
**ESTABLISHING THE INFLUENCE OF ROAD NETWORK ON THE DEVELOPMENT OF
AGRICULTURAL ACTIVITIES IN UGANDA,
A CASE STUDY OF BUHEHE DISTRICT**

1 Bwire Nelson, 2 Dr Arinaitwe Julius

1 Metropolitan International University, 2 Lecturer Metropolitan International
University

Abstract

The study aimed at establishing the influence of road network on the development of agricultural activities in Uganda with a case study of Buhehe district and it was guided by the following objectives; to examine the factors hindering agricultural activities in Busia district, to assess the nature of financial and government support which can be rendered to support farmers in Busia district and to analyze the challenges encountered by farmers when starting agribusinesses in Busia district. Although all the farmers wish to expand their market, only 66.7% of farmers supported the notion of forming partnerships with other people and entrepreneurs. Due to various reasons, a total of 33.3% farmers were against the establishment of partnerships. Their reasons vary from bad past experiences with partnerships or co-operatives, to witnessing challenges encountered by others and failure of other partnership initiatives. The study revealed that the small scale-farmers in this region were affected and limited by poor road infrastructure and that access to suitable water for irrigation was far from ideal. As a result, the sector did not perform to its full potential and this hinders economic development. Suitable and appropriate recommendations have been made to address the shortcomings identified in this research.

*Key words: road network and development of agricultural activities***Background of study**

Infrastructure has a huge impact on economic growth. It is one of the fundamental entities that facilitate economic growth and sustainable development. Bhattacharyay, (2010:201) classifies infrastructure into two

categories, namely hard and soft infrastructure. The difference between the hard and soft infrastructure is that hard infrastructure is tangible and relates to structures or facilities that support society and economy; for example: transport, energy, telecommunications and basic services whereas soft infrastructure is non-tangible. Soft infrastructure provides support to the hard infrastructure that is in its development and operation for example, policy, institutional framework, governance mechanisms and social networks.

The classification by Bhattacharyay, (2010:201) was adapted for this research. Bhattacharyay, (2010:201) goes further and takes into consideration the policies and institutional framework, as they guide planning and enable development of infrastructure. The two categories of infrastructure were investigated and discussed in this research and this will make it possible to conduct an evaluation of the impact of infrastructure on agriculture to promote economic growth. According to the United Nations Human Settlement Programme (2011:2) the absence of adequate infrastructure hinders economy development and efforts aimed at reducing poverty in Africa. Identifying infrastructure gaps, and the appropriate responses to these gaps, is critical in overcoming development challenges (UN-NEPAD-OECD Africa policy briefs, 2010:1).

Problem Statement

Many households at Busia district and its surrounding locations (peri-urban areas) participate in subsistence farming and some individuals are small-scale farmers-entrepreneurs. Transportation infrastructure is crucial for these small-scale farmers to succeed in commercial farming. Roads are used by the farmers on a daily basis to access their farms and to transport products to consumers and the market place. The roads to and in the surrounding locations are barely maintained and in rainy seasons the conditions of these roads deteriorate. This study will seek to analyze the effect of road transportation network infrastructure gaps and how do they overcome these challenges.

Research Objectives

The study was guided by the following objectives

- 1. To examine the factors hindering agricultural activities in Busia district*
- 2. To assess the nature of financial and government support which can be rendered to support farmers in Busia district*
- 3. To analyze the challenges encountered by farmers when starting agribusinesses in Busia district*

Research Questions

- 1. What are the factors hindering agricultural activities in Busia district?*
- 2. Discuss the nature of financial and government support which can be rendered to support farmers in Busia district*
- 3. What are the challenges encountered by farmers when starting agribusinesses in Busia district?*

Methodology

Research Design

The study adopted a case study design. The case study design was selected because it was an empirical inquiry that investigated a contemporary phenomenon within its real-life context. The case study design focused on developing an in-depth understanding by to exploring describing and explaining phenomena by an exhaustive study (Ellis & Levy, 2019). The case study design was appropriate for this study because it allowed the use of both quantitative and qualitative data. Quantitative data was the basis for drawing statistical inferences by relating internal agricultural productivity and transport network. Qualitative data supplemented the quantitative data by providing detailed

information in form of statements from interviews for in-depth analysis

Study Population

The population of this study was all 245 farmers who were the farmers from Buhehe sub county. The other ten people were key officials from the district agriculture office. These staff were expected to have the necessary information for the study.

