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OPPORTUNITIES FOR VANILLA ASSOCIATION TO IMPROVE FARMERS ACCESS EXPORT MARKET: The case study of vanilla smallholder farmers in Kilimanjaro region, Tanzania

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DEDICATION

This research study is dedicated to Vanilla producer association in Kilimanjaro region, Tanzania.

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ABSTRACT

The Kilimanjaro region is found in the Northern parts of Tanzania mainland and is among of the regions in Tanzania which grows vanilla. The region has favorable climatic conditions, potential area for cultivation and is among the regions that have many water sources for irrigation and many irrigation schemes. The access to the export markets is the key challenges which faces the vanilla producer association, which is articulated with low production and productivity due to low investment among farmers, price fluctuation, inadequate certified seedling/cutting, and low prices received by the farmers discourage the farmers from producing in an agribusiness way. The study aimed to determine the factors which hinder the UWAVAKI association from accessing export markets for their processed vanilla products, and suggest recommendations that will improve access to the export market to maximize profitability in the Kilimanjaro region.

The research strategies which were applied for the collection of both qualitative and quantitative data include desk study, survey and case study. The method of data collection includes a questionnaire to collect data from farmers, semi-structured interviews with key informants and exporters, and desk study for triangulation. This involves a combination of different research methods to find out the current vanilla value chain, chain governance, competitors, export market requirements, opportunities, and constraints on both vanilla production and export markets. In data analysis, numerous tools were used, such as chain map, stakeholder matrix, SWOT, and descriptive statistics (graphs, charts) by using SPSS software ©26 version 2021.

The current vanilla chain map also shows there is no direct link between the UWAVAKI Association and importers of processed vanilla outside the country (international markets). The opportunities in both production and marketing of vanilla include sustainable organic farming production of vanilla without the application of chemicals, and mixing with other crops such as bananas, coffee, and trees (agroforestry) because vanilla requires at least 45% of shading, potential area for production, increase in demand for organic vanilla in the market, and favorable climatic conditions. On the other hand, the challenges faced by vanilla smallholders were the majority of vanilla producers in Kilimanjaro are not certified to any certification standards, most processors are not certified to ISO, Global GAP, or organic certificates, price fluctuation of the vanilla, reactive order, and unstable market due to lack of contract farming. These were the factors which limited the opportunities to access the export market for processed vanilla. Hence, this has led to difficulty for vanilla smallholders investing in vanilla production.

The recommendation on linking vanilla producer association to export market includes, create awareness to the farmers of food quality and certification standards, support the farmers on the certification, and improving availability of vanilla seedling/cutting to the farmers. In addition, the future research on compatibility of producing vanilla organically mixed with coffee, and contract farming scheme that will work for vanilla farmers.

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List of Acronym

APCM	Agriculture Production Chain Management
FGD	Focus Group Discussion
GDP	Gross Domestic Product
IO	Irrigator's Organisation/Association
ISO	International Organization for Standardization
KI	Key Informants
KIT	The Royal Tropical Institute, Dutch
LGA	Local Government Authority
Ltd	Limited
MOA	Ministry of Agriculture
MoU	Memorandum of Understanding
NEI	Natural Extract Industries
NGO	Non-Government Organisation
NiRC	National Irrigation Commission
NMB	National Microfinance Bank
SWOT	Strength, Weakness, Opportunity and Threats
TADB	Tanzania Agricultural Development Bank
TAHA	Tanzania Horticultural Association
TFDA	Tanzania Food and Drugs Authority
UWAVAKI	Vanilla Association in Kilimanjaro
VHL	Van Hall Larenstein University of Applied Sciences

CHAPTER ONE: INTRODUCTION

This chapter will cover the background information about the study, problem statement, problem owner, research objective, main question(s), and research sub-question(s) responding to the main question.

1.1 Background of the study

Vanilla is a spice crop with a high value and its rank as the third most expensive spice in the world. Vanilla originated in Mexico and Central America and grows in tropical and subtropical areas (Pérez et al. 2017). There are two main species of vanilla sold commercially in the world which are *Vanilla planifolia* and *Vanilla tahitiensis*. Vanilla (*Vanilla planifolia* A.) commonly known as 'Bourbon' account 75% of vanilla product sold on the international markets. Vanilla is the major natural flavor widely used in many industries as food such as ice cream, milk chocolate, flavoring bakery products (cakes), yogurt, sodas, pharmaceuticals, cosmetics (perfumes), and traditional crafts (Richard, 2010). According to Trade Map (2021) total exported vanilla in the world from 2017 to 2020 range between 5,000 to 6,015 tons per year. The estimated global demand for natural vanilla ranges from 3,000 to 7,000 metric tons per year and prices per tons is US\$ 6,534 (Pérez et al. 2017).

Agriculture contributes 25% of the GDP of the Tanzanian economy and employs over 65% of the Tanzanian population. The economic growth in agriculture has been disappointing compared to other sectors, with an average annual growth rate of 3.2 percent between 2010 and 2014 (Chuan-hong *et al.*, 2021). The challenges which face vanilla smallholder produce includes, lack of integration along the vanilla value chain and insufficient compliance to global food standards for accessing the export markets. Horticulture is among the sub-sector in Agriculture which employs about 2.5 million people and it contributes 38% of the foreign income. Horticulture is mainly dominated by small-scale farmers with an average farm size of less than two hectares (Embassy of the Kingdom of the Netherlands 2017). Vanilla is among the horticulture crops, which is intercropped with other crops (Chuan-hong *et al.* 2021; Embassy of the Kingdom of the Netherlands 2017). It is mainly traded for local and export markets, where amount of exported vanilla from Tanzania on 2016, 2017, and 2019 was 2, 4, and 1 tons per year respectively (Trade map 2021).

In recent year, the Tanzanian government created policy and strategy which emphasizes the establishment of producer cooperatives and rehabilitation of the already existing cooperatives, and conversion of the government irrigation scheme to the agricultural cooperative to be owned by smallholder producers. However, the role of these cooperatives is to support smallholder producers in the production, marketing of produce, and encourage the adoption of good agricultural practices. The government initiative on strengthening cooperatives is to help in the development of the agriculture sector and alleviate poverty among smallholder producers in the rural community (Chuan-hong *et al.*, 2021).

According to the United Republic of Tanzania report 2016/2017, vanilla production rose from 40 tons in 2014 to 156 tons in 2017 and mainly produced in Kagera, Kilimanjaro, Morogoro, Arusha, Mbeya, and Pemba region. Due to the increase in production of vanilla the Kilimanjaro Vanilla Association (UWAVAKI) was established in 2018 and registered under the cooperative act with intention of organizing vanilla smallholder producers in groups, collecting bulk quantities of green vanilla pods, processing, and marketing processed vanilla within the region.

Kilimanjaro is one of the administrative regions in Tanzania which have a good favorable condition for the growth of the Bourbon vanilla variety, which is the most traded in the world market. The vanilla smallholder producers are scattered around the different districts in Kilimanjaro and production is done through mixed farming (bananas, beans, maize, coffee, or tree). The vanilla production is characterized by small-scale farmers with less than two hectares, with an average yield of 1.5 tons per hectare and limited access to markets both local and export (The United Republic of Tanzania 2017).

The UWAVAKI association sources the green vanilla pods from smallholder farmers in the Kilimanjaro region, process, and marketing processed vanilla. The UWAVAKI Association has a contract with cooperate officers in each district where the vanilla are produced. These officers train the smallholder farmers on good agricultural practice, ensure the farmer harvest the vanilla in the proper maturity stage, and arrange the date of harvesting. The smallholder farmers' transport the vanilla to the collection point, the association weighs, pays the farmers, and transports it to the processing plant which is located in Moshi town. The association process the green vanilla pods, where the process includes a curing process, aimed to stop the enzymatic reaction, sweating, drying, and the last stage is the packaging of the dry pod base on the size and customer requirements. However, with the increase in vanilla production, most of the small-scale producer's associations are not well connected to regional and international markets, there are limited opportunities to access the export market for the processed vanilla hence, this leads to difficulty to invest in vanilla production. Shepherd (2007) explains that vanilla needs labor-intensive during fertilization because it needs to be pollinated by hand and irrigated during the hash condition.

1.2 Research problem

The high demand for the processed natural vanilla in the international markets provides an opportunity for producer association to get more income by exporting as compared to the price currently get in the local market. The UWAVAKI Association has managed to train and organize farmers, sourcing the green pods vanilla, paying farmers and collecting vanilla at the collection point, transporting to the processing plant at the right time, processing and packaging vanilla. Despite all the efforts made the Association still faces challenges in accessing the export market for its products to utilize the opportunities to reap the maximum profit in the global market. Hence, this research is essential to identify the hindering factors for UWAVAKI Association to access the export market. In addition, the information gathered will help to provide recommendation to UWAVAKI Association on address the challenges of accessing the export market.

1.3 Problem owner

Kilimanjaro Vanilla Association (UWAVAKI).

1.4 The research Objective

The study aimed to determine the factors which hinders UWAVAKI association to access export markets of their processed vanilla product, and suggest recommendation that will improve on the access export market to maximize the profitability in the Kilimanjaro region of Northern part of Tanzania.

1.5 Main research question(s)

Q1. What is the current vanilla value chain in Kilimanjaro region?

Sub research question(s)

- 1a. What are the vanilla farming system and production capacity?
- 1b. Who are stakeholders and their roles in the vanilla value chain?
- 1c. What are current vanilla value chain governance?
- 1d. What are the opportunities and constraints of vanilla value chain?

Q2. What are the factors affecting UWAVAKI Association to access export markets?

Sub research question(s)

- 2a. What are the vanilla food safety quality requirement for export market?
- 2b. What are the requirements for export market?
- 2c. What are the opportunity and constraints of association for accessing export market?

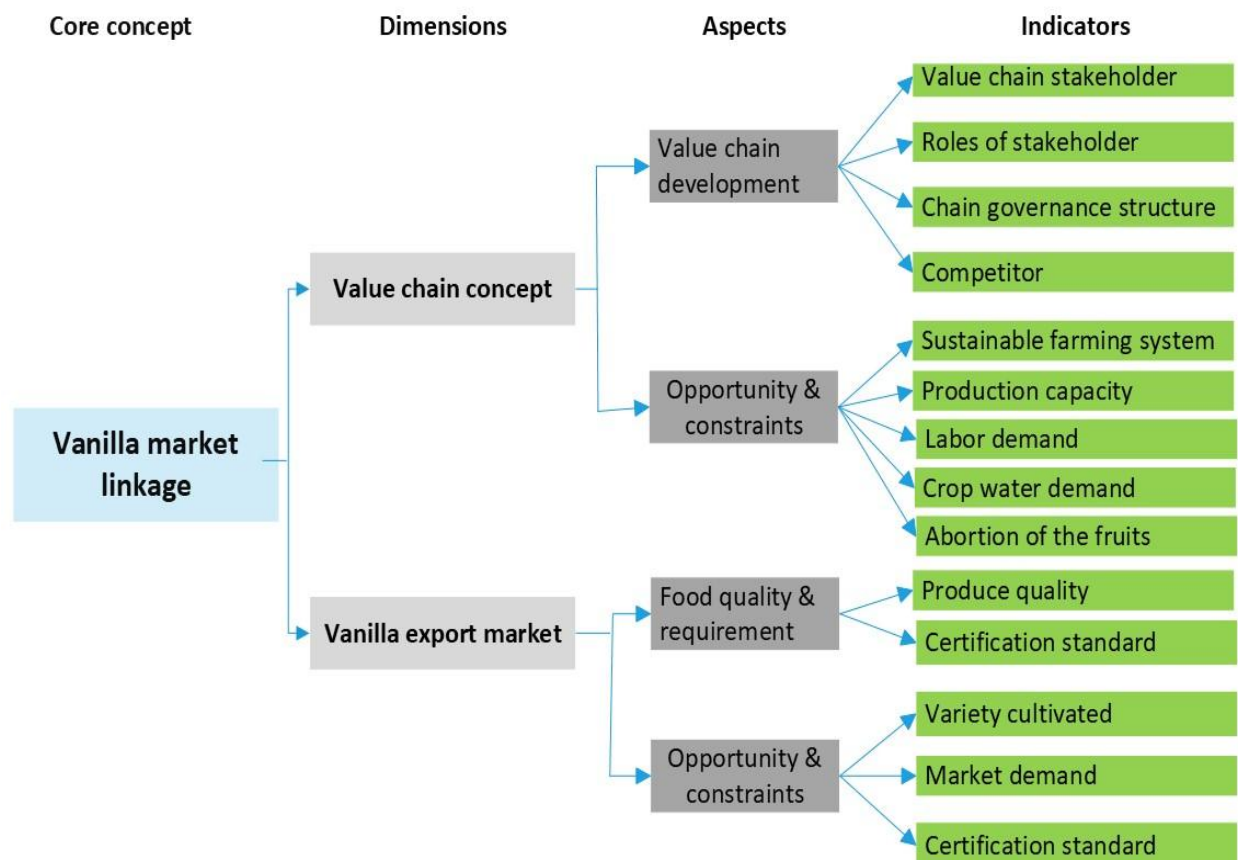
CHAPTER TWO: LITERATURE REVIEW

This chapter summarizes previous research on the primary issues examined in this study. This chapter also explains the vanilla production in Tanzania, value chain concept, market linkage, opportunity, and constraints in vanilla in value chain and marketing. However, the indicator described includes value chain stakeholder and function, chain governance structure, competitor, sustainable farming system, production capacity, labor demand, crop water demand, abortion of the fruit, produce quality, certification standards, variety cultivated, market demand, and challenge in certification standards.

