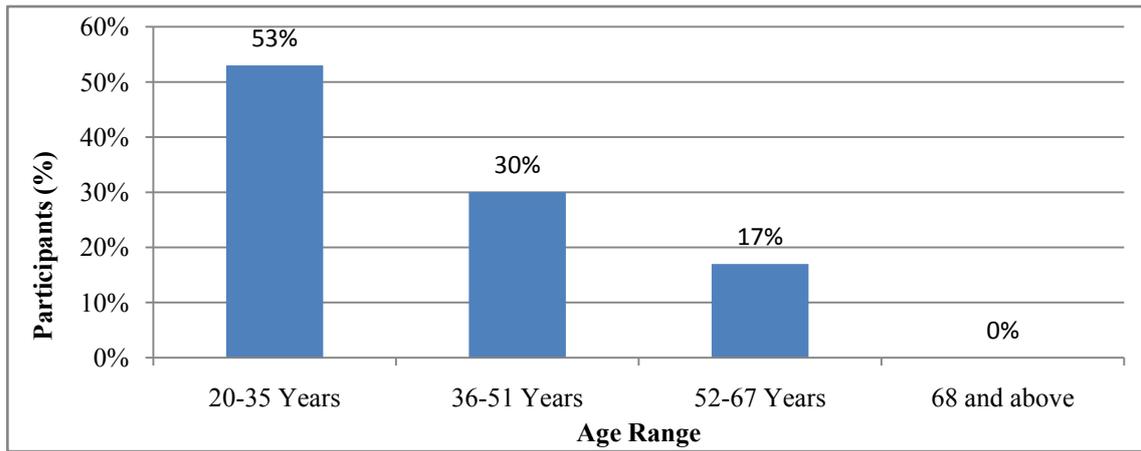


Figure 2. Age of participants (Source: Fieldwork (2019))

Table 3. Duration lived in Juba

Years	Frequency	Percentage (%)
10-above	10	33%
7-9 Years	08	27%
4-6 Years	06	20%
Less than 3 Years	06	20%
Total	30	100%

Source: Fieldwork (2019).

3.2. Factors that Contribute to Loss of Agricultural Lands

3.2.1. Ownership of Land, Size and Types of Crop Grown in Juba

More than half (70%) of the participants interviewed owned the land and only (30%) of the participants do rent the land for farming. Most of those who owned the land are the indigenous people of Juba (Bari tribe) with a few who bought from the local authorities. Those who rent the land are mostly foreigners and Internally Displaced Persons (IDPs) (Table 4). About (27%) of the participants interviewed had farms of 1 acre, (33%) of the participants had farms ranged between 2-3 acres, (13%) had farms ranged between 4-5 acres, and also (27%) had farms sizes that they could not be estimated in acres but its less than 1

acre (Table 5). From the study, (60%) of the participants interviewed grow vegetable crops on their farms such as tomatoes, cabbages, okra, egg plants, dodo, sukumawiki, etc., (33%) grow staple crops such as cassava, maize, groundnuts, potatoes, etc., (2%) grow fruit trees such as bananas, mangoes, lemons, oranges, guava, jack fruits, etc. and none of those interviewed grows cash crops (Figure 3).

Table 4. Ownership of the land

Land Ownership Status	Frequency	Percentage (%)
Owned the land	21	70%
Rent the land (temporary)	09	30%
Total	30	100%

Source: Fieldwork (2019).

Table 5. Average size of farms of the participant

Size of farms	Frequency	Percentage (%)
2-3 acres	10	33%
1 acre	08	27%
Other sizes	08	27%
4-5 acres	04	13%
Total	30	100%

Source: Fieldwork (2019).