Sample and Selection

The sample size of the study was 133 respondents who was selected from the population of 245 staff using the statistical table of Krejcie and Morgan (1970)

Sampling Techniques and Procedures

The sample was selected using two sampling methods, namely; simple random and purposive sampling. By simple random sampling, each individual was chosen by chance (Oso & Onen, 2019). Simple random sampling was used because it eliminates bias in the findings. With purposive sampling, this was used to select senior staff of the organisation as secondary key respondents to provide in-depth responses for qualitative analysis. The method of purposive sampling was intensity purposive sampling which allowed the researcher to select a small number of rich cases that enable the obtaining of in-depth information (Patton, 2016). Purposive sampling helped in obtaining detailed data for in-depth analysis from ten key officers in the district agriculture office.

Data Analysis

Qualitative Data

The qualitative data collected was coded and grouped according to the study objectives and emerging themes. Analysis was carried through thematic analysis. Thematic analysis ensured that clusters of text with similar meaning were

presented together (Devetak, Glažar & Vogrinc, 2018). This enabled making of comparison between qualitative and quantitative data.

Quantitative Data

Quantitative data was analysed at different levels, namely univariate and bivariate. At univariate level, the data was based on percentages from the frequency tables and descriptive statistics such as the mean. At bivariate level, the dependent variable (DV), organisational performance was correlated and regressed on internal controls the independent variables (IVs). The statistical package for social scientists (SPSS 20.0) was used in the analysing of data.

RESULTS

Infrastructure

Table 1 shows infrastructure to which farmers currently have access, i.e. water, roads, land and health.

Variable	Number	Percentage
Water		
Borehole	4	13.33
Water fetched from river	15	50.0
Water tank	3	10.0
Rain	3	10.0
Community tap	4	13.33
Self-made dam	1	3.33
Roads		
Gravel roads, muddy when raining	11	36.67
Gravel roads	19	63.33
Land		
Residential	11	36.67
Agricultural fields	13	43.33
Residential agricultural fields	6	20.0
Health		
Town	13	43.33
Clinic	17	56.67

Table 1 Distribution of Water, Road, Land and Health

Water

The absence of water poses serious problems for farmers, as 50% of the participants indicated that they derive their water from nearby rivers. On the

other hand, out of 26.66% of participants, half (13.33%) source water from boreholes and the remaining half (13.33%) fetch water from community taps. The source of water for some 3.33% of farmers is a self-made dam. Some 20% of the farmers reported that their main problem is lack of access to water.

Roads

According to the World Bank Report (2004:5), infrastructure such as roads promotes spatial integration, and inadequate access results in fragmented markets. The study area is linked to Port Edward and Flagstaff by a provincial road, the R61, which also links Busia district to Kokstad, which is on the N2. Umoren, Ikurekong, Emmanuel and Udida (2009:53) argue that road infrastructure is essential to enable easy transportation of agricultural produce from rural areas to the markets. Untarred access roads are used by farmers to travel from their farms to the tarred provincial road, and from the provincial road to the urban area and the market place. Some 36.67% of the responding farmers indicated that the gravel access roads used by them are slippery when it rains and this makes it difficult to transport produce from the farm to the market place. Because of this, some farmers are forced to explore and use different modes of transportation for their produce (for example head-carry and the use of cattle/horse carts) to enable them to reach the market place. Pick-up trucks present the easiest and quickest option to transport produce.

Health Services

Human resources are one of the key components in agriculture. For the land to yield the desired or ideal outputs it is important that those working on the farms and in the community at large have access to health facilities, which will promote good health and give the farm a better chance of producing at maximum output. A total of 56.67% of the farmers indicated that they have easy access to health services, as they reside close to local clinics in their communities and need not travel long distances to access health services. On the other hand, 43.33% of the

farmers have to travel to town to access them.

Land

According to the World Bank Report (2008:10), agriculture promotes development and this can be realized in various ways; for example, increasing access to land, water and education. Some 36.67% of the farmers undertake agricultural activities in their residences, whereas 43.33% have agricultural fields. Some 20% of the participants undertake agricultural activities in both residential and agricultural fields. In the previous chapter it was highlighted that Busia is predominantly rural. The Busia district Local Municipality Integrated Development Plan Review (2010/11:103) highlights that some areas in the region still practice traditional land allocations. One of the requirements for an applicant to qualify for or be considered for the awarding of financial support from the municipality, is that he/she must submit a letter from the chief or headman acknowledging that the applicant has land and that indeed has a project.