2.1 Conceptual Framework

The conceptual framework describes the core concept which represents the overall research, the dimensions represent the major areas the research will be looking at to solve a problem while the aspects represent the areas where the research will seek findings. Figure 1 illustrates core concepts, dimensions, aspects, and indicators which are related to research questions and sub-questions.

Figure 1: Conceptual Framework



Source: Author's illustration (2021).

2.2 Value chain concept

The value chain can be defined as the full range of value adding activities required to bring a product or service through the different phases of production, including procurement of raw materials and other inputs, assembly, physical transformation, acquisition of required services such as transport or cooling, and ultimately a response to consumer demand (Webber and Labaste 2010; Diamond 2014). The value chain may consist of several supply chains for a particular product. However, may include the supporting services that allow the supply chains to operate, as well as the economic environment factors. Also, value chains may include, the vertically linked, which is interdependent processes that generate value for the consumer, and horizontal linkages to other value chains which provide intermediate services and goods. Value chains focus on value creation typically via innovation in products or processes, as well as marketing and also on the allocation of the incremental value (Webber and Labaste 2010). According to KIT (2012) explain vanilla may be sold to consumers as dried beans or as a powder or in bulk as a powder to ice cream makers, bakers, chocolatiers, and confectioners.

According to Musa, Boniface and Tanakinjal (2014), investigate there are relationships between seed suppliers and farmers; food importers and exporters; processors and farmers. However, the strong relationship between a buyer and a seller is likely to result in an efficient supply chain and superior market performance.

2.2.1 Value chain Stakeholder and function

Khudair and Abdalla (2016) define a stakeholder in the value chain as an individual or group with an interest in a certain product, delivering intended results and maintaining the viability of its products, services, and outcomes within a certain time. Stakeholder Value chains consist of a series of chain actors, chain supporters, and chain influencers. Chain actors are linked by-product flow, finance, information, and services while the chain supporters provide chain actors with services that provide an enabling environment for Chain actors to thrive. Chain actors are made up of input suppliers, producers, processors, manufacturers, traders, and consumers. At each stage of the chain, value is added to a product to make it more valuable to the customer which causes costs to accumulate at each stage. Moreover, vanilla smallholders should be involved in processing, which will add an important aspect to capacity building (KIT 2012).

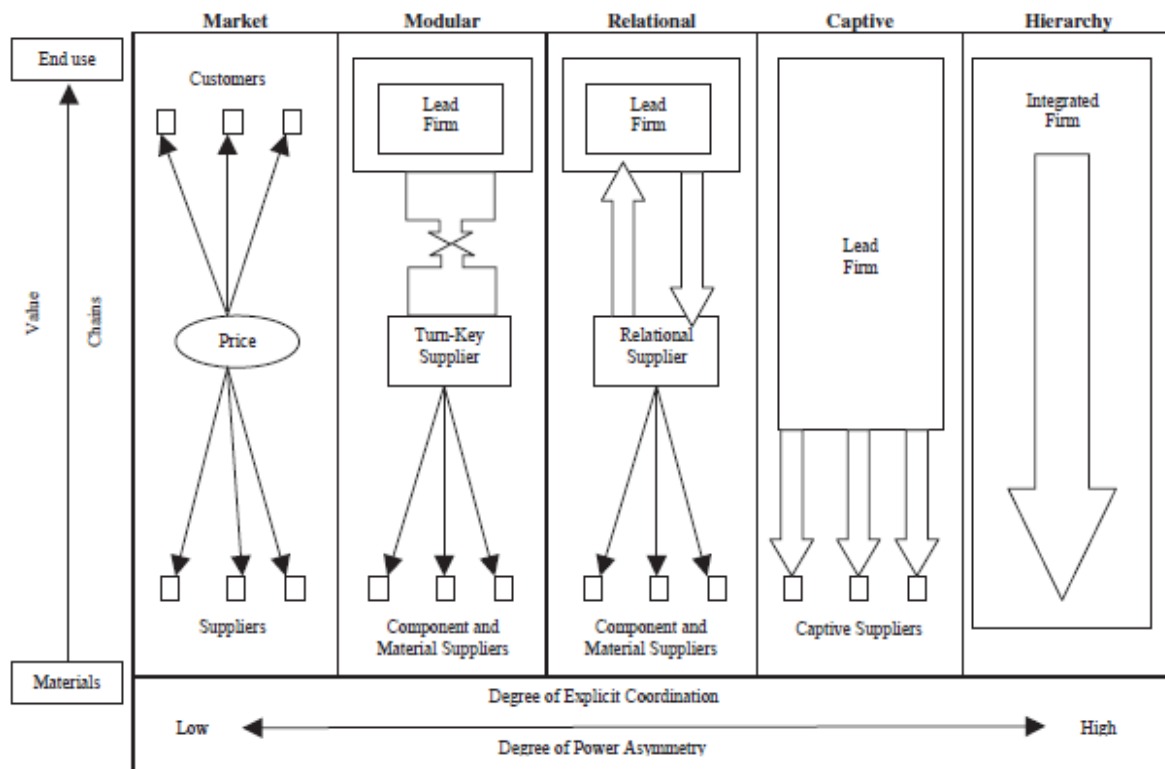
The information flow in the value chain can be horizontal from the supporters to the chain actor and vertical along the chain. The product can flow from producer to consumer, where money can flow from consumer to producer (KIT 2012; Boniface et al. 2012). KIT (2012) shows there need for modern communication in marketing issues and building the capacity of the farmers.

2.2.2 Value chain governance

Value chain Governance can be defined as the ability to yield control along the chain for a particular purpose. Lead actors are usually the most powerful in value chains with the power to choose and replace suppliers and these actors are driven by quality and safety competitiveness and increased pressure from the public for good social and environmental conduct (Webber and Labaste 2010). Musa, Boniface and Tanakinjal (2014) explain five types of value chain governance, which are hierarchy, relational, captive, modular, and market which range from high to low levels of explicit coordination and power asymmetry among the value chain stakeholders. The exchange of tacit knowledge between buyers and sellers that

normally being accomplished by frequent face-to-face interaction and governed by high levels of explicit coordination, which makes the costs of switching to new partners high. This shows the importance of intermediaries' roles and function as value chain partners. Figure 2 shows five types of value chain governance and their degree of coordination.

Figure 2: Five types of value chain governance



Source: Musa, Boniface and Tanakinjal, (2014).

2.2.3 Competitor

Despite the successes of many African exporters in selling to new markets, without further improvements to their business environments and the competitiveness of their processors, export commodities, and marketing, there are being trapped into the risk of inadequate amount sourcing, low value products and services, and struggling to obtain a significant value added share in global market (Webber and Labaste 2010). The main three processor of vanilla in Tanzania include Blue Pacific Flavors company limited, Natural Extracts Industries company limited (NEI), and UWAVAKI association. However, both processor company and producer organisation source green vanilla pods from the smallholder farmers, transport, process, package and marketing the graded and packaged vanilla. Moreover, due they depend on the same source there is competition of this processor in term of sourcing of the product, price, and marketing of the processed vanilla (Food Ingredients 2021).

2.3 Opportunities and constraints in Production

This part will explain the opportunities of vanilla which includes sustainable farming system, potential area for vanilla production, and variety grown. The second part is the constraints which include labor demand, abortion of the fruit, and high water demand.

2.3.1 Opportunities of vanilla production

This section will cover the opportunities in vanilla production such as sustainable farming system (environmental conservation, profit and people (3P)), and vanilla production.

Sustainable farming system

i. Environmental conservation

Vanilla can be diversification by cultivate vanilla with other crops and the ability of the cultivation of vanilla for growth in mixed agroforestry systems. The vanilla can be successfully cultivated with coffee, lemon and citrus orange production systems (Martin et al. 2020).

Vanilla is almost exclusively produced in rather extensively managed agroforestry systems without the application of fertilizers, herbicides and pesticides (Martin et al. 2020). This kind of production leads to conserve the environmental due to avoid application of the chemical and planting vanilla with tree.

ii. Profitability

Vanilla need another plant for support, hence many producer plant vanilla with the secondary crop such as rubber, clove, pepper, *Jatropha curcas*, or coconut that serve as support for the vanilla vines (Pérez et al. 2017). However, if the crop is cultivated simultaneously with other species of importance in agriculture, hence becoming a strategic product to promote the sustainable development of rural communities by gaining addition income through crop integration.

iii. People

Organic fertilization application is mainly used by majority of vanilla farmers, derived from the decomposed leaf litter of trees or animal manure (Pérez et al. 2017).

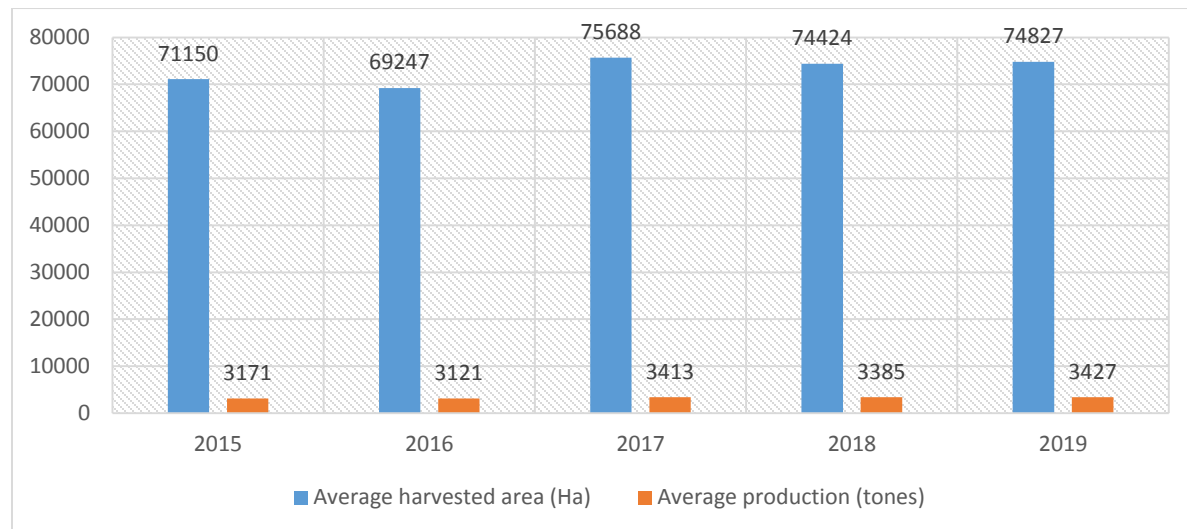
Vanilla production

Vanilla (*Vanilla planifolia*) is among the horticulture crop and in the world's third most expensive spice after saffron and cardamom. The vine crop is typically grown with a supporter tree such as *Jatropha*, which helps to provide support for climbing and provide shade. However, vanilla can be mixed with other crops such as cereal crops (maize, beans) or perennial crops (banana, citrus, coffee). Vanilla flowers are pollinated by hand and it takes 6 to 9 months to reach maturity (ready for harvesting). The green pods are cured, to develop their distinct flavor, sweetness, black color and it loses about 80% of their weight (Martin et al. 2020).

According to KIT 2012 indicate the number of vanilla plants can range from 200 to 400 vines in an acre. Moreover, vanilla takes 2 years to start the first harvest depend on the size of the vine, and can stay productive for up to 5 years (KIT 2012). Figure 3 shows the area harvested and the trend of vanilla production in East Africa from 2015 to 2019. Although the trend of vanilla production increase in East

Africa country, bulk farming takes place in a rural and remote area with poor accessing to the market and infrastructure (Martin et al. 2020).

Figure 3: Average vanilla harvested area and production in East Africa country from 2015 to 2019



Source: <http://www.fao.org/faostat/en/#data/QC/visualize>

According to food ingredient (2021) explain the Kilimanjaro produces “Bourbon” Vanilla which has good quality with a good aroma. However, table 1 shows the vanilla production in Tanzania where the average yield of vanilla per hectare in Kilimanjaro (2016/17) is 1.5 tons/Ha which is higher than all other regions in Tanzania (The United Republic of Tanzania 2017).

Table 1: Vanilla production in Tanzania (2016/17)

Region	Planted Area (Ha)	Harvested Area (Ha)	Quantity Harvested (Tons)	Yield (Tons/Ha)	Quantity sold (Tons)
Kagera	140	86	19	0.2	19
Kilimanjaro	85	85	126	1.5	94
Mjini Magharibi	19	10	10	1.0	10
Kaskazini Pemba	56	56	2	0.0	2
Total in Tanzania	300	237	156	0.7	125

Source: The United Republic of Tanzania (2017)

2.3.2 Constraints of vanilla production

According to Abhishek (2019) explains, the challenges which face vanilla smallholder farmers include; labor demand due to hand-pollinated crop, limited knowledge on certification, limited amount and research on planting material, underdeveloped irrigation infrastructure, incompetent labor, poor handling during transportation, low production due to cultivation in small parcel area, and competition with synthetic vanillin among local buyers. Farmers have resources, primarily land and labor, but they lack inputs, capital, technical knowledge, and market access, and are also faced with a lack of infrastructure such as rural roads and transportation (Shepherd 2007).

Vanilla need water throughout the whole season for growth. There is a need to implement appropriate irrigation systems is not an exclusive aspect of the cultivation of vanilla for the supplementation of water during dry periods (Shepherd 2007). According to Pérez et al. (2017) stated that most small-scale farmers grow it under rainfed conditions, and a small number of farmers use irrigation schemes. However, there is evidence to all farmers was the technological backwardness that prevailed in most of production and agronomic management. In this regard, the farmers indicated that it was not easy for them to implement innovative production schemes since they lacked the capital to make large investments in technology (Shepherd 2007).