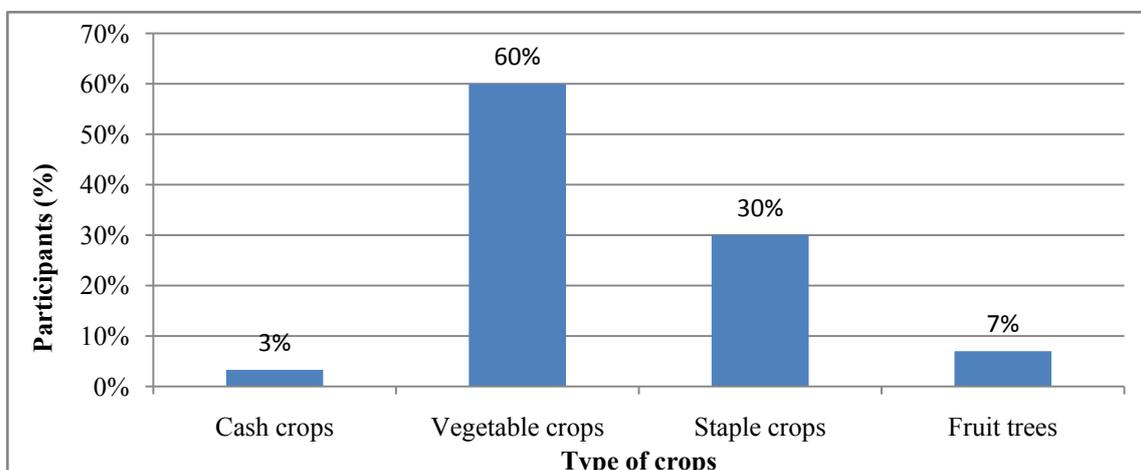


Figure 3. Types of crops grown by the farmers (Source: Fieldwork (2019))

3.2.2. Urbanization Factor

Urbanization is arguably the most dramatic form of human social progress. Even though urbanization occurs throughout South Sudan, it is especially prevalent in Juba City. Urbanization is normally calculated by the percentage of population living in urban areas [20], a massive growth in urban infrastructure and economy of a city [21]. This view also applies to Juba City, for which we analyzed the spatiotemporal processes leading to urbanization and its change over time.

Participants were asked whether they think rural-urban migration could lead to urbanization. About (80%) of the participants interviewed said 'Yes' and only (20%) of the participants said 'No' (Table 6). From those who responded 'Yes', (83%) of the participants gave the reason that rural-urban migration increases the population of the people living in the urban areas thus sparking the need for more land to settle and hence reduces agricultural land, (17%) of the participants said it would lead to development of slums while (0%) gave no reasons (Table 7). Participants were asked to rate whether urbanization could lead to loss of agriculture land. About (53%) of them agreed, (47%) of them strongly agreed and only (7%) of them disagreed (Table 8)

Table 6. Rural-urban migration lead to urbanization

Selection	Frequency	Percentage (%)
Yes	24	80%
No	06	20%
Total	30	100%

Source: Fieldwork (2019).

Table 7. Reasons why rural-urban migration lead to urbanization

Reason	Frequency	Percentage (%)
Increase urban population	20	83%
Leads to slums	04	17%
Others	00	00%
Total	24	100%

Source: Fieldwork (2019).

Table 8. Participants were asked if urbanization leads to loss of agriculture land

Selection	Frequency	Percentage (%)
Agree	16	53%
Strongly agree	14	47%
Disagree	2	07%
Total	30	100%

Source: Fieldwork (2019).

3.2.3. Political Factors

Farmers were asked on the effect of political situation on agricultural production. About (43%) of the participants interviewed said that bad political situation resulted in displacement of farmers from their areas, (30%) of them believed it caused insecurity and lead to loss of tools, (17%) said it made implementation of laws difficult, in addition derails implementation of agricultural

plans and only (10%) of them held that it lead to low supply of funds to the agricultural sector (Table 9).

Farmers were also asked what they think the local government has if there is change in the political situation. About (53%) of them said there is need to improve security and increase agricultural funding which is a priority according to the majority of the participants, (30%) of them said there is need to set laws to protect agricultural land and only (17%) of them said consider agriculture inclusively in plans and agendas (Table 10).

Table 9. Effects of political situation on agriculture production

Effects of political situation	Frequency	Percentage (%)
Displacement of people	13	43%
Insecurity and loss of tools	09	30%
Derails implementation of laws	05	17%
Low fund in agriculture sector	03	10%
Total	30	100%

Source: Fieldwork (2019).