Challenges Hindering Growth

According to the results in Busia, 36.6% of the farmers reported that their main problem is the scarcity of water, the absence of irrigation schemes and slippery gravel roads when it rains. The World Bank report (2007:119) highlights that the availability of road networks links farmers to local and international markets. The O.R. Tambo District Municipality Integrated Development Plan (IDP) (2010/11:13) points out that community consultation undertaken revealed that access roads in the local municipalities were poorly maintained and some were inaccessible. A total of 33.3% of the participants complained about fencing, electricity and drought. Farmers also require fencing to ward off stray livestock such as goats. For the farmers who require irrigation systems and boreholes, electricity is essential to make this a reality. Though diesel generation is possible, that also adds to the logistical and financial burdens of the farmers.

Financial and Government Support

When the participants started with commercial farming, all the farmers (100%) used their own finances. When asked whether they received government support/assistance, the majority of farmers (76.7%) stated that they are not receiving government support. Seven farmers (23.3%) are receiving government support from either local government and/or the Department of Agriculture (see Table 4.2). These institutions supplied agricultural inputs such as seedlings and fencing, and provided farmer training and support. Some farmers receive support from the Ntinga O.R. Tambo Development Agency, which contributed 50% of the production costs. The agency provided inputs such as fertilizer, seeds and tractors for ploughing and planting. In 2011 the farmers indicated that the tractors were provided late into the season, and as a result the farmers started planting late, resulting in low yields.

Table 2: Distributions of Financing and Government Support

Variable	Number	Percentage
Finance		
Own	30	100.0
Government support		
Yes	7	23.3
No	23	76.7

Local government provides support to farmers both in the form of financial support, and as a facilitator. There are two key programmes in which the municipality provides financial support to the farmers and these are the Income Generating Projects (IGP) and the Anchor Projects.

Taking this, and the problems encountered during maize over-production, into consideration, the municipality encourages diversification of agricultural produce, e.g., planting sunflowers and soya beans. As an incentive to encourage people to diversify, the municipality provides funding to purchase inputs, and this

is partly due to the fact that people are often skeptical to start new ventures, as they are often associated with high risk. The project of planting sunflowers and soybeans is at a trial stage, and if the trial projects succeed, the municipality will increase its target of cultivated land.

Challenges Encountered by Farmers when Starting a Business

The farmers listed a number of challenges that they encountered and these included drought, spoilage and lack of information on planting, which resulted in farmers using traditional techniques. Poor access to infrastructure reduced the opportunities for farmers to optimally produce, operate and interact effectively with the markets and generate maximum profit. The consequences of this also resulted in increased transaction costs and difficulty to penetrate the markets. The absence of equipment, for example tractors, was one of the frequently encountered obstacles by farmers when they initially pursued commercial farming.

According to local government most people in general have resources to undertake agricultural activities for their households, but the challenge arises when one wants to get into commercial farming, often requiring start-up capital.

Employee Recruitment

Figure 2 illustrates whether the business is family-owned and operated, or whether the farmer recruits' employees. The results below show that 18 (60%) of the farmers recruit employees. The recruitment demographics reflect that most farmers tend to recruit mostly females, followed by youth and then adult males. Amongst various reasons females and youth are the most preferred candidates during the recruitment process, is the perception that the youth can do the more labour-intensive work and women are more familiar with gardening and hoeing.

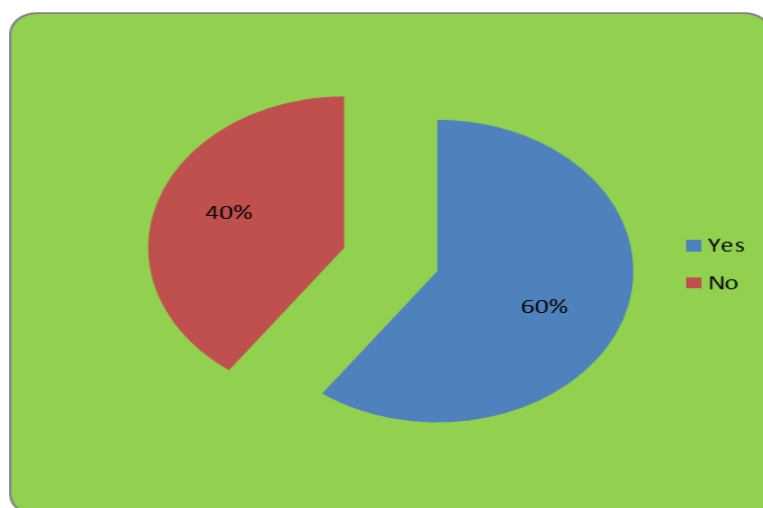


Figure 1: Distribution of the Farmer Recruits

Skills Transfer and Training

According to figure 3 the results reflect that in Busia district 18 farmers (60%) trained newemployees on how to execute their tasks. Some farmers train employees to such an extent that some have been able to venture out and start their own small-scale farming projects. One of the participants sends employees on courses. Twelve of the farmers (40%) do not offer training, but rather recruit people who know how to do the work, whilst 13.33% of the farmers impart knowledge through knowledge-sharing sessions.

In addressing skills development for the farmers, the municipality works closely with the Department of Agriculture. The municipality provides the Department of Agriculture with the list of beneficiaries and the Department provides extension support and training. In some cases, the municipality sources the required training from a service provider.

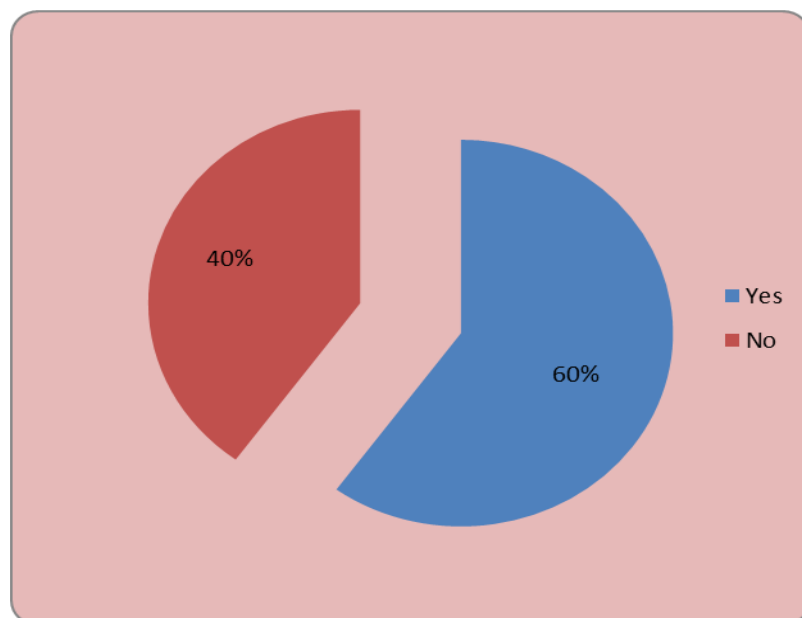


Figure 3: Skills Transfer and Training

Storage Facilities

Access to post-harvest and storage facilities helps to ensure and guarantee the quality of perishable agricultural produce. Post-harvest storage facilities are one of the major challenges facing the farmers. Figure 4 shows that most farmers (76.7% of the participants) do not have access to adequate storage infrastructure and end up harvesting and having to sell their produce on the same day as harvest. Some 23.3% of the farmers have storage rooms without coolers and on hot sunny days there is a higher risk of spoilage of produce.

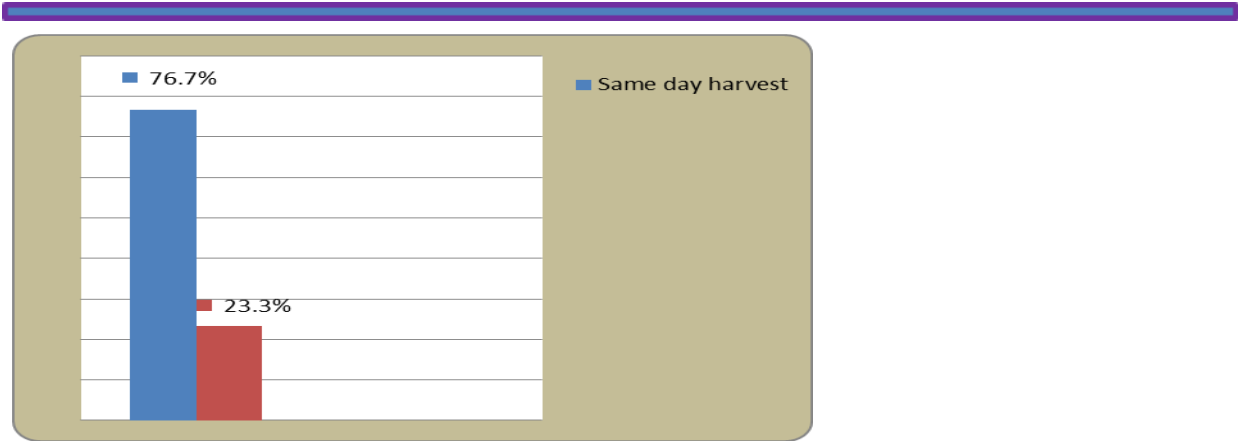


Figure 4: Access to Storage Facilities

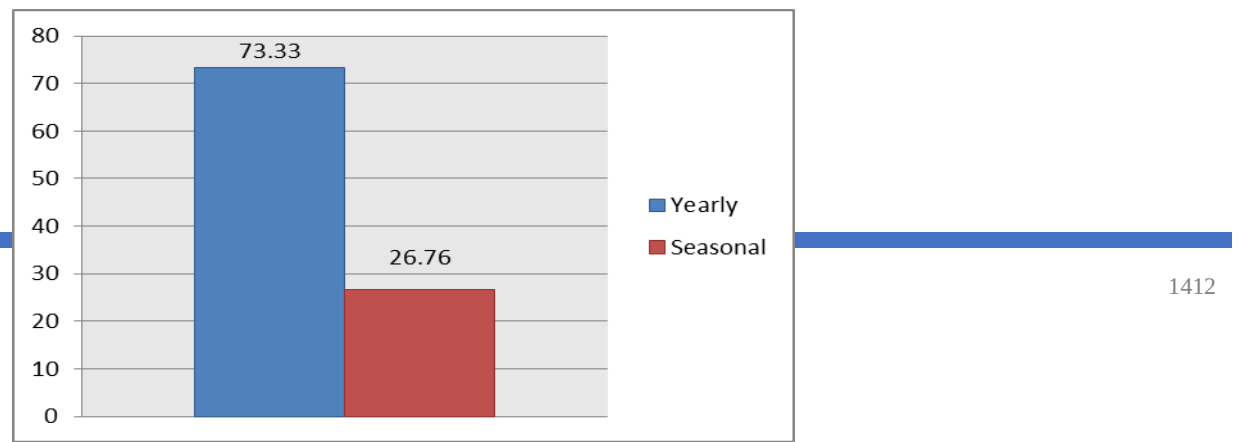
Planting Activities

Figure 5: Distribution of Planting Activities

When farmers were asked when they undertake agricultural activities, 22 (73.33%) of the farmers plant throughout the year, whereas 8 (26.67%) farmers plant in certain seasons. One of the reasons for seasonal planting is the scarcity of water.

Variable	Number	Percentage
Pick-Up truck	10	33.33
Customers buying at residence	6	20.0
Public transport/Hire Pick-up truck	6	20.0
Horses	1	3.3
Walk	7	23.3

Table 3: Distribution of Travel between the Farm and the Market Place



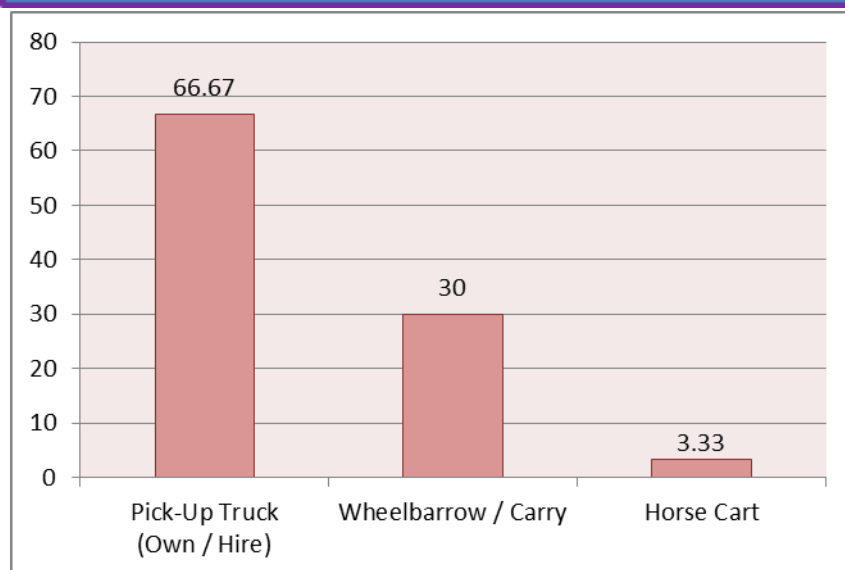


Figure 6: Distribution of How Farmers Travel between the Farm and Market Place

Figure 6 explains how the farmer travels between the farm and the market place. The absence of reliable private transport is a challenge for the farmers, and this has a negative impact on the marketing of the produce and threatens the ability to deliver quality produce on time to the market and the consumers, and this may result in spoilage and losses. The majority of the farms are located and operated close to town. The absence of reliable private transport increases transaction costs for farmers, as the farmer incurs costs for hiring transport and this reduces income and profits. These additional costs reduce the chances of farmers expanding and operating in other areas. In Busia district 9 participants (33.33%) owned pick-up trucks, 6 (20.0%) used public transport and hired pick-up trucks and 6 (20%) had customers buying at residence. Walking is the second most frequently used method of travelling between the farms and the market places. A mere 3.33% of the farmers use a horse cart to transport produce.

Figure 7: Distribution of the Mode of Transport Used to Transport Produce to the Market Place

Figure 7 shows the mode of transport that farmers used to transport their products to the customers and the market place. The most frequently used mode of transportation is the pick-up truck at 66.67%. Thirty percent (30%) of the farmers either use wheelbarrows or carry their produce. The decision on the mode of transportation by these farmers is determined by various factors, which include distance to be travelled and the quantity to be transported.



Figure 8: Distribution of the Location of Customers

All the farmers sell to their communities, with 36.67% farmers selling exclusively in their own communities. Apart from selling to their communities, some 33.33% farmers sell to retailers in town, and 13.33% farmers sell along the streets in town. A total of 16.67% of farmers have expanded their target market to towns such as Umtata, Flagstaff, Harding and Sea view.

Table 4: Distribution of Partnership and Crops

<i>Variable</i>	<i>Number</i>	<i>Percentage</i>
<i>Consider partnership</i>		
<i>Yes</i>	<i>20</i>	<i>66.7</i>
<i>No</i>	<i>10</i>	<i>33.3</i>
<i>Type of Crops</i>		
<i>Cabbage & Spinach</i>	<i>29</i>	<i>96.67</i>
<i>Maize</i>	<i>19</i>	<i>63.33</i>
<i>Root crops</i>	<i>23</i>	<i>76.67</i>
<i>Other</i>	<i>5</i>	<i>16.67</i>

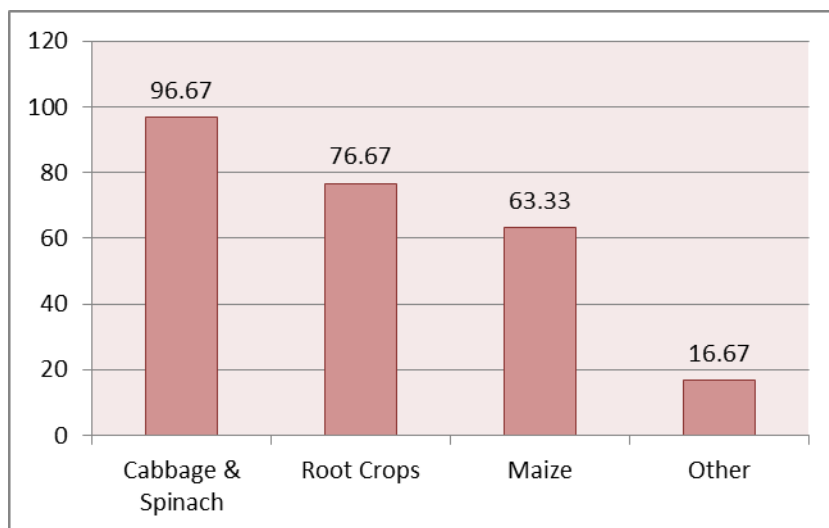


Figure 9: Distribution of Crops

All of the farmers consider expanding their target market and consumers. Although all the farmers wish to expand their market, only 66.7% of farmers supported the notion of forming partnerships with other people and entrepreneurs. Due to various reasons, a total of 33.3% farmers were against the establishment of partnerships. Their reasons vary from bad past experiences with partnerships or co-operatives, to witnessing challenges encountered by others and failure of other partnership initiatives. The perception of the farmers who do not support partnerships is that only a few individuals work in partnerships and that some people tend to be „free riders“. These „free riders“ are only visible at the initial stages of the projects when receiving government support and when dividends need to be paid out. A large percentage (96.67%) of farmers plant cabbage and spinach, and the second most planted crops are root crops at 76.67%, followed by maize at 63.33%. Only a handful of farmers diversify and plant other crops including sunflowers, beans, onions, sorghum, butternuts and pumpkins.

Based on the data collected it is evident that many people realize the benefits associated with agriculture and the potential of commercial farming as a source of food, income and employment opportunity creation. There is room for growth in the region only if certain aspects are put into place for example adequate

access to infrastructure. One of the setbacks for the region is that the agricultural activities undertaken by the various stakeholders (i.e. communities, farmers, the private sector and the different spheres of government) are disjointed and uncoordinated. The majority of the farmers prefer to work in isolation. The Busia Municipality can play a bigger role in promoting synergy and this can lead to the development of this region. The benefits of this will not only be realized by the farmers and by Busia district communities but also by the district municipality and the Eastern Cape Province. This will contribute towards growth and development, but for this to be realized certain factors need to be in place.

Conclusion

There is basic infrastructure which forms the foundation for agricultural economic development. This infrastructure includes transport, access to water and telecommunications. The study sought to establish the impact of roads infrastructure on agricultural economic development in Bizana (Busia). The study revealed that the small scale-farmers in this region were affected and limited by poor road infrastructure and that access to suitable water for irrigation was far from ideal. As a result, the sector did not perform to its full potential and this hinders economic development. Suitable and appropriate recommendations have been made to address the shortcomings identified in this research. If the recommendations made in this study are adopted and carefully implemented, one would expect to see an improvement in the underlying conditions for these rural farmers. It is vital that the recommendations when implemented are closely monitored for any deviation from the intended outcome so that adjustments may be made to ensure improved circumstances for rural farmers.

Recommendations

The gravel roads used to commute between the farms and the market places are not easily navigable, and as a result farmers spend too much time travelling

between the farms and the market places. Due to the absence of post-harvest facilities, farming is labour-intensive and as a result farmer must be in the fields very early every day to harvest produce and to be able to supply the markets. The absence of these facilities has an impact on income generated, as the produce not sold within a particular time are forced to be sold at cheap prices by the farms, to avoid spoilage and loss. The majority of the farmers still use the traditional planting techniques. Access to the markets is one of the major challenges that face the farmers. The majority of the farmers do not own private transportation, and as a result most farmers are confined to the existing markets. To increase their target market, farmers at times hire pick-up trucks to transport their produce.

References

Agriculture, Forestry and Fisheries Yearbook 2010/ 11 Uganda

A Guide to the DTI Incentive Schemes 2011/ 12.

Anríquez, G., and Stamoulis, K. 2007. Rural development and poverty reduction: Is agriculture still the key?

Asfaha, T.A., and Jooste, A. 2006. The agricultural input elasticity of rural-urban migration in Uganda [Online].

Asian Development Bank. 2006. When do rural roads benefit the poor and how? An in-depth analysis based on case studies.

Banister, D., and Berechman, Y. 2000. The economic development effects of transport investments.

Bhattacharyay, B.N. 2010. Infrastructure for ASEAN Connectivity and Integration.

Binns, T., and Nel, E. 1999. Beyond the development impasse: The role of local economic development and community self-reliance in rural Uganda.

Binns T, Hill, H., and Nel, E. 1997. Learning from the people - participatory rural appraisal, geography and rural development in the „new“ Uganda.

Blakely, E.J., and Bradshaw, T.K. 2002. Third edition. Planning local economic development. Theory and Practice. Sage. Thousand Oaks, California

Bogetić, Ž., and Fedderke, J.W. 2005. International benchmarking of Uganda's infrastructure performance.

Bryman, A. 1988. Quantity and quality in social research. Unwin Hyman, London.

Cities Alliances. 2007. Liveable cities: The benefits of urban environmental planning: A citiesalliance study on good practices and useful tools. Cities Alliances, Washington DC