Another aspect that farmers consider as a constraint is a pre-mature abortion of fruits. Additionally, the abortion rates vary between production cycles, therefore there is a need to define the criteria for controlling fruit abortion (Abhishek 2019). Moreover, vanilla is not a self-pollinated crop, so it needs labor for hand pollination and the proper time for the fertilization reduces the rate of dropping of the flower (Abhishek 2019).

2.4 Food quality and export market requirement

This section will explain the quality of vanilla, and certificate standard requirements for export of the processed vanilla.

2.4.1 Produce quality

In recent years, Indonesia and Madagascar have replaced Mexico as the world's leading vanilla produce and exporters of vanilla (Pérez et al. 2017). The estimated global demand for natural vanilla ranges from 3,000 to 7,000 metric tons per year. According to Trade Map (2021) total exported vanilla in the world from 2017 to 2020 range between 5,000 to 6,015 tons per year. The most exporter of vanilla in East Africa is Uganda, Kenya, and Tanzania respectively in terms of the quantity of vanilla products exported per year from 2016 to 2020 detail are shown in table 2 (Trade Map 2021).

Table 2: Table which show main exporter of vanilla in the World (tons/year)

Exporters	2016	2017	2018	2019	2020
	Exported quantity, Tons	Exported quantity Tons	Exported quantity, Tons	Exported quantity, Tons	Exported quantity, Tons
Madagascar	1,575	1,605	1,879	1,453	1,675
United States of America	338	455	668	578	543
France	532	433	401	379	355
Turkey	107	75	124	288	346
Germany	308	259	203	220	207
Canada	249	204	154	164	137
Netherlands	-	230	143	138	135
Belgium	200	148	45	92	105
Uganda	28	32	22	30	15
Kenya	5	8	2	1	1
Tanzania, United Republic of	2	4	0	1	0
Total amount in the World	-	5,605	5,939	6,015	5,257

Source: <https://www.trademap.org>

2.4.2 Certification standard

In Tanzania, vanilla is mainly cultivated as the cash crop for the local and export market (UNDP and ESRF 2017). The main export markets of vanilla from Tanzania are; Germany, France, and United States (USA) (Traldi 2021). The overall vanilla market demand depends on the food quality. Markets such as the European Union, particularly Germany, prefer grade “A”, whereas United States prefers grade “B” or “C” quality products and certification based on ISO regulation 5565-2:1999 or Organic Certification (Abhishek 2019; Hänke et al. 2018; Hänke and Fairtrade International 2019; Hachman 2017).

According to a survey done by EOS Research Paper (2012), German consumers prefer Bourbon Vanilla, with its rich, sweet, and intensive flavor, and Tahitian Vanilla, with its fruity and floral flavor. Bourbon Vanilla is mainly produced in Madagascar, Mexico, Indonesia, Tanzania, and Uganda (Traldi 2021).

2.5 Opportunities and constraints in market

This part will explain the opportunity of vanilla which includes quality, consumer, and market demand. The constraints include difficult comply with certification and price fluctuation.

2.5.1 Opportunities of vanilla market

This section will explain the opportunities available in the vanilla for the export markets such as variety cultivated, and market demand for the processed vanilla.

Variety cultivated

There are two types of vanilla beans used for flavoring, Bourbon, and Tahitian. Bourbon Vanilla is characterized by having thin bean types, quite rich, sweet, and dark color, while Tahitian Vanilla is characterized by having the thickest, darkest of the vanilla types and is intensely aromatic, but not as flavorful. Bourbon Vanilla is mostly quality and preferred more than Tahitian. Bourbon Vanilla is mainly produced in Madagascar, Mexico, Indonesia, Tanzania, Uganda, and Vanuatu (EOS Research Paper 2012; Martin et al. 2020).

Market demand

Recently there is an increase in consumer preference and demand for naturally produced food. From fair trade products to organic products, branding a product all-natural is almost a prerequisite for a spot on the shelf. Likewise, for the vanilla consumer, there is demand for a natural vanilla product, and even organic. However, due to the consumer shift towards natural vanilla products, food companies are moving back to real vanilla beans. Moreover, the demand for organic vanilla in the world increases due to an increase in consumer preference and conciseness to health issue for natural and organic vanilla (EOS Research Paper 2012).

2.5.2 Constraints

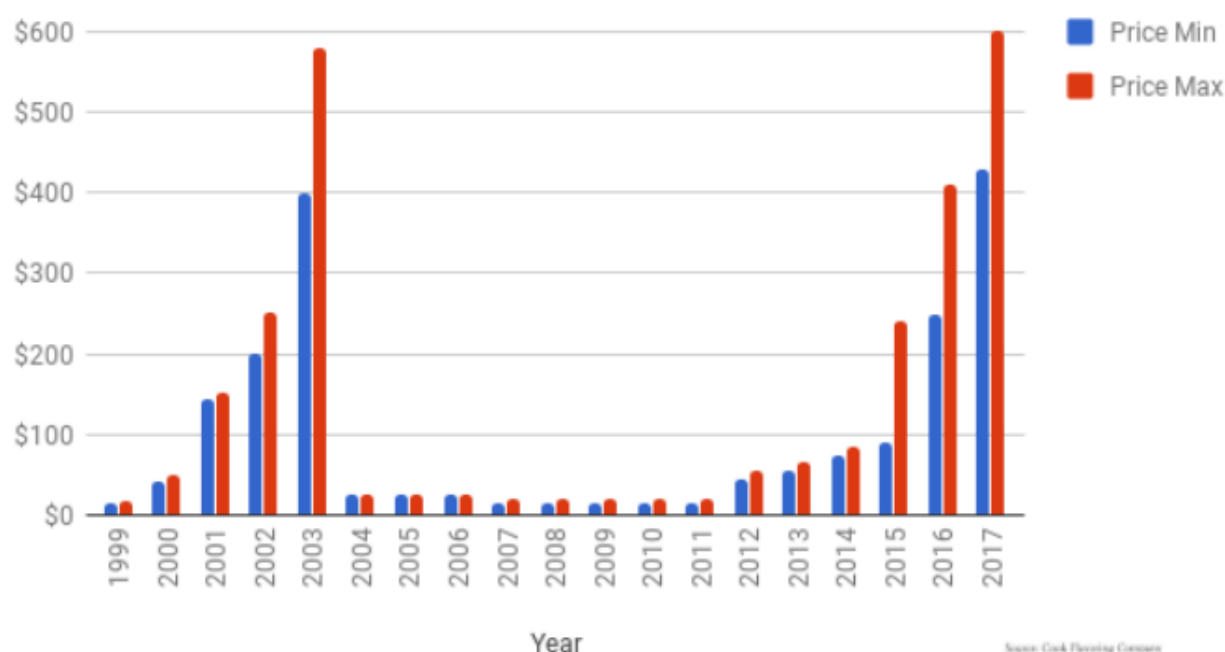
Certification is a procedure by which a third party (the certifier or certification body) gives a certificate that shows that the product or service conforms to specified food quality requirements standards. Food quality standards mean the product is free from environmental and other contaminants and sources of toxicity (physical, chemical, or biological) that are injurious to health. Usually, the collectors and processors are responsible for carrying out the curing of vanilla beans. Moreover, farmers faced difficulties entering the international market for compliance issues with regulatory requirements. In addition, Bijman et al. (2007) make a synthesis about the constraints that smallholders face when they want to link to new

markets or become more competitive in the existing markets. The farmers challenges includes; lack of knowledge on the value addition, unfamiliar with the right requirement for accessing global market, volumes required to meet the global market, low bargaining power, high transaction costs, and poor consolidation to comply with regulatory standard (Abhishek 2019). Therefore, all of the farmers stressed the need to obtain training on the procedures required for marketing their product.

A producer organization is defined as a voluntary economic associative body, established by and for producers with democratic decision making structure to promote their economic development. Then, the core objective of a producer organization is to enhance prosperity of their members (Bijman 2007). Jointly, they may have better conditions to reduce transaction costs of accessing inputs and outputs, obtain market information, access new technologies and better integrate high value markets.

According to Shepherd (2007) explain about major problems faced by vanilla small scale farmers in many developing countries is the poor marketing linkage. However, according to analysis done by Fintrac in Uganda on vanilla value chain, shows there is room to increase the productivity and profitability of the crop through improved technology and proper marketing (KIT 2012). Some government programs and aid donors are still concentrating on how to increase agricultural production without facilitating the marketing of farm produce to the market (Chuan-hong et al. 2021). However, vanilla market is associated with extreme price volatility as shown in figure 4, which is compounded by such low prices during the “bust” face of the market which makes farmers to switch into alternative crops (Hänke & Fairtrade International 2019; Wiley 2017). In Tanzania, the price for green pods (farm gate price) and processed (drying, curing, grading and package) of vanilla ranges from 60,000 - 80,000 and 330,000 – 440,000 Tanzanian shillings (US\$27 – 35 and US\$144 - 193) respectively, were 1 (one) kilogram of processed vanilla takes average of 5.5 kilogram of green vanilla pods (unprocessed) (Tanzania 2018). Despite the high value crop with high price, the profit/income obtained from vanilla production by smallholder is still minimum due limited capacity and capabilities, producer association to explore new market opportunities.

Figure 4: Shows minimum and maximum price of vanilla per Kilogram



CHAPTER THREE: RESEARCH METHODOLOGY

This chapter will cover the research methodology, including the study area, selection of study area, research strategy, research framework, method of data collection, and analysis of the findings.

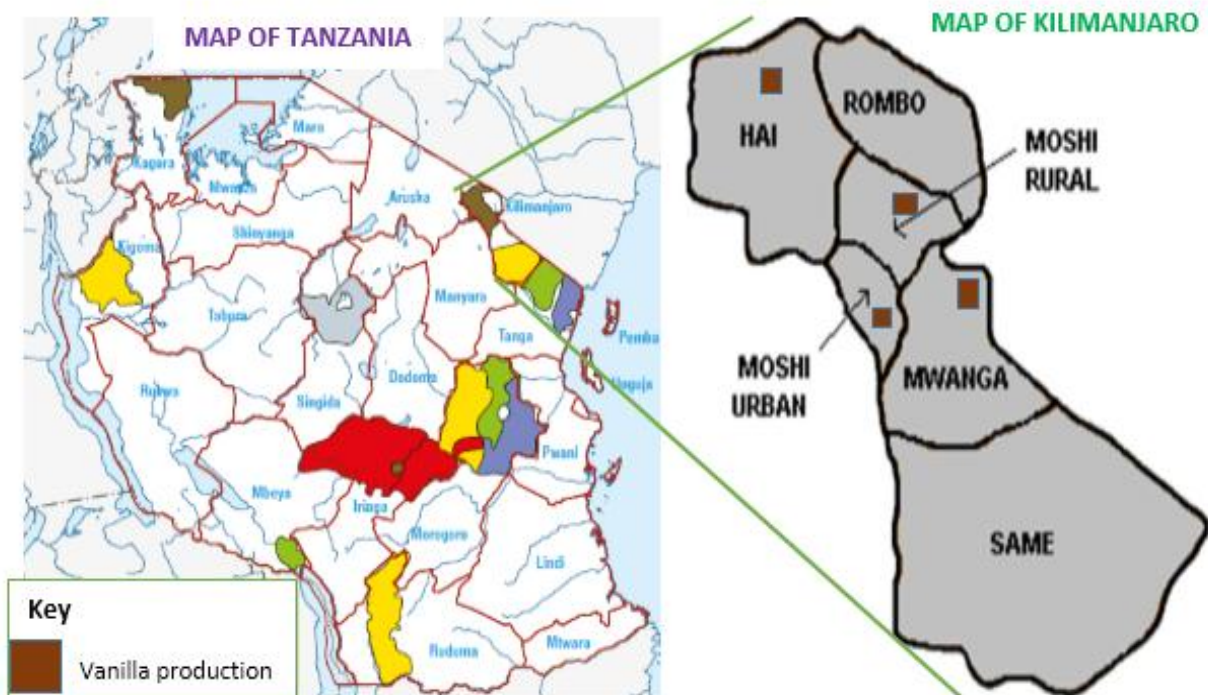
3.1 Study area

The Kilimanjaro region is one of the 36 administrative regions in Tanzania. It is located in the North-Eastern part of Tanzania, just south of the equator (20° 25' and 4015' S; 360° 25' 30'' and 380° 10' 45'' E). In the North and East, the Kilimanjaro region is bordered by Kenya, to the West by the Arusha region, to the South by the Tanga region, and to the Southwest by the Manyara region. However, Kilimanjaro comprises six (6) district councils, which are, Rombo district, Same district, Mwanga district, Hai district, Moshi district, Siha, and one (1) municipal council, which is Moshi municipal council (figure 5 shows the map of Tanzania and the Kilimanjaro region with their districts and council). The administrative headquarters of the region is in Moshi town.

3.1.1 Selection of study area

The Kilimanjaro region has been selected for the study because it is among the regions in Tanzania which produce vanilla. The vanilla is mainly produced in three districts, which are Moshi district, Siha and Hai district. However, the UWAVAKI association sources their green vanilla from concentrated in these three districts within the region.

Figure 5: The map of Tanzania and Kilimanjaro region



Source: UNDP and ESRF (2017).

3.1.2 Population and area

According to the National census (2012), the region has a population of 1,640,087 and it covers 13,209 km² of area (UNDP and ESRF 2017).

3.1.3 Rainfall and temperature

The Kilimanjaro region receives an amount of rainfall ranging from 700 mm to 900 mm per annum and an average temperature ranges from 21 °C to 27 °C (UNDP and ESRF 2017).