Table 10. Action scenarios the government have if there is change in political situation

Action scenarios	Frequency	Percentage (%)
Improve security and increase agriculture funding	16	53%
Set laws to protect agriculture land	09	30%
Hold agriculture inclusive in plans and agendas	05	17%
Total	30	100%

Source: Fieldwork (2019).

Farmers where asked on the effect on imported agricultural products on their daily life. About (70%) of the participants said imported agricultural products such as cabbage, tomatoes, bananas, oranges, etc. affects them as it created competition in the market. They recommended the regulation of agricultural products importation and the price of imported agricultural products to minimize competition with the local producers. About (23%) of the participants said imported agriculture products have no effects on them because their agricultural production is in small scale and (7%) of the participants do not know whether imported agricultural products have effect on their local products or not (Table 11).

Table 11. Farmers were also asked whether imported agricultural products affect them

Effects of agricultural imports on local production	Frequency	Percentage (%)
Yes	21	70%
No	07	23%
Do not know	02	07%
Total	30	100%

Source: Fieldwork (2019).

Participants were asked to rate the price of land in their area. About (63%) of them estimated the price to be above

SSP 1,000,000/hectare; (30%) of them estimated the land price to be between SSP 900,000 - SSP 1,000,000; (7%) of them ranged from SSP 800,000- SSP 900,000 and none accepted that the land price could be less than SSP 800,000 (Table 12). Participants were asked whether they would sell their land because of poor economic situation. About (97%) of them said they would not sell their land but would like to protect it for agriculture but (3%) said they would only sell their land on condition.

Table 12. Farmers were asked to rate how much the price of land is in their area

Estimated Land Price in SSP/hect	Frequency	Percentage (%)
Above 1,000,000	19	63%
900,000-1,000,000	09	30%
800,000-900,000	02	07%
Below 800,000	00	00%
Total	30	100%

Source: Fieldwork (2019).

3.2.4. Farmers' Socioeconomic Condition

Participants were asked about their main sources of income. About (63%) of them rely on agriculture as their main sources of income, while (37%) of them rely on other sources of income (Table 13).

Farmers were also asked whether they get enough money from agriculture. About (27%) of them said they get enough money from agriculture to cover their basic needs only, while (73%) of them said they do not get enough money from agriculture to cover their basic needs (Table 14).

Table 13. Farmers' main source of income

Source of income	Frequency	Percentage (%)
Agriculture	19	63%
Others	11	37%
Total	30	100%

Source: Fieldwork (2019).

Table 14. Farmers were also asked whether they get enough money from agriculture

Selection	Frequency	Percentage (%)
No	22	73%
Yes	08	27%
Total	30	100%

Source: Fieldwork (2019).

Participants were asked whether they receive subsidy (support) from the government or organizations. About 67% of the participants said they received support such as seeds, watering cans from FAO, and urban agriculture trainings carried out by World Vision South Sudan, while 33% of the participants said that they have not received any support even when they were faced by natural disasters like drought and poor rainfall (Table 15).

Furthermore, participants were asked about the requirements they need for urban agriculture. About (40%) of them need seeds and fertilizers, 20% of them need grants and subsidies. Insurance against disasters, trainings and others (security), tools and equipment had 7%, 7% and 10%, 19% respectively (Figure 4).

Furthermore, participants were also asked whether the prices of agricultural supplies affect agricultural production. About (57%) of the participants said high prices of agricultural inputs leads to high cost of production, (23%) of them said high prices of agricultural inputs would result in low profits and (20%) of them said the price of agricultural supplies has no effect on agriculture production (Table 16).

Table 15. Provision of subsidy (support) by the government or organizations

Selection	Frequency	Percentage (%)
Yes	20	67%
No	10	33%
Total	30	100%

Source: Fieldwork (2019).

