



## ***Towards unlocking the hidden potential of Horticulture in Arusha Tanzania***

*What are the bottlenecks constraining the Horticulture sector and what does it takes for the sector to grow?*

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**Universiteit Utrecht**

## ***Towards unlocking the hidden potential of Horticulture in Arusha Tanzania***

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### **Master Thesis - International Development studies**

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## **List of Abbreviations**

AfDB- African Development Bank

KADCO - Kilimanjaro Airports Development Company

EAC- East African Community

KIA- Kilimanjaro International Airport

JNIA- Julius Nyerere International Airport

JKIA- Jomo Kenyatta International Airport

TAHA- Tanzania Horticultural Association

ORIO- Ontwikkelingsrelevante Infrastructuurontwikkeling

RVO- Rijksdienst voor Ondernemend Nederland

IFAD- International Fund for Agricultural Development

NGO's- Non Governmental Organizations

WEF- World Economic Forum

WB- World Bank

Kilimo Kwanza- Agriculture first

BRN- Big Results Now

MKUKUTA- Mkakati wa kukuza Uchumi na Kupunguza Umaskini Tanzania (Tanzania's National Strategy for Growth and Reduction of Poverty, NSGRP)

Tshs – Tanzanian shillings

TRA- Tanzania Revenue Authority

TAPP- Tanzania Agriculture Productivity Program

BOT- Bank of Tanzania

FYDP- Five Year Development plan

CEO- Chief Executive Officer

GAP- Good Agricultural Practices

1hectare= 2.5 acres

## Acknowledgement

With genuine pleasure I present to you a research thesis exploring the hidden potential of horticulture industry in Arusha Tanzania, the challenges the industry is facing and examining how the existing interventions help to solve those challenges to unlock that potential of this industry.

This research is part of wider research projects of The Facility of Infrastructure Development (ORIO), conducted by 6 Master students of the University of Utrecht, trying to examine impacts of different projects in different countries where ORIO projects are located.

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## Executive Summary

The role of agriculture in development has received much attention in the last decade. Early literature considered the role of agriculture in economic development to be a supportive one to industrial sectors such as ensuring a supply of cheap labour and food for workers in industrial sectors (Andersen and Shimokawa, 2006). However, agriculture is currently back on top of development agenda especially in African countries including Tanzania. The awakened involvement in agricultural activities for development is in consonance with World Bank's conviction that agricultural development is the most viable tool to achieve the first Millennium development goal of reducing extreme poverty and hunger by 2015 in the region (Mwase, 2015). This is after witnessing impressive economic growth of many developing countries but with insignificant reduction in poverty. It is argued that agriculture sector which employs majority of the poor in agricultural economy led countries has not been growing at the same pace as other sectors of the economies, therefore failing to make the poor also benefit from the economy growth. Horticulture development especially, is claimed to be in a good position to benefit the poor due to the fact that horticulture crops offers better prices than prices offered for traditional staple crops such as maize. Additionally, horticulture accommodates majority of the poor population because of its nature to require intensive labour, skilled and unskilled. Therefore, any efforts to boost the horticulture is claimed to have positive impact on the living standard of the poor.

This research examines the horticulture sector in Arusha Tanzania, exploring how it is organized, the main players, its potentials and bottlenecks it faces, the existing interventions to boost the growth of the sector by specifically giving attention on one physical infrastructure intervention, KIA rehabilitation, on trying to understand how those interventions help to unlock the potential of horticulture industry to benefit the poor, by asking the following research question,

*"How will the rehabilitation of Kilimanjaro Airport contribute to the growth of the horticulture sector in Arusha Tanzania?"*

To come to the understanding of the horticulture sector in general, a total of 51 interviews were conducted in Arusha Tanzania. This included large scale farmers and small scale farmers who were important in understanding the main activities, logistics, the problems they faces and the potentials they see in the sector. Additionally, to get an overview of how the industry is operates an organized, key informants such as the Tanzanian Horticultural Association (TAHA), the government, horticulture processors, sector experts, logistics companies, Horticulture training institute, NGO's, the Airport, horticulture cargo handling at the airport, and the airlines operating at KIA (Kilimanjaro International Airport) were also approached.

Research results reveal that horticulture production and export in Arusha and in Tanzania in general has a lot of potential. Tanzania can become one of the largest producers and exporters of horticulture products in the world. Currently, horticulture is relatively well developed in the northern region which includes Arusha, but there is still a lot of production potential unexploited (within Arusha) and in other regions of the country. Unlocking this potential is limited by many challenges and bottlenecks that are constraining the horticulture industry in Arusha. Research findings reveal that there are many bottlenecks constraining the growth of the horticulture sector in Arusha, Tanzania. Lack of airfreight capacity at KIA due to dependence on a KLM passenger flight to lift up horticulture cargo from Arusha and the northern region in general is the main bottleneck that is undermining the export growth of horticulture. Due to this problem, horticulture products have to be trucked for 3 to 5 hours to Jomo Kenyatta Airport (JKIA) in Kenya or 8-10 hours to Julius Nyerere International airport (JNIA) in Dar es salaam, for export. Findings further reveals that unlike previous studies which concluded that farmers chose to go to JKIA because of costs reasons (trucking products to JKIA being cheaper than at KIA), this study found that farmers incur extra costs of between \$2 dollar cents and \$1 dollar extra per kilo by trucking their products to JKIA. Besides, large scale farmers indicated that through trucking their products to JKIA, they waste time, something that was indicated to be extremely valuable for horticulture business due to the perishability nature of horticulture products. Additionally, farmers indicate that they and

lose control of their products making it difficult to solve problems occurring while products are on Kenyan side. All large scale farmers indicated a preference to use KIA as long as it has reliable flights with enough capacity to lift up horticulture products to different destinations.

Furthermore, while previous research revealed that horticulture industry in the northern region (including Arusha) is not attractive due to the small size of the industry not being able to produce enough volumes, the research results of this study refutes this claim. Previous studies suggested that the horticulture industry in Arusha and Northern region in general requires an average volume of 40 tons per consignment to make the industry attractive for a cargo airline. This research found that currently, the industry produces more than 40 tons weekly. An average of 40 tons per week are lifted up at KIA, plus the amount that is taken to JKIA, which are definitely more than 40 tons, because majority (64 percent) of large scale farmers interviewed indicated to export the largest share (50 to 100 percent) of their products to JKIA and some farmers exported their products entirely through JKIA. And studies show that 80 percent of Tanzanian horticulture products are exported via JKIA, mainly produced from the northern region (Adams, 2013). Furthermore, according to the Tanzanian Horticultural Association (TAHA), a horticulture export volume is a very small percentage of horticulture production. Additionally there is massive after harvest loss due to lack of storage and proper collection facilities and knowledge along the value chain on proper handling of horticulture products. Therefore, there are relatively enough volumes for at least two times weekly export consignment of 40 tons, what the industry is actually lacking according to TAHA is the cooperation and coordination between private and public sectors. Each of the stakeholders in the industry is working independently solving problems that could have better been collectively solved such as with the limited freight capacity at KIA. Likewise, findings reveal that the horticulture sector faces many other challenges that are limiting the industry's growth, such as its dominance of small scale farmers who lack the skills and knowledge and efficient technology to produce the new and difficult to produce non-traditional horticulture crops, affecting quality and productivity. Furthermore, the industry lacks processing industries, cooling and storage facilities and the investment climate in general is poor (non supportive policy and infrastructure, limited access to finance, and too many taxes).

The abovementioned challenges limit the potential growth of horticulture sector in Arusha, triggering many efforts to solve some of those challenges. On one hand, the Tanzanian government has prioritized horticulture sector as one of the driving sectors to create growth that is translated to improving lives of the many poor, and on the other hand, there are many efforts and interventions by different sector's stakeholders to boost the sector. There are many interventions that are directly linked to increasing horticulture productivity for example through training farmers to comply with Good agriculture Practices (GAP) standards and post harvest management to reduce after harvest losses. There are also other interventions that are indirectly linked to horticulture performance such as improvement of roads and airports (the KIA rehabilitation intervention). Findings reveal that though many of these interventions are geared towards long term goals to make the industry in general attractive for investments, such as for cargo airline, to establish a reliable route to KIA. Farmers identified immediate interventions that could have a huge impact on the growth of the horticulture industry such as the change of the route of KLM passenger flight, by flying first to Dar es salaam's JNIA to offload majority of its imports, creating space for more horticulture cargo at KIA, and then flying to KIA as its final destination before returning to Amsterdam.

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**1. Introduction**



Developing countries such as Tanzania have renewed their interest in agriculture for development after many years of neglect since independence in 1960's (Mashindano et al., 2013). Many countries have been inspired by the World Bank's 2008 report, "*agriculture for development*" which portrays agriculture as an important sector that can have an important role in creating pro-poor and inclusive growth. Studies indicate that growth in agriculture tend to be more beneficial to the poor than growth in other sectors.

Tanzania after witnessing an impressive economy growth averaging 7 percent in the past decade but with insignificant reduction of total number of poor (World Bank, 2015), has identified agriculture and horticulture subsector as priority sectors to create pro poor growth in its vision to graduate from poor country to middle income country by 2015. This is through increased productivity therefore creating employment and generating income to the majority poor who dominate the agriculture sector in general. Horticulture specifically is proven to employ twice the labour input per hectare of cereals. Therefore, even if small farmers do not participate directly, they can benefit through farm employment. This increase in productivity of land and labour not only results in an increased incomes for farmers and farm workers and enhanced purchasing power for consumers, but also contributes to economic activity in input, processing, distribution, and storage industries, generating multiplier effects beyond agriculture (Andersen and Shimokawa, 2006). However, horticulture productivity increase depends on good rural infrastructure (energy, transport, irrigation systems, telecommunication (for obtaining market information about the right products, and prices), well-functioning domestic markets, appropriate institutions, and access to appropriate technology (Andersen and Shimokawa, 2006). However, for many developing countries such as Tanzania, having these infrastructures is a huge challenge.

Horticulture industry in Tanzania has been receiving insufficient attention in terms of interventions as the country has been focusing on cash crops (cotton, sisal, and coffee) and staple (maize). This is despite of horticulture's increasing export earnings (reaching 447 million US dollars in 2014) and impressive growth rate for the last decade which has been around 8-10 percent per annum, two times more than average growth rate of agriculture sector in general. Besides, while many Tanzania's regions have a potential for horticulture production, horticulture sector is mainly well developed in the northern part of the country which includes Arusha, where this research was conducted. Horticulture is one of the main economic activities in Arusha because of its highly fertile soils and climatic condition which is highly suitable for horticulture for products such as vegetables, fruits, seeds (vegetables and flowers), cuttings and flowers. However, despite that Arusha's districts have a high potential in producing these products, such as in Ngorongoro district, horticulture activities are mainly concentrated in Arumeru and Arusha districts. There is also a room to improve horticulture productivity in these districts through the usage of irrigation, better seeds and proper farming practices. This shows that there is still a lot of potential for horticulture in Tanzania in general.

However, there are several bottlenecks that make it difficult to improve horticulture productivity, hindering the unlocking of horticulture growth potential. In general, Tanzania's horticulture sector wastes about 50 to 70 percent of horticulture products after harvest due to lack of efficient infrastructures such as transport (airports), collection and storage centres (Wa Simbeye, 2015). The horticulture sector in Arusha specifically lacks dedicated cargo flights from the nearby airport, Kilimanjaro airport (KIA). As a result, majority of horticulture production in the Northern region in

general are exported via Jomo Kenyatta International Airport (JKIA), which is about 3 to 5 hours, or go all the way to Julius Nyerere International Airport (JNIA) in Dar es salaam, which takes about 8-10 hours. This indicates how an unreliable and insufficient transportation system can be a key obstacle in the overall productivity of the horticulture sector.

In the last decade, Tanzania has prioritized infrastructure development and increased spending on infrastructure and energy sectors to address infrastructure bottlenecks in the country as a way to improve productivity of agriculture sector in general (African Economic Outlook, 2015). There are currently a large number of ongoing constructions of new infrastructures and maintaining the old ones. One of those projects is Kilimanjaro International Airport (KIA) rehabilitation project financed by the Dutch and Tanzanian government. It is expected that the project will have a positive impact on tourism sector and will improve the economic development (horticulture industry) of the region. For that reason, this research paper investigates in more details whether this rehabilitation will indeed contribute to the growth of the horticulture sector in Arusha, therefore playing a role in unlocking this hidden potential of horticulture in Arusha Tanzania.

### **1.1 Justification of the study**

Even though it is widely documented by different studies which shows that Tanzania has enormous potential of horticulture production which could in turn play a huge role in improving the incomes of majority of poor populations around the country, there are however few studies that have focused at how and what is being done to unlock that potential. After a long time of neglect, there are currently many ongoing infrastructural projects implemented by the Tanzanian government, private sector and development partners that are being executed in Arusha in order to boost the growth of horticulture sector and therefore in that way help to unlock its potential.

Indeed efficient infrastructure such as airports can boost the economy through benefiting many sectors including horticulture. Horticulture industry can benefit in many ways such as in bringing horticulture products on time to the market (due to its perishability nature) and storage facilities to avoid post- harvest losses and extend product's shelf life. It is crucial to analyze the current situation of the horticulture sector in Arusha and its existing infrastructures and how those impact the performance of the horticulture sector. Additionally, it is important to understand how these infrastructures can play a role to improve the overall performance of the industry and whether the ongoing infrastructure projects fit the priorities and needs of the horticulture industry. Since these projects have only gained momentum in few recent years, there is no identified research that has been done looking at these projects, placing a need for this study.

### **1.2 Problem Identification**

Tanzania has a huge potential in production of horticulture production which is dominated by small holder farmers. The country is among world biggest producers. However, it is not among of the world's largest exporters missing a chance to improve the living standards of many poor that are dominant in the horticulture sector. The industry faces many challenges and bottlenecks that are

limiting the country from exploiting its potential in horticulture production and export. One of those challenges is lack of dedicated cargo flights to lift up horticulture products especially at its northern zone airport, Kilimanjaro Airport (KIA) in Arusha. As a result, nearly 80 percent of total Tanzania's horticulture export products are uplifted via Jomo Kenyatta International Airport (JKIA) in Kenya (Adams, 2013). JKIA also exports nearly 65 percent of all Tanzania's flower export mainly produced in the northern region (Nkwame, 2008). This is a lost opportunity for Tanzania because lots of employment opportunities and government revenue that could have been created if those products were exported through KIA are lost to Kenya. Farmers and exporters could save time by exporting via KIA, the nearby airport, something that is very important in the horticulture business. The benefits obtained through the use of KIA by farmers would have manifested itself into more investments done and therefore more businesses and production activities in the ground, hiring more people and engaging more farmers and eventually benefiting the many poor.

Tanzanian government has renewed its interest in agriculture sector and has identified improving productivity of agriculture and horticulture as a priority sector in creating pro poor economic growth. To increase productivity the government also committed itself in improving infrastructures to allow efficient flow of agriculture products from production areas to the markets. Airports rehabilitation is among top priority strategic focus areas identified by the Tanzanian government policies in order to improve agriculture productivity including horticulture in the country. In 2011, the governments of Tanzania and of the Kingdom of the Netherlands signed a grant agreement to rehabilitate the Kilimanjaro Airport (KIA) so that it continues to meet the international safety standards for aviation. While the rehabilitation is expected to contribute largely to the tourism sector, (however, a research by Karlijn Smits, a fellow student, revealed that rehabilitation will not contribute much to the tourism sector either) it is also expected to indirectly boost the economy growth (horticulture) in the region, through the increased aircraft traffic at the airport. This research paper examines the horticulture sector in Arusha, its main challenges and bottlenecks and whether KIA rehabilitation indeed will help to boost the economic growth of the region through improving performance of the horticulture sector.

## **1.2 Research Question**

This paper examines how a physical infrastructure such as KIA rehabilitation can contribute to Horticulture development by asking the following research question;

***How will the rehabilitation of Kilimanjaro Airport contribute to the growth of the horticulture sector in Arusha Tanzania?***

The above question is operationalized into the following sub questions;

- How Arusha's horticulture sector organized and what is the role of horticulture sector in creating a pro- poor growth in Arusha's societies?
- What are the potentials and bottlenecks that are currently facing the horticulture sector in Arusha Tanzania?
- What policy Interventions can contribute to the growth of the horticulture sector in Arusha and how do current interventions (specifically focusing at KIA rehabilitation) fit with the challenges and bottlenecks facing the horticulture sector in Arusha Tanzania?

### **1.3. Methodology**

To find answers to the aforementioned questions, a desk research in the Netherlands and a three months field study in Arusha were done. Primary data was collected through interviews, observation and informal conversations with farmers (large scale and small scale), export companies and key industry stakeholders.

#### **1.3.1. Research Design**

This study used mixed method design to collect and analyze qualitative and quantitative data. Primary data was obtained through interviews and secondary data through literature review. Interviews, participation on a farmer's field day and farmer's training, observation and informal conversation were used to obtain primary data from individuals and organization in the horticulture industry in Arusha. Books, academic articles, policy papers, official reports and publications, and internet sources were used to collect secondary data.

#### **1.3.2 Units of Analysis**

To obtain primary data, this study has two units of analysis, the individuals and organizations. Organizations include International and local horticulture producing/exporting organizations (large scale farmers, who transport through KIA, and those who transport through other airports or combined). Individuals are small scale farmers (new, existing, members and non-members of TAHA) and representatives from farmer's groups. In addition, key informant interviews were conducted to examine research themes in more depth. Respondents were selected based on issues highlighted in interviews. These were the NGO's as the Tanzania Horticultural association (TAHA), and Echo Community, Export logistics companies, horticulture processing companies, KADCO (Kilimanjaro Airports Development Company - owner/operator), Horti Tengeru- a horticulture training institute, Swissport and airlines.

Due to the fact that not all farmers could be reached due to refusal and the ongoing rains when this research was conducted, the views in this report therefore represent only from those who were reached. Until the writing of this report, a total number of 51 interviews had been done. A complete list of type of stakeholders interviewed is given in the findings section and in the appendix A.

#### **Area selection**

Arusha region has a total of 6 districts. Though there is potential for horticulture activities in many of these districts, majority of horticulture producing firms are located in Arusha and Arumeru district. Therefore, field research was conducted in these two districts.

#### **1.3.4 Sampling**

Research population of this study was all people working in the horticulture sector in Arusha. These were divided into farmers (both large scale and small scale) and key informants to understand how the sector is organized. Key informants from the Tanzanian Horticulture Association (TAHA), government (including Tanzania's president), logistics companies, airport (KIA), horticulture handling company at KIA and airlines operating at KIA were interviewed.

10 of Arusha's 17 large scale companies/exporters, (all members of TAHA), were interviewed. One extra firm from Kilimanjaro region was also interviewed and therefore the analysis includes this firm as well to make a total of 11 large scale firms. The effort was made to make sure that these companies/exporters were diversified from cut roses (1), flower cuttings (2), vegetable seeds (2), fruits (2), vegetables(4), to spices(1). One company overlaps because it produces both cuttings and vegetable seeds.

Small scale farmers are very important in the value chain of horticulture products in Arusha because they are dominant in the production of vegetables. To get the impression on how they operate, they were divided into three groups; Individual small scale farmers (6), small scale farmers in groups without a registered group association (2 groups) and out grower farmer's groups (registered) (2 groups).

Key informants such as the government officials (Tanzania ministry of agriculture and food security and the Tanzanian president), TAHA (11), NGO's (2), export logistics companies (2), sector experts (2), KADCO – KIA airport (2), Swissport Tanzania (2) and Airlines (6) were reached.

### **1.3.5 Data collection**

Data collection has been guided by the following approaches, Literature review, semi structured Interviews (through one to one, telephone and emailing), participant observation and informal conversations. Literature review was done partly in the Netherlands and partly while in field in Tanzania.

An inventory of large scale companies operating in the horticulture sector in Arusha was made. The list was adjusted while in the field because some of the companies especially flower companies did not exist anymore; they either had gone bankrupt or were merged with large companies.

Furthermore, some questions were developed already at the beginning of the research after a critical analysis of the literature. However, many interview questions were continuously altered from one field interview to another based on the information found in the field and the type of stakeholder. For example, small scale farmers were asked different questions compared to the large scale farmer's whose questions were also different rent compared to those asked to key informants such as KADCO (the airport). English (mainly) and Kiswahili languages were used during the interview.

Semi structured interview technique was chosen because having partly clear questions gave a focus during the interviews. The interviews were mostly done where farmers and companies were located. An interview was mostly followed by a tour in companies or farms to see how different activities took place. In some cases participating in those activities for example putting fertilizers and seedlings into the ground was done. Participation was also made in the farmer's field days and farmer's short - course trainings to increase horticulture productivity organized by TAHA and USAID -TAPP. Some companies hesitated to give a tour because of the bad experience they had with previous researchers who lied about the purpose of their research and ended up publishing pictures and information that was not asked during the interview.

All these techniques allowed also for the observation of daily activities of farmers, the problems that they face and how they were handling them. However in some cases it was challenging to reach

some farmers due to the rains and the long distances to those farmers were located. For these farmers, data was collected by email or telephone interview. Quantitative data was also collected via the email, about the volumes of the horticulture cargo at KIA for the year from 2011 until 2014 and the total horticulture export volumes statistics.

### **1.3.6. Data Analysis**

The qualitative data that was collected was analyzed by word document while the quantitative data was analyzed through excel.

The draws conclusion from the analysis of 11 large scale companies, 6 individual farmers, 2 out growers groups and 2 groups( of approximately 40 and 50 farmers) of small scale farmers without official registered association. A total of 51 interviews have been done. Not all large scale companies or the unknown number of small scale farmers could be reached due to limited research time, the inaccessibility of the roads to reach them but also the limited time availability of the respondents. Therefore the findings of this research apply only to the views of those that took part in the research and do not represent the views of the whole industry population.