3.1.4 Topography and soil

The Kilimanjaro lies between 900 m and 1,800 m above sea level and hosts the Agro forestry-based Chagga gardens that integrate trees/shrubs with food, cash crops, and livestock on the same unit of land. The Lowland plains lie below 900 m above sea level. The soils are mostly dominated by sandy clay loam in the upper highlands, and the fine texture of clay and silt loam in the lowland plains. In addition, the soils are generally well drained.

3.2 Research strategy

The research aimed to determine the factors which hinder the UWAVAKI association to accessing export markets for their processed vanilla products, and suggest recommendations that will improve access to the export market to maximize profitability. According to Laws et al. (2013), the different research strategies are desk study, survey, FGD, and case study. The primary data has been collected by combining different strategies, such as surveys, and case studies (semi-structured interviews) to gain in-depth information about the opportunities and constraints for vanilla smallholder farmers to access markets in the Kilimanjaro region. The secondary data has been obtained through desk study (more details in table 3).

Table 3: Overview of data collection tools for the study and justification

Research question	Research questions	Data collection tools	Justification of the tools
Main question	Q1. What is the current vanilla value chain in Kilimanjaro region?		
Sub questions	1a. What are the vanilla farming system and production capacity?	Desk study	Ascertain evidence on farming system from published sources
		Survey	Ascertain vanilla farmers responses on production capacity
		Semi-structure interview	Ascertain vanilla farming system

	1b. Who are stakeholders and their roles in the vanilla value chain?	Semi structure Interview	Identify vanilla stakeholders and their function
	1c. What are current vanilla value chain governance?	Desk study	Ascertain evidence on chain governance structure from published sources
		Semi structure Interview	Ascertain key informant views about stakeholder who has power in the chain
	1d. What are the opportunities and constraints of vanilla value chain?	Desk study	Ascertain evidence of opportunity and constraints from published sources
		Survey	Ascertain farmers views about the challenge
		Semi-structure interview	Ascertain key informant views about opportunity and constraints
Main question	Q2. What are the factors affecting UWAVAKI Association to access export markets?		
Sub questions	2a. What are the vanilla food safety quality requirement for export market?	Desk study	Ascertain evidence on food quality and export market requirement from published sources
		Semi-structure interview	Ascertain exporters views about food quality and export market requirement
	2b. What are the requirements for export market?	Desk study	Ascertain evidence on export market requirement from published sources
		Semi-structure interview	Ascertain exporters views about export market requirement
	2c. What are the opportunity and constraints of	Desk study	Ascertain evidence on opportunity and constraints in export market from published sources

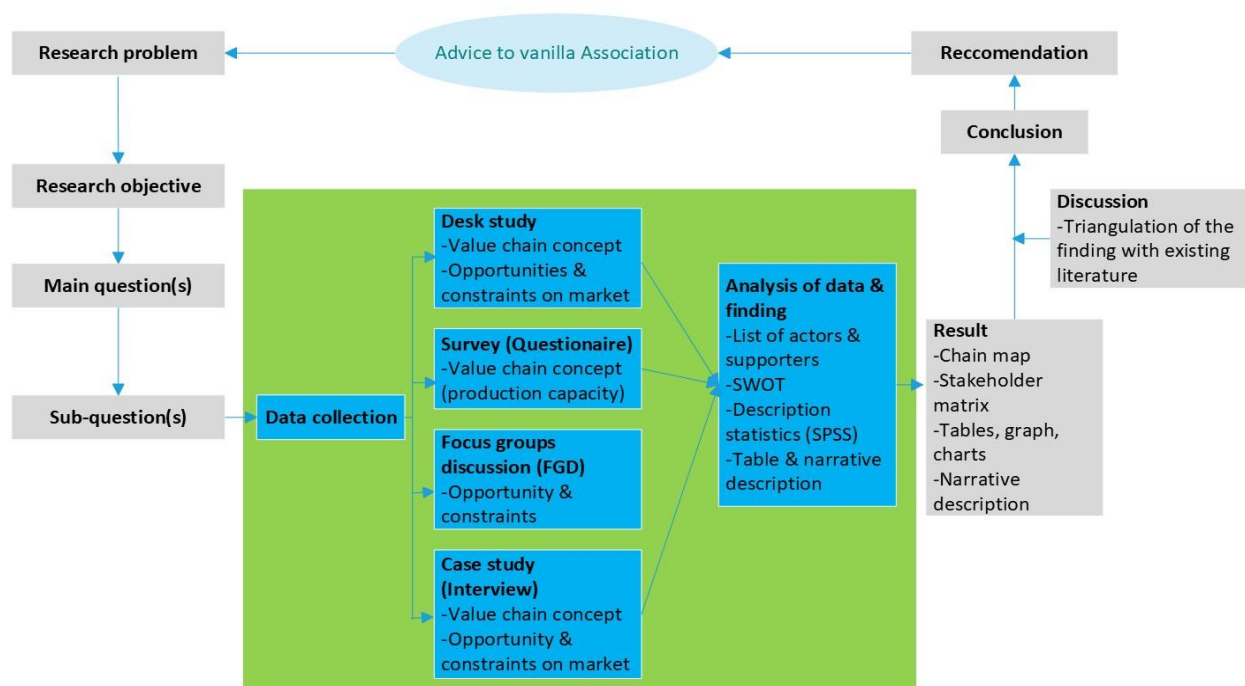
association for accessing export market?	Semi-structured interview	Ascertain exporters views about opportunity and constraints in export market
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Source: Author (2021)

3.3 Research design framework

Figure 6 shows the research framework which illustrates the sequence of steps that have been taken during the research study.

Figure 6: Research framework



Source: Author's illustration (2021).

3.4 COVID – 19 situation

Due to the Covid 19 situation, imposed restrictions on travel back to the home country to collect data for research, research assistants were hired to collect field data. The criteria for selection of the research assistance include fluent in English and Swahili, a minimum bachelor's degree in Agriculture science, and having an idea about vanilla production. However, before performing the survey and interview, the research assistants were instructed to comprehend and ask proper questions.

3.5 Methods of data collection

The primary data has been collected online using semi-structured interviews and surveys by filling in survey questionnaires. However, the secondary data has been collected using desk study.

3.5.1 Desk study

The secondary data was collected from desk study by searching literature using different search engines (such as Science direct, Google scholar, and Greeni) to give theoretical understanding of the main concepts in the study and the farming system in vanilla production and export market requirements.

3.5.2 Survey

The data from the survey has been collected using a questionnaire form which will be supervised by a research assistant in Tanzania. Data has been collected from 40 farmers in the three (3) districts, which are Siha, Hai, and Moshi found in the Kilimanjaro region. The research assistant filled the data in excel format for the results obtained from the survey questionnaire form (See annex 1 for the survey questionnaire).

3.5.3 Online Semi - structure Interviews

The semi-structured interview was conducted online with key informants and exporters. The key informants interviewed included 2 LGA officers in Siha and Hai district, 3 village extension officers from Hai, Siha, and Moshi, 1 NiRC officer from Kilimanjaro regional irrigation office, 2 farmers, and 1 UWAVAKI Association. The exporters of vanilla contacted include NEI Company limited, TABARO Terminal Handling limited, and TAHA Association (See annex 2 for the topic addressed during the interview).

3.6 Sample size and selection

The survey addressed forty (40) respondents (farmers) for the study from three (3) districts, which are Siha, Hai and Moshi districts in the Kilimanjaro region. For the interview, ten (7) key informants and three (3) exporters were selected by way of purposive sampling for the online interviews as shown in table 4.

Table 4: Overview of the sample size

Survey Respondents	
District	Number of respondents
Siha District	20
Hai District	15
Moshi District	5
Total	40 farmers
Key informants	
Agriculture Officer (NiRC)	1
Village extension Officer (Siha, Hai, and Moshi)	3
Extension officer (Siha and Hai)	2
UWAVAKI Association	1
Farmers	2
Exporter (TAHA, NEI and TABARO)	3
Total	10 key informants

Source: Author's (2021).

3.7 Data analysis

The results of the survey with farmers were clustered according to district (Siha, Hai, and Moshi), farmers' demographics (gender, age distribution), land holding capacity, and size of the farm cultivating vanilla.

Qualitative data collected via semi-structured interviews was analyzed by using the narrative method as a way of interpreting responses from the interviewees within the context of the study. The process was used to identify patterns, codes, and themes as a way of interpreting the interview outcomes.

A stakeholder's analysis and a value chain map were used to map the vanilla stakeholders by defining their different roles in the vanilla chain. Literature sources were used to benchmark determinants for producer associations on accessing the export market against what has been collected from surveys and interviews.

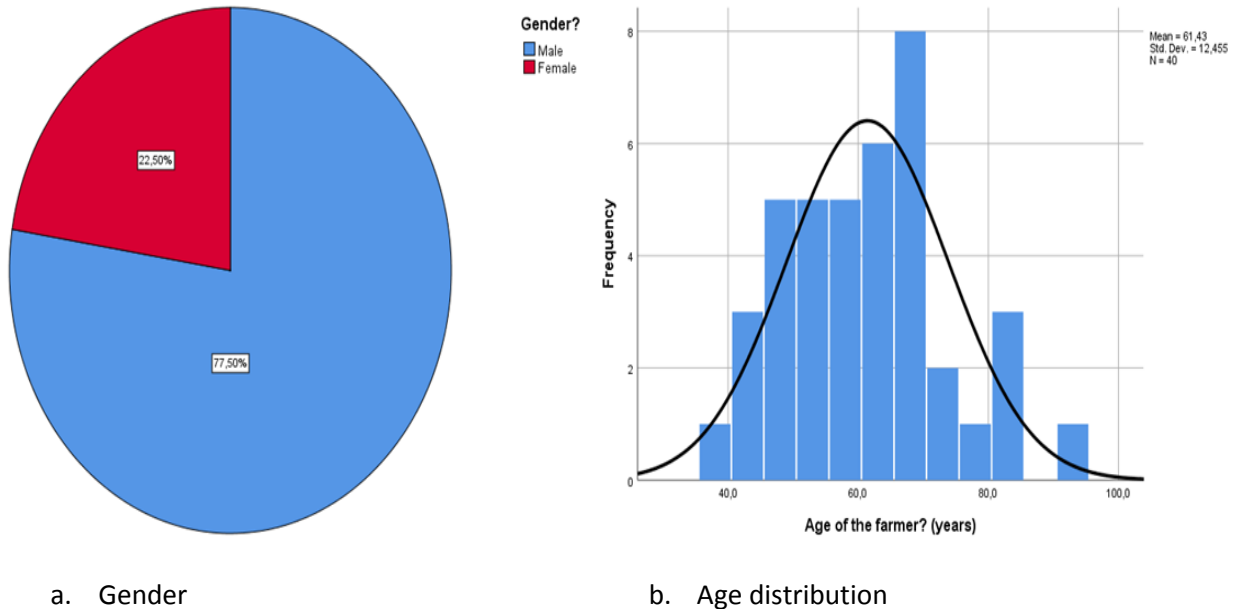
CHAPTER FOUR: RESULT

This chapter provides the results of a survey conducted with vanilla smallholders in the Kilimanjaro region from three districts (Siha, Moshi DC, and Hai), an online semi-structured interview with key informants (farmers, village extension officer, LGA extension officer, processor, and NiRC field officer), and exporters (TAHA association, NEI company limited, and TABARO Terminal Handling company). The information from survey respondents and interviews was used to identify vanilla value chain stakeholders and their functions, chain governance, competitors, food quality and export market requirements, opportunities, and constraints in production and export markets.

4.1 Gender and age group

The results show that a majority of farmers (77.5%) were male and (22.5%) of the farmers were female, as presented in figure 7 (a). In addition, the average age of the farmers was 61.4 years, where the minimum age was 38 and the maximum age was 91 years (figure 7 (b)).

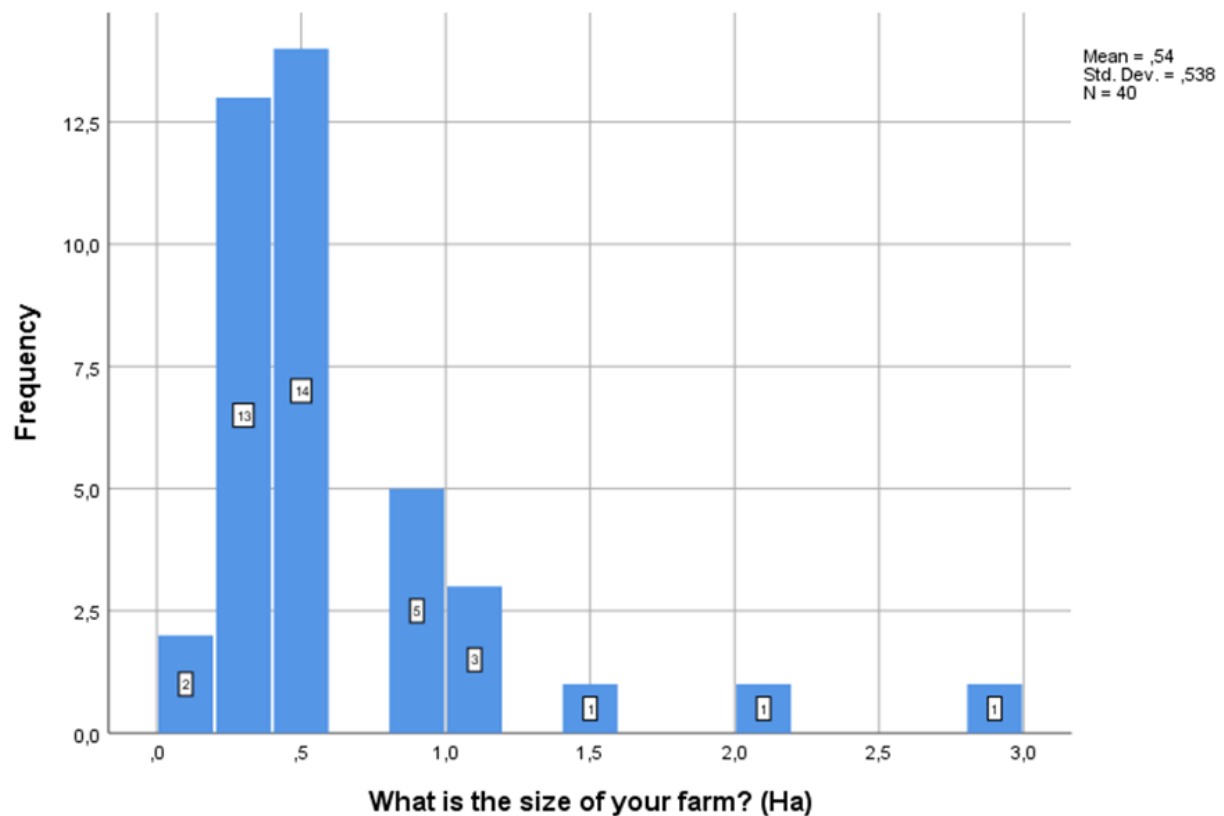
Figure 7: Gender and age distribution of survey farmers



Source: Field survey data (2021)

The survey results indicate that the average land holding capacity was 0.54 Ha, and the majority of the farmers hold land between 0.1 Ha to 1 Ha (figure 8).