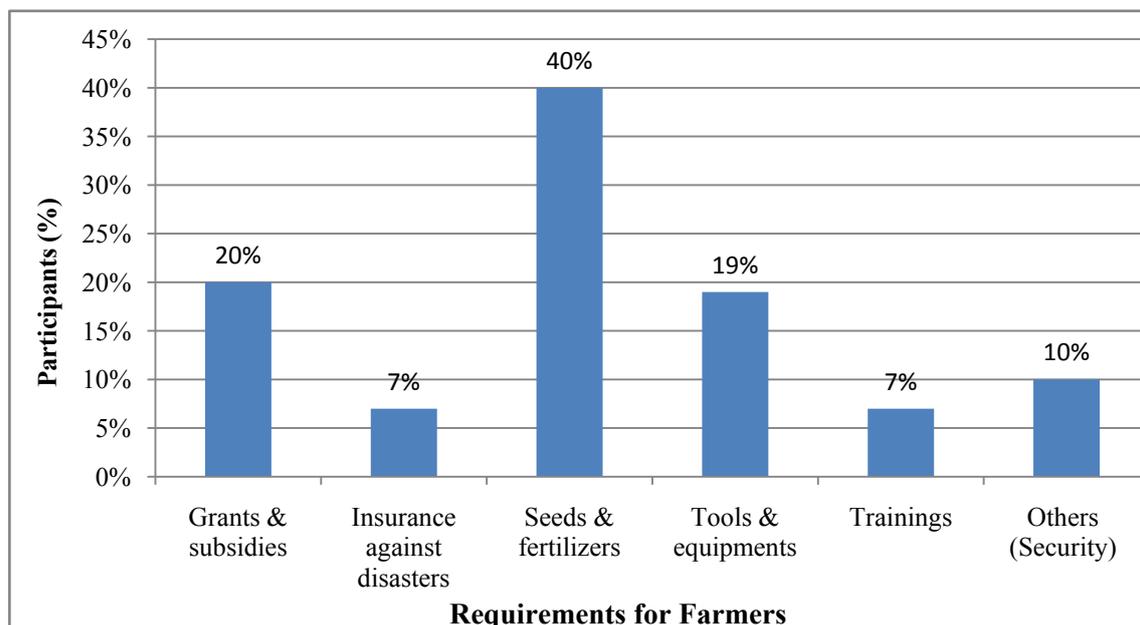


Figure 4. Farmers' requirements to support agriculture sector (Source: Fieldwork (2019))

Table 16. How the prices of agricultural supplies affect agricultural production

Effects of agricultural supply prices on agric. production	Frequency	Percentage (%)
High cost of production	17	57%
Low profits	07	23%
No effects	06	20%
Total	30	100%

Source: Fieldwork (2019).

Participants were asked about how they take decision of what to plant and how much to plant. About (87%) of the participants make personal decision on what to plant and how much to plant, 10% of the participants said they received some instructions from agricultural NGOs and companies, (10%) received instruction from the agricultural cooperatives and none received instruction from the government on what to plant and how much to plant (Table 17).

Further, the participants were also asked about how they sell their agricultural products. About (63%) of the participants sell their products by themselves directly in the local market, (37%) of them said they do not sell their products because they grow only for subsistence. The government and the cooperatives have no role in selling farmers' products (Table 18).

Table 17. How farmers take decision of what to plant and how much to plant

Source of instruction	Frequency	Percentage (%)
Personal decision	26	87%
NGOs and company instruction	02	10%
Agriculture cooperative instruction	02	10%
Government instruction	00	00%
Total	30	100%

Source: Fieldwork (2019).

Table 18. Participants response to how they sell their agricultural products

Variables	Frequency	Percentage (%)
Self-marketing	19	63%
Do not sell my products	11	37%
Through agriculture cooperatives	00	00%
Through government	00	00%
Total	30	100%

Source: Fieldwork (2019).

3.2.5. Land Productivity Factor

Participants were asked whether they want to use their land for agriculture in the next 5-10 years. About (70%) of them responded 'Yes' because they consider agriculture as crucial and wants to protect the land for their future children, while (30%) of them responded 'No' because of urbanization effect (Table 19).