### **1.3.7 Research Limitations**

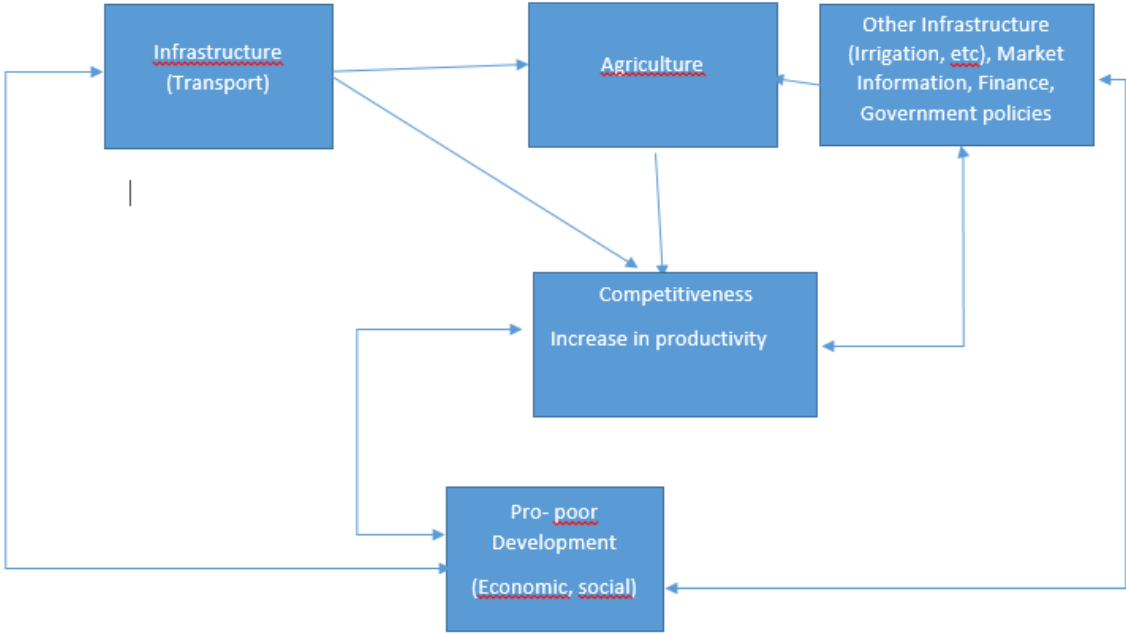
During the data collection and analysis of this report, a number of limitations arose which are worth mentioning because in one way or another could have influenced the findings. To begin with time was limited (between February and May) to reach as many farmers and other stakeholders as possible. It was not easy to reach farmers right away after a single approach. In some cases up to four approaches was made to reach a single farmer. The government representative was the most hard of all to find. Until the end of the field research the efforts to reach government officials were not fruitful. However, while back in the Netherlands efforts were still made to try to reach officials from the ministry of agriculture and food security with success. Furthermore, a short interview with the current president of Tanzania, Dr. Jakaya Mrisho Kikwete, was done while he visited the Netherlands, and he was surprisingly well informed of the challenges of horticulture sector in the Northern region of Tanzania. Therefore this research paper represent views of few stakeholders in the sector and is therefore not representative of the whole industry stakeholders.

Accessibility of data was also difficult and where obtained some data was outdated and did not represent the current status of the industry. Some figures that were given by farmers for example on the question about how much percentage of their products are transported via JKIA, and how much percentage via KIA, were a mere wild guess, not an exact known percentage. Therefore the interpretation should be taken with caution.



### 1.3.8 Conceptual Framework

In this chapter a conceptual framework is drawn on the linkages of infrastructure and agriculture and how when integrated can lead to competitive and hence development.



Agriculture growth depends on an efficient transport systems and well functioning other infrastructures such as irrigation, availability of markets and market information, facilitating policies and availability of finance, to name a few. A good transport system reduces costs of doing business and makes an area/region/country competitive compared to other areas without well-developed transport systems. This can attract investment opportunities to the area/region/country therefore allowing for more jobs creation and improving in incomes since farmers can produce more as they are able to reach more markets through improved transport system. This will make the region more competitive than regions without a well developed transport systems. However, improving transport alone is not the only factor that makes a region competitive and results into the opening up of more economic activities in the region. There are other factors that play a role as well such as the availability of finance, the knowledge and willingness of the farmers to increase production (because prices might go down due to increased supply) and sound investment climate in general. A competitive region attracts more investments, which in turn stimulates more economic activities such as production, allowing also the poor to benefit from the created growth opportunities. In this paper however, a special focus will be given to horticulture sector and the role of infrastructures such as air transport in contributing to the growth of the sector to spur economic and social development of the society.

### 1.3.9 Operationalization

To have a common understanding of the main themes discussed in this report, in this section definitions are given to understand what they do or do not include.

- Poverty- there is no single definition of poverty. In this paper poverty is defined according to the World Bank definition.
  - o World Bank definition: Poverty is pronounced deprivation in well-being, which comprises low incomes and the inability to acquire the basic goods and services necessary for survival with dignity, low levels of health and education, poor access to clean water and sanitation, inadequate physical security, lack of voice, and insufficient capacity and opportunity to better one's life.
- Pro- poor growth- according to the World Bank's definition, a pro poor growth is about changing the distribution of relative incomes through the growth process that favours the poor. It is growth that does not leave the poor behind while the rest of the economy is advancing.
- Small scale farmers- TAHA define small scale farmers as those having plot sizes that are below 2 acres. Small-scale farmers may practice a mix of commercial and subsistence production. In this report, the meaning of small scale farmers is consistent to TAHA's definition.
- Large scale farmers- According to TAHA's agronomist, TAHA defines large scale farmers as those having farms that are not less than 12 hectares, approximately 30 acres. In this report, the meaning of large scale farmers is consistent to TAHA's definition. Some of the farmers interviewed for this research own less than 12 hectares of land. However, they make use of on average 2000 contracted small scale farmers (out growers), therefore falling in this group of large scale farmers.
- Horticulture - TAHA defines horticulture as defined as an agricultural activity that involve production, processing or packaging of flowers, fruits, vegetables, vegetable seeds, spices and roots and tubers.

### 1.3.10 Structure of the Thesis

After the introduction and methodology which explained the how sampling was done, how data was collected and analyzed, the second chapter introduces the theoretical background on the role of agriculture in poverty reduction as it is presented in the academic literature. Furthermore this chapter also introduces the ideas and arguments about the role of infrastructure in enhancing agriculture for poverty reduction. This is followed by chapter three with the analysis of the current status of agriculture, and infrastructures supporting horticulture. Chapter four turns to Arusha which provide a basis for understanding the current status of the horticulture sector in Arusha, how it operates and the main infrastructures horticulture sector in Arusha depend on. Chapter five outlines the opportunities, potentials and bottlenecks constraining the horticulture sector. That is followed by chapter six with a number of interventions that are currently taking place in Arusha, to in order to solve some of the challenges facing the sector. That is followed by chapter seven with stakeholder's

opinion on the effectiveness of those interventions in solving industry problems. Chapter 8 presents the ideal interventions suggested by industry stakeholders that can ease industry's challenges and contribute to the sector's growth. That is followed by chapter nine which examines the fit between the KIA rehabilitation intervention and the challenges and bottlenecks the sector is facing. Discussion follows in chapter ten on how the rehabilitation of KIA will contribute to the growth of the horticulture sector in Arusha Tanzania, followed by a conclusion.

## 2. Literature review



Agriculture has for a long time not been on top of countries' agenda with regards to its contribution to development. Early literature considered the role of agriculture in economic development to be a supportive one for industrial sectors such as ensuring a supply of cheap labour and food for workers in industrial sectors (Andersen and Shimokawa, 2006). However, agriculture is currently back on top of development agenda especially in African countries including Tanzania. The awakened involvement in agricultural activities is in consonance with World Bank's conviction that agricultural development is the most viable tool to achieve the first Millennium development goal of reducing extreme poverty and hunger by 2015 in the region (Mwase, 2015). This view is also supported a large body of evidences suggesting that expansion of agricultural sector is key to economic growth and poverty reduction in most Sub-Saharan Africa (Christiaensen & Demery, 2007; Dercon, 2009).

This chapter introduces the main discussions put forward by different scholars that have been evolving for several decades. The chapter begins with definitions of economic growth and development and the role of agriculture in development as explained by different theories of economic growth and the role played by agriculture industry. These will form a basis for the research of understanding the economic and social importance of agriculture (specifically horticulture) in the societies where it is being practiced.

## 2.1 Economic growth and Development Definitions

Economic growth and development have been used synonymously and interchangeably in development field. However they have different meanings; for the purpose of this research, they are defined as the following:

**Economic growth** of countries refers to the increase in output of goods and services (known as Gross Domestic Product (GDP)) that a country produces over an accounting period, normally a year (Desai and porter, 2014, pg. 25).

**Economic (and social) development** is a much wider concept than economic growth. It must imply enhancement of human welfare as central concerns of development agenda. Growth is a necessary condition for economic and social development however; it is not a sufficient condition because the aggregate measure of growth or per capita income pays no attention to how that output is distributed amongst the population (Desai and porter, 2014, pg. 25, Szirmai, 2005, pg. 6). Amartya Sen (1999) in his *Development as Freedom* book, argued for much broader development concept which includes freeing people from un-freedoms which they don't desire such as poverty.

## 2.2 Economic Growth theories and the role of agriculture

For many decades economic growth was not differentiated with development. Economic growth was associated with industrial growth. One of the famous West Indian economists, Arthur Lewis, who published his paper "*economic development with unlimited supply of labour*" in 1954, became widely known for his ideas of the dualistic nature of the economies in developing countries. He argued that developing countries had capitalist and subsistence sectors that co existed alongside each other. The subsistence sector is dominated by small scale farmers with lower productivity than the capitalist sector which is dominated by manufacturing industry and estate agriculture (Desai and Porter, 2014,

Szirmai, 2005, Christiaensen, Demery, Kühl, 2006). For the overall development of such a country according to Lewis, the capitalist sector needed to be developed at the expense of subsistence sector, drawing labour from the agriculture sector to work in the manufacturing sector (Desai and Porter, 2014, Szirmai, 2005, Christiaensen, et.al, 2006). Higgins and Higgins (1979, cited in Szirmai, 2005) have ironically described this as getting rid of farmers. The subsistence sector was eventually going to benefit from it through employments in the manufacturing sector.

Lewis's arguments are comparable to Gunnar Myrdal and Albert Hirschman's arguments in later years. Myrdal's "*commutation causation principle*" of 1957, suggested that some regions in the countries tend to have some initial advantages over the others; as a result, labour, capital and commodities tend to move to those regions creating a backwash effect in those regions where they come from. He argued that however, by stimulating demand in one region can result into spread effects or economic growth in other regions (Desai and Porter, 2014, Szirmai, 2005). Therefore the initial disadvantaged regions will benefit from the increased growth in some other regions.

Hirschman's proposed a strategy for unbalanced growth in 1958. He proposed that development of one or more regional centres is essential for the overall income growth of the country. He argued that the interaction between the developed and undeveloped regions will eventually create trickle down and polarization effects, uplifting the undeveloped parts of the counties as well (Desai and Porter, 2014, Szirmai, 2005).

### **2.2.1 The role of agriculture growth in poverty reduction debate**

The above mentioned scholars did not make a difference between economic growths and improving standards of living of people. However, they did have a significant influence in the policy decisions made in different countries. Today there are lots of countries such as Tanzania that are showing a decade of impressive economic growth rates are at the same time having the highest levels of poverty that are hardly declining. That has made the recent research to evolve in different directions spurred by the World Bank's (2008) report which emphasized that agriculture is the most fundamental instrument for sustainable development and poverty reduction. The report says in order for developing countries such as sub Saharan Africa to meet the Millennium Development Goal of halving poverty and hunger by 2015, agriculture should be put at the centre of development agenda. The report emphasized "*Using agriculture as the basis for economic growth in the agriculture-based countries requires a productivity revolution in smallholder farming*".

There have been more studies in this line of thinking of pro-poor rather than overall growth for poverty reduction. Studies (Christiaensen, et.al, 2006, and Cervantes-Godoy, and Dewbre, 2010, Andersen and Shimokawa, 2006) point out that the contribution of economic growth to poverty reduction might differ across sectors because the benefits of growth might be easier for poor people to obtain if growth occurs where the poor are located. This approach favours agriculture-led development policies in order to stimulate growth with the maximum amount of poverty reduction (Tanzania National Bureau of statistics, 2014, Mashindano et al, 2011, King, Milanzi, 2014, Andersen and Shimokawa, 2006, Christiaensen, et.al, 2010).

According to IFAD's rural poverty report of 2011, poverty remains predominantly a rural phenomenon because 70 per cent of the developing world's 1.4 very poor people live in rural areas, engaging in agriculture. Therefore, agricultural income growth is more effective in benefiting the

poor and therefore reducing poverty than growth in other sectors. This is due to the following reasons;

First is that the incidence of poverty tends to be higher in agricultural and rural populations than elsewhere (World Bank, 2008). Second reason is that most of the poor live in rural areas and a larger percent depend on agriculture (employing over 80 per cent of rural households) as a main economic activity and as a source of livelihood (World Bank, 2008, IFAD, 2011, Tanzania National Bureau of statistics, 2014, Mashindano et al, 2011, King, Milanzi, 2014, Sarris et al, 2006). Third reason is that there are studies that have empirically shown that poor people tend to benefit more from economic growth originating in agricultural sectors than from that originating in industrial or service sectors (World Bank, 2008, Ravallion and Datt 1996; Ravallion and Chen 2004; and Timmer 2002, 2005, cited in Andersen and Shimokawa, 2006). Fourth, agriculture can be the lead sector for overall growth in the agriculture-based countries therefore can also represents a major source of opportunities to move out of poverty for large numbers of poor people who can make it a 'sound business' (World Bank, 2008, IFAD, 2011). Fifth, growth of agriculture can enhance growth in other sectors through consumption and production links when agricultural incomes are spent on domestically produced non tradable goods and services which stimulates demand for domestic industry and services (World Bank, 2008)

### **2.2.2 Horticulture's role in poverty reduction**

Specifically for horticulture, the production of horticultural products offers opportunities for poverty alleviation. Studies found that farmers engaging in horticulture earn significantly higher incomes than farmers producing other products because horticulture products are high value products (World Bank, 2008). In Kenya, farmers producing fruit, vegetables or flowers for export can earn six to twenty times more than maize growers (Gabre-Mahdin and Haggblade 2003; Minot and Ngigi 2003 cited in USAID, 2005). Also, the study by English et. al, (2004) found that horticultural production is significantly more profitable for a smallholder than the traditional maize-bean intercropping system that is most common among subsistence farmers.

Besides, horticulture is usually more labour intensive than the production of staple crops such as maize, cassava and banana. It generates considerable employment through crop growth periods, (planting, weeding and harvest) about twice the labour input per hectare of cereals and more off-farm jobs in processing, grading, packaging, delivery to exporters' factories or collection centres and marketing (World Bank, 2008, English, Jaffee and Okello, 2004). It is estimated that there are about 700,000 new entrants in to the labour market each year in Tanzania, mainly being youth, aged between 15 and 24, who account for the 60% of the unemployed (Rural Development strategy, 2001). Horticulture can play an important role in reducing unemployment since semi and unskilled workers can be employed.

In addition, while prices and export quantities for traditional agricultural products such as coffee have stagnated or declined, quantity and price trends for non-traditional horticultural exports have generally been favourable for developing countries (Davis, 2006). Farmers can therefore earn better incomes by switching to horticulture.

Additionally, as many of the horticulture products are new to farmers, they get an opportunity to learn and upgrade their upgrading agricultural skills (like irrigation and farming methods) but also

through technology transfer to the wider community on the construction of greenhouses, boreholes or irrigation systems for example (Ulrich, 2014).

Moreover, horticulture generates economic benefit beyond the farm through associated services and industries. Such farm-related business could include provision of seeds, agrochemicals (fertilizers and pesticides) and infrastructure (irrigation, sheds). Also, horticulture can stimulate the development of value-added industries such as jams, pickles, dried product, packaging, storing; and transportation of products (English, et. al 2004).

Therefore, due to above reasons, horticulture can create more opportunities than staple food production to the population to increase their earnings per annum that would in return help alleviate poverty and achieve development goals set by the government.

### **2.2.3 Other factors that play a role in poverty reduction**

The most recent studies are sceptical and hold that agricultural growth such as horticulture on its own cannot create broad-based growth, especially in Africa (Ellis 2005 and Dercon, 2009). They argue that agricultural development can only be led by large farms and will not create wealth for smallholder farmers (Collier and Dercon 2009, cited in Christiaensen, et.al, 2010). Dercon (2009) argue that much basic analysis of the importance of agricultural growth for poverty reduction is based on simplistic premises that since the poor are employed in agriculture, agriculture must be the basis of poverty reduction efforts. Ellis (2005), adds that though many current policy directions in agriculture remain valid and should be supported (such as improving public-private partnerships in service and input delivery), he calls for donors and governments to encourage growth processes with support policies that have generally beneficial effects upon all types of economic activity in rural areas, and on rural-urban mobility, rather than focusing narrowly on agricultural yield growth alone. This is because rural economic activities are not limited to agriculture, as non agriculture activities are becoming more and more important contributor to poverty reduction (Szirmai, 2005). Therefore, infrastructure (transport, communications, and power for example), services (education and health), information (knowledge, ideas, radio, television, and newspapers), exchange and mobility all have their roles to play in poverty reduction. The following section examines the role of infrastructures in enhancing agriculture growth in more detail.



**2.3 Role of Infrastructure in Agriculture development for poverty reduction**

This section examines how infrastructure can contribute to agricultural development in developing countries.

Agriculture accounts for the largest share of most low-income countries’ economies and is generally the primary source of income in rural areas. Therefore the issue of the importance of improving rural infrastructure, for agriculture development and therefore poverty reduction is not new in the development community. In most low-income developing countries, market integration is said to be limited by poor transport, irrigation, storage and communication infrastructure, lack of effective competition among market agents, limited rule of law and restricted access to commercial finance (Andersen and Shimokawa, 2006). These infrastructures fosters physical connectivity and promotes better integration of rural and agriculture areas with growing urban markets, which, in turn, are linked to the global trading markets (Llanto, 2012, Venkatachalam, 2003, Patel, 2010, Andersen and Shimokawa, 2006). Inadequate and poor quality infrastructure can be a significant constraint to growth and productivity of the agriculture sector because it can increase the costs of doing business undermining local markets and exports (World Bank, 2008, Llanto 2012, Andersen and Shimokawa, 2006, Patel, 2010, Nichols 1969). Efficient transportation infrastructure for example lowers the transactions costs, travel time and cost, and leads to expansion of markets and economies of scale (World Bank, 2008, Mwakanemela, 2014, Patel, 2010). It also contributes to economic activity in input, processing, distribution, and storage industries, generating multiplier effects beyond agriculture (Patel, 2010). The World Bank and African development Bank (2005, 2007, cited in Llanto, 2012) found that poor infrastructure and lack of investment in infrastructure has serious consequences for the country’s competitiveness and attractiveness in particular for its growth and poverty reduction targets. Rural infrastructure deficiencies in particular undermine the potential of the agriculture sector in developing countries to contribute to growth and poverty reduction (Mwakanemela, 2014, Llanto 2012, AFDB, 2013, Mashindano et al, 2011, Venkatachalam, 2003, Andersen and Shimokawa, 2006).

**Table 1: Examples of Agriculture Infrastructure**

|                              |   |
|------------------------------|---|
| Input based                  | Seed, Fertilizer, Pesticides, Farm equipment and machinery  |
| Resource based               | Water/irrigation, Farm power/energy   |
| Physical infrastructure      | Road connectivity, Transport, storage, processing, preservation   |
| Institutional infrastructure | Agricultural research, extension & education, technology, information & communication services, financial services, marketing |

*(Source: Patel, 2010)*

The table above lists different examples of agriculture infrastructure. The provision of these infrastructures separately might not result in increasing agricultural productivity and therefore poverty reduction. For example, investments in hard infrastructure (roads, communication and energy supply) are necessary, but not sufficient for successful market integration. The infrastructures are integrated and depend on each other in order to effectively reduce transaction costs. For example, only the availability of good physical transport systems such as roads while input, resource and institutional based facilities are lacking or inefficient will not result into increased productivity in the agriculture sector. Likewise market information not only offers transport recommendations but

also keeps farmers and traders attuned to the demands and changing preferences of consumers, that guide farming, marketing, and investing. Market information also encompasses timely and accurate prices, buyer contacts, distribution channels, buyer and producer trends, import regulations, competitor profiles, and grade and standards specifications. Therefore, Investments in agriculture infrastructure should be addressed in terms of a more holistic approach that considers the complementarities between soft (i.e. extension services) and hard (physical) infrastructures (Jouanjean, 2013).

### **2.3.1 Importance of efficient infrastructure for horticulture performance**

The perishability of most horticulture products requires careful handling in the whole value chain from production to until when products reaches the final consumers. Special facilities (such as packhouses, cold storage, and refrigerated transport) and rapid delivery to consumers to maintain quality and reduce physical and nutritional losses are highly needed (World Bank, 2008).

In many developing countries, horticulture sectors are characterized by, long horticulture supply chain, poor access to roads and electricity, and inadequate infrastructure and services in physical markets which all add to the transaction costs and cause quality deterioration and high spoilage losses (World Bank, 2008). This is also particularly true to Tanzania's horticulture sector which wastes about 50 to 70 percent of horticulture products after harvest due to lack of post-harvest facilities, lack of processing capacities and delayed transportation given the perishable nature of horticulture (Wa Simbeye, 2015). Furthermore, the lack of access to physical (irrigation, transport, cold chains, collection centres, and packhouses), human (education), and social assets by small scale farmers, limits them from taking advantage of the opportunities horticulture sector presents, therefore missing the opportunity to improve their lives.

Infrastructure development (both soft and hard) opens up the rural economy in general to a wider market outside, allowing for horticulture productivity growth therefore benefiting the poor as well who depend on it (Patel, 2010, Andersen and Shimokawa, 2006). Andersen and Shimokawa, (2006) and the World Bank (2008) argue that without significant investments in rural infrastructure and related institutions such as rural infrastructure (markets, electricity, irrigation, cold storage, transportation), market institutions, Investments in education (and training on good agricultural practices) and support formation of producer organizations, the low-income developing countries will not fully integrate and benefit from the increasing opportunities due to growth of world demand for horticulture products.

**3. Background Information**



From the literature analysis presented in the previous chapter, it is clear that developing countries, after witnessing their economies grow without significant poverty reduction, have renewed their attention to agriculture and consider it as an important sector that could play a significant role in creating pro poor growth. Tanzania is also one of those countries whose agriculture sector has been lagging behind despite the impressive economic growth in the last decade. Horticulture industry especially which has a lot of potential in Tanzania, has been neglected because the focus was on staple and cash crops. Horticulture in Tanzania has been regarded merely as a subsector of agriculture. Therefore, to unlock the potential in Tanzania’s horticulture, it is important to understand the agriculture sector in general. This section introduces Tanzania’s economy, agriculture sector in general and the infrastructures supporting horticulture sector in Tanzania.

**3.1 Tanzania’s Geographic and Demographic context**

Tanzania, a home to approximately more than 49 million people (CIA, 2014), is located in eastern coast of Africa and covers more than 940 000 sq.km, making it the 13th largest country in Africa and the 31st largest in the world (CIA, 2014). The country has an Indian Ocean coastline of approximately 800 kilometres (500 mi) long with islands such as Zanzibar, Mafia and Pemba. Tanzania is the most linguistically diverse country in East Africa. It has two formal language, Kiswahili and English and over 120 ethnic groups, each with its own language or dialect.

**Map 1: Tanzania**



Tanzania shares borders with Burundi, the Democratic Republic of the Congo, Kenya, Malawi, Mozambique, Rwanda, Uganda, and Zambia. In 2008, Tanzania together with Kenya, Uganda, Burundi and Rwanda formed the East African Community (EAC).

Within Tanzania, climate and geographical zones varies widely. In general, the country has a tropical climate but with regional variations due to topography. In the highlands for example, temperatures range between 10 and 20 °C (50 and 68 °F) during cold and hot seasons respectively. In the coastal belt it is tropical, temperatures are higher and conditions more humid than inland. The central plateau is cooler and drier because of its higher altitude. This diversity of climatic and geographical zones allows farmers to grow huge variety of horticulture crops such as fruits, flowers and flower cuttings, vegetables, spices and seeds.

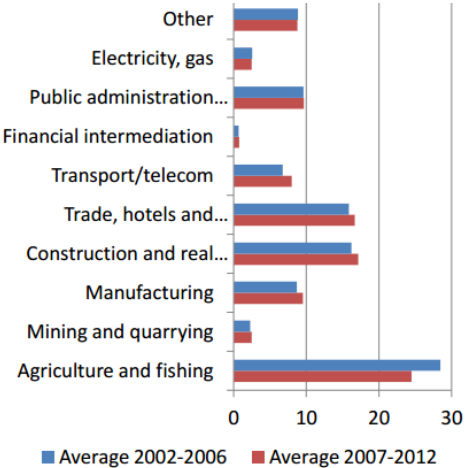
**3.2 Tanzania’s Economy**

Tanzania’s economy is one of the fastest growing economies in the continent, with an average growth rate of above 7 percent annually between 2001 and 2012 (AfDB, 2014). In 2013, Tanzanian economy recorded a 7.3 percent growth and remained above 7 percent in 2014. It is expected to reach 7.4 percent in 2015 (AfDB, 2014). This rate is above average in Sub Saharan Africa (Tanzania

Human Development Report (THDR), 2014) and significantly higher than the rate achieved by other EAC countries (World Bank, 2014).

Tanzania’s economy depends heavily on agriculture, accounting for more than one quarter of GDP, 85 percent of exports, and employing about 80 percent of the total work force (AfDB, 2014, KPMG, 2012, Mwakanemela, 2014). In 2014, agriculture accounted for the second largest share of GDP (27.6 percent), after services (47.4 percent) (AfDB, 2014). The Tanzanian economy is projected to further grow reaching 7.4 percent in 2015, driven by transport, communications, manufacturing and agriculture supported by public investment in infrastructure, the investments in the recently discovered natural gas reserves and low inflation rate (AfDB, 2014, KPMG, 2014, African Economic Outlook, 2014).

**Table 2 share of GDP in Percentage**

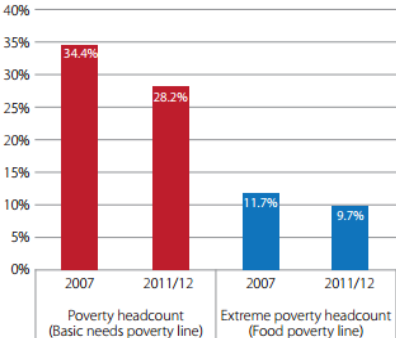


Source: IMF, (2014)

**3.3 Economic Growth in relation to poverty reduction**

Despite the recent sound macroeconomic achievements, poverty is still a major problem facing the majority of Tanzanians, particularly those living in rural areas. Despite the relatively little improvements in the poverty level, there are still nearly 12 million Tanzanians living in poverty (World Bank, 2015). This is a slight decline of 10 percent from about 13 million poor counted in 2007 (World Bank, 2015).

**Table 3: Poverty and Extreme Poverty Incidence in Tanzania**

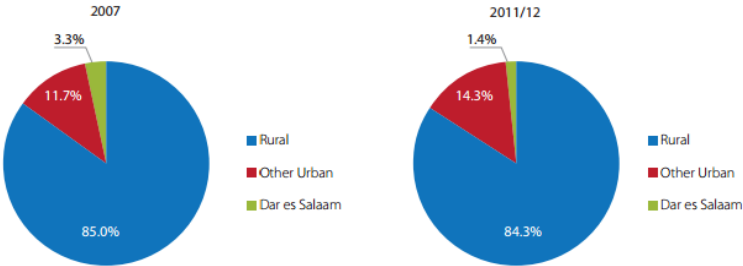


Source: World Bank, 2015

According to the recent household budget survey conducted in 2011/12, 28.2 percent of Tanzanians still suffer from basic needs poverty. That is a slight decline in percentage from 34.4 percent of population in 2007. Poverty incidence is higher in rural areas (33%) than in urban areas (21.7%), because the majority of population depends in agriculture as the main source of their income (African Economic Outlook, 2015, World Bank, 2015). During 2011/12, 84.3 percent of the population

living in rural areas was poor compared to 85 percent in 2007, showing almost no signs of decline in a five years period (World Bank, 2015).

**Figure 1: Proportion of Poor By Geographic Domain**



Source: World Bank, 2015

Among of the reasons for the hardly declining poverty levels in Tanzania is the fact that the economy growth is not pro poor growth (KPMG, 2014). Growth is occurring in sectors with limited impact on the income levels of most citizens such as mining, construction and tourism (KPMG, 2014). Economy sectors in Tanzania that are employing majority of the population such as agriculture are experiencing low or limited growth. This coincides with the literature findings outlined in the previous section, that economic growth does not necessarily translate into improving the population’s welfare. It is therefore important to have an in depth look at Tanzania’s agriculture sector, and horticulture subsector and the role they play in the population’s daily lives.

**3.4 An overview of Agriculture in Tanzania**

Agriculture in Tanzania includes the subsectors of crops, livestock, hunting and gathering, fisheries and forestry. Tanzanian agriculture is dominated by two types of smallholders (majority being women). The first group comprises of very poor farmers who own very small pieces of land (normally an acre or less) and grow food crops only for their subsistence. The second group is for farmers with medium to large size farm plots (more than one acre) also referred to as commercial farmers who grow both food and cash crops (Mshindano et al, 2013). These farmers are characterized by low levels of productivity due to dependence on unreliable weather conditions and poor technology (hand hoe). In total, these farmers cultivate 5.1 million hectares annually, of which 85 percent is food crops. Small scale farmers also are characterized by low level of education, skills and experience (especially for non-traditional products), and have insufficient access to credit and input (FAO, 2013). As introduced before, agriculture remains the dominant sector in Tanzania in terms of its size, contribution to GDP, generation of employment and export earnings. It employs about three quarters of the workforce in the country (and of which most livelihoods depend on).

From 2002 to 2010, Tanzania’s annual agricultural growth averaged 4.2 percent, which is below the national economy growth average of about 6.7 percent over the same period (FYDP, 2012). In 2013, it grew at 4.3 percent, and went back to 4 percent in 2014, in both cases lower than the overall annual economic growth (African Economic Outlook, 2014, African Economic Outlook, 2015).

According to the 2002 Tanzania’s National Irrigation Master Plan, 29.4 million hectares in Tanzania are suitable for irrigation farming, however, only 310,745 hectares, equivalent to 1% were actually being irrigated by 2011, the Guardian, 2014). The underdeveloped infrastructure (such as transport,

irrigation systems which affect production and distribution to markets), overdependence on rain-fed production, inadequate storage facilities, restrictive policies and pests and diseases affecting productivity are explained to be some of the reasons for low performance of the agriculture sector (Franz and Muller, 2014, African Economic Outlook, 2015, Five Year Development Plan (FYDP), 2012). Other reasons hindering productivity include dominance of small-scale farmers, their limited education, skills and experience (especially on non-traditional products), and insufficient access to credit and input (FAO 2013). Furthermore, Tanzania's low yearly budget allocation to the agriculture sector is also one of the reasons contributing for agriculture's low productivity. According to the Tanzanian minister of finance (2015), Tanzanian shillings 1,001.4 billion (approximately 5% of the total budget) is allocated for agriculture for 2015/16 to be used in strengthening irrigation infrastructure, construction of warehouses and markets in different areas of the country. However, according to the Agriculture Council of Tanzania (ACT), in order to transform the agriculture sector to match the overall economy growth, agriculture needs a 10% annual allocation of the national budget.

### **3.5 An Overview of Horticulture Sector in Tanzania**

Despite the stagnant growth of the agriculture sector, horticulture subsector (which is the focus of this study) has gone against all odds and has been performing remarkably well in the last decade. Horticulture is identified as the fastest growing sector in Tanzania, (TAHA, 2011, the World Bank, 2014). It grows at a rate of 8-10 percent per annum, two times more than the overall annual growth rate of agriculture which is below 5 percent (Nishwitz, 2009, Mwakamemela, 2014). It has created at least 500,000 employments, to both semi skilled and unskilled workers, majority of them being women, more than 65 percent of the workforce in horticulture (TAHA, 2011). Horticulture in Tanzania is dominated by small scale farmers with less than 2 hectares, especially in vegetables production where they account for 70% of vegetable producers, who are categorized as poor (TAHA, 2011). Some are individually producing for the local markets, and some forming groups to produce as contract farmers or out growers to large scale export firms. Besides employing small scale farmers, Tanzania's horticulture industry has less than 30 large scale growers/exporters, majority of them located in the northern Tanzania (Arusha and Manyara) also creating employment opportunities to unskilled and semi skilled population. Therefore, horticulture offers an opportunity to improve lives in Tanzania through creating employments. For that reason, horticulture, just like agriculture has been also identified by the government of Tanzania as one of the priority sectors (in its National Export Strategy, 2008 and Kilimo Kwanza (Agriculture First) Resolution) that could have a significant contribution in creating the pro poor. The sub sector has been prioritized because there is still a room for improvement in the sector such as through use of efficient technologies (such as irrigation) and farming practices that can allow farmers to earn even more income from horticulture.

#### **3.5.1 Horticulture definition**

The Tanzania Horticultural Association (TAHA) (2009) defines "horticulture" as *an agricultural activity that involves production, processing or packaging of flowers, fruits, vegetables, vegetable seeds, spices and roots and tubers*. Horticultural products include all products either raw or processed that arise from the horticultural industry (Lema, et al, 2014)

**3.5.2 Horticulture History in Tanzania**

Horticultural sector in Tanzania is generally regarded as having started in the 1950s with the production of bean seeds for selling in Europe, mainly to the Netherlands. Perishable horticultural exports to Europe started in the 1970s, following Kenya’s lead which has a strong established horticulture industry (Mwakanemela, 2014). In the mid-1980s, a cut rose industry was established, followed by the development of a cuttings industry based on chrysanthemums.

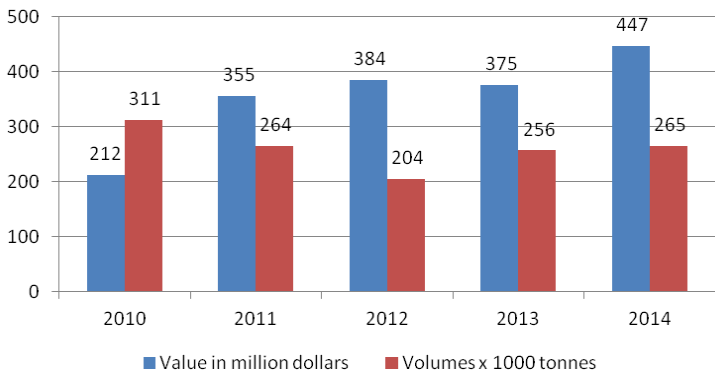
Business picked up during the mid-1990s, and the value of horticultural exports from Tanzania increased from USD 5.2 million in 1997 to USD26.7 million in 1999 (Cooksey, Kelsall 2011). The sector currently earns more than USD 477 million. As of mid-2010 there were fifteen or so companies growing flowers, flower cuttings and seeds for export. In addition, five companies exporting vegetables, vegetable seeds and fruits. In the last decade, there have been specialized investments in the propagation of hybrid vegetable seeds, higher value fruits and vegetables but also cut-flowers other than roses (Lema, et al, 2014, Mwakanemela, 2014). There are many varieties of horticulture vegetables produced in Tanzania in addition to flowers& flower cuttings and fruits which include Asian Vegetables, Baby corn, baby marrow, Beetroots, Beans, Cabbage, Carrots and baby Carrots, Cauliflower, Eggplant, Kale, Leeks, onions and shallots, Okra, Peas, Potatoes, Spinach and Tomatoes to name a few. Main markets for these horticulture products include, European Union, local markets, regional markets (East African Community (EAC), Southern African Development Community (SADC) and Middle East (Mashindano et al., 2013, TAHA, 2013).

Tanzania is among world top producers of fresh vegetables. In 2007, According to FAO statistics, Tanzania was the 18<sup>th</sup> world largest producer of vegetables (Mashindano et al., 2013). However, Tanzania is not among largest exporters of vegetables. This suggests that Tanzania has an enormous potential for increasing production and export of horticulture products.

**3.5.4 Horticulture Export**

According to the Tanzanian Revenue Authority (TRA)), horticulture industry registered export revenue of US \$ 477 million in 2014, up from USD 375 million in 2013. This export value in 2014 was equivalent to 38 percent of total agricultural exports valued at \$1.18 billion. However, while export value has been increasing year after year, the export volumes have relatively remained stagnant averaging about 2600 thousand tons between 2010 and 2014. For example, in 2011, export revenue increased from 212 (in 2010) to 311 USD million dollars, volumes decreased from 311 thousand tons (in 2010) to 264 thousand tons, likewise for 2011 to 2012. This might suggest that there has been an increase in export of high value horticulture products which normally weigh less.

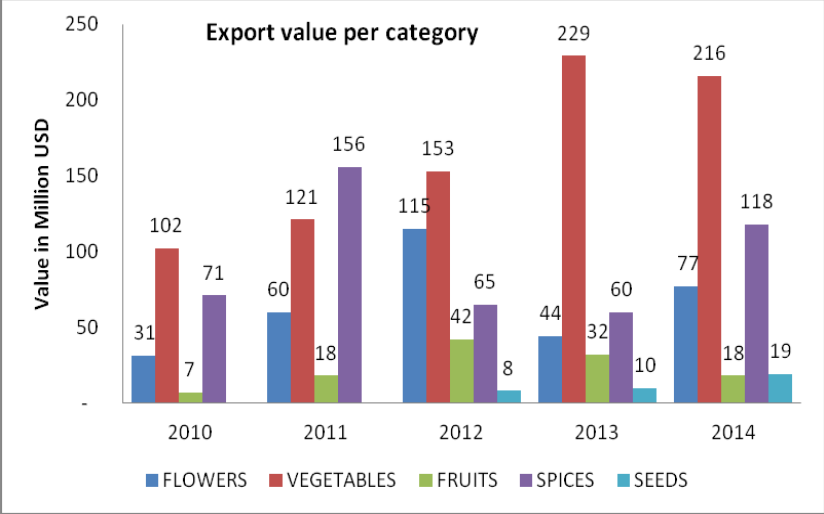
**Tabel 4: Tanzania Horticulture Export 2010-2014**





Vegetables accounts for the largest percentage of horticulture exports in Tanzania. Between 2010 and 2014, vegetables accounted for the largest share of total annual horticulture export. In 2014 for example, vegetable exports

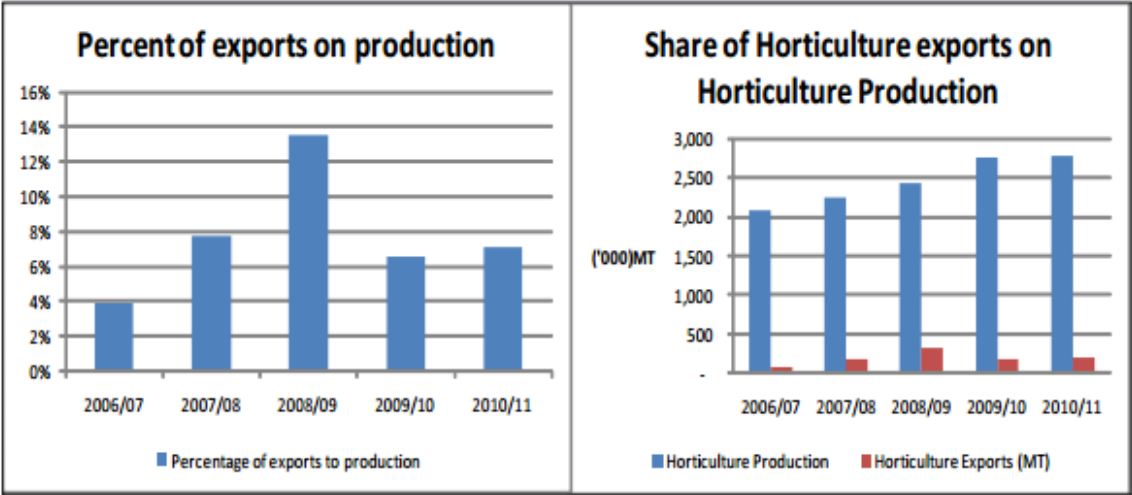
**Table 5: Export Value per Horticulture category**



accounted for 48 percent of total export value, (lower than in previous year (2013) when it accounted for 61%) followed by spices and flowers which accounted for 26% and 17% respectively. Furthermore, seeds are also slowly starting to make its way in the total export of horticulture products.

In the order of importance in terms of export value, vegetables earn most revenue, followed by spices, flowers, fruits and seeds. Generally, the volumes of horticulture exports represent a very small proportion of the volumes produced during the same period. In the figure below the volumes exported are compared to the volumes produced during the years 2006/07 and 2010/11. Between 2006/07 and 2010/11, it was only in during 2008/09 that horticulture export accounted for 13 percent of total horticulture production. In other years export accounted less than 10 percent of total production.

**Table 6: Horticulture Production and Export**



Source: Mashindano et.al, (2013)

### **3.6. An overview of Infrastructures supporting Tanzania's Horticulture sector**

Tanzania's horticulture sector does not operate in isolation; to achieve its desirable objectives and targets, the physical as well as institutional infrastructures such as the national policies, respective institutions as well as legislations need to be supportive (Mashindano et al., 2013). In this section an in depth description of the current status of physical and institutional infrastructures that are intended to support horticulture is provided.

#### **3.6.1 Physical Infrastructures**

Tanzania's horticulture sector physical infrastructure is insufficient or in some areas non-existent, something that pose a serious bottleneck in horticulture resulting into high operational costs. The efficiency and quality of transport services in Tanzania for example has been inadequate despite the country's impressive economic growth rates in the last decade (AfDB, 2013). The existing transport infrastructures including air transport do not serve the current needs of the growing economy because a high proportion of the infrastructure is now beyond its economic life (AfDB, 2013). As a result, Tanzania now faces serious infrastructure challenges, constraining both the local and regional economy which calls for an urgent need of government action (African Economic Outlook, 2014), AfDB, 2013). In the 2013-14 Competitiveness Index of the World Economic Forum (WEF), Tanzania scored 3.2 out of 7 on quality of overall infrastructure, ranking 124th among 148 countries (African Economic Outlook, 2014).

Other than transport challenges, Tanzania's horticulture industry also faces deficit and inefficiency of other business development infrastructures such as energy, communication (for accessing markets), processing, grading, finance, storage facilities, irrigation which play a role in this as well on improving the performance of horticulture sector. Furthermore, infrastructure gaps especially in rural areas including poor transport, limited power supply and lack of storage facilities has been one of the major hindrances to the development and growth of the horticulture sector in Tanzania in general (African Economic Outlook, 2014). Lack of these infrastructures form major bottlenecks to develop commercial and export oriented horticulture industry in Tanzania (Nyambo and Verschoor, 2005, cited in Lema, et al, and 2014). It has led to the increase in the costs of agricultural production process in terms of high costs of transport, increased costs of inputs limiting farmer's/exporter's competitiveness in international markets (Mwakanemela, 2014). For example, In Tanzania, transport costs constitute 46 per cent of the total value of export consignments while in Zambia they are just 17 per cent (Semberya, 2010)

Lack of these infrastructures forces farmers to look for other alternative solutions to export and source their input products through using JKIA airport in Nairobi instead if the nearby airport, KIA. They use Nairobi as the gateway for horticulture exports largely because of the absence of Business Development Services (BDS) as well as supportive policies prevailing in Tanzania in terms of export facilities at local airports such as KIA. Furthermore, much of the inputs need to be imported from Kenya and other European countries via Kenya making it more expensive than if larger quantities would be imported directly via KIA. Supply of inputs like chemicals and fertilizers in Tanzania is about 20-25percent more expensive than in Kenya (Haug, et al, 2008). Additionally, studies claim that the high export tariffs charged by the local authorities in Tanzania make export via Kenya cheaper than Tanzania (Mashindano et al., 2013).

### 3.6.2: Institutional Infrastructures- Private sector and Government Policies

#### 3.6.2.1 Private sector- NGO'S and Development Partners

Owing to the impressive performance of the horticulture sector in Tanzania is the private sectors through the Tanzania Horticultural Association (TAHA), and funding from development partners (such as the Royal Netherlands Embassy, United States Agency for international Development (USAID), the Finish government, the Swedish government (Sida) the Danish government (Danida), BEST-AC (a grant programme that assists these organizations as TAHA to be successful in their dialogue with government to change policies, laws and regulations in favour of horticulture) has been also of huge support to the Tanzania's horticulture Industry. USAID for example, offers over US\$ 5 million per annum, to support small scale farmers to improve production, harvesting and marketing of their produce (Mwakanemela, 2014).

#### **Box: 1 Tanzanian Horticultural Association (TAHA)**

Established in 2004, Tanzanian Horticultural Association (TAHA) is a private sector member based organization dedicated to develop and promote Tanzania's horticultural industry. It was established with the help of Dutch grant aimed at promoting and developing horticulture and addressing the general and specific needs of its members (large scale farmers, small scale farmers (individuals and groups), traders, processors, exporters and Development Partners such as USAID, the Royal Netherlands Embassy and Finnish Government to mention a few). Its main mission is ***'To develop and promote the Horticulture sector in Tanzania to become more profitable, sustainable, and participate more effectively in the development of the country'***.

TAHA's main objectives include lobbying and advocacy for policy changes. Through this role, TAHA has successfully campaigned for numerous policy changes that have positively impacted the whole horticulture industry. For example, TAHA played a crucial role in persuading the government of Tanzania to waive the 18percent VAT placed on airfreight for horticulture goods, which was hindering Tanzanian businesses to become more competitive in the international markets. Furthermore, in 2013, TAHA uplifted Kenya's import ban on Tanzania's cut flowers in transit (imposed by Kenya in 2011 to protect Kenyan industry from pests) through JKIA for export to Europe and other countries (Toroka, 2013).

TAHA has been playing a crucial role in capacitating farmers with Good Agricultural Practices (GAP) trainings to meet production standards for international markets such as the Global Gap certificate. Additionally, TAHA promotes the industry locally and abroad. Through TAHA, horticulture sector has seen a tremendous rise in export and overall revenue generated from horticulture industry. After only ten years, (according to the Tanzanian Revenue Authority (TRA)), the industry registered export revenue of US \$ 477 million in 2014, up from USD 64 million when TAHA was established in 2004. TAHA's ambition is to make horticulture sector a 1 billion USD dollar industry by 2018.

### 3.6.2.2 The Tanzanian National Policy Frameworks and Strategies Supporting Horticulture

The government has slowly started to build enabling business environment for horticulture though collaborating with private sector such as with TAHA. In this section an overview of the policies and strategies guiding the horticulture industry are presented, showing that there is still much work to be done to transform this industry.

#### 3.6.2.2.1 Horticulture supporting policies

As briefly introduced, horticulture in Tanzania is regarded as a subsector of agriculture. The subsector falls under sectoral (agricultural) policies which include the draft of “the *national agricultural policy of 2010*” which seeks to revolutionize agriculture through modernization and productivity enhancement. Some of proposed areas of attention that hinder development of the agricultural industry include low productivity, inadequate support services, low quality produce, poor participation of private sector and dependence on rain-fed agriculture. The “*national irrigation policy (2009)*” seeks to expand land under agriculture and improve agricultural productivity and profitability for food security and poverty alleviation through irrigation. In addition, horticulture also falls under the “*agricultural marketing policy (2007)*” which seeks to develop an efficient, effective, flexible, accessible, and equitable agricultural marketing system such as institutional and tax reforms in value chain, infrastructure and private sector development (Mashindano et al, 2013). Also, the *Agriculture Sector Development Plan (ASDP)* with objectives to enable farmers to have better access to and use of agricultural knowledge, technologies, marketing systems and infrastructure, and increase private sector investment in agriculture based on an improved regulatory and policy environment. Furthermore, horticulture falls under “*Rural Development Policy (2001)*” focusing on increasing rural incomes through improving productivity of the agriculture sector, and growth of rural nonfarm businesses to reduce poverty. This is through improved agricultural production incentives through the liberalization regulations to encourage the production of non-traditional export crops, Support research and extension to improve its effectiveness, and to promote private sector participation in production, processing, storage, input supply and marketing, improving rural infrastructure and reduction of post harvest losses.

#### 3.6.2.2.1 Strategies guiding Horticulture Sector

Horticulture in Tanzania is also guided by the following policy frameworks (for the realization and implementation of the above mentioned policies):

**National Horticulture Development Strategy 2012-2021:** Under the above policies, the “National Horticulture Development Strategy 2012-2021” was drawn by Horticultural Development Council of Tanzania (HODECT), sets a road map for transforming horticulture sector in Tanzania through achieving the seven pillars of its strategic initiatives including the promotion of horticulture; expanding long-term financing & investment; addressing land, policy & infrastructure bottlenecks; expanding production base and improve quality; strengthen industry linkages and mobilize human resources which are expected to directly address the most critical constraints in the industry and provide the catalyst for expanding the market for Tanzania horticulture.

**Tanzania National Development Vision 2025:** the National Horticulture Development Strategy 2012-2021 falls under the “Tanzania 2025 Vision” which aims at achieving a high quality livelihood for its people through transforming Tanzania from least developing country to be a society with

characteristic of a middle income country by 2025, having eliminated abject poverty and maintaining a high economic growth rate of at least 8 percent per annum. It outlines five main attributes that Tanzania is expected to have attained by the year 2025, namely, a high quality livelihood, peace, stability and national unity, good governance, a well educated and learning society and a competitive economy capable of producing sustainable growth and shared benefits. Vision 2025 was designed to be implemented through a series of three “five year development plans (FYDP)”.

**Five year development plans (FYDP) I 2011/2012- 2015/2016:** overall goal of FYDP I is to unleash the country’s resource potentials in order to fast-track the provision of the basic conditions for broad-based and pro-poor growth. The targeted average GDP growth rate of 8% for FYDP per annum is to be achieved through (i) large investments in energy and transport infrastructure, (ii) strategic investments to expand the cotton textile industry; high value crops (**horticulture, floriculture, vineyards**); and (iv) drastically improving the business environment. This will also require sustaining the following sectoral transitions: agriculture to increase its average annual growth rate from 4.4 percent to 6 percent by the year 2015/16 (FYDP, 2012).

**The “Kilimo Kwanza”** (agriculture first) (2009): Horticulture also falls under Kilimo kwanza initiative to transform agriculture into a modern commercial sector. This is expected to increase agricultural productivity through policies and institutional reforms, infrastructure development especially rural roads, use of modern technology, extension services, irrigation systems, market access, reform of land laws and advocating for investment in agro-processing industry.

**Mkakati wa Kupunguza Umaskini na Kukuza Uchumi Tanzania (MKUKUTA) II** (National Strategy for Growth and Reduction of Poverty, NSGRP): Horticultural development strategy is also integrated in MKUKUTA, is intended to accelerate the linkage between economic growth and improving the living standards of the poor, whereby the economic growth is created in the sectors where majority of the poor engage themselves. The country intends to reach that goal through rural economy transformation, largely through significant improvements in infrastructures that in turn are expected to result into an increase in agricultural productivity creating employment in both the farm and non-farm sectors.

**Tanzania “Big Results Now (BRN)”:** In the 2013/2014 financial year, Tanzania, with support from development partners, adopted a Big Results Now (BRN) initiative as part of an effort to move the country from low- to middle-income status. BRN focuses on six priority areas which are agriculture, energy and natural gas, water, education, transport, and mobilization of resources.

**Rural Development Strategy:** The overall objective of the Rural Development Strategy (RDS) is to provide a strategic framework that will facilitate the co-coordinated implementation of sector policies and strategies concerned with the development of rural communities. In particular, the RDS supports the implementation of the Poverty Reduction Strategy and create a development environment that will contribute to enabling rural communities and households achieving sustainable livelihoods. Through targeting rural based agriculture activities such as agricultural productivity, input procurement, extension services (provision of farmers with knowledge, information, experiences and technologies needed to increase and sustain productivity), rural financial institutions, agricultural taxation, roads and communication.

#### 4. Arusha's Horticulture sector profile



After a general description of horticulture sector and its performance in Tanzania, this chapters turns to Arusha to understand how the horticulture sector is organized, the main infrastructures and the importance of horticulture to the population involved in horticulture. This part presents and discusses findings obtained during data collection. This chapter is guided by the first question,

*How Arusha's horticulture sector organized and what is the role of horticulture sector in creating a pro- poor growth in Arusha's societies?*

The chapter starts with providing general overview of Arusha region, the horticulture sector and other economic activities in order to have an impression of how the horticulture sector operates in Arusha. Furthermore, identified characteristics of the farmers interviewed and the horticulture sector in general will be outlined, followed by in depth description of the main infrastructure that Arusha's horticulture sector depend on (air transport). This chapter finishes with the role of horticulture sector in Arusha in contributing to economic and social development of the region.

#### 4.1 Arusha at Glance

Arusha region is situated at the Northern part of Tanzania. Arusha shares borders with Kenya to the North, Mara region to the North West, Shinyanga to the West, Manyara and Dodoma regions to the south and Kilimanjaro region to the east. The region comprises seven districts namely Monduli, Arusha, Karatu, Arusha Rural, Ngorongoro, Longido and Arumeru.

**Map 2:Arusha**



Source: Google Maps

According to Tanzania's Population census of 2012, Arusha has a total numbers of 1,694,310 people of which 1,135,188 live in rural and 559,122 live in urban. Population density is 45 people per square kilometre. Arusha has a total of 378,825 household with an average of 4.5 people per household. 92,374 households depend on electricity as their main source of energy, while 14,670, 124,685, 3,966, and 16,137 households depend on solar, kerosene lantern, candles and firewood respectively. 233,985 households use firewood for cooking, while 60,596 and 1,055 households use charcoal and farms wood residuals, respectively.

#### 4.2 Arusha's Main economic activities

Agriculture is the main economic activity in Arusha region employing a total number of 259,007 farmers. It contributes to more than 45 percent of Arusha's GDP and also accounts for more than 75 percent of region's export earnings. Moreover, agriculture and livestock sector combine, employ more than 65 percent of the rural population (Arusha's regional Commission office, 2015). Of Arusha's total households, 174,095 households are engaged in agriculture, of which 150,145 households live in rural areas and 23,950 households in urban areas (Tanzania's Population census of 2012). Other important economic activities in Arusha include tourism (famously known for Mount

Meru, Ngorongoro crater, Serengeti National park, Tarangire national park, Arusha National park and other parks) and mining (Tanzanite).

Out of the total Arusha's land area of 34,526,000 hectares, arable land (the area that is suitable for agriculture purposes) covers only 487,795 hectares, or 1.4 percent of the total land area of the region. The remaining land area (34,038,205 hectares or 98.6 percent) is not suitable for agriculture; it includes national parks, game reserve areas and grazing land.

**Table 7 Distribution of Arable land in Arusha by District**

| District     | Total Land Area (Ha) | Total Arable Land (Ha) | Percent of District Arable Land | Arable Land Under Crop Production | Percent of Arable Land Under Crop Production (Ha) | % of Arable Land as Total Arable Land |
|--------------|----------------------|------------------------|---------------------------------|-----------------------------------|---|---------------------------------------|
| Arusha       | 93,000               | 6,400                  | 6.9                             | 5,769                             | 90.1  | 1.3                                   |
| Arumeru      | 2,896,000            | 159,700                | 5.5                             | 104,733                           | 65.6  | 32.7                                  |
| Monduli      | 6,419,000            | 81,830                 | 1.3                             | 28,915                            | 35.3  | 16.8                                  |
| Karatu       | 3,300,000            | 102,573                | 3.1                             | 38,945                            | 38.0  | 21.0                                  |
| Longido      | 7,782,000            | 73,164                 | 0.9                             | 29,223                            | 39.9  | 15.0                                  |
| Ngorongoro   | 14,036,000           | 64,128                 | 0.5                             | 25,651                            | 40.0  | 13.1                                  |
| <b>Total</b> | <b>34,526,000</b>    | <b>487,795</b>         | <b>1.4</b>                      | <b>233,236</b>                    | <b>47.8</b>                                       | <b>100.0</b>                          |

Source: arusha.go.tz

### 4.3 Agriculture and Horticulture activities in Arusha

Arusha is endowed with fertile soils and with different altitudes/temperatures which offers climatic conditions suitable for production of many varieties of food and cash crops. The major food crops grown in the region include maize and beans. According to Arusha region agriculture census of 2007/08, maize crop is the most dominant crop in the region accounting for 63 percent of the total area planted with annual crops in the region, followed by beans which constitute 26 percent. Furthermore, other crops such as coffee are grown in the slopes of Mount Meru in Arumeru and Arusha districts because of its high altitude ranging from 800 – 4,500 meters above sea level and have temperate temperatures and heavy rainfall (over 1,000mm) annually.

Due to different temperatures and altitudes in Arusha, each of its seven districts offers unique opportunities for different horticulture crops from flowers to fruits and vegetables. According to the recent Agriculture sample census of 2007/08, the annual production of fruits and vegetables in Arusha was 30,549 tons. The most cultivated vegetable crop was tomato with a production of 18,866 tons (61.8% of the total fruit and vegetables produced), followed by cabbage (3,649 tons, 15.2%), onions (1,925 tons, 6.3 %), Cucumber (1,464 tons, 4.8 %), carrot (993 tons, 3.3%), bitter Aubergine (751 tons, 2.5%), Spinach (566 tons, 1.9%), Egg Plant (519 tons, 1.7%), amaranthus (309 tons, 1%), and chilies (276 tons, 0.9%). The production of the other fruits and vegetables was relatively small with less than 1 percent of the total fruit and vegetables produced. In terms of flower production, Arusha is the number one region in terms of total number of flower production compared to other regions in Tanzania. In the 2007/08 agriculture census, the region had the second largest area under flower cultivation (191 hectares) after Morogoro region.

Arusha is the oldest region that began to produce horticulture products, especially flowers therefore, horticulture industry is relatively more developed compared to other regions in Tanzania. When one mentions horticulture in Tanzania they refer to the northern region. More than 85 percent of



commercial horticultural investment in Tanzania is concentrated in the Northern part of Tanzania, especially in Arusha, and Kilimanjaro regions (Lema, et al, 2014, Haug et al, 2008). Arusha has the largest number of horticulture companies in the Northern region; therefore it is the heart and prime location of horticulture industry in Tanzania. Today there are 17 horticulture producing/exporting and processing companies, which mainly employ workers from the neighbouring communities. However, the industry is dominated by small scale farmers who are also producing for large scale exporting companies.

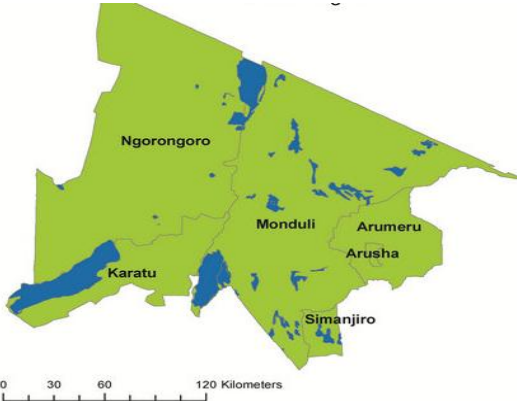
Arusha is a major supplier of onions to Dar es Salaam, Mwanza, Shinyanga and Tabora urban markets during August and October. A larger amount of fruits and vegetables grown in the region is consumed within the region because of the rapid urbanization and the growing tourist industry. Part of horticulture production is exported to neighbouring countries such as Kenya and Comoro, and also to Europe and Asia.

**Table 8: Crops production per district**

| District   | crops  |
|------------|--|
| Arusha     | coffee, flowers, flower cuttings bananas, legumes, tomatoes, eggplant, okra, onions, carrots, beat roots, cucumber, peas, cauliflower, sunflower, cassava, sweet potatoes, Irish tomatoes, millet, watermelon  |
| Arumeru    | coffee, flowers, flower cuttings, bananas, legumes, tomatoes, egg plant, okra, onions carrots, beat roots, cucumber, peas, cauliflower, sunflower, cassava, sweet potatoes, Irish tomatoes, millet, watermelon |
| Monduli    | rice, bananas, legumes, sunflowers   |
| Karatu     | wheat, barley, maize, legumes, sunflower, millet   |
| Longido    | wheat, barley, maize, legumes, sunflower, millet   |
| Ngorongoro | coffee, bananas, legumes, tomatoes, egg plant, okra, onions, carrots, beat roots, cucumber, peas, cauliflower, sunflower, cassava, sweet potatoes, Irish potatoes, millet, watermelon                          |

Source: Adapted from : Barnett, (2010)

**Map 3: Arusha Districts**



Source: Aller, Lwiza, Pizer, Aller (2013)

**4.4 Characteristics of farmers interviewed**

This section provides findings by first outlining the characteristics of the farmers that participated in the research, and afterwards the general characteristics and dynamics of the horticulture industry in Arusha Tanzania.

**4.4.1 Large scale farmers**

This research is a result of interviews with a number of small scale and large scale farmers. To begin with, 11 large scale companies’ managers and owners of horticulture producing firms were interviewed, who were all male. On average, these companies employ about 400 employees on fixed contract, ranging between 75 and 1300 employees. During busy seasons (such as harvesting), these companies offer temporary employment to between 250 and 400 people. These employees come mainly from neighbouring communities, but also from other regions surrounding Arusha. Seven out of eleven companies have operated in Tanzania for between six to ten years, while the rest (five firms) operates in Tanzania for more than ten years.

**Table 9: Firms Interviewed**

|                      |
|----------------------|
| Rijk Zwaan-Afrisem   |
| Africado             |
| Hortanzia            |
| Kiliflora            |
| Kilihortex           |
| Mara Farming         |
| Serengeti Fresh      |
| Fides Tanzania Ltd   |
| Sanifresh            |
| Homeveg Tanzania Ltd |
| MultiFlower          |

Majority of large scale firms in Arusha that were interviewed were Dutch owned (45%), producing cut flowers (roses) vegetable and flower seeds and flower cuttings. The remaining companies were owned by Tanzanians and Kenyans and do produce vegetables and herbs for export. On average, area under cultivation of the firms with owns a farm is 67 hectares, ranging between 6 and 180 hectares. Seven out of the eleven companies use out grower farmers to partly (5 companies) or entirely (2 companies) produce the products for them. The total number of out growers contracted by these firms, ranged between 2000 and 3000 farmers mainly owning about one acre each. Out growers contributes to up to 90 percent of total export according to TAHA.

**Table 10 characteristics of large scale farmers**

|   | count | %    |
|---|-------|------|
| <b>Gender</b>                               |       |      |
| Male  | 11    | 100% |
| Female                                      | 0     |      |
| <b>Function</b>                             |       |      |
| Manger                                      | 6     | 55%  |
| Owner                                       | 5     | 45%  |
| <b>Ownership</b>                            |       |      |
| Dutch                                       | 5     | 45%  |
| Tanzanian                                   | 2     | 18%  |
| Kenya                                       | 2     | 18%  |
| Others                                      | 2     | 18%  |
| <b>Horticulture crops</b>                   |       |      |
| Flowers                                     | 2     | 18%  |
| Fruits                                      | 2     | 18%  |
| Vegetables                                  | 4     | 36%  |
| vegetable seeds                             | 1     | 9%   |
| vegetable and flower Seeds+ flower cuttings | 1     | 9%   |
| Herbs+ vegetables                           | 1     | 9%   |
| <b>Years of operation</b>                   |       |      |
| 0-5 years                                   | 0     |      |
| 6-10years                                   | 7     | 64%  |
| 11-20years                                  | 3     | 27%  |
| Above 20 years                              | 1     | 9%   |

The large scale producers that were interviewed produce the following varieties of vegetables (kales, baby corns, beans, French beans, carrots, beetroots, sweet pepper, sweet potatoes, chili pepper), herbs (chives, mint, basil), fruits (avocado, berries, mangoes, passion fruits, water melons), flower and vegetable seeds (flower seeds (open pollinated varieties), tomato, cucumber, eggplant, African kale, African eggplant and hot pepper) seeds and flowers and cuttings (roses, chrysanthemum, geranium, lavendula and kalanchoe). All these products were produced both in greenhouses and open fields, and collected and stored in private storage. Nine of the eleven companies used KIA and JKIA to export their products to the international markets. Seven of them (64%) transported between 50 and 100 percent of their produce via JKIA. These companies produced products that required frequent or daily shipments. Only two of the eleven interviewed companies exports majority (85% and 95%) of its production via KIA. These companies did not require daily or frequent shipment. The Netherlands was the most popular export destination of horticulture exports from the companies interviewed, followed by United Kingdom. Other countries include Germany and France, Switzerland, Belgium, Austria, Japan, China and United States.

**4.4.2 Small scale farmers**

Small scale farmers were also reached for interviews. A total of 6 individual small scale farmers were met, owning between 0.5 and 2.5 acres of land for horticulture production. These farmers produced crops such as tomatoes, sweet potatoes, beetroots, cabbage, onions, water melons, sweet pepper, cucumbers and eggplant. Four of the six farmers have been producing horticulture products since between 1980 and 2012 for the local market. Two of the individual farmers were in the process of starting to produce or are producing horticulture products but have not yet harvested for the first time. Furthermore, chairpersons from two out growers groups were interviewed. Mtazamo vegetable growers produces French beans, tomatoes, cucumber, sweet peppers, corn, sweet potatoes for export in a 10 acres hired farm that was formerly used to produce coffee. Uwano Ngerananyuki cultivates beans, tomatoes, baby corns and onions on individually owned plots of approximate 5 acres. Furthermore, two large groups of farmers who did not belong to a group association were met during trainings by agronomists of TAHA in April 2015. Majority of individuals in the groups produce horticulture products such as tomatoes but for the local markets, and others had never engaged in commercial horticulture. These owned plots of between a quarter of an acre and five acres.

**Table 11 characteristics of large scale farmers**

|  | count                   | Farm size- acres   |
|--|-------------------------|--|
| Individuals (1 female, 5 male)   | 6                       | 0,5 -2,5   |
| Representatives – out grower groups (Uwano Ngerananyuki (78) members and Mtazamo vegetable growers (44) members) | 3                       | 5 acres per individual (Uwano), 10 acres hired (Mtazamo) |
| Individual Farmers in Groups (without association)   | 2 groups of (40 and 50) | 0,5-5  |

Both, large scale and small scale farmers were mainly located in Arusha and Arumeru districts in the following areas, Arusha town, Tengeru, Usa River, Kisongo, Ngurdoto, Nduvu, Kigongoni, Duluti, KIA, Mianzini, Kijenge and Ngaramtoni.

**4.5 Characteristics of Arusha’s Horticulture Industry**

This section will present the main characteristics and dynamics in the horticulture industry as was observed and indicated by farmers and key stakeholders that were interviewed for this research.

**Dominance of small scale farmers:** Horticulture industry in Arusha is dominated by small scale farmers especially in production of vegetables (in flower and flower cuttings production, large scale farmers are dominant) and a handful of large scale farmers. According to TAHA’s agronomist, small scale farmers lack the skills and knowledge to produce horticulture crops because for many of them these crops are new (or have only produced for local market) and difficult to produce to meet international quality standards. This was indicated to negatively affect product’s quality and resulting into rejects in international markets (rejects are unsold produce caused by natural differences in size, shape and colour and breakage during washing and transportation; but still fit for consumption)

**Uncoordinated activities:** The dominance of small scale farmers in Arusha's horticulture value chain requires highly coordinated activities. For example, small scale farmers are highly dispersed and hardly work together. Due to small quantities produced by each farmer, say if an exporter company would want to buy 20 tons of tomatoes, will have to travel around villages to different farmers to collect it. There are hardly collection centres where such volumes could be bought. Furthermore, private sector and the government are also not working together to solve industrial problems. Stakeholders interviewed indicated that Producers/exporters, KIA, seed producing companies, chemical producing companies, the government bodies (such as the Tanzania revenue authority, Ministry of agriculture, local government) independently work on their own interest trying to get the maximum profit they can get from the value chain. This was indicated to increase transaction costs, making products from Tanzania less competitive.

**High dependence on Kenya:** There is high dependence of large scale farmers and exporters on Kenya for importing inputs and exporting horticulture products. There was no single farmer/exporter that was exporting 100 percent of his/her products via KIA, they all either combined with other airports such as JKIA and JNIA, or exported entirely through JKIA. KIA offers limited capacity and choice of planes to export their products to different destinations as literature above suggested. Inputs such as fertilizers, packaging materials, chemicals and seeds are mainly sourced from Kenya.

**Growing awareness for horticulture production potential:** there is generally a growing awareness of the potential of Arusha region in production of horticulture products. According to TAHA's agronomists, there are more and more small scale farmers shifting and combining staple food production with horticulture production. Many are also shifting from coffee production or leasing their farms for horticulture production because horticulture is perceived to generate more income than growing coffee. Furthermore, urban areas are expanding to the areas that were originally used for farming crops which requires large area to be profitable (e.g. staple). Farmers in these regions are opting for horticulture, because it is believed to be capable of creating more incomes even with a small farm size. The government has slowly started to recognize the role horticulture can play in employing more poor people. The budget allocation for agriculture in general has not improved but it is allocated in infrastructures that are intended to benefit horticulture sector as well such as construction of collection and storage centres.

**Large number of initiatives and programs to increase productivity:** related to the increasing awareness of horticulture, there are an increasing number of activities and programs to increase productivity in the sector. Experts mainly from private sector are conducting short courses to train farmers on those agriculture practices. For example, due to the increasing need, Horti Tengeru research institute has been training at least 50 farmers every month in the whole country. TAHA on the other hand together with other stakeholders has been organizing farmer's field days at least after every 3 months where farmers exchange information and ideas with other farmers about the high quality inputs, new technologies for example. As a result of above efforts, according to TAHA agronomists, there is increase in productivity of varieties of horticulture products in the industry. Something important to note is that this increase in productivity is mainly noticed in vegetables and fruits production (such as sweet potatoes, water melons, avocados, mangoes), and on products that will be requiring shipping instead of air transport. The production of flower has been declining since the financial crisis and it is not expected to significantly increase due to the fact that flower industry

is not doing well worldwide, and there are new comers such as Ethiopia, placing Tanzanian producers at a difficult competitive position.

**New agriculture technologies:** there is a rapid spread of new agriculture technologies in the sector especially in vegetable production such as drip irrigation systems and the use of greenhouses (plastic covering). However, these technologies are not an option for small scale farmers because they are still expensive. Nevertheless, they are there and expanding rapidly.

**Increase in traders from Kenya:** there is an increase in the number of traders (and investors) in the horticulture industry especially in vegetables coming from Kenya to the areas of Arusha and Kilimanjaro which share a relatively similar climatic condition as in Kenya. They look for farmers that can grow on contract or sell their horticulture products at a farm gate price.

*“Vegetable sector from Kenya is coming here more because land is very expensive in Kenya...They use out growers here, which means they don’t have to own land in Tanzania.” Jerry Goh, Executive director, Kiliflora*

This is seen as a strategic move to diversify risks related to the political instability in Kenya (linked to the 2007/08 election crisis and frequent terrorist’s attacks of Al Shabaab. During this research, Al Shabaab attacked and killed almost 150 Kenyan students at Garissa University in Kenya.

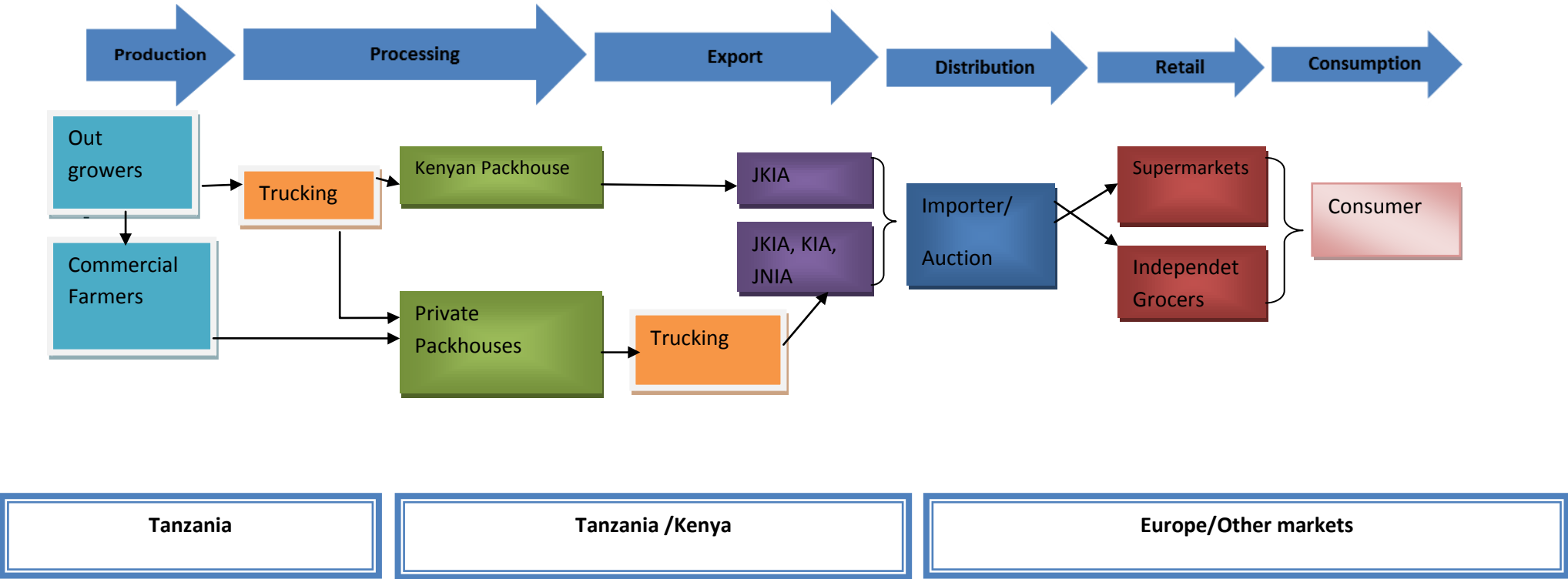
**The value chain:** the value chain in Arusha’s horticulture is characterized by last minute changes and quick actions and plans due to last minute changes especially for companies that are not having a fixed contract with KLM at KIA, and are therefore waiting for an opportunity if KLM will have an available space for their products. Sometimes, KLM makes last minute changes or even offload products that were once loaded into the plane. Time is the most valuable element of the value chain because of the product’s perishability nature. A one day delay in transport might result into huge losses. Therefore, if products are offloaded from KLM at KIA, or at the last minute it was decided that there is no space, plans are made to quickly truck the products to other airports.

The value chain for horticulture products especially vegetables is long and highly fragmented. If these vegetable are produced by out growers, the value chain starts even before production. Export companies using these out growers supplies inputs such as seeds, fertilizers and chemicals. After harvest, exporting companies collect products from out growers. These products are trucked to company’s own packhouse for processing (cutting, peeling, washing and testing), packing and grading. Thereafter, products are trucked to the airport. This process takes place in Tanzania. However some companies (sister companies of Kenyan companies) do the grading and packing in Kenya before export.

Companies that produces own products such as flower companies, process, pack and grade its products at own packhouses ready for trucking to the airports either in Tanzania or Kenya. This trucking is either done by company’s own fleet of refrigerated trucks or by hiring export logistics companies which also arranges the bookings and transport.

At the destination, products are received by importers (this could be supermarkets as well) who deliver it to the supermarkets or other independent stores ready to be purchased by consumers. For flowers they could also be imported by auction where retailers purchase and redistribute to consumers

Figure2: Air Lifted Horticulture Value Chain



#### 4.6 Main Infrastructure that Arusha's Horticulture sector depends on

Air transport is the main infrastructure that Arusha depends on for export of horticulture products. Other infrastructures identified in previous chapters such as cold storages and collection centres are also regarded as important. As transport accounts for the largest percentage (46) of total costs incurred by large scale horticulture farmers in Tanzania (Semberya, 2010), it is worth to examine in depth the logistics behind horticulture cargo transport.

##### Air Transport around Arusha

Arusha has two nearby important Airports, the Kilimanjaro International Airport (KIA) located between Kilimanjaro and Arusha, and Arusha airport in Arumeru district which serves domestic airlines. Arusha relies on KIA for horticulture export. The following section will describe how KIA is serving the horticulture industry in Arusha and the northern region in general.

##### Kilimanjaro International Airport –KIA



**Source:** Kilimanjaro Airports Development Company (KADCO)

KIA, located at the foot of Mount Kilimanjaro is approximately over 600 km by road from Tanzania's largest city, Dar es Salaam. KIA is the second largest international gateway in Tanzania after Dar es Salaam's Julius Nyerere International Airport (JNIA), covering approximately 110sq.km (KIA, 2014). The airport is located midway between Arusha and Moshi, and is approximately 50 km from each town. KIA is famously known among tourists as it covers the Northern tourism circuit involving the famous safari parks, such as Serengeti, lake Manyara, Tarangire, Ngorogoro and the highest volcanic mountain in Africa, "Kilimanjaro" of which it is named after (Tanzania National Bureau of statistics, 2014). The airlines operating at the airport includes, KLM, Qatar airlines, Kenya Airways, precision air, Rwandair, Ethiopian airline, Turkish airline, Fastjet, and Condor, to mention a few (Tanzania National Bureau of statistics, 2014, KIA, 2014).

In the last decade, numbers of passengers at KIA have grown significantly. While the airport was designed to handle 200,000 passengers, it currently handles about 900 000 passengers annually, and expects to handle 1.2 million passengers at the end of this year (KIA picked...2014). The airport passenger traffic has been growing at 25 percent annually, and this trend is expected to continue in the coming years. Passenger flow at the airport is important to the horticulture industry especially because horticulture export at KIA depends on passenger airlines. The airport has a 3,607metres



runway which can accommodate the largest aircraft. However, the terminal building is estimated by the Tanzania Airports Authority (TAA) to have reached its capacity already in 2006 because it is relatively small and is frequently congested (AfDB, 2013). In addition, the airport's aprons and taxiways are also in bad shape, raising an issue of safety (Netherlands Embassy in Dar es Salaam, 2014, Mhagama, 2014). During this research it was observed that the tarmac at the airport is also in bad shape especially when it is raining, forcing passengers to walk (there is no air bridge) through splashes of water collected on the tarmac.

#### **4.6.1 KIA's role in Arusha's horticulture sector**

KIA handles the second highest volumes of air cargo in Tanzania, after JNIA Dar es salaam with an average of 23,000 tons (in 2011) a year. However, the annual export volume is relatively small at KIA, at about 4,000 tons of which 60% (2400 tons) is for export. Vegetables accounts for 50 percent of export cargo at KIA (AfDB, 2013).

Many horticulture producing and export companies in Arusha are located within 20 minutes and over an hour from KIA. Horticulture products that pass through KIA are currently exported through the passenger airlines. It is mainly KLM passenger plane which is preferred by most exporters because currently, it is the only plane flying to the Netherlands (West Europe) where large percentage of the horticulture cargo is destined. Farmers/exporters of horticulture products prefer to use a direct plane to its destinations to avoid risks of delay and losing control of products when they have to be offloaded and uplifted again at another airport. Therefore, cargo handled at KIA from the horticulture industry in Arusha and other northern regions is smaller in terms of volume than the available amount produced in the region due to the fact that it is only KLM that uplifts horticulture cargo at the airport. As a result farmers and exporters opt to export their products through JKIA in Nairobi and JNIA in Dar es salaam.

According to the KADCO Marketing officer, cargo business at KIA accounts for an insignificant percentage (percentage was not given) of the total revenue earned. Of the total cargo uplifted at the airport for export, horticulture products accounts for the majority of the cargo (91percent for 2014), mainly being flowers. In 2014, a total of just below 2 000 tons of horticulture products were lifted from KIA slightly down from the previous year, when it totalled slightly above 2000 tones.

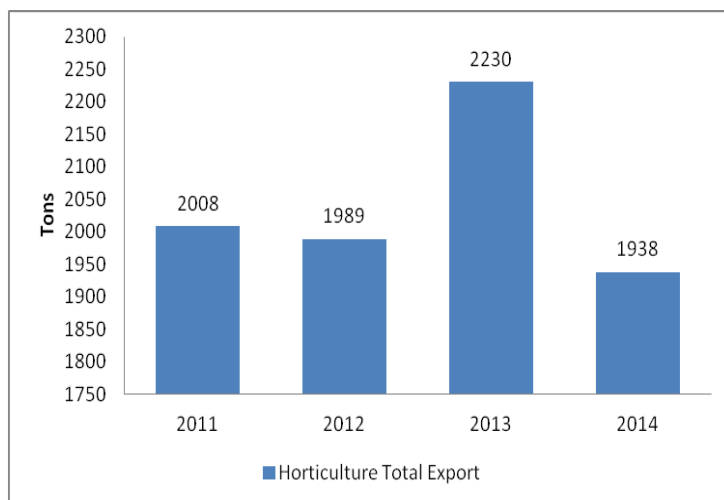
For the period from 2011 through 2014, it shows that generally, there has not been much change in the total export volumes at KIA. Only in 2013, the export volumes were slightly higher but the increase was insignificant. On average only 6 tons of horticulture products are lifted from KIA daily, an approximate of 40 tons a week (Ubwani). 6 tons a day is comparable to on average a total volume of a day export of one flower Company, Kiliflora, which exports almost 95 percent of its flowers via JKIA in Kenya.

CARGO UPLIFTED AT JRO (in Kilograms) COMPARISON PERIOD JAN-DEC FOR 2011- 2014

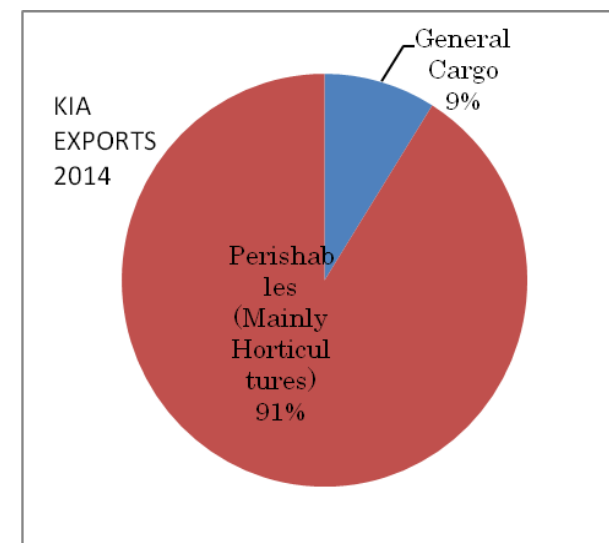
| Year                   | Jan          | Feb          | Mar          | Apr          | May          | Jun          | Jul          | Aug          | Sep          | Oct          | Nov          | Dec          | Total            |
|------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|
| <b>2011</b>            | 192.237      | 176.097      | 160.657      | 145.948      | 174.633      | 155.401      | 150.712      | 155.578      | 169.579      | 171.165      | 157.678      | 195.819      | <b>2.007.515</b> |
| <b>2012</b>            | 197.425      | 237.499      | 150.734      | 146.748      | 152.435      | 123.157      | 131.981      | 125.330      | 155.647      | 163.962      | 202.205      | 201.840      | <b>1.988.962</b> |
| <b>2013</b>            | 260.416      | 229.971      | 206.879      | 142.889      | 170.890      | 150.951      | 185.140      | 187.040      | 153.100      | 175.301      | 196.344      | 171.130      | <b>2.230.051</b> |
| <b>2014</b>            | 193.431      | 180.360      | 179.761      | 106.610      | 124.147      | 155.058      | 166.067      | 157.278      | 171.319      | 181.768      | 186.392      | 135.721      | <b>1.937.912</b> |
| <b>average per day</b> | <b>6.802</b> | <b>7.356</b> | <b>5.629</b> | <b>4.518</b> | <b>5.017</b> | <b>4.871</b> | <b>5.112</b> | <b>5.042</b> | <b>5.414</b> | <b>5.582</b> | <b>6.188</b> | <b>5.682</b> | <b>5.592</b>     |

Exports in Percentages (2014)

KIA Horticulture export volumes (2011-2014)



Source: adapted from KIA, 2015



With regards to the horticulture facilities at the airport, there is one cold room storage building. The building is still in good condition but it lacks the capacity to provide required temperatures needed for flowers, cuttings and perishable goods storage (RVO, 2013, Mhagama, 2014). Furthermore, it is widely known in the industry that KIA charges high landing fees and the dominance of Swissport (being the only handling company at KIA) is skyrocketing fuel prices making it expensive for flights to land at KIA, therefore negatively affecting the costs of exporting horticulture products (Mashindano et al, 2013, Cooksey 2011, Haug et al, 2008, TAHA 2011, Kenya’s ban..., 2015). Farmers and exporters at KIA have only one option to export their products to Europe, the KLM passenger airline resulting into limited cargo capacity at the airport.

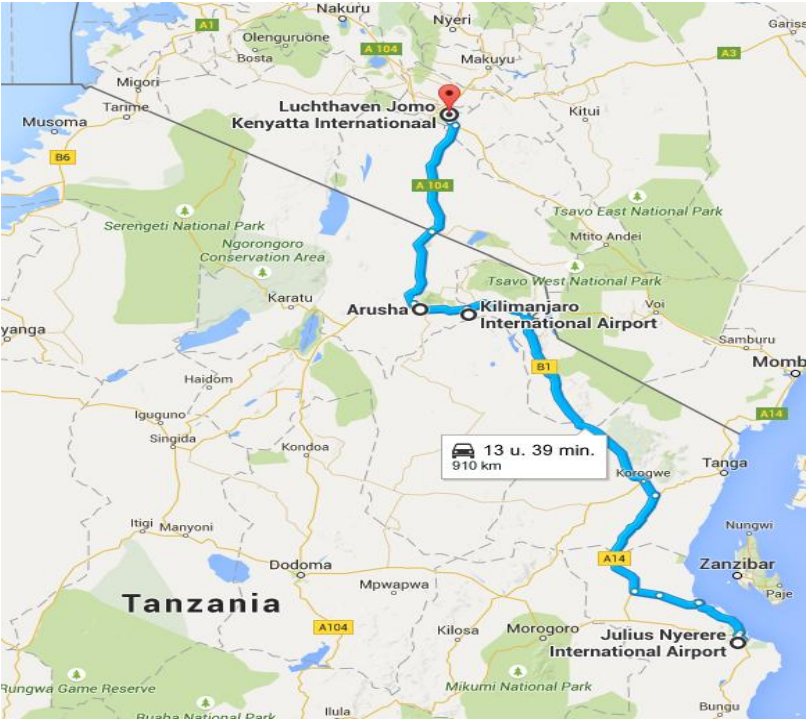
**Table 12: Costs comparisons at KIA and J KIA Airports**

| Cost Element               | KIA/JRO (USD)  | JKIA/NBO (USD) | Difference (USD) |
|----------------------------|----------------|----------------|------------------|
| Trucking – farm to airport | 0.03/kg        | 0.15 – 0.20/kg |                  |
| Handling charges           | 0.06/kg        | 0.03/kg        | 0.03kg           |
| Documentation charges      | 55.00/shipment | 48.00/kg       | 7/shipment       |
| Airfreight                 | 2.10/kg        | 1.85/kg        | 0.25/kg          |
| Aviation fuel per litre    | 0.83/kg        | 0.77/kg        | 0.06             |
| Turnaround charge          | 2,500          | 1,100          | 1,400            |
| Landing fee                | 1,850          | 1,750          | 100              |
| For 30,000kg per flight    | 74,340         | 55,500         | 18,840           |

Source: (TAHA,2012 Cited in Mashindano et al, 2013). As of July 2015, fuel was priced 0.7 (USD) per kg KIA.

Limited capacity at KIA and high airfreight costs make it extremely difficult for farmers and exporters to export via KIA. Therefore, even through some farmers are located 20 minutes from the KIA, they cannot benefit from it and majority opt to truck their products to JKIA.

**Map 4 -Distance Arusha- KIA, JKIA JNIA**



Unlike the findings by other studies, which cite higher costs at KIA to be the main reason for farmers to truck their products to JKIA, this research found that majority of farmers are using JKIA for reasons other than high costs at KIA airport. Those reasons are reliability and assurance to transport to (European) destinations everyday unlike at KIA which depend on KLM only which is not always reliable. This was especially important for farmers that produced products requiring frequent or daily shipments. This means even when KIA would have a cargo airline but unreliable they will still choose to export via JKIA. Some farmers indicated that they are wings of larger companies in Kenya which combine the products at Kenya before exportation to its destinations. Furthermore, other farmers go to JKIA because customers in Europe who takes care of their own transport demands that all products be loaded to JKIA where they are first repacked before being exported.

#### **4.6.2 Is Export through JKIA cheaper than through KIA?**

*"I would love to transport 100% of my products through KIA... I hate sending them through Kenya, it costs me money, it is very expensive, I pay 1 US dollar extra per kilo" Mr. Yusuph, -manager, Hortanzia*

*"I want to fly from here directly, not go all the way to Kenya..., I incur up to 50 US dollar cents a kilo by sending my berries to Kenya... I lose extra 24 hours which is very inconvenient for berries because they need to be quickly delivered after picking". Erik Koster, owner and Managing director- Kilihortex*

This study found that all farmers and exporters indicated to incur extra costs by trucking their products to JKIA instead of KIA. This is in the contrary to what many studies which propose that costs of transport at KIA are expensive than trucking products to JKIA (Mashindano et.al, 2013, Cooksey 2011, Haug et al, 2008, TAHA 2011, Kenya's ban..., 2015). Large scale farmers and exporters that were interviewed for this research indicated that costs per kilograms exported are lower at JKIA due to competition of many passenger airlines and cargo airlines. However, additional costs of trucking products to JKIA, dealing with custom authorities of two countries (Tanzania and Kenya) and the time lost by taking products to JKIA makes it cheaper to use KIA than JKIA. Farmers interviewed incurred between \$2 dollar cents and \$1 dollar extra per kilo by trucking their products to JKIA. Furthermore, large scale farmers indicated that they lose control of products once they truck their products to JKIA, something that brings difficulties to solve any problem with the products if it happens while in Kenyan side. Large scale Farmers mentioned that additional costs associated with transporting their products to Kenya are a big disadvantage and an obstacle to be competitive at the destinations of those products. The price that these farmers receive at the market in Europe depends on the freshness of the product; a day delay reduces value. Furthermore, the overdependence in Kenya's infrastructure makes the horticulture sector in the northern Tanzania vulnerable. For example in 2008, due to political clashes, Tanzanian horticulture industry lost approximately 450,000 Euros only in one month after flower consignments were forced to rot due to cancellations of cargo flights in Nairobi, Kenya (Nkwame, 2008). Following those reasons, all large scale farmers and exporters interviewed in this research indicated the preference to use KIA instead of JKIA to export their products to different destinations.

## **4.7 Importance of Horticulture in improving living standards in Arusha region**

*“Since we started engaging in horticulture, members have been able to improve their standard of living for both themselves and their families by building modern houses, enrolling their children in schools, and investing in other economic activities such as livestock”... We benefit from it, many of us are also managing to buy solar panels...You can notice that people are having more income in our village. K. Saanya, chairperson, Uwano Ngarenanyuki farmers group.*

After having seen the main characteristics and trend in Arusha’s horticulture sector, this section examines the importance of horticulture in improving living standards of the societies involved in horticulture business. The section is partly guided by the same sub question,

*How Arusha’s horticulture sector organized and what is the role of horticulture sector in creating a pro- poor growth in Arusha’s societies?*

It is proclaimed that horticulture can have a positive impact on creating pro poor growth. Tanzanian government has even prioritized the sub sector for that purpose. The dominance of small-scale farmers in horticulture production presents an opportunity for making an impact on poverty reduction efforts. Below are main findings on how horticulture in Arusha contribute to improving living standards as described by farmers themselves, both small scale and large scale.

### **4.7.1 Economic Development**

The horticulture firms interviewed do provide employment opportunities by hiring both, skilled and unskilled workers from the neighbouring communities therefore increasing job security. Export companies also create employment for farmers when they use out growers to produce products for them. Some of these companies work with more than 3000 contract farmers each. These farmers therefore have a secured buyer and do not have to look for a market themselves, or be tempted to sell their products at farm gate prices (which are always lower) because of not being sure of securing the market after harvest. In the 2007/08 Tanzania’s agriculture census, Arusha had the second largest number of farm employees (large scale farms) and the first with largest number of temporary farm employees and the fourth with largest number of permanent farm employees.

In addition to employment, large scale farms make large scale investments to train farmers and employees different technologies, of which they can use the expertise in growing their own horticulture products or even start a business. In that way, the firms help to educate and give skills to the population, something the industry is lacking. Employment in the firms or as an out grower allows farmers to improve their incomes. Farmers interviewed indicated that with increased income, they can take their children to schools, build better houses, buy solar panels and save money for hospitals and other basic needs.

Additionally, horticulture has played a very significant role in employment creation in the period when employment in other important export sector such as coffee went down significantly due to decline in world prices (Lema, et al, 2014). In 2013 for example, Coffee exports value from Tanzania dropped by 29 percent. Therefore, horticulture production created alternatives to diversify income so as people not to fall into poverty again due to plunging coffee prices. There is currently a trend in Arusha whereby farmers uproot their coffee plants (which take years to yield) to lease or use the farms for horticulture production.

Arusha is one of regions in Tanzania that are highly expanding, welcoming urbanization. Large areas that were once used for agriculture are now being turned into settlements, therefore farming plots are becoming smaller and smaller for small scale farmers who have small size farms in the first place. Farmers indicated that horticulture offers options for the people to still earn a decent income from their small pieces of land four times a year (due to four seasons of horticulture harvest, horticulture products are mainly harvested after three months ) than if those small plots are used to grow staple food such as maize (harvested once in a year).

#### **4.7.2 Social Development**

Moreover, horticulture does not only allow farmers to earn more income and employment but also allows the communities around large scale farms to benefit from social community projects (water, schools, dispensaries) that are provided by the horticulture companies as part of their Corporate social responsibility. Large scale firms that hire personnel provide free meals (which to some employees might be the only balanced diet meal of the day) and pay for medical costs of its employees and other fringe benefits in addition to their monthly salary. Kiliflora for example has its own dispensaries at its farms that provide free medical care to its employees. The company also pays school fees to 200 workers whose children are selected to join government and private secondary schools. Furthermore, farmers interviewed indicated that engaging in horticulture farming has reduced crimes in their societies as people spend a lot of their time in their farms.

Despite of the benefits that horticulture brings, small scale farmers have indicated that sometimes there has been tension between large scale farmers and small scale farmers especially over land issues. Farmers cited the fact that some large scale farms, in order to protect their products from spoilage or contamination, close paths that pass though their farms. This causes inconveniences for the locals who spend more time going around the farm, therefore creating tension.

## 5. Potentials and bottlenecks constraining Arusha's Horticulture sector

As indicated in previous chapters, Tanzania and specifically Arusha has an enormous potential to become major producer and exporter of varieties of horticulture products. However, the potential for growth in horticultural production and exportation in Tanzania remains not optimally exploited. This chapter identifies main opportunities and potentials in Tanzania horticulture sector in general and the main bottlenecks that are hindering the growth of horticulture industry in Arusha. This section is guided by the second research sub question

*What are the potentials and bottlenecks that are currently facing the horticulture sector in Arusha Tanzania?*

### 5.1 Opportunities and Potentials for Horticulture Growth

Worldwide, the demand for horticulture products has been increasing driven by rising in incomes, liberalized trade, and increased urbanizations both in developed and in developing countries which results into changing lifestyles and the increased awareness about benefits of eating fruits and vegetables (Davis 2006, Dolan and Humphrey, 2000 cited in Mashindano et al., 2013, Cooksey, 2011 World Bank, 2008). The increase in horticulture products demand is also due to the increasing number of supermarkets, which has made small-scale producers in developing countries to rise to the challenge of supplying the supermarkets with non-traditional horticulture products to meet the growing demand of their consumers (FAO, 2003). These are opportunities that Tanzania can take advantage of through increasing its exports. Tanzania still has high potential in becoming one of the biggest exporters of horticulture products because it has the following strengths and competitive advantages:

Large scale Farmers indicate that Tanzania's favourable climatic conditions (from temperate to tropical) which allows them to produce different horticulture crops in a year was one of the reasons they invested in Tanzania. The ability to produce through the whole years gives them a competitive advantage to supply horticulture crops even during winter time in Europe. Furthermore, they mentioned Tanzania's, enormous water sources and vast pieces of fertile arable land suitable for horticultural production.

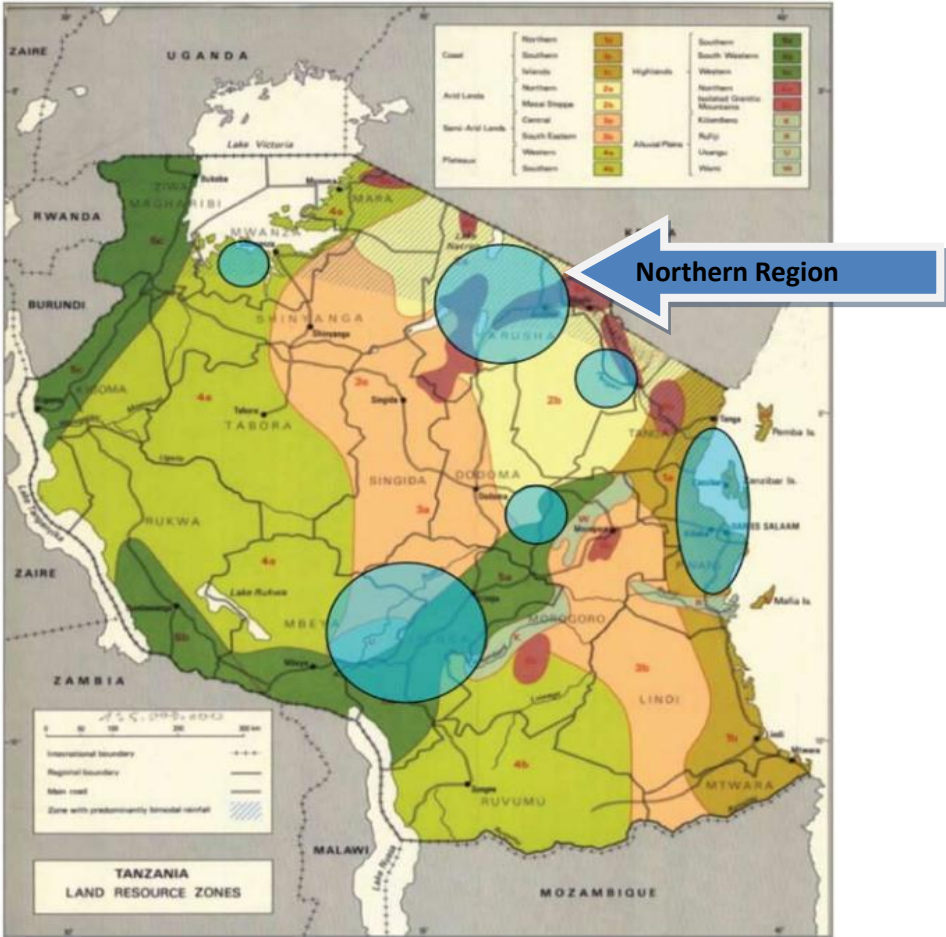
*"Tanzania has a lot of virgin land of which if it will be utilized for horticulture agriculture, it can make Tanzania feed the whole Africa" Kipkemoi, R.- Kenyan Horticulture Expert in Horticulture in Tanzania*

However, large areas in Tanzania that could play an important role in horticulture production are unexploited. For example, despite the high production potential in many parts of the country at the moment, horticulture is well developed only in the Northern regions (Arusha, Kilimanjaro and Manyara for high value vegetables: (French beans, baby corns, baby carrots, sugar snaps and mange touts), high volume vegetables (carrots, tomatoes, cucumbers, onions and cabbage), fruits (avocado, banana, citrus and passion) and Flowers (roses and cuttings) and the Southern highlands (Mbeya and Iringa). There is still a room to improve production of these products in their respective areas through use of high quality seeds and proper farming methods and technologies.

There are however other zones in Tanzania that are also suitable for horticulture production that are still not optimally exploited. Those zones includes the coastal zone (vegetables: tomatoes, vegetables

and cabbage, fruits: pineapples, watermelons and mangoes), central zone (vegetables (onions and cabbage), fruits (grapes), lake zone (capsicums) and Zanzibar (vegetables (spices, carrots, capsicums and tomatoes), fruits (watermelon and pineapples). Arusha itself has many areas that have potential for improving horticulture production.

**Map 5: Geographical Distribution of Horticulture Clusters in Tanzania**



Source: Tanzania horticultural development strategy 2012- 2021 paper

Additionally, large scale farmers indicated that Tanzania in general has a competitive advantage when it comes to costs of production (though they indicated that costs are continuously rising). In his study, Nishwitz, (2009), found that the cost of operating a greenhouse in Tanzania is less expensive than in temperate parts of the world. The Tanzanian growers use less advanced technologies in their greenhouses because being so near the equator, the greenhouses do not require heat or light sources, the only exception being in chrysanthemum flowers production. Moreover, he found that generally labour costs are considered cheap in Tanzania compared to more developed countries, taking up just 3.4% of the budget compared to 20-30% in other countries. In addition, electricity costs (though unreliable) are very low compared to other parts of the world. When compared to its neighbouring country, Kenya, the Tanzania’s cost of production, mainly labour and land, is found to be lower (Haug, et al, 2008, TAHA, 2011). These opportunities indicate that there is still enormous potential for Tanzania to compete in the world’s horticultural export market just like its neighbour Kenya.



## Future expectations on the Horticulture sector

Stakeholders that were interviewed say that horticulture in Tanzania in general has a huge potential which is still not realized, neither by the government officials majority of farmers. In an attempt to try to understand how they oversee the future of horticulture farming in Northern Tanzania, respondents were asked on how they see the sector performance in the next coming ten year in terms of productivity and growth.

On one hand small scale farmers, Logistic companies, TAHA and other stakeholders (except some large scale farmers and sector experts) are positive that in the coming ten years there will an increase in the horticulture products volumes produced (especially vegetables) in the industry per annum. They linked this to the increased number of small holder farmers that are joining the industry due to the training efforts done by TAHA, USAID, NGO'S, logistic companies, horticulture training institutes together with the farmers themselves who are eager to learn from other farmers after witnessing their success. The increased in volumes is also linked to the currently growing popularity of different technologies such as the drip irrigation. Furthermore, the productivity increase is linked to the growing demand of horticulture products both in the local and international markets.

However, on the other hand, majority of large scale farmers (7 out of 11) as well as sector experts are sceptical whether this increase in productivity will be significant.

*"It depends on how the government policies will be with regards to horticulture". Shah, M., Owner and director-Serengeti Fresh.*

They argued that if everything remains the same as how it is now, (in terms of current policies, lack of finance, unreliability of KIA, and the unfavourable investment climate in general) the horticulture industry will remain the same and if there will be any increase in production volumes it will be insignificant like it has been in previous years. However, even with the abovementioned opportunities and strengths of Tanzania to become one of the largest exporters of horticulture products, Tanzania's horticulture industry future depend on solving many challenges and bottlenecks that are constraining the country's capacity and capability to explore its potential. The following section identifies main bottlenecks in the industry.

**5.2 Main bottlenecks constraining Arusha’s Horticulture sector**

Based on the analysis given in the previous sections, this section identifies main bottlenecks that have been raised by large, small scale farmers and key informants to be constraining the growth of horticulture sector in Arusha Tanzania, and therefore an obstacle in unlocking horticulture potential in the region. These are the limited freight capacity at KIA, the fact that the industry is still young, uncoordinated and unable to produce enough volumes and the unattractive investment climate in general.

**5.2.1 Limited Freight Capacity at KIA**

This was the first and foremost bottleneck that all industry stakeholders identified. As already introduced, there is limited freight capacity at KIA due to lack of dedicated cargo flights to lift up horticulture cargo from the Industry and the dependence on limited passenger flights (namely KLM only) flying directly to Europe. This has been identified by majority (95%) of large scale farmers to be the main obstacle constraining the horticulture industry in Arusha. This is also the first problem that they would prefer to be solved in the industry.

KLM flies directly from Amsterdam to KIA where it offloads majority of its passengers, load new passengers heading to Amsterdam (AMS) and then goes to JNIA, in Dar es salaam where it offloads the rest of passengers from AMS and majority of its cargo, before loading new passengers for AMS. KLM carries import cargo that is mainly destined for JNIA in Dar es salaam. Therefore when it first lands at KIA, majority of its cargo still remains in the plane to be offloaded at JNIA. KLM reserves 6 cargo pallets for JNIA in Dar es salaam, while KIA gets 2 pallets a day. KLM has contract with some farmers to export their products for specific days. These are assured that their products will be up lifted in those particular days.

**Cold room storage -KIA**



*Containers on the left and Pallets on the right side at KIA cold room. (Only 20% of the cold room is in use at KIA)*

In addition to that, KLM can take extra 2 containers if there is available space which means if Dar es salaam has confirmed on time that not all 6 reserved pallets are going to be in use for that particular

day. These two containers are what most of the large scale farmers are fighting for at KIA. There is a big chance of horticulture products that could have not been accepted at KIA because of limited space to be accepted at JNIA because of the extra space that is created after offloading import cargo. Therefore, some of horticulture firms prefer to go directly to JNIA in Dar es salaam, 650 kilometres away (8 to 10 hours), where they have a bigger chance to transport their products. Majority of horticulture firms (nine of the eleven interviewed) prefer to go to JKIA in Nairobi because it is just about 3-5 hours depending on the amount time tucks have to spend on traffic and at the border.

*“The company export almost all its flowers via Nairobi, 95 percent... we have tried to use KIA but it’s just doesn’t have enough capacity. We have to fight for space at KIA; we don’t want to fight for it. The average export capacity per day is 6 tons; that is our production for one day here because we export about 5 to 6 tons of flowers every day”. Jerry Goh, Executive Director at Kiliflora Ltd*

Furthermore, as already introduced before, KLM is incapable of letting farmers and exporters (who do not have contracts with KLM) know in advance of the availability of space in a particular day. This information is given around 11 o’clock in the day itself (this is still not a guarantee though that there will be indeed space available). As the plane leaves around 20:00 hrs, this means the products for that particular day have already been harvested and packed. If there is no space, these products have to be rushed to JKIA. For some companies such as Kilihortex, which is exporting berries to European markets, this inability to know in advance can easily results into huge losses (berries ripen very quickly) because trucking berries to Kenya costs the company extra 24 hours.

Additionally, farmers also have to deal with frequent breakdowns of the cooling storage at KIA, which also lacks facilities for screening the products. Furthermore, activities in the cold room are not automatized, the offloading from trucks, weighing and are done manually, something that can be results into delays if there are more trucks waiting to offload.

**Manual Work cold room KIA**



*Source: Taha Fresh*

**5.2.3 Young Industry**

The fact that the industry is young it is an obstacle in itself in unlocking horticulture potential in Arusha and the whole northern region. The industry produces inadequate volumes to be attractive for cargo airlines and the government has only recently started to recognize the industry as important in its efforts to create inclusive, pro poor growth. Therefore most required infrastructures are still not in place.

**5.2.3.1 Inadequate Volumes:** The horticulture industry does not produce enough volumes due to dominance of small scale farmers. Low productivity (and low quality of products) in the industry was the second main problem mentioned (by large scale farmers (82%) and other key informants interviewed such as the TAHA, logistics companies, sectoral experts, a horticulture training institute

and the government officials interviewed) to be one of the chronic problems hindering the development of the horticulture industry in Arusha. They indicated that the sector's volume have increased compared to the last ten years before TAHA was launched. However, they the increase in volumes in the industry has been very marginal and slow due to the dominance of small scale producers making it less attractive for a dedicated cargo airline. Small scale farmers produce small volumes because of their small size farms, the poor technology they use the lack of knowledge and skills on how to grow horticulture products of high quality and the lack of infrastructures to store harvested products. As a result, large scale farmers who contract small scale farmers have to train these farmers on own costs and provide them inputs such as seeds. All these extremely affect the quality of products and productivity in the industry, affecting the competitiveness of farmers in international markets.

Furthermore, not having enough volumes is explained to be a huge obstacle for farmers in finding customers in the European markets who wants a consistent supply of large volumes of which the industry cannot yet deliver at this moment. This argument is in line with the results of studies outlined in the literature review section. In his study Cooksey (2011), found that the minimum freight volume to make it viable transaction to the European Union is about 40 tons per consignment, of which he said the industry is not ready yet to produce.

Horticulture in Arusha, especially in vegetables for export has only picked pace in the last decade, unlike floriculture which has been around for some years. Small scale farmers who dominate the industry lack the comprehensive market information (to produce required products), required skills and knowledge such as on GAP standards required to produce for international markets. These farmers lack knowledge and skills on how to produce these difficult non-traditional horticulture crops. Due to ignorance, some farmers spray chemicals such as those that they used for coffee (because they have been producing coffee) on the vegetables, unaware of the health risks for themselves and those who will be purchasing the vegetables.

*"Airfreight capacity is not a problem if we do have enough volumes ... if there are enough volumes, planes will just come" Mr. Erik Koster, owner and Managing director- Kilihortex*

*"There is no cargo plane at KIA because there is not enough volumes produced in the Northern regions, the problem is not the plane but the volumes". Hon. Dr. Jakaya, M. Kikwete, Tanzania's president, Den Haag*

Furthermore, lack of high quality inputs (due to existence of counterfeit seeds, fertilizers and chemicals in the market) which is a main problem for small scale farmers and packaging materials (for large scale farmers) do affect productivity as well. These costs are extremely high for farmers who have to import it from other countries such as Kenya and Europe, because Tanzania's horticulture industry cannot yet facilitate these products.

### **5.2.3.2 Government and Farmers are not ready yet**

Horticulture has only recently started to be recognized as an industry that could play a role in poverty reduction after years of neglect when the country was focusing on staple and cash crops. Horticulture has only been regarded as a subsector of agriculture. That means it falls under the policies and regulations of agriculture sector. This in one way or other constrains the industry

because horticulture has special needs and requires different strategies and infrastructures. For example, Infrastructures such as cool storage houses are not required for storing maize or coffee. To cater the specific needs of this industry, the government recognizes that it needs a specific approach for this industry. According to the assistant director –policy of the ministry of agriculture in Tanzania, Mr. Mabavu, the ministry through its agriculture promotion department, has started working together with other stakeholders such as TAHA to promote the industry within and outside the country. Promotion of horticulture in the industry is needed to change people’s mindset about horticulture potential to earn income.

Furthermore, slightly related to the above mentioned point, small scale farmers that accounts for the largest share of horticulture supply, are not ready either. To engage more farmers in horticulture production for export means training them on how to be such farmers that can produce high quality products with international standards in terms of quality, colour, size and shape. For many of them these products and products standards are new and non- traditional. Even those that have produced these products before, they are only skilled to produce for local markets, therefore also need trainings to produce higher quality products from higher quality inputs for international markets. Furthermore, stakeholders indicated that the government and people in general still need to change their mindset on how they look at horticulture. For the government, they have embraced has for such a long time embraced the idea that only cash crops such as cotton and sisal are what can earn foreign income. The population lack entrepreneurial culture to see opportunities in horticulture. Agriculture in general is still perceived as a job for the poor in Tanzania.

**5.2.3.3 Infrastructure not in place**

Infrastructures such as roads and energy are mentioned to be a huge obstacle and something that makes horticulture industry unattractive for investment. All eleven large scale companies that were interviewed had invested in massive and expensive standby generators due to unreliable power supply in Arusha region. The researcher observed power cuts of more than 5 hours reaching up to four days a week during field research. Temperature is the single most important factor in maintaining quality of perishable products during production and after harvest. Change in temperatures due to power cuts can result into substantial losses. In addition, while the trunk roads are relatively good in Arusha, the status of roads stretching to the production areas are in bad shape (especially during rainy seasons) which also dwarfs this sector in Arusha. Small scale farmers interviewed mentioned other types of infrastructures such as not having access to proper irrigation facilities, transport, cold storage, and collection centres. These all severely limits the capability of producers to provide consistent supplies of high quality products.

*Tomato collection at Tengeru- Horti Tengeru*



**5.2.4 Lack of cooperation and Coordination:** There is also lack of coordination between government departments and private sector, something that increases uncertainties and the cost to doing business. The capacity of the industry to generate positive externalities through collective action (coordination) and collective bargaining (lobbying) with the state also influences the sector's profitability (Cooksey, 2011). While majority of farmers pointed the lack of volumes to be the second main obstacle constraining the industry, 18% of large scale farmers and TAHA's CEO (Jacqueline Mkindi) pointed out that the lack of cooperation and coordination within and between private and public sectors is the biggest obstacle affecting the industry. They point out that if stakeholders in the industry were cooperating to solve common problems such as the lack of cargo airfreight at KIA, they would have solved the problem. Ms. Mkindi gave an example of TAHA's and USAID efforts in 2008 to bring in a cargo plane (MK Airlines) which succeeded (but later failed), when export volumes were 183 000 metric tons, for 2007/2008, (Mashindano, 2013). Those volumes are lower than the current volumes produced by the industry i.e. 265 000 metric tons for 2014 (TAHA, 2015). The MK plane which had a capacity of 100 tons first filled up in other countries such as South Africa and filled up the last 20 tons weekly at KIA. After few weeks volumes exported increased to 40 tons, two times a week (farmers produced more and some shifted their exports from JKIA to KIA) according to TAHA fresh manager, Bob Kisamo. However, one of the planes crashed and the financial crisis did hit hard the flower industry hard which resulted into significant drop of volumes at KIA, unattractive for a cargo plane to land at KIA. Ms. Mkindi holds that if the same kind of arrangements could be done, as the industry currently has enough volumes for at least two times a week 40 tons consignment. However, the government waits for the private sector to solve the problem.

*"The government needs to close the border (to JKIA) absolutely for exporters of horticulture to cooperate and find a solution to the problem" Mr. Erik Koster, owner and Managing director- Kilihortex*

Furthermore, according to Ms. Mkindi, the volume of exports captures a very small proportion of the volumes produced during the same period in Tanzania. This coincides with the findings by Mashindano et al, (2013), that Tanzania is among of top 20 world's producers of horticulture but does not fall in the top 20's world exports. Production of vegetables is dominated by informal small scale farmers who are not connected to the regional and international markets and therefore have limited chance to conduct export business themselves.

#### **5.2.5 Unattractive investment climate:**

*"Legal framework is absent in Tanzania, for example, title deeds mean nothing..." Mr. Erik Koster, owner and Managing director- Kilihortex*

The investment climate is defined as the institutional, policy, and regulatory environment in which firm operate. Key determinants of the investment climate include infrastructure, economic and political stability, rule of law, government regulations, taxes, property rights, functioning of labour and finance markets, and government transparency and accountability. A good investment climate fosters productive private investment and economic growth by creating opportunities for the private sector to invest, create jobs, and lay the foundations for long-term business success (World Bank, 2005)

The World Bank’s ease of doing business report of 2015 places Tanzania at a 131 position in the ranking of 189 countries. Tanzania’s score is slightly better than Kenya (136) and Uganda (150). However in general it is not good enough. In the figure below are the scores on different indicators measured in the doing business report.

**Figure 3; Tanzania Ease of Doing Business**



Source: Doing Business. Org, 2015

In general, the worse scores above correspond to the response obtained in the field while conducting this research. Nine out of eleven large scale firms (equal to 81%) interviewed for this research mentioned unattractive investment climate in Tanzania to be one of the main obstacles that they have to deal with everyday in their business operations. Farmers mention the difficulties in obtaining permits, unstable policies and government strategies that frequently change the absence of legal framework, large number of taxes, the inconsistencies between the central government and local governments and the harassment of foreign investors by Tanzanian local government officers. One large scale farmer referred to this as *“we are treated like oranges, not investors”*

Furthermore, educated and skilled workforce is very important element in attractive investments. All firms that were interviewed have to deal with uneducated and unskilled workforce (or farmers for those firms that make use of out growers) through providing trainings to equip workers with the skills to be able to work at or produce for a firm. For some companies that takes up to four months. Additionally, there are currently few experts and extension officers in the sector to train farmers on good horticulture farming practices to meet the standards that are acceptable for the international markets. The government has only two agriculture institutes, SUA and Horti Tengeru. Horti-Tengeru (was interviewed for this research) for example, is a research institute for fruits, vegetables, spices and flowers can train only up to 35 students a year at a diploma level, who are not enough to serve the increasing number of horticulture farmers. Some small scale farmers indicated that it might take up to four months to access an extension officer from the government.

Moreover, local financial institutions in Tanzania are also still reluctant on providing finance to the agriculture sector, because agriculture is considered too risky and expensive to lend money to, especially to small scale farmers. Even when it is available then it is not affordable because the interest rates are very high, up to 18%. This has been an obstacle for expansion for some firms. This difficulty in accessing finance is also reflected in the Ease of doing business report of 2015 citing it as one of the most problematic factor for doing business in Tanzania.

Additionally, even though Tanzania performs slightly better than its neighbour countries in number of procedures for registering a property ( 8 procedures taking 67 days against 9 procedures and 72 days of Kenya, (Doing business, 2015), it is difficult and expensive to access land for large-scale agricultural investors in Arusha. Large scale farmers interviewed for this research indicated to have difficulties accessing information on land availability and quality. There are three categories of land in Tanzania, general land, village land and reserved land. Foreign companies can obtain granted rights of occupancy on general land only. If foreign investors are interested in village land, the land must first be transferred to general land before being allocated to them, something that can take years.

All the above mentioned bottlenecks seriously limit the growth of the horticulture sector in Arusha. Large scale farmers have indicated that they can produce more if there is a reliable transport and they would also like to expand but they do face difficulties in obtaining land due to the high costs and the difficulties in obtaining land permits. The multiple taxes and delayed tax refunds are also discouraging farmers to invest more in the production, something that could boost the growth of this sector.



## 6. Interventions to improve Horticulture performance in Arusha

The following chapters are guided by the sub question:

*What policy Interventions can contribute to the growth of the horticulture sector in Arusha and how do current interventions (specifically focusing at KIA rehabilitation) fit with the challenges and bottlenecks facing the horticulture sector in Arusha Tanzania?*

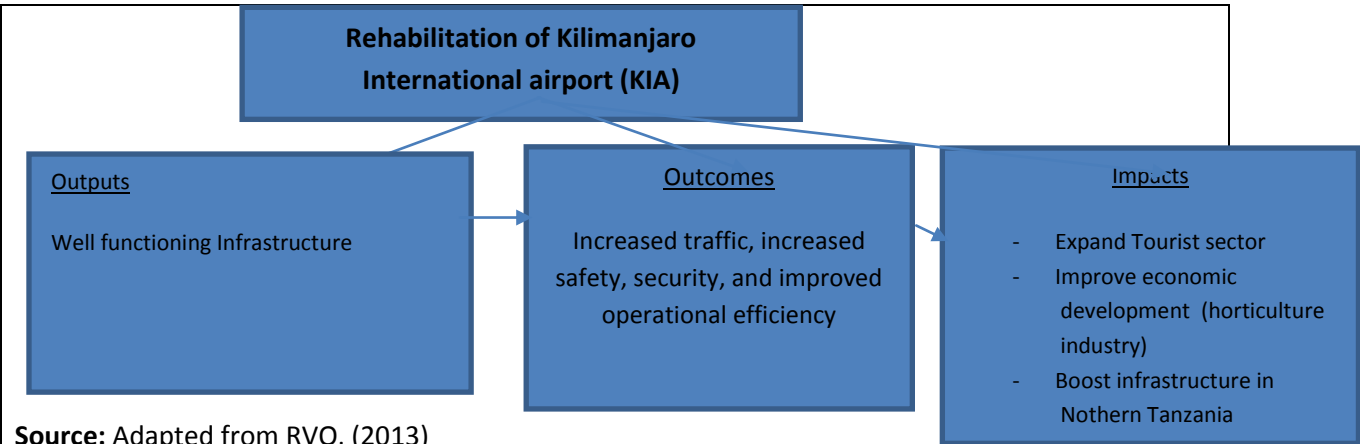
To begin with, this chapter will identify main interventions (starting with to KIA project, the focus of this study) that are currently being implemented in the horticulture sector in Arusha. These interventions are linked to the policies and strategies mentioned above and how these interventions directly or indirectly are trying to encounter bottlenecks that are constraining the horticulture industry in Arusha. Other parts if the sub question are answered in the following chapters.

### 6.1 KIA Rehabilitation Project - The Infrastructure Development Facility (ORIO)

The Infrastructure Development Facility (ORIO) is a grant facility operated by the Dutch Ministry of Foreign Affairs under the responsibility of the Minister for European Affairs and International Cooperation. ORIO facility was established to encourage public infrastructure development such as KIA in developing countries to contributes development, implementation (construction and/or expansion), operations and maintenance of public infrastructure aiming at reducing poverty and contributing to the Millennium Development (RVO, 2013).

The project costs 35 million Euros ((EUR 15million funded though ORIO, and EUR 20.5 million by the Tanzanian government) and it is in the implementation stage, the implementation activities are yet to start. The rehabilitation is deemed necessary after KIA’s many years of operations without significant renovation and improvements of the facilities. It will cover KIA’s aprons, taxiways and the terminal building (the cold room storage at KIA will not be part of the rehabilitation). The project time was estimated to be between 2014 and 2020 (Mhagama, 2014).

#### KIA Rehabilitation Project - Theory of Change



**Source:** Adapted from RVO, (2013)

**Output:** Output- products and services resulting from the completion of activities within a

development intervention

**Outcome:** Outcome is the intended or achieved short-term and medium-term effect of an intervention's output, the outcome specifically refers to improved access to and use of infrastructure by the private sector and households (RVO, 2013).

**Impacts:** This is the long-term positive and negative long-term effects on identifiable population groups produced by a development intervention, directly or indirectly, whether intended or unintended (RVO, 2013). These are such as the expanded tourism sector due to increase in traffic, furthermore the improved operational efficiency and increased traffic is expected to make the region more attractive to the investments in the economy and in this case the horticulture industry.

## 6.2 Other Interventions currently taking place in Arusha Region

There is new investment drive in Tanzania's agriculture sector, which is mainly seen as an opportunity to spur productivity among smallholder farmers and therefore addressing rural poverty. In the following section a summary of interventions that are currently taking place in Arusha region to boost agriculture (horticulture) sector in general are outlined.

Key interventions relate to horticulture value chain development; Domestic, regional and export trade promotion; GAP standards certification and compliance; Postharvest management and logistics support; Formation and strengthening of farmer associations; Promotion of public-private partnerships and Ensuring food security and improving family nutrition. Some of the interventions carry more than one theme.

**Table 13 Main Horticulture interventions in Arusha Tanzania**

| Name of the project  | Project cost        | Time frame | Donor/funder     |
|--|---------------------|------------|------------------|
| Tanzania Agriculture productivity program (TAPP)                 | \$24 million USD    | 2011-2015  | USAID            |
| Market Infrastructure, Value Addition And Rural Finance (MIVARF) | \$150 million USD   | 2011-2018  | URT, IFAD, AfDB, |
| Intervention for improving Advocacy                              |                     | 2004-      | BEST- Dialogue   |
| Arusha – Holili – Taveta/Voi Road Project – Tanzania and Kenya   | \$232.5 million USD | 2013-2018  | AfDB             |
| Kenya–Tanzania Power Interconnection Project                     | \$144.9 million USD | 2005-      | AfDB             |

### 6.2.1 Interventions to increase horticulture productivity and compliance to Good Agriculture Practices (GAP) standards certification

**(a) Tanzania Agriculture productivity program (TAPP):** The USAID-TAPP program is a 24 million USD part of the “*Feed the Future program*” which was established with a primary goal to increase incomes of smallholder farmers through enhanced productivity, increased investment, and improved market systems through agricultural innovation and commercialization to benefit 20585 rural families. To reach this goal, the program introduces basic technologies including green houses technology and good agricultural practices, promotes crop and market diversification, and establishes a balance

between nutrition enhancement and income generation for a variety of vegetables, fruits, and spices. Some of TAPP's main activities include the transfer of GAP agricultural practices to smallholder farmers, promotion of private and public partnership through partnering with small, medium and large companies to increase opportunities for smallholder farmers to obtain updated inputs, new technologies and markets. Additionally, to promote good practices to improve health and nutrition in assisted households, to train rural enterprises in business management and expand access to local, regional, and export markets (TAPP, 2013).

**(b) TAHA** is providing **technical support and extension services** in production and post-harvest handling, also known as Good Agriculture Practices (GAP) to small scale farmers. These practices includes methods such as raised beds, correct spacing, using irrigation technology, improved seeds, and proper use of fertilizers and pesticides in order to improve productivity. Furthermore, Horticulture training institute, Horti Tengeru and NGO's such as Echo Community is also providing trainings to farmers to increase productivity. Companies such as Afrisem also organize field days where farmers are invited to see and learn on the productivity of hybrid seeds.

**(c) Horticultural training centre:** A horticultural training centre in Arusha with green houses, drip irrigation system, nursery, pest management materials and training plots has been launched in 2015 to accommodate about 400,000 farmers from the northern region. The centre will serve as a platform from which farmers and other stakeholders such as students and lecturers will be introduced to a wide range of horticultural practices and technologies. This project is established by close collaboration of Tanzania Horticultural Association (TAHA), USAID Tanzania Agriculture Productivity (TAPP) program and the Ministry of Agriculture, Food Security and Cooperatives (MAFC). The centre is established in the efforts to improve productivity in the horticulture sector expected to address constraints such as high post harvest losses, poor infrastructure, inadequate credit, vague markets, strict export standards and low levels of value addition among small holder farmers (Adams, 2015).

**(d) Tanzania Horticulture board:** The government of Tanzania has proposed for the creation of a horticulture board to help farmers defend their own interests; including avoiding low prices for their produce and other challenges the small farmers are facing especially in market expansion and securing required inputs. This initiative is seen as the renewed interest by the Tanzanian government in the Tanzanian horticulture sector (Board propose to..., 2014).

### **6.2.2 Intervention for Formation and strengthening of farmer associations to improve Advocacy/private public partnership**

Business Environment Strengthening in Tanzania–Advocacy Component (BEST-AC), now known as “*Best -Dialogue*” is a program funded by Danish International Development Agency (DANIDA), Swedish International Development Agency (SIDA), UK Department for International Development (DFID) and the Embassy of the Kingdom of the Netherlands (EKN). Its main aims are to support business environment reforms through public-private initiatives in support of Tanzania's vision for economic growth through supporting private sector organizations to advocate for improved policy

coordination and public-private dialogue. This is done through grants, training and technical assistance to private sector membership organizations such as TAHA.

**6.2.3 Interventions for promotion of post harvest management, Horticulture value chain development and trade**

**(a) Market Infrastructure, Value Addition and Rural Finance (MIVARF)**

In market infrastructure, the government of Tanzania has proposed the construction of feeder roads (1550km), market centres and storage facilities (70) to improve farmers’ access to markets. In value addition, the rehabilitation and resourcing of 16 Post Harvest training centres to increase share of value added of small- and medium-scale producers which will ultimately enhance food security and improve the socio-economic welfare of the farmers and small- and medium- scale producers through increase in household income. This will in turn contribute to the Government’s efforts in reducing poverty and in accelerating economic growth on a sustainable basis in Tanzania (AfDB, 2013).

**Example: Collection and storage centres in Arusha (post harvest management)**

High levels of postharvest losses mainly resulting from poor or lack of on-farm storage facilities is among the many stumbling blocks preventing farmers from accessing markets. TAHA and the Ministry of Industry and Trade (MIT) under the project *“Improving the Competitiveness of the Horticultural Value Chain in the Northern Region of Tanzania”* have constructed collection and storage centres and irrigation infrastructure facilities in Arusha to improve the competitiveness of the Horticultural value chains. The collection and storage centres are built with simple and innovative technologies (the use of charcoal, therefore not relying on the unreliable electricity supply) to maintain the quality and freshness of products before they reach the markets. The projects are aimed at enhancing farmers’ production, minimizing post harvest losses and improving market access of horticultural products collected and stored in these centres.

**A collection centre (left) and a cooling and sorting facility at Midawe, Arusha**



Source: Taha, (2014)

### **(b) Arusha – Holili – Taveta/Voi Road Project – Tanzania and Kenya (logistics support)**

This is a 157.5-kilometre road project from Arusha to Holili in Tanzania, and Taveta to Voi in Kenya, in an effort to reduce the cost of transport and enhance access to agricultural inputs, larger markets and social services within the East Africa Community. Launched in 2013, the project is expected to be completed by December 2018. The main beneficiaries of the project include export/import and freight operators (horticulture export falls here), manufacturers, traders and generally the business community in the region especially tourism, and communities in the zones of influence of the road sections. The communities will benefit through reduction in transport costs, easy access to larger markets, agricultural inputs and social services.

### **(c) Kenya–Tanzania Power Interconnection Project**

In February 2015, the Board of Directors of the African Development Bank Group (AfDB) through African Development Fund (ADF) approved a loan of US \$144.9 million, to the Kenyan and Tanzanian governments for a Tanzania-Kenya Power Interconnection Project. The project involves the construction of approximately 508 kilometres of transmission line between Kenya and Tanzania (about 93 km in Kenya and 415 km in Tanzania) and associated substations in Arusha and Singida (Tanzania). This project through not directly linked to horticulture could positively affect the horticulture sector as well which largely depend on unreliable power supply in Arusha.

All the above mentioned interventions are focusing on the long term goals to make the industry attractive with enough volumes. There are relatively no efforts identified to solve the most pressing problem facing the industry, lack of freight capacity at KIA. The KIA project is the only project that comes close. Large scale farmers, logistics companies, KADCO and other stakeholders have different opinions how the above mentioned interventions can contribute to unlock the horticulture potential in Arusha.

## 7. Stakeholder's Opinions on the effectiveness of Policies and Interventions

### 7.1 Opinions about Horticulture guiding policies

Looking at policies and strategies that were mentioned in previous chapters, one will say that the horticulture subsector is relatively well covered not only to boost the industry but also infrastructures supporting the industry. However, even with well documented policies, industry stakeholders such as farmers and TAHA view the policy environment for horticultural industry in Tanzania as surrounded with a number of bottlenecks which, as a result, makes the investment climate not as attractive as it should to allow for production and trade competitiveness. According to the Policy & Advocacy Manager at TAHA, Mr. Chamanga, the industry experiences many challenges associated with policies such as multiple taxes that are hindering access to inputs such as fertilizers and pesticides hence making the horticultural businesses expensive and difficult to run.

For example, according to the law, produce cess tax is charged to the buyers at 3-5 percent of farm gate price although most districts have resorted to the maximum allowable rate of 5%. However, farmers that are commercially producing for export markets are charged instead of buyers. Recognizing the problem, in his budget speech for Financial Year 2009/2010, Minister for Finance, Hon. Mustafa Haidi Mkulo proclaimed that effective from 2010/2011, produce cess rates would be amended from the current range of 3-5% to a fixed rate of 3%. However, this policy decision has never been implemented and the government has not given clarification (Mshindano et. al, 2013). Furthermore, farmers are charged tariffs and VAT charges on importation of cargo inputs that were supposed to be VAT exempted. Most of horticultural planting materials are charged at the rate of 25% tariff and 18% VAT due to a confusion of the exempted products between those listed by the Tanzania Investment Centre (TIC) as incentive of VAT exemption on imports and the list by the customs officers. Additionally, large scale farmers and exporters indicated that whenever horticultural exporters pay VAT on their exports, they can reclaim these payments from the Tanzanian Revenue Authority (TRA) offices with relevant documents of evidence. However, it takes them long time (6 months or even a year) to get these refunds.

Apart from numerous taxes, small scale farmers and a Horticulture training institute especially have indicated that they do not see the implications of implementation of policies. They cite Kilimo kwanza policy to increase productivity through agriculture commercialization which according to them favours large scale farmers than small scale farmers.

*"Kilimo kwanza is not reaching small scale farmers. The fertilizer and other prices do not reflect the kilimo kwanza ambitions". Kaaya, R- Associate Manager, Mtazamo vegetable growers*

*"Kilimo kwanza is just a politician slogan just the same as "Big results Now". Impact is very minimal. It doesn't reach the real farmers". Interviewer no. 40.*

There is therefore a huge mismatch between the national policy statements on one hand and practice on the other hand because some good policies related to horticulture sub sector in Tanzania are not consistent with practice on the ground to spur development in the horticulture sub-sector. Implementation has been unsystematic and uncoordinated and therefore with limited effectiveness (Mshindano et.al (2013).

## 7.2 Opinions on Interventions' effectiveness on tackling Horticulture sector's bottlenecks

In general, small scale farmers especially recognized and appreciated interventions by private sector such as TAPP and NGO's such as TAHA on field days, extension services and trainings to comply with GAP farming practices. Intervention by public sector such as road constructions were not seen as directly related to improving horticulture performance or agriculture in general.

With regards to KIA rehabilitation project, only four of the eleven large scale farmers had even heard about the project and all small scale farmers were not aware of the project. All eleven large scale farmers and export logistic companies that were interviewed for this research said that rehabilitation will only be meaningful to the horticulture industry if it will result into creating more space capacity such as through an increase in number of passenger planes flying to horticulture produce destinations, (more international flights to connect to Europe especially) or by attracting cargo planes. Therefore it will be only meaningful if it will result into solving their current problems related to limited space in the limited choice of the available passenger cargo, namely KLM. If that is not the case they indicated that KIA rehabilitation will not result into any improvement in the industry just like many KIA's rehabilitation they heard before.

*"This is just maintenance, it is not rehabilitation... Tanzanians have a tendency of overemphasizing things... just wait and see, this maintenance so called rehabilitation might not mean so much" Erik Koster, owner Kilihortex*

Other stakeholders saw that KIA rehabilitation will not have impact in the horticulture industry, citing the bottlenecks of facing the industry such as not having enough volumes which makes the industry not ready yet to make it attractive for planes and especially cargo planes to take the horticulture products business seriously.

*"You are building a house to a neighbour who is not ready to move in into that house"- Mr Kitururu, M. - Field Technical Officer- TAHA*

However, KADCO is positive about the rehabilitation that it will attract more airlines (as the airport will be in a good position to market itself) which will increase passenger traffic at the airport. At the end of this year KADCO expect an increase of 8 airlines from 12 to 20 scheduled airlines which is expected to impact cargo business as well because of the increased space in those passenger planes, depending on whether they will be flying to the relevant markets where there horticulture products are sold. However, according to the airlines interviewed, airport facilities are not an enough reason for airlines to be attracted to fly to a certain destination. KLM for example looks at the availability of the market, competition, and the security of the destination. Rehabilitation alone is an enough reason for KLM to fly (or fly often) to a certain destination, because a good airport without customers is not interesting.

## 8. Interventions that can contribute to the growth of the horticulture sector in Arusha

Majority of farmers and key informants interviewed for this research are sceptical about whether the current situation of horticulture industry is going to improve after interventions such as the rehabilitation of KIA have completed. They indicated that if the project covers only about maintenance of the airport, it will hardly make the industry any better. This chapter is guided by the research sub question

*What policy Interventions can contribute to the growth of the horticulture sector in Arusha and how do current interventions (specifically focusing at KIA rehabilitation) fit with the challenges and bottlenecks facing the horticulture sector in Arusha Tanzania?*

Ideal interventions to address problems facing the industry and therefore start unlocking its potential according to the large scale farmers, logistic companies, NGO'S such as TAHA and KLM were identified for a short run and long run.

***In the short run:*** Immediate solution to solve the most pressing problem of capacity at KIA is needed, according to industry stakeholders. This can be in two forms: First, stakeholders in the industry such as the government through TRA (as it is the one that loses a lot of revenue by letting farmers truck their products to Kenya), KADCO and Swissport Tanzania (they all benefit from increased cargo movement at KIA), large scale farmers and TAHA can persuade KLM to change its route. Instead of flying to KIA first and leaving to Dar es salaam while still full of import cargo, it could start landing at JNIA first to offload all the imports and fill up at KIA the rest of the cargo space. Farmers indicated that this will increase the little space currently available and they might be able to export more with KLM.

Another option, though it is highly unlikely (according to KLM officer at KIA) is to persuade KLM to send a combi plane which has a space for more cargo. Of course KLM will benefit from this as well because once horticulture goes to JKIA in Nairobi, these farmers have more options and are not necessarily going to export with KLM, but at KIA, KLM has no competition at the moment. The third option is for stakeholders to make an arrangement with a cargo airline same as when the MK airline was approached to pick up cargo at the KIA after filling up already at the nearby airports such as JKIA. There are currently enough volumes in the horticulture industry to reach 40 tones that are predicted to be needed to convince an airline to pick up horticulture cargo. KIA rehabilitation project could support some of these interventions to facilitate the coordination between industry stakeholders in solving the problem.

***In the Long run:*** KIA rehabilitation project and other interventions are more suited for long term goals, focusing on other industry's concerns such as the fact that the industry is small, resulting into low production volumes which make the industry unattractive. For these projects to realize its impacts relatively faster, there is also a need to support other interventions on making the industry more attractive. For example, it should go along with supporting advocacy initiatives by private sector to improve the business environment in the horticulture sector. This is because according to Ms. Mkindi, TAHA's CEO, though the government is showing an interest in the horticulture, it is slow



in adjusting policies, developing processing industries, marketing the horticulture industry abroad, facilitating input stations, reducing the number (and ambiguity) of taxes and constructing infrastructures needed for horticulture such as storage facilities and collection centres. The government needs pressure from the private sector to speed up its actions. For Arusha specifically, according to Mr. Mibavu, assistant director policy at the ministry of agriculture in Tanzania, due to the fact that there are many large scale farmers, the ministry assumes that they will not be requiring more of the facilities such as cold room storages or collection centres because these companies have already have their own facilities. However, there are number of small scale farmers that are producing as out growers for some of these companies which are bearing all the costs before the products are handed to the large scale exporter. That means when these products rotten before being picked up, it is the farmer who bear the costs. Therefore, these farmers need those facilities as well just like in other regions.

Furthermore, in order for more farmers and rural communities to benefit from exploiting the horticulture potential, it requires specific types of investments in that are currently lacking to support the coordination of activities in the industry will solve many of the abovementioned bottlenecks. For example, if individual small-scale farmers are coordinated to form partnerships (which makes it relatively easier to give trainings), either to offer a greater quantity of a certain product at a given time for local or international markets, or to guarantee a more regular supply to the market, which is often needed throughout the year. This will help to reduce transaction costs since large volumes can be obtained in one specific area. Furthermore, even farmers will have a voice/power in price negotiations (Davis, 2006).

If activities are well coordinated, it becomes clear for stakeholders of the role they can play in exploiting the horticulture potentials. The government for example, on its part it can coordinate and facilitate policies to identify, together with other stakeholders (e.g. small-scale farmers and large scale farmers) the constraints to the successful operation of their businesses and to facilitate the provision of appropriate support for a dynamic private sector (e.g. specific infrastructures, technical training to improve products quality, financial services) (Davis, 2006). If activities are well coordinated even the help of donors and development partners with projects such the KIA rehabilitation and USAID-TAPP can be more effective by providing support where it is mostly needs.

It is also important when deciding about interventions to have a clear overview and an inventory of the beneficiaries with their needs and what it takes for them to optimally use that infrastructure for example. This will help in making decisions on for example whether another project need to be added next to the main project, or whether other stakeholders need to be taken aboard in decision making process. This will ensure whether it make sense to continue with the project and whether the realization of the project's objectives on time.

## **9. Does KIA rehabilitation fit with the bottlenecks facing the horticulture industry in Arusha Tanzania?**

From previous analysis, it is obvious that horticulture industry in Arusha is facing many obstacles that are dwarfing the industry locking in its potential to become one of the biggest industries in terms of job creation and export earnings and therefore having an impact in many poor people that could benefit from the growth of the industry. It is also clear that there many interventions that are directly and indirectly have a linkage with horticulture industry such as the KIA rehabilitation. This section evaluates a fit between KIA rehabilitation project and horticulture industry bottlenecks. It is guided by the research sub question

*What policy Interventions can contribute to the growth of the horticulture sector in Arusha and how do current interventions (specifically focusing at KIA rehabilitation) fit with the challenges and bottlenecks facing the horticulture sector in Arusha Tanzania?*

Will the KIA rehabilitation project indeed help to boost the economic development of the region?

Until writing this report, the ambitious project to renovate, expand and modernize KIA to efficiently handle an expected increase in passengers over the coming 20 years had not kick started yet. One of the expected impacts of KIA rehabilitation project is to “Improve economic development (horticulture industry)” in Arusha region. That could be translated into helping to solve the previous mentioned bottlenecks that currently face the horticulture sector in Arusha such as the limited freight capacity limiting its performance.

The horticulture sector is expected to indirectly benefit from the rehabilitation of the airport through the expected increase in passenger airlines (therefore creating extra space for cargo) attracted to land at KIA after rehabilitation. During the research, it was noticed that KIA has received awards as an overall winner of the Routes Africa Airport Marketing Award for 2013 and 2014, one of the most valuable wards in the industry. Furthermore, there was an increase in number flight frequencies of Kenya Airways (KQ), Rwandair and some domestic flights flying at KIA, with expectation of welcoming 8 scheduled more airlines end 2015. It was not revealed whether this includes international airlines flying directly to Europe. However, secondary analysis revealed that the airport had said exactly the same thing about the increase of 8 airlines a year before. Therefore, for the time being, KLM will remain the only plane at KIA lifting horticulture products from the industry and farmers will continue to suffer from this situation. If there will be an increase in number of airlines at KIA in the coming years, it is however not necessarily because of the rehabilitation. According to airlines it will be due to increase in passengers because that is more attractive to them than airport facilities. This together with other challenges previously mentioned in the sector are the main issues that are crimping the sector, hindering exploitation of its potential.

Looking at these challenges, one can say that the rehabilitation of KIA will not make large scale farmers start exporting more of their products though KIA and stop using JKIA. That being said, the project does not directly fit the current needs of the sector. This is because of the following reason;

The main problem facing the industry is not a lack or poor performance of a physical transport infrastructure. It is not that farmers and export companies who are exporting their products through Kenya and Dar es Salaam do so because it is currently impossible for planes to land at KIA, as the airport can accommodate big planes such as the KLM 's Airbus 330-200. Furthermore, KIA has

already a good name outside because of the awards it has been winning in the past years. This means if those airlines that KADCO hope to attract after the rehabilitation wanted to come at KIA, they would have been there already. Therefore, the rehabilitation of the airport is not directly going to make more planes land at KIA, because landing at KIA according to the six airlines that were interviewed, depends on other factors other than a good looking airport. There must be enough passengers or enough cargo to make it attractive for the airlines to land at KIA. Only if the current state of KIA is threatening the continuity of the current operations at KIA, would this rehabilitation of KIA have an impact on the horticulture sector, meaning all farmers and exporters currently using KIA for export would have to look for other airports.

In the long run, the rehabilitation of KIA might have a positive impact on horticulture sector after the volumes have increased in the industry, where by cargo planes might be attracted to land at KIA or if there will be more passengers attracting passenger flights (that are flying directly to horticulture product's destinations) creating more cargo space. Therefore, increased traffic at that time would not be a problem to the airport because of this rehabilitation.

Horticulture industry in Arusha currently faces pressing issues that will hardly to be solved by the rehabilitation of the airport. The industry interventions are more positioned for long term plans to boost the industry. With the current pace in productivity which reflects the size of the industry, and the level of inadequate cooperation and coordination between different stakeholders, the realization of impacts of the current interventions including the ORIO-KIA project might take many years. However, interventions such as KIA rehabilitation help to prepare the industry to be ready when the industry will kick off. *"It's a chicken and egg situation"* concluded TAHA's CEO, Ms. Mkindi. If the project's aim is to improve economic development of the region through boosting the horticulture industry in a relatively short period of time, it need to solve or to accompanied by other projects that solve the real problems/bottlenecks, otherwise, it might take many years for the project to realize its impacts.

## **10. How will the rehabilitation of KIA contribute to the growth of the horticulture sector in Arusha Tanzania?**

The previous chapters presented the research findings on the status of horticulture industry in the Northern Tanzania, specifically focusing on Arusha region. Findings suggest that the industry is facing serious issues that undermine its growth and therefore it's potential to create pro poor growth. Throughout the research questions are asked about how research results relate to the previous research about whether horticulture industry can create pro poor growth.

This chapter will first link the research findings to the literature presented in chapter 2 on how horticulture industry can create pro poor growth. That will be followed by a discussion how and whether the rehabilitation of KIA will contribute to the growth of horticulture sector in Arusha. This will be followed by recommendations on how KIA rehabilitation can best achieve its impacts to boost the horticulture sector in Arusha.

### **10.1 Previous Literature**

The World Bank's report of 2008, "*Agriculture for development*" suggests that agriculture is dominated by small scale farmers in most agriculture-led economic growth countries such as Tanzania. In Arusha, small scale farmers dominate the horticulture industry especially in the production of vegetables. In general, small scale farmers in Tanzania contribute of up to 90 percent of the total horticulture export, providing evidence that, in order to create pro poor growth agriculture sector growth is extremely important because majority of the poor are to be found in this sector. Furthermore, studies found that farmers engaging in horticulture earn more income up to twenty times than staple food growers such as maize (Gabre-Mahdin and Hagglade 2003; Minot and Ngigi 2003 cited in USAID, 2005). Though small scale farmers interviewed for this research could not reveal how much extra they earn, they indicated that with horticulture they can harvest four times in a year, because horticulture crops takes three months to mature while maize is grown in one season. Furthermore, they indicated that one will need a large size of a farm to earn the same income earned for a small sized horticulture farm. From this it was concluded that they therefore earn more income than maize growers.

Furthermore, a study of Davis (2006) found that while prices and export quantities for traditional agricultural products such as coffee have stagnated or declined, horticulture has been a better option for farmers because quantity and price trends for non-traditional horticultural exports have generally been favourable. Northern region of Tanzania (including Arusha) is widely known for production of Arabica coffee. Farmers interviewed for this research have indicated to have uprooted their coffee plants following a decline in price in the world market and turned to horticulture. Furthermore, signifying that this has been a trend, some farmer's groups had hired large sized farms that were formerly used for coffee production. Therefore, horticulture farmers can earn better and stable incomes by switching to horticulture production. Additionally, as many of the horticulture products are new to farmers, they also get an opportunity to learn and upgrade their agricultural skills (like irrigation and farming methods) also through technology transfer to the wider community on the construction of greenhouses, boreholes or irrigation systems as a study by Ulrich (2014) suggested. Besides, horticulture firms provide community services such as schools and dispensaries that otherwise had to wait for the government to be in place, therefore benefiting the poor communities.

Some companies are even covering school fees costs for their employee's children helping to educate the poor youth population. This all suggest that horticulture can indeed play an important role in reducing poverty.

However, studies suggest that inadequate and poor quality infrastructure can be a significant constraint to growth and productivity of the agriculture sector because it can increase the costs of doing business and therefore limiting agriculture's role to contribute to poverty reduction (the transaction costs) (World Bank, 2008, Llanto 2012, Andersen and Shimokawa, 2006). Findings of this research reveals that indeed lack of infrastructures such as feeder roads, collection and storage centres for example, play a significant role in constraining the attractive of horticulture industry in Arusha. However, it is the lack of freight capacity at KIA instead of physical infrastructure in general that mostly constrains the horticulture sub sector. Large scale farmers and exporters of horticulture crops in Arusha indicated if there is anything that they would like to be solved among of all the problems they face in the industry then this is their main concern.

Unlike studies (Cooksey 2011, Haug et al, 2008, Mashindano et. al 2013) that indicated that the highest costs to transport at KIA is what is making large scale farmers to truck their products to JKIA in Nairobi, this study reveals that it is not only the price that they are concerned about, and as a matter of fact they incur extra costs by trucking their products to JKIA. In addition to costs, they lose time, something that is most valuable in horticulture business. All farmers exporting through JKIA indicated that reliability of JKIA that they are sure their products will be transported; (something that they can never be sure at KIA) is what forces them to go to JKIA. All large scale farmers interviewed indicated their preference to use KIA if the limited freight capacity and reliability issues are solved. The fact that the horticulture industry is young in Arusha poses many challenges such as the lack of cooperation and coordination between public and private sector, the commitment of government on improving performance of this sector such as on constructing infrastructures (such as dynamic private sector, collection and storage centres) which are not in place to allow produce enough volumes to make the sector attractive for cargo airlines. However, none of the interviewed farmers indicated these obstacles were enough reasons to make them stop their businesses in Tanzania.

## **10.2 How will the rehabilitation of KIA contribute to the growth of the horticulture sector in Arusha?**

The findings suggest that the lack of physical transport infrastructure is not the industry's main concern. The current status of KIA allows big planes such as KLM's airbus A330-200. Furthermore, the airport has received many awards that could attract airlines if that was enough reason for them to come to KIA. Therefore the claim that KIA will be attractive for airlines after rehabilitation need to be seriously checked. It will definitely improve the efficiency at the airport, but that only not make attract airlines to land at KIA, according to the airlines that were interviewed.

Stakeholder sees KIA's rehabilitation as maintenance; therefore, they doubt whether the rehabilitation of will improve the performance of the horticulture sector in Arusha, at least for the short run. KIA rehabilitation and many interventions are seen to be focused for long term goals of making the industry attractive, something that will take some years because the current pace of horticulture growth is limited to the small volumes produced by small scale farmers who dominate

the industry. Unless more large scale farmers enter the industry production levels will not increase at a high speed. However, that is questionable due to the fact that for so many years horticulture industry in Tanzania has been having a small number of large scale farmers and large scale farmers interviewed indicated that the last ten years has seen few firms entering the industry.

## 11. Conclusion

This research focused on the horticulture sector in Arusha Tanzania, its main stakeholders, the challenges and bottlenecks it faces that are limiting growth of the sector and the role played by horticulture sector in creating a pro-poor growth. The research findings suggest that horticulture is dominated by small scale farmers especially in vegetables production and a handful of large scale farmers. The sector faces many challenges including the lack of dedicated cargo air freights at a nearby airport, KIA, to lift horticulture cargo from the industry to export destinations especially in Europe. Majority of horticulture crops are therefore mainly exported through an airport in Kenya, JKIA. trucking products to this airport in Kenya takes about 3 to 5 hours and can result into up to 24 hours extra delay to export the products. For the moment, farmers and exporters prefer to use JKIA because it is reliable; there are more options to transport their products unlike at KIA. However in general farmers and exporters would prefer to use KIA because by trucking their products to JKIA they incur extra costs per each kilo exported (between \$2 dollar cents and \$1 dollar), they lose time and control of the products making it hard to solve problems if it happens on the Kenyan side before export.

Apart from lack of airfreight capacity at KIA, the horticulture industry also lacks enough volumes to make the industry attractive for cargo airlines. However this is not to say that the available volumes are not large enough to attract a cargo plane to partly fill up at KIA. On average 40 tons are shipped weekly at KIA though KLM passenger airline. The volume that is trucked to JKIA is definitely more than 40 tons a week because majority of the farmers and exporters that were interviewed for this research export largest percentage (50 to 100 percent) of their products through JKIA. There were also farmers that exported 100 percent of their products through JKIA. Furthermore, studies show that JKIA absorbs 80 percent of all horticulture exports from Tanzania, mainly coming from the northern region. Therefore, this research found that there are enough volumes to attract a cargo airline that could partly fill up at KIA. However, the industry has not been able to solve the problem because of lack of coordination and cooperation between private and public sector to solve such a common problem.

Moreover, the industry's small scale farmers and employees of large scale farmers lack knowledge and skills to produce horticulture products which are mainly new, non-traditional and demands high quality standards. As a result trainings are needed to equip farmers and employees with these skills. Small scale farmers also lack infrastructures such as cold storage and collection centres resulting into significant after harvest losses. Large scale farmers especially encounter large number of taxes, and have to deal with inconsistency in policy implementation between the central government and local governments.

All these challenges limit the growth of the horticulture sector in general, missing a chance for the horticulture sector to improve more lives, because evidence suggests that small scale farmers do benefit from horticulture activities and there is still a lot of potential for horticulture growth in Arusha and Tanzania in general. This research looked at how the rehabilitation of KIA can contribute to the growth of the sector by asking the following research question;

“How will rehabilitation of KIA contribute to the growth of the horticulture sector in Arusha Tanzania?”

The research findings suggest that KIA rehabilitation will help to improve the efficiency of operations at KIA. However, a physical infrastructure performance is currently not the industry's main priority. The horticulture sector first priority is how to improve airfreight capacity at KIA with reliable direct flights to export destinations so that products do not have to be trucked to JKIA or JNIA, reducing travel time. Therefore, KIA could play a very important role in the export of the horticulture products produced in the northern regions of Tanzania (Arusha and Kilimanjaro) if it was suited to serve that need. Otherwise, farmers and exporters consider the rehabilitation project just like many previous projects to upgrade the airport. However, unlike the airport expectations that after the rehabilitation it will be able to attract more airlines, airlines that were interviewed revealed that airport facilities are not enough to attract an airline at an airport but customers. This places doubts whether the rehabilitation of KIA will help to boost growth in the horticulture sector, therefore improving its performance.

The rehabilitation of KIA project can still help to boost the horticulture industry through adaption by additionally facilitating joint efforts to coordinate industry stakeholders in solving common problems such as the lack of airfreight capacity at KIA. Quick solutions were identified by industry's stakeholders such as even a mere change of KLM route by first landing at JNIA then to KIA will create more cargo space after the offloading of imports that it first carries when it now lands at KIA. Unless industry stakeholders work together, it might take years for KIA rehabilitation impacts to be felt in the horticulture sector, unless there is an increase in passenger planes that are directly flying to Europe where majority of products are going, which is highly unlikely in the near future, according to the airlines interviewed. Therefore, findings suggest that currently, KIA rehabilitation is only valuable to the extent that it avoids the discontinuation of services at the KIA.



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## Appendix A

### Respondents (companies + Individuals)\*

| Large scale Firms                      | Products   | Hectares                                    |
|--|--|---|
| Rijk Zwaan-Afrisem                     | Hybrid Vegetable Seed (African, Eggplant, Hot Pepper, Tomato, African kale)                | 20  |
| Africado                               | Avocado  | 130   |
| Hortanzia                              | Chives and Mint, baby corn, basil, French beans  | 120   |
| Kiliflora                              | cut flowers and fillers  | 50  |
| Kilihortex                             | Raspberries, Strawberries and Blackberries   | 20  |
| Mara Farming                           | Exporters of French beans  | 180   |
| Serengeti Fresh                        | Vegetable exports- French beans, broccoli, Asian vegetables, sugar snaps, peas             |   |
| Fides Tanzania Ltd                     | Cuttings of Chrysanthemum and Kalanchoe  | 10  |
| Sanifresh                              | Vegetables exports   | Unknown* Uses out growers                   |
| Homeveg Tanzania Ltd                   | Vegetable exports  | Unknown* Uses out growers                   |
| MultiFlower                            | chrysanthemum, geranium, lavender and kalanchoe and flower seeds                           | 6 hacters + 3000 growers with 1 acre each   |
|  |  |   |
| <b>Small scale farmers</b>             |  |   |
| Uwano Ngarenanyuki Farmers association | Beans, baby corns, onions, tomatoes  | Group of 78 members, 5 acres per individual |
| Mtazamo Vegetable Growers              | Vegetables outgrower- French beans, tomatoes, cucumber, sweet pepers, corn, sweet potatoes | 10 acres                                    |
| Shaban Adam                            | Water melons, sweet pepper, cabbage, tomatoes  | 15 acre- group of 10 farmers                |
| Mzee Ali                               | Cucumbers, tomatoes, watermelon  | 1 acre                                      |
|  |  |   |
| <b>Key Informants</b>                  |  |   |
| NGO's                                  |  |   |
| TAHA                                   | n/a  | n/a   |
| Echo Community East Africa             | Vegetable seeds + trainings  | n/a   |
| Logistics Companies                    |  |   |

|  |                                 |     |
|--|---------------------------------|-----|
| Taha Fresh   | n/a                             | n/a |
| Kuehne Nagel   | n/a                             | n/a |
| The government   |                                 |     |
| Assistant director –policy at the Ministry of Agriculture Tanzania - Gungu Mibavu- | n/a                             | n/a |
| The United republic of Tanzania president, Dr. Jakaya Mrisho Kikwete               | n/a                             | n/a |
| Airlines   |                                 |     |
| KLM, KLM Cargo KIA   | n/a                             | n/a |
| Ethiopian Airlines   | n/a                             | n/a |
| Air Tanzania   | n/a                             | n/a |
| Qatar airlines   | n/a                             | n/a |
| Turkish Airlines   | n/a                             | n/a |
|  |                                 |     |
| Others   |                                 |     |
| Crop Bioscience solutions  | Vegetable seeds breeding        | n/a |
| Patmo Fruit Wine processors  | Pineapple wine, rosella wine    | n/a |
| Horti Tengeru  | Horticulture training Institute | n/a |
| Swissport Tanzania   | n/a                             | n/a |
| KADCO  | n/a                             | n/a |

\*Some respondents not included because they preferred to be anonymous