Figure 8: Landholding capacity in hectare (Ha)



Source: Survey data (2021)

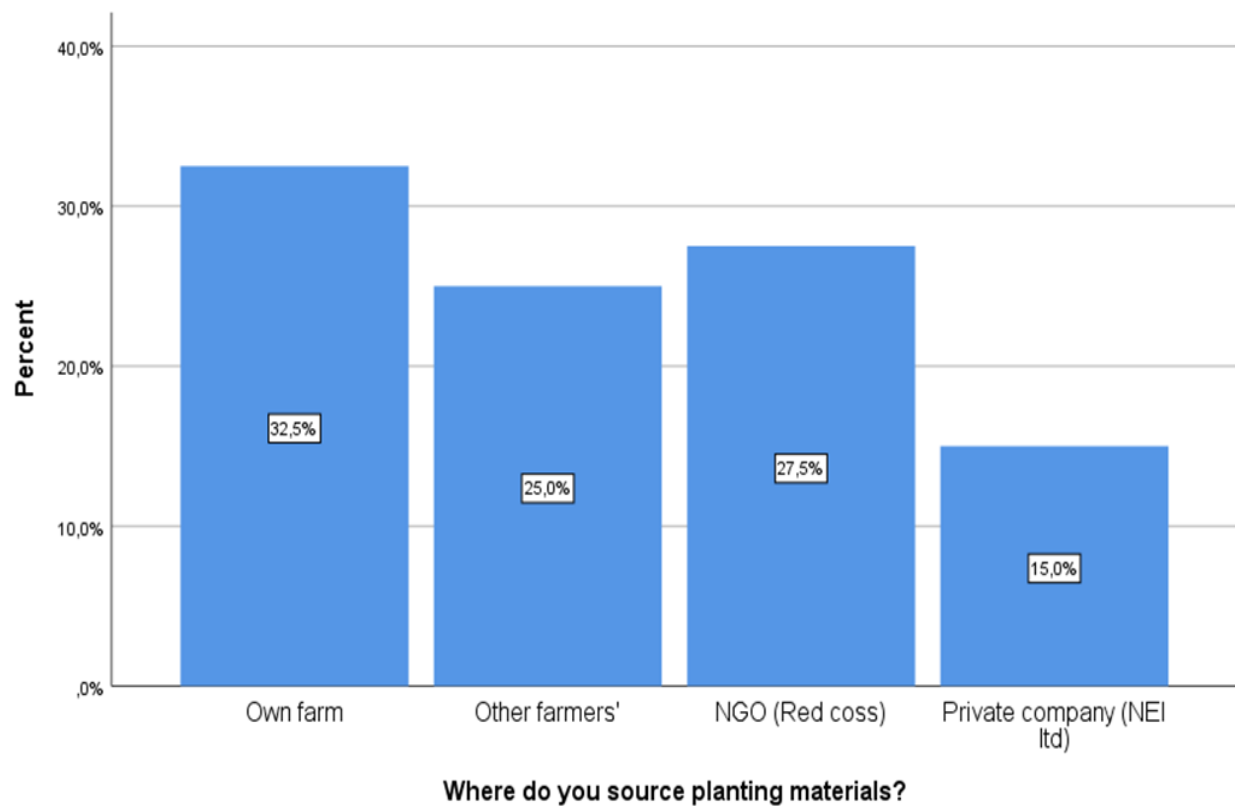
4.2 Current vanilla value chain stakeholders and their function

The results obtained from a survey and semi-structured interview with key informants, they identified the following stakeholders in the vanilla value chain; Agro shops/dealers, Red Cross, farmers, NEI company limited, UWAVAKI association, Local buyers, international consumers, LGA, NiRC, TFDA, Irrigator's Organization (IO), Pangan Water Basin, Ministry of Agriculture, NMB bank, and TAHA Association. Furthermore, the identified vanilla stakeholders were categorized into two groups, which are Actors, and Supporters.

4.2.1 Vanilla value chain Actors and their function

Input supplying: The interview results identify the major input suppliers, including; Agro shops/dealers (Kiziga agro vert, Kawaya agro vert, Kibo agro vert), and the Red Cross. The respondents mentioned the following functions: supplying production tools (hoe, machete), fertilizer, vanilla cuttings, and irrigation equipment to the farmers. In addition, survey result from farmers indicate that 32.5% of the farmers source the cutting from their own farm, 27.5% from NGO (Red Cross), 25.0% from other farmers and 15.0% source from a private company (NEI ltd) (figure 9 for more detail).

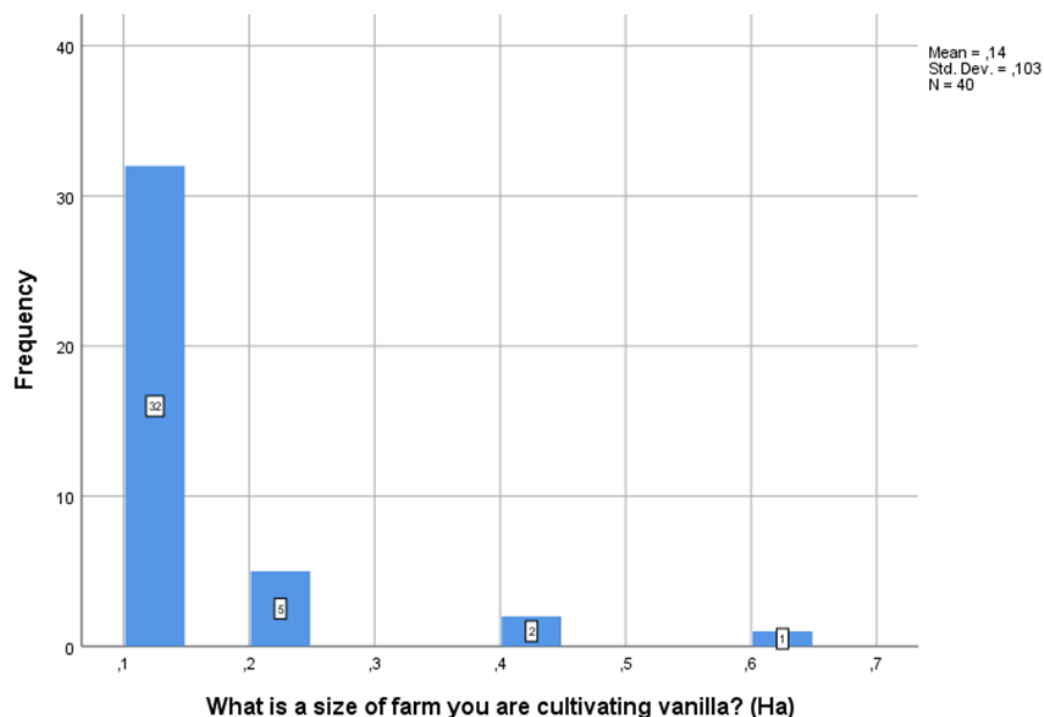
Figure 9: Sourcing of planting material (cutting)



Source: Survey respondent data (2021)

Producing: During the interview, the respondent identified the farmers as the main producers of vanilla. Also, a few farmers produce seedlings/ cuttings (*marando*), and the majority of farmers produce green vanilla. The survey results indicated that the average farm size for cultivated vanilla was 0.14 Ha, where 32 and 5 of the farmers cultivate vanilla in an area of 0.1 Ha and 0.2 Ha respectively (Figure 10 for more detail). The price for the cutting (*marando*) ranges from 1,000 to 3,000 Tsh per cutting (*marando*), and the farm gate price for green vanilla ranges from 25,000 to 150,000 Tsh per kilogram. It always depends on the world market price.

Figure 10: Land holding capacity and Size of farm cultivated vanilla (Ha)



Source: Field survey data (2021)

Collecting: The interviews with LGA and UWAVAKI association explain that every district has a collection center which arranges the harvesting and collection date and time for each center. During the collection, vanilla is arranged according to the grade based on the size of the pods and weight, then packaged in clean sulphate bags ready for transport to the processing plant.

Processing: The result of an interview with key informants shows that there are two (2) vanilla processors, which are UWAVAKI association, and a private company called NEI Company Limited. The association and company established a collection center in each district which produces vanilla in Kilimanjaro and transports it to the processing plants which are located within the region. According to the interview with the processor, the UWAVAKI association sources 880 kg of green vanilla from farmers in three (3) districts, which are Siha, Moshi DC, and Hai, where they processed 176 kg in 2019. Another key informant from the village extension officer argues that few farmers process the green vanilla beans locally for local consumption. According to the key informant,

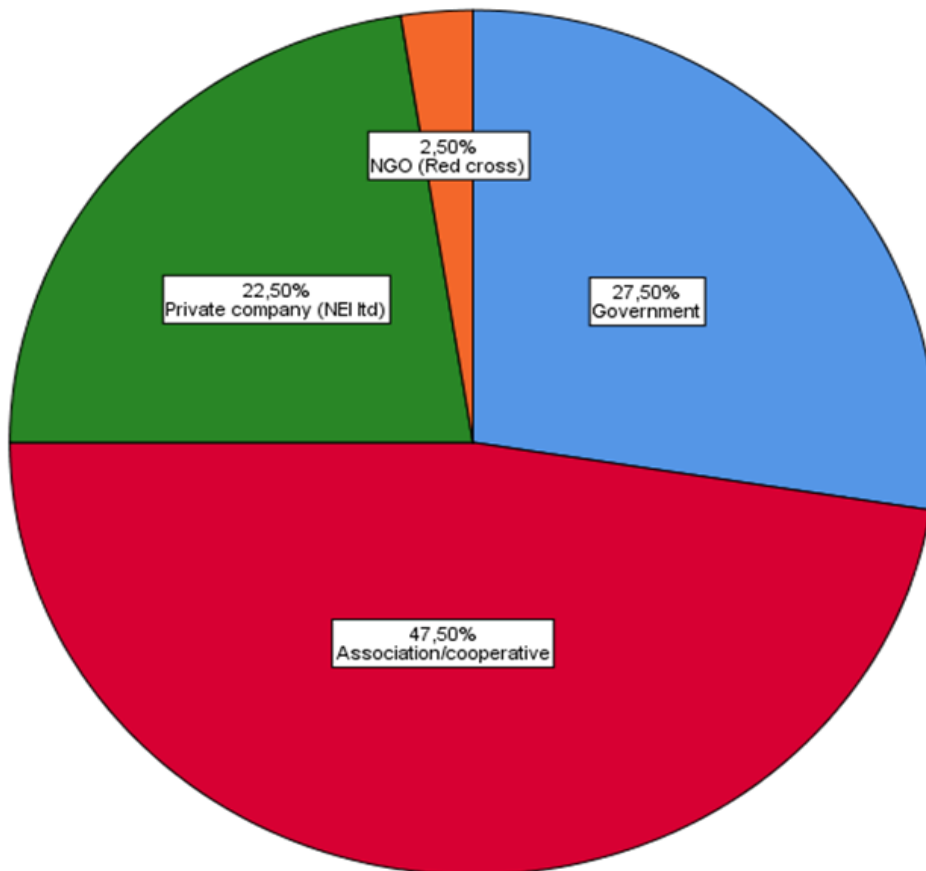
"... there is also the local consumer, therefore when transport there is other local processor, so there is consumer, here they are process local..." KI- 4 (2021)

Consuming: The interview with the key informant (LGA, NiRC, Village extension officer), and exporter identified consumers involved in the vanilla value chain, including local consumers (bakers, cake makers), and international consumers (South Africa, Spain, the United State of America (USA), EU countries, and the United Kingdom (UK). In addition, the result of an interview with the UWAVAKI association explained that the local markets take a small amount of vanilla and the price was 300,000 per kg of the processed.

4.2.2 Vanilla chain supporters and their function

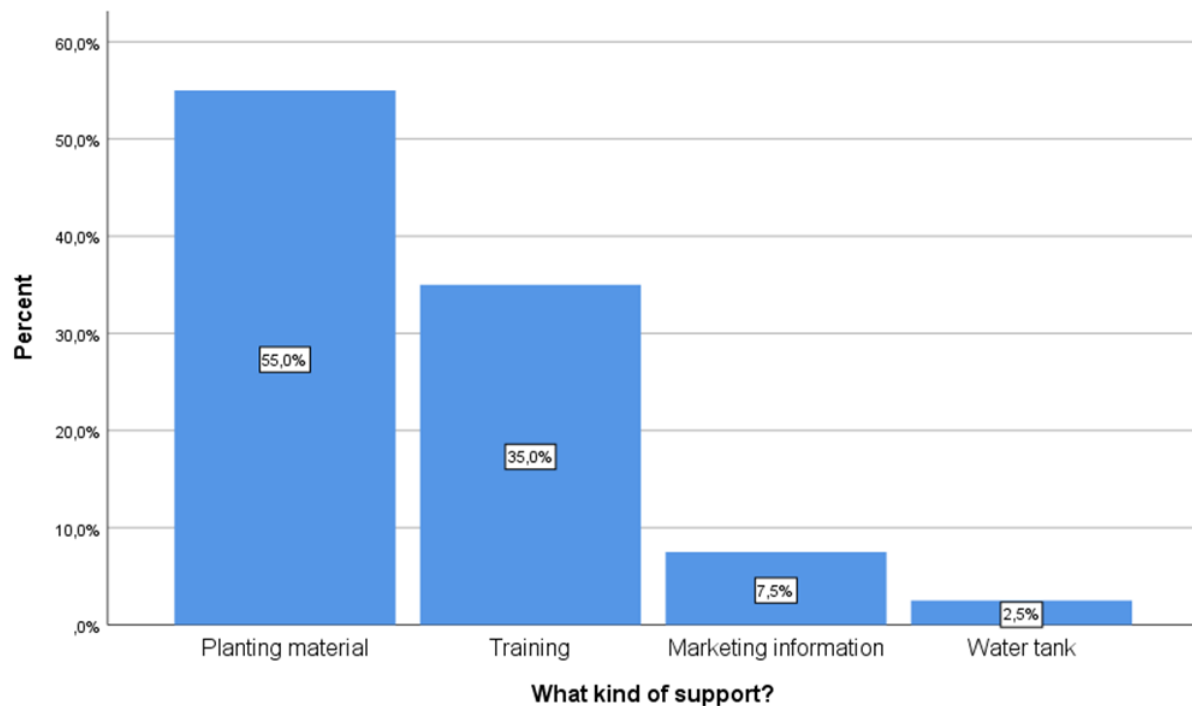
The results from the key informant identified supporters in the vanilla value chain in Kilimanjaro include; LGA, NiRC, TFDA, Irrigator's Organisation (IO), Pangan Water Basin, Ministry of Agriculture, NMB bank, and TAHA association. However, the survey results indicate that 47.5%, 27.5%, 22.5%, and 2.5% of the farmers receive support from association/cooperative, governments, private company, and NGO's (Red Cross) respectively (Figure 11 & 12).

Figure 11: Vanilla chain supporters



Source: Survey data (2021)

Figure 12: Kind of support received



Source: Survey data (2021)

4.2.3 Vanilla stakeholder matrix

Table 5 shows the vanilla stakeholder matrix of different stakeholders identified in the vanilla value chain and their functions.

Table 5: Vanilla stakeholder matrix

Stakeholder group	Stakeholder	Their function
Actors	Input supplying	Red cross <ul style="list-style-type: none"> • Supply of cuttings • Provide technical support on vanilla seedling/cutting production
		Agro dealers (Kiziga agro vert, Kawayo agro shop, Kibo agro vert) <ul style="list-style-type: none"> • Supply of Agro chemical • Supply irrigation facilities and tools such hoe, machete etc.
		Vanilla cuttings/seedling (Farmer, NGO (Red cross, Private company) <ul style="list-style-type: none"> • Cutting producer • Produce and sell seedlings/cuttings (<i>marando</i>)
	Producing	Green pods producer (Farmers) <ul style="list-style-type: none"> • Hand pollination (fertilization) and caring of vanilla to maturity • Application of organic fertilizer and mulching

			<ul style="list-style-type: none"> • Irrigation of the farm
	Processing	NEI Company ltd	<ul style="list-style-type: none"> • Buying of green vanilla pods from the farmers • Collection and transportation of vanilla • Processing of the green vanilla pods • Sorting and package of the processed vanilla pods
		UWAVAKI association	<ul style="list-style-type: none"> • Buying of green vanilla pods from the farmers • Collection and transportation of vanilla • Processing of the green vanilla pods • Sorting and package of the processed vanilla pods
	Exporting	NEI company ltd	<ul style="list-style-type: none"> • Collect from other processor • Export to the international buyers (importer)
	Retailing	Bakers and cakes maker	<ul style="list-style-type: none"> • Buying the processed vanilla for cakes making
	Consuming	Consumer both Local and International	<ul style="list-style-type: none"> • Influencing and driving vanilla market trend • Set out their quality preference • Price determination
Supporter	Government	Ministry of Agriculture	<ul style="list-style-type: none"> • Construction of market infrastructure, • Regulation of inputs • Overseer of the agriculture sector • Provide extension services and training • Regulates weights and measures • Registration and supervision of the IO group and cooperative
		LGA	<ul style="list-style-type: none"> • Provide extension services to the farmer • Regulate the measures and weights • Provide the markets information • Conduct training the training • Formulate and supervise the irrigators groups and cooperative groups
		NiRC	<ul style="list-style-type: none"> • Formulate and registry of the IO groups • Supervise the IO groups • Construction of the irrigation infrastructure • Training of the operation and maintenance of the irrigation structure • Training in good agronomic practice of the irrigation scheme
		IO	<ul style="list-style-type: none"> • Supervision and arrangement of water for irrigation distribution schedule

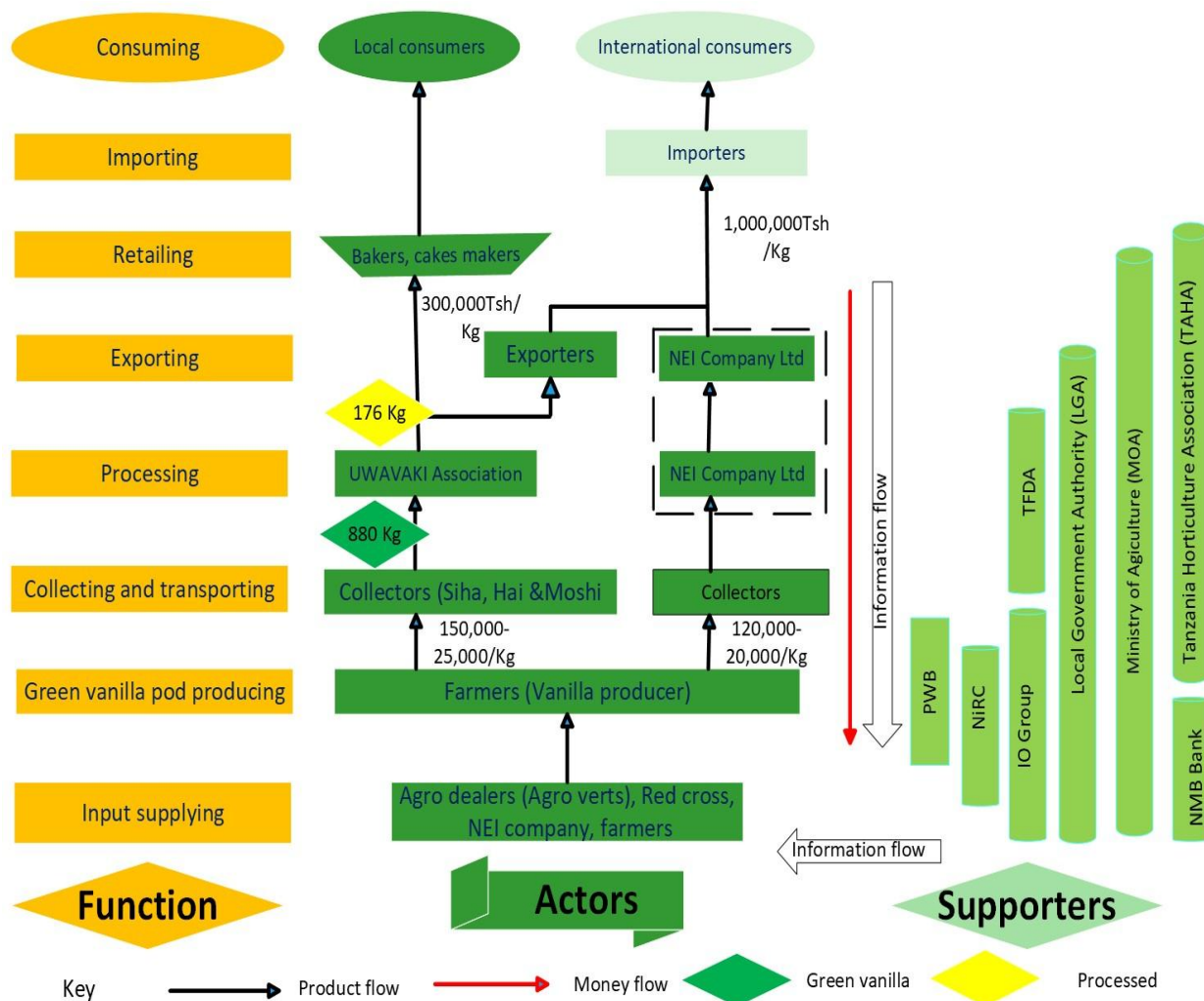
	Pangan water basin	<ul style="list-style-type: none"> • Collection of fee for irrigation water • Offer irrigation water use permit • Environmental and water source protection
	TFDA	<ul style="list-style-type: none"> • To regulate and control quality of food and safety
Financial	NMB bank	<ul style="list-style-type: none"> • Collaborate with LGA provide subsidies seedling/cutting (<i>marando</i>) to farmer
NGO's	Red cross	<ul style="list-style-type: none"> • Distribution of quality vanilla cuttings • Establishment of farm field schools • Training on vanilla production • Enhance in the formation of the farmer's association and cooperative
	TAHA association	<ul style="list-style-type: none"> • Training the farmer on the production practices • Market linkage with the buyer • Sharing of the market information
Private company	NEI company ltd	<ul style="list-style-type: none"> • Conduct training to the farmer • Loans for water storage tank and stand for irrigation

Source: Author Interview & survey data (2021).

4.2.3 Current vanilla chain map

After collecting data on the vanilla value chain in Kilimanjaro, the vanilla chain map was created to depict the current value chain. Figure 13 depicts information about stakeholders, supporters, product flow, and information flow involved in the vanilla value chain.

Figure 13: Current vanilla value chain map



Source: Authors survey and interview data (2021)

4.3 Chain governance

The results of the interviews with key informants indicate that the export prices are determined by the world market. According to one key informant, argues that.

"..... farmer does not have say, if the farmer has the say like maize is able to store and wait until the price is good or can tell a buyer has a certain amount of bag to find a market. But for vanilla are collected by agency only, so you should sell to them depend on the market price, farmers cannot determine price and specification of vanilla to produce at all....." KI - 1 (2021).

"..... the price of vanilla depend on the world market that means this processor when they are transported base on the demand of the market. The company does not decide to buy vanilla or with which specification and which price or the farmer do not have possibility of decide, it is determined by the world market....."

example in the previously year the vanilla reach to 120,000 Tsh per Kg of green vanilla, but depend on Covid the price drop and reach 25,000 Tsh per Kg” KI – 2 (2021).

4.4 Competitor

According to the interview with key informant (NiRC, LGA (Siha, and Hai), Village Extension Officer (Siha, Hai, and Moshi), and processor, explain that there are other company which source green vanilla from the farmers in the region, such as NEI Company limited and processed. According to the key informant,

“... in addition, also the Kilimanjaro region, there is private company which involved in vanilla production, and taking the green vanilla pod from farmer, there are two competing vanilla in Kilimanjarothat company NEI limited” KI- 7 (2021).

4.5 Opportunities and constraints in vanilla value chain

This part will explain result of the survey and interviews on the opportunities of vanilla production which includes sustainable farming system, and potential area for vanilla production. In addition, the constraints includes labor demand, abortion of the fruit, and high water demand.

4.5.1 Opportunities in vanilla production

Farming system

The survey results indicated that all farmers mix vanilla with other crops to provide shading for vanilla, also as a source of income and food. The result shows 67.5% of the farmers cultivating vanilla mixed with coffee and banana, and 32.5% of the farmers cultivating vanilla mixed with banana only (detail figure 14). Moreover, according to the interview with key informants (NiRC, LGA, Extension officer in Siha) and exporter (TAHA association), most of the farmers cultivate vanilla with other crops such as bananas, coffee, and vegetables. Another key informant, who is an irrigation officer from LGA Hai, argued that most farmers cultivate their vanilla organically and consider environmental conservation. Also mentioned, vanilla requires at least 45% of shade so it can be cultivated mixed with trees, and vanilla plants are not susceptible to pest and diseases. According to one key informant,

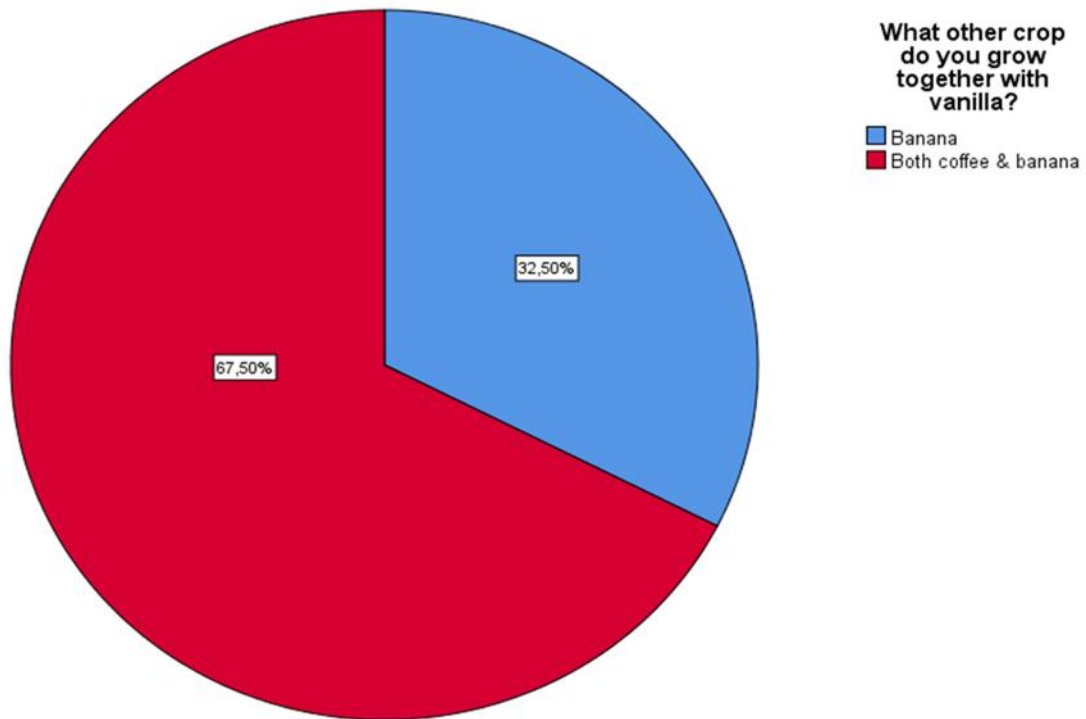
“..... majority of vanilla producer cultivate vanilla organically, the farming which relaying on the environmental conservation and as you know vanilla is among of the crop which require shading for at least 45% of the vanilla farm should have shade. So is among of the crop which is favorable to be planted with tree. Also it can be mixed with other crops, but I ask Tacri which is among of research institute deals with coffee, if there is possibility of the farmers to cultivate coffee with other crops. The objective of asking this question is because there is variety of coffee which are cultivated organically (without the application of chemicals) also vanilla is not crop which are highly affected with pest and disease.....” KI – 5 (2021).

In addition, the LGA, and extension officer Siha, argue that other companies restrict farmers from cultivating vanilla by mixing it with coffee and there is no application of inorganic fertilizer. Instead, they use organic manure and mulch to cover the soil. According to one key informant from LGA Siha mentioned,

“.... in general, they receive the training, vanilla should not applied any kind of chemical, however the fertilizer used is farm yard manure, mulching, type of cropping is mixed cropping. I discover for the farmers

who sell their produce to NEI, they instruct the farmer not mixing the vanilla with other crops, so the place where they cultivate vanilla should remove the coffee....” KI- 2 (2021).

Figure 14: The crop which are cultivated together with vanilla

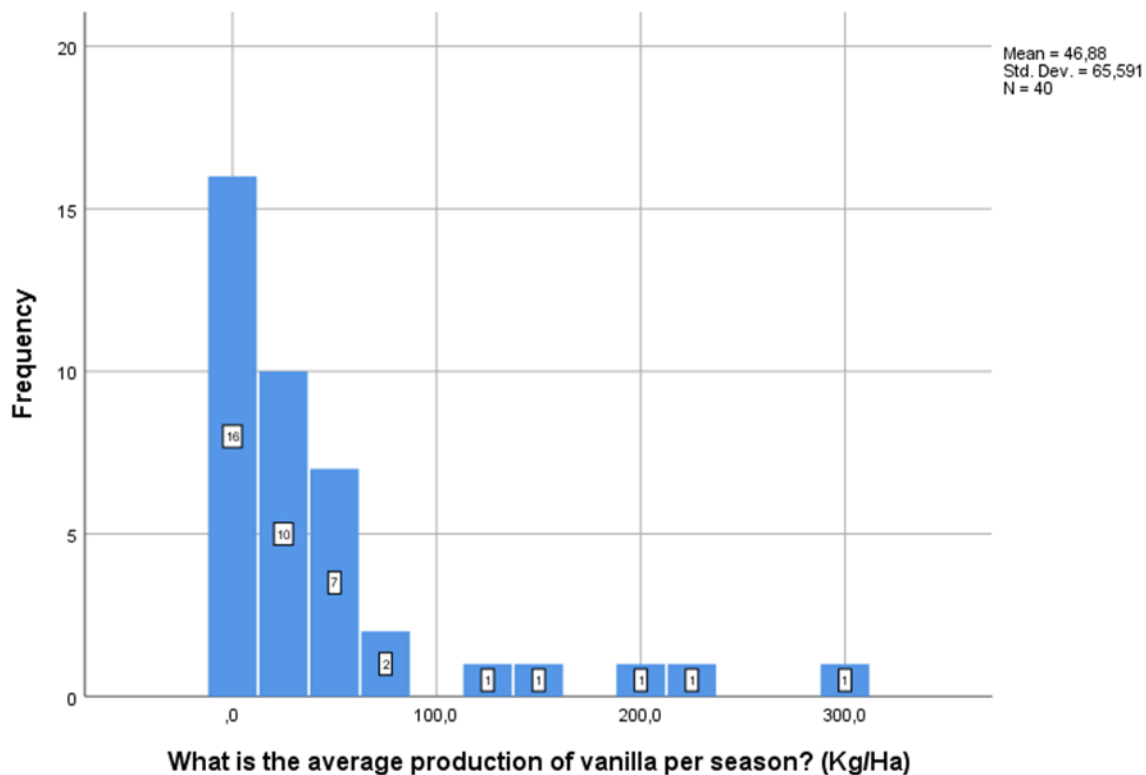


Source: Survey data (2021)

Production capacity

The survey results from 40 farmers indicated that the average production was 46.88 kg per hectare, where the minimum production was 0 and the maximum production was 290 kg per hectare (table 6).

Table 6: Average production of vanilla per season (Kg/Ha)

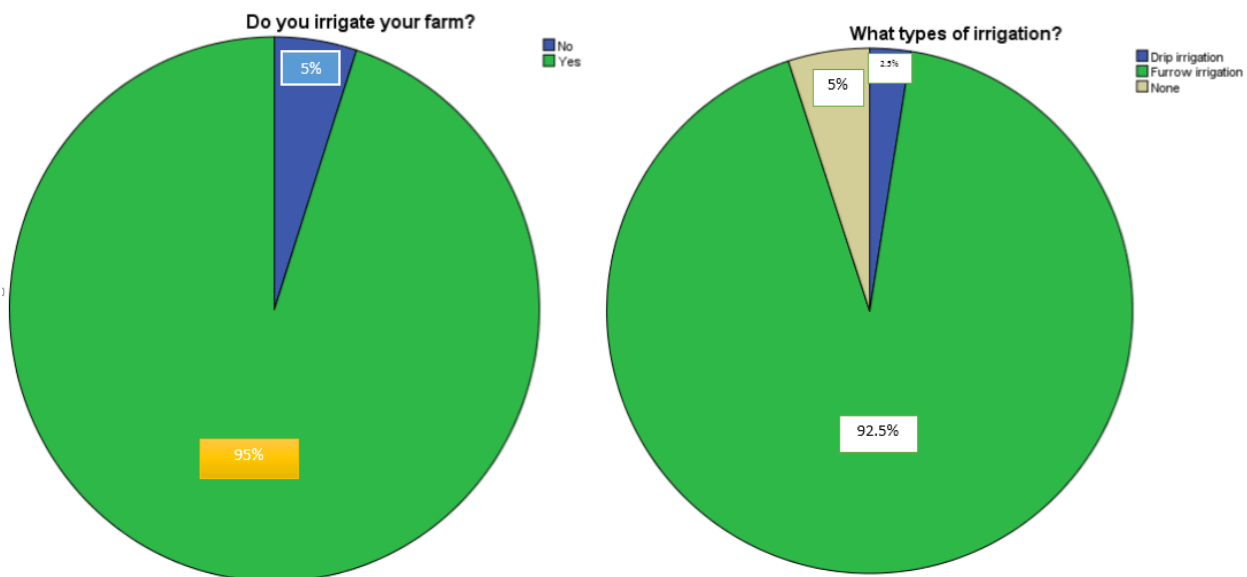


Sources: Survey data (2021)

Other opportunities

According to the results of the interview with key informants and exporters (TABARO), other opportunities in vanilla production include; a source of income for the farmer due to the high price of the crop, employment for the youth in production and transportation, low cost of storage, and reducing the level of poverty among the farmers. In addition, the respondents from TAHA and LGA Siha explain that there is a potential area for vanilla production, and the availability of source for water for irrigation. This is shown by the survey results, 95% of farmers irrigate their vanilla farms and 92.5% of farmers use furrows for irrigation of their farms (Figure 15).

Figure 15: The farmer response on irrigate and types of irrigation



Source: Survey data (2021)

4.5.2 Constraints in vanilla production

The result survey shows that 27.5% and 72.5% of farmers indicate there is a serious and less serious challenge to the low productivity of vanilla respectively, 17.5% and 80% indicate the demand for water is serious and less serious, respectively, 15% and 85% indicate there is a serious and less serious abortion of fruit, 7.5%, and 92.7% indicate there is a serious and less serious demand for labor in the vanilla production (for more detail table 7).

Table 7: Challenges which face vanilla smallholders in Kilimanjaro

Challenges	Number of respondent	Level of Impact					
		Serious		Less serious		Not serious	
		%	f	%	f	%	f
High water demand	40	17.5	7	80	32	2.5	1
Low productivity	40	27.5	11	72.5	29	0	0
Abortion of fruit	40	15	6	85	34	0	0
High demand for labor	40	7.5	3	92.7	37	0	0
Difficult to comply with certification	40	0	0	0	0	100	40

Sources: Survey data (2021)

In addition, the results of the survey indicate other challenges which can be categorized into production and market challenges. On the production side, farmers identify the following challenges; dropping of the fruit due to heavy rainfall, thief of green vanilla and cuttings (*marando*), damage to the vanilla shoots caused by chickens, inadequate amount of water for irrigation, lack of training knowledge on fertilization, and inadequate of the seedling/cutting (*marando*) for planting. While on the market, the challenges

include; price fluctuation associated with low prices received by farmers, and poor knowledge of the processing of vanilla.

This also been mentioned by key informants (NiRC, LGA Siha, UWAVAKI, Extension officer Siha and Hai), and exporters (TAHA, TABARO) most of the challenges which face farmers in the production of vanilla are as follows; inadequate certified seedlings/cutting (*marando*), low production and productivity (average production per plant is 4 kg, but farmers produce 1 to 1/3 kg per plant), poor harvesting quality and post harvesting losses, pest and diseases which affect vanilla, thief of vanilla pods and cutting (*marando*), inadequate training to farmer on fertilization, heavy rainfall leads to dropping of fruit/pods, inability of the farmer to process vanilla, restriction to cultivation of vanilla with coffee, and poor policy for promotion of the production of vanilla. They also point out other challenges which face farmers, such as an insufficient amount of water for irrigation, especially in the dry period. According to an interview with a key informant,

"... in other time the farmer does not receive enough amount of water for irrigation, like the volume of water is low, so farmer does not receive the water on time..... they use furrow irrigation ..." KI-3 (2021).

4.6 Food quality and export market requirement

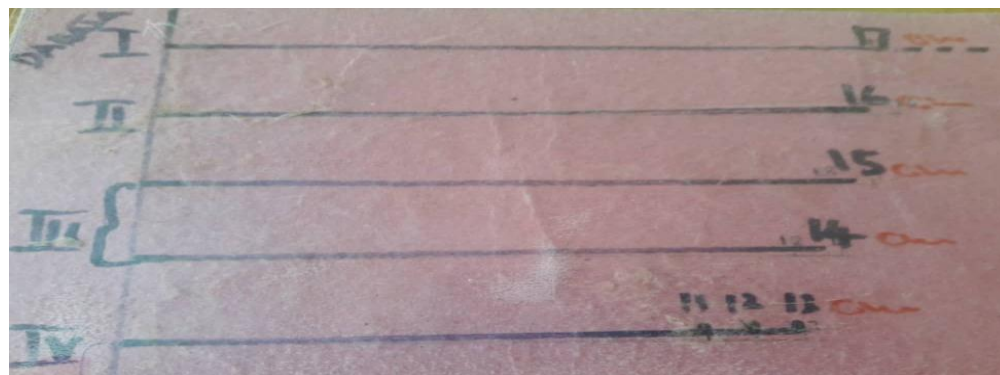
4.6.1 Produce quality

The results of an interview with an exporter indicate that vanilla quality and quantity are the key issues for the export market as a processor of vanilla, the need for certification quality based on internal and international quality. Both TABARO Terminal Handling company and the TAHA association indicate that other parameters should be met before the export, including the required level of moisture content, chemical residue level should be below the minimum requirement, laboratory test and analysis show that the level of vanillin content should be above 1.6% dry weight basis (Annex 5 for more detail on vanilla laboratory analysis), volume and pod size based on customer demand (figure 16).

"..... on the quality of produce, mostly the consumer leads, so the produce should be with a certain amount of content, or pesticide residue in which minimum level....." EX – 8 (2021).

".... it depend on size, but for low grade buyer always buy all size, depend on extraction grade, previously they start at 13 cm up to 18 plus cm pod size for premium size, but now they start at 14 plus cm up to 18 plus cm pod size for premium size....." EX – 9 (2021).

Figure 16: Vanilla pods size scale charts



Source: Fieldwork (2021)

4.6.2 Certification standard requirement

The result of an interview with an exporter described "quality" for the processing of vanilla based on the requirements of the buyer. For example, other buyers need Organic Certified Produce, Phytosanitary certification, or Global GAP. The TAHA association and cooperative/association explained the processor need to have a registered company, registered and qualified to process the vanilla according to the quality requirements of the Tanzania Food and Drug Authority (TFDA), which is the government organisation which insures the company meets the quality requirements of the product (Annex 6 TFDA certificate for processor). The interview with two exporters mentioned that,

"..... you should have the company which is registered, to have certificates such as Phytosanitary certificates, certificates of origin, also we consider the customer require organic, should have organic certification, Global GAP or bill of land....." EX – 8 (2021).

"...in this time export market focus on organic farming, certified organic they demand, if certified, the price increase, they use malaria pesticides they leads to problem, they bring the contamination to the produce... the buyer deals with certified organic only. The buyer are willing to buy all amount you have We get another buyer from Turkey, they also say now the demand is organic certified farming produce ..." EX - 9 (2021).

4.7 Opportunities and constraints for export market

This part will explain result of the survey and interviews on the opportunities of vanilla for the export markets includes variety cultivated, and market demand for vanilla. In addition, the constraints includes certificate standards, reactive order, price fluctuation, and lack of stable market.

4.7.1 Opportunity for export market

Variety cultivated

The results of the survey indicate that the majority (100%) of farmers cultivate a variety known as *Vanilla planifolia*. The survey results also indicate that they received training and seedlings/cutting (*marando*) from an NGO (Red Cross) and other private company. However, according to an interview with a processor and exporter, explains that farmers cultivate the same variety in Bukoba, Madagascar and Comoro. In addition, they source this cutting (*marando*) from Bukoba, where they grow a variety which is *Vanilla planifolia* for the local and export markets. The interview with two exporters mentioned that,

"..... the famous cultivated vanilla in business way is Vanilla planifolia, botanic name fragilance....." EX – 9 (2021).

".....variety grown in Tanzania is only one that is Vanilla planifolia, species....." EX – 10 (2021).

Market demand

TAHA association, NEI company Ltd, and TABARO Terminal Handling company Ltd mentioned there is an opportunity for processed vanilla, especially in the market. Both explain the demand for vanilla is high, especially for the export market. EX – 9 points out that there is a readily available market for vanilla but

only for organic certified products and they offer a premium price. The interview with exporters mentioned that,

“..... the company which we deals with has capacity of buying 30 tones cured vanilla ... there is good market available and demand are not fulfilled within the year....” EX – 9 (2021).

Apart from the export market, the local market demand is also increasing due to the increase in awareness among consumers. For example, most of local consumers use processed vanilla pods for baking, cakes, etc. Other few farmers process vanilla locally for home consumption at the family level. The interview with exporters mentioned that,

“..... instead of exported as row, but now there is growing demand for the processing, that means you get the people who are making cakes and other product are use l large, but also local consumer they are aware for the use of vanilla. But now we get normal people are used after be trained on the issue of nutrition and consumption, therefore there is growing demand for vanilla because people are consciously now.....” EX – 8 (2021).

In addition, one exporter and processor of vanilla argue more about the increase in demand for value added vanilla through extraction of vanillin instead of selling only the processed pods (dried and cured pods). The interview with exporters mentioned that,

“..... but now for local market prefer the flavor already extracted, but the processed equipment now we don't have, when we add value we get 30 mls sold 8,000.00 Tsh of liquid mixed with water, we see there is potential” EX – 9 (2021).

4.7.2 Constraints for the export of vanilla

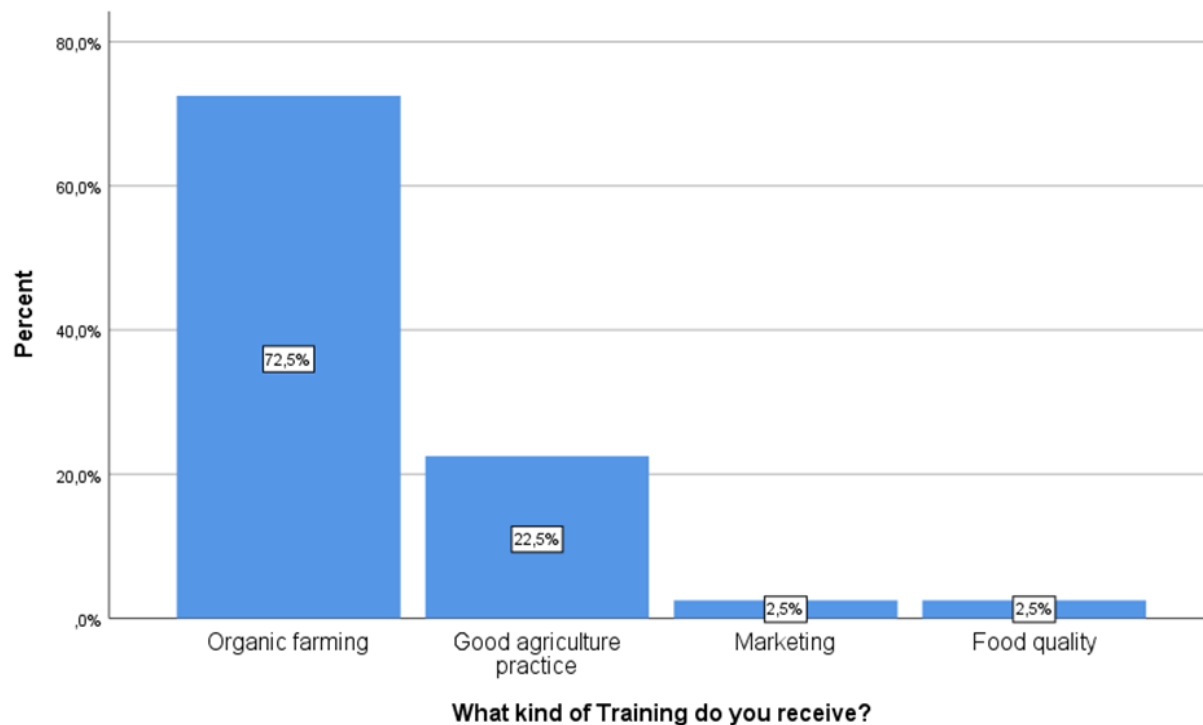
Certificate standards

The survey results indicate the majority of vanilla producers (100%) are not certified to comply with the certification standard. Also, the survey respondents indicated that 72.5%, 22.5%, 2.5% and 2.5% of the farmers received training on organic farming, good agricultural practice, marketing, and food quality respectively (Figure 17). This has been confirmed by key informants. The LGA explains that, most vanilla farmers are not registered and certified to any certification standards such as Global GAP, or Organic production. Also, LGA describes that most farmers are already receiving training on organic production from NGOs and processing companies (figure 17). In addition, the findings from interviews with exporters explain that most of the vanilla processors are not certified to ISO, GAP or organic. One exporter argues more with other companies certified previously, but due to the application of chemicals to kill malaria mosquitoes and blankets used during processing, lead to high levels of chemicals in the processed vanilla during testing, hence causing it to not comply with organic production (reject certified as organic).

“..... most of processor has no certificate like Phytosanitary certificate, certificate of origin or organic certificate or Global GAP certificate....” EX – 8 (2021).

In addition, according to the interview done with TABARO company ltd, which exports vanilla from Bukoba, most consumers prefer organically produced vanilla and consumer are ready to pay a premium price compared to conventionally produced vanilla.

Figure 17: Kind of training



Sources: Survey data (2021)

Other challenges which were mentioned by many interviewees were low profit received by the farmer, price fluctuation, reactive orders, no stable market, and smuggling of vanilla to Uganda. The interview with the TAHA association said that,

“..... there is no direct traders involved, while we get the most involved is middle man, you get someone is google price as you know everything is online and see vanilla price let say to exported to Netherland and compare the price of vanilla in Netherland and price received by middle man, means the customer who demand vanilla in Netherland they are not have direct contact with farmer that is one of challenges.... Let say farmers hear the price of vanilla is 800,000 Tsh but middle man buy from farmer 120,000 or 150,0000 or 200,000 Tshs so we get the farmer are discourage.....” EX – 8 (2021).

“.... But if you get someone who have direct contact with farmer or company, they make agreement with association/cooperative, were the customer has a demand of vanilla and the specification on the tones required, then agree to form MoU or have the contract which show the buyer are willing to buy, it is possible and it will be more formal it remove the room of middle man to exploit the farmers and discouraged to engage in production of vanilla....” EX – 8 (2021).

CHAPTER FIVE: DISCUSSION

This chapter describes the interpretation of the result from both the survey of vanilla smallholders from three districts (Hai, Siha, and Moshi), which are found in the Kilimanjaro region, and information from interviews with key informants and vanilla exporters. The interpreted result includes vanilla value chain stakeholders and their function, vanilla chain governance, competitor, opportunities and constraints on both production of vanilla and export markets, and product quality and market requirement for the export markets.

5.1 Vanilla value chain stakeholder and function

The vanilla value chain in the Kilimanjaro region starts from input suppliers to consumers. The current vanilla chain map shows that farmers receive input from different Agro shops within their districts and villages. Also, there are two types of producers, seedling/cutting, which was produced by NEI company Ltd., NGO (Red Cross), currently operated by UWAVAKI Association, and farmers. For the green vanilla producers are farmers from three (3) districts (Siha, Hai, and Moshi). In addition, the interview shows there is a deficiency of planting material (seedling/cutting) to the vanilla producer. The key actors in the vanilla chain were farmers, who were dominated by males (77.5%) and females (22.5%) of the farmers, and the mean age was 61 years. That means, men are the dominant in the vanilla production and majority of vanilla producers in Kilimanjaro are old. Moreover, the majority of the vanilla producers are smallholder farmers with an average landholding of 0.1 to 1 Ha (mean 0.54 Ha) and the area cultivated vanilla ranges from 0.1 to 0.2 Ha (0.14 Ha). This is confirmed by Embassy of the Kingdom of the Netherlands (2017) also found most horticulture is mainly dominated by small-scale farmers with an average farm size of less than two hectares.

The farmers sell their green vanilla to two (2) major processors, which are NEI company Ltd., and UWAVAKI Association. However, there are few farmers who process vanilla locally for home consumption. In addition, this processor has a collection center in each district where the farmers bring the vanilla for selling ready to transport to the processing plants. After processing vanilla, small amounts of vanilla are sold to the local markets and large amounts are exported outside the country. According to the vanilla chain map, there is no direct link between the UWAVAKI Association and importers of vanilla outside the country. Moreover, there are eight (8) vanilla chain supporters (LGA, NiRC, TFDA, Irrigator's Organisation (IO), Pangan Water Basin, Ministry of Agriculture, NMB bank, and TAHA association).

According to KIT (2012), value chains consist of a series of chain actors, chain supporters, and chain influencers. Chain actors are linked by product flow, finance, information, and services, while chain supporters provide chain actors with services that provide an enabling environment for chain actors to thrive. Chain actors are made up of input suppliers, producers, processors, manufacturers, traders, and consumers. At each stage of the chain, value is added to a product to make it more valuable to the customer, which causes costs to accumulate at each stage. Moreover, vanilla smallholders should be involved in processing, which will add an important aspect to capacity building (KIT 2012).

5.2 Vanilla chain governance

The actors who have power in the vanilla chain are buyers, especially international consumers. This was observed from interview results with key informants, they mentioned the international consumer is the one who decides the price and the type of processed vanilla. However, the market is not stable due to the present price fluctuation year after year. According to Webber and Labaste (2010), explain lead actors are

usually the most powerful in value chains, with the power to decide on price, quality, and safety. Moreover, the type of value chain governance identified was market power (Musa, Boniface and Tanakinjal 2014).

5.3 Competitors

Vanilla needs to be processed before being sold to the market. There are different products obtained from vanilla, such as dried and cured vanilla pods, and oil containing vanillin compound. The company which sourced the green vanilla from Kilimanjaro was NEI Company limited. In addition, this company processes vanilla into oil for the local market, as well as grading and package of processed vanilla for export. According to Food Ingredients (2021) explain that there are two (2) processors in the vanilla value chain, which are Natural Extracts Industries company limited (NEI), and UWAVAKI association.

5.4 Opportunities and constraint in vanilla production

This part will interpret the result on the opportunities of vanilla production which includes sustainable farming system, and potential area for vanilla production. In addition, the constraints includes low productivity, abortion of the fruit, and high water demand.

5.4.1 Opportunities in vanilla production

Sustainable farming system

i. Environmental conservation

The study found that most farmers produce vanilla without the application of inorganic fertilizer. Instead, they use organic manure and mulch to cover the soil. In addition, the majority of farmers cultivate their vanilla organically, consider environmental conservation, as well as vanilla requires at least 45% of shade so it can be cultivated mixed with trees, and vanilla plants are not susceptible to pest and diseases. This is in line with Martin et al. (2020), who explain that vanilla is almost exclusively produced in rather extensively managed agroforestry systems without the application of fertilizers, herbicides, and pesticides. This kind of production leads to conserving the environment because there is no application of chemicals and planting vanilla mixed with trees (agroforestry) reduces the level of CO₂ gases in the atmosphere.

ii. Profitability

The survey result revealed that 67.5% (27) of the farmers cultivate vanilla mixed with coffee and bananas, and 32.5% (13) of the farmers cultivate vanilla mixed with bananas. This is in line with interviews information about most farmers cultivate vanilla