Further, participants were also asked, 'what could be the effect of constructing on the available agriculture land? About (80%) of them said it would lessen area for

cultivation, while (20%) of them said it would make people loss interest in urban agriculture (Table 20).

Table 19. Farmers' plan to use their land for agriculture in the next 5-10 years

Variables	Frequency	Percentage (%)
Yes	21	70%
No	09	30%
Total	30	100%

Source: Fieldwork (2019).

Table 20. Effect of constructing on the available agriculture land

Variables	Frequency	Percentage (%)
Less area for cultivation	24	80%
Loss of interest in agriculture	06	20%
Total	30	100%

Source: Fieldwork (2019).

The famers were asked on the problems that farmers are facing in managing their agricultural land. About (40%) said political situation makes it difficult to manage their land very well as there is less hope that you may profit from it and if there was to be good political situation, they would have been fully supported, (30%) said the land became less productive, the output is very small and they could not buy expensive fertilizers to improve its fertility, (25%) of them said there is no support being given to them and (5%) said there is no profit in urban agriculture, thus making better land management difficult (Table 21).

Participants were also asked whether agricultural supplies such as fertilizers and seeds have impacts on land production. About (70%) said agricultural supplies would reduce their cost of production, (23%) said it would increase the yield of their land and (7%) said it maintains the fertility of the soil, and there is no negative impact of agricultural supplies on them according to the interviewed participants (Table 22).

Table 21. Problems that farmers are facing in managing their agricultural land

Variables	Frequency	Percentage (%)
Political situation (factor)	19	40%
Less productive land	11	30%
No support	00	25%
Less profit	00	05%
Total	30	100%

Source: Fieldwork (2019).

Table 22. Impacts of agricultural supplies on land production

Variables	Frequency	Percentage (%)
Reduce cost of production	19	70%
Increase yield per area	11	23%
Maintains soil fertility	00	07%
Others	00	00%
Total	30	100%

Source: Fieldwork (2019)

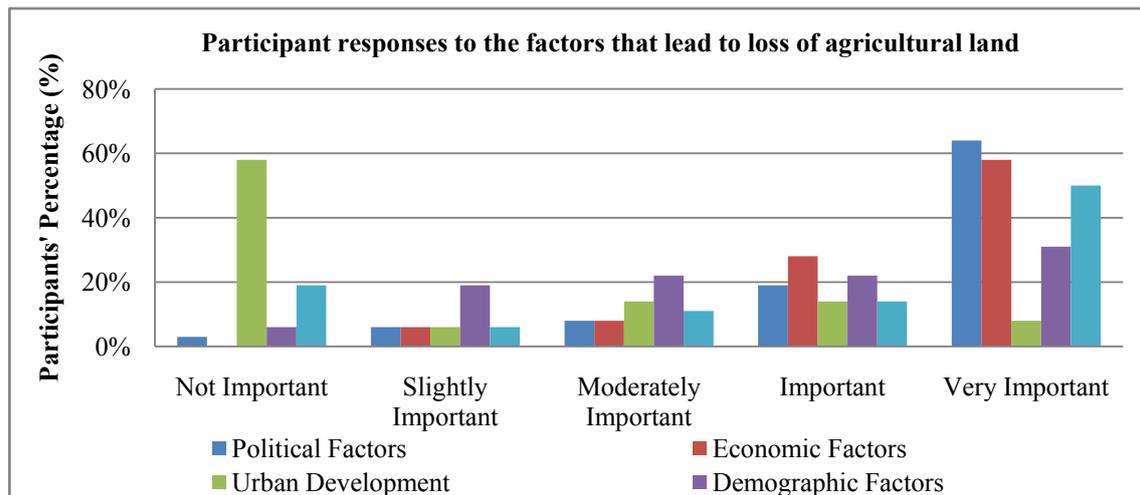


Figure 5. Participant responses to the factors that lead to loss of agricultural land (Source: Fieldwork (2019))

3.2.6. General Questions to the Study Participants

At the end of each interview, the 36 participants of this study were asked to fill out a questionnaire. The questionnaire contains questions pertaining to the factors that may have a direct effect on the loss of agricultural land in Juba. The participants were asked to rank those factors from 1 to 5, where 1 is the least important and 5 is the most important. Figure 5 shows a histogram of the participant responses. The results highlighted that the political, economic and policy and planning factors are considered the most important factors, with 64%, 58% and 50%, respectively. While, the urban development is considered as not important factor with only 8% of the participants consider it very important.

Further, the participants were asked to rank the factors that contribute to the sale of agricultural lands for urban uses. The result pertaining to the participant's responses are presented in (Table 23). The following observations were drawn:

a) Poor economic situation of the farmers resulting from low products prices, lack of support and

guidance and competition from foreign/ imported agriculture products play an important role in losing the agricultural lands for urban uses as more than 50% of the interviewed participants considered these factors important and very important.

- b) Poor planning policy, interest in working in agriculture, land prices, scarcity of water, land fragmentation and increase in population are also significant factors.
- c) Interestingly, participants consider lack of financial support for agricultural activities and lack of laws to protect the agricultural lands the most important factors that led to agricultural land loss with 80% and 73% respectively.
- d) At the same time, factors such as dividing of land to Class 1, 2 and 3 areas, increase in population and low level of farmers' education were considered as minor factors. With 42%, 47% and 44% respectively of the participants consider these factors not important.

Table 23. Factors leading to loss of agricultural lands to urban uses in Juba

Factors standing behind the changing the agricultural land to urban areas	Not Important (%)	Slightly Important (%)	Moderately Important (%)	Important (%)	Very Important (%)	Combined Important and Very Important (%)
Poor farmers' income comparing with other jobs	6%	8%	22%	25%	39%	64%
The price of the land	8%	14%	25%	28%	25%	53%
Low level of education	44%	06%	11%	25%	14%	39%
Interest in working in agriculture sector	8%	8%	17%	39%	28%	67%
Increase in population	47%	8%	6%	14%	25%	39%
Population migration to the city	0%	14%	25%	22%	39%	61%
Low products prices	8%	8%	28%	28%	28%	56%
Scarcity of water	0%	14%	31%	22%	33%	53%
The dividing of land to Class 1, 2 and 3 areas	42%	25%	19%	6%	8%	14%
Lack of financial support for the agricultural activities	0%	6%	14%	25%	55%	80%
Competition from imported/foreign products	6%	14%	25%	22%	33%	55%
Poor planning policy	22%	6%	6%	22%	44%	66%
Lack of guidance	6%	14%	22%	25%	33%	58%
Lack of effective planning law that protect the agricultural land	6%	6%	11%	33%	44%	73%
Size of land/ land fragmentation	6%	11%	19%	33%	31%	64%

Source: Fieldwork (2019).

4. Conclusions

Juba city is facing rapid urbanization at the cost of agricultural lands, especially in the northern side of the city. This expansion is due to limited land availability, migration to the city, and natural population growth. The weak planning system especially regarding agricultural issues played a critical role in the loss of the agricultural lands and the uncontrolled urban expansion in the city. This study found that there is a lack of communications and collaborations between the different planning departments and organizations as well as lack of consideration of the agricultural organizations' role in the planning process. The results of the general questions agreed with the findings from the qualitative interviews, which supports that the economic situation, politics, planning and policies are the major factors that contribute to the urbanization and the loss of agricultural lands in Juba. Several actions and strategies shall be implemented and enforced at the local and national level in order to prevent the loss of agricultural lands and sustain their uses. It is very important to integrate agriculture land use and activity in the sustainable urban development process, especially in the Juba's urban environments because the population in this city is living under threats and political instability conditions. To save agricultural land, the local government and the planning departments should review, update and apply land use policies and regulations related to urbanization to fit the current situation and the development obstacles' they are facing. The government should increase its support to farmers to improve their standard of living and their economic conditions by initiating a loan and support system for the conservation and management of agricultural lands. The government should work to increase the percentage of landholders whose main occupation is agriculture by preventing the fragmentation of agricultural holdings area by finding laws and legislation to prevent fragmentation of agricultural holdings. Managing the urbanization carefully may avoid serious environmental problems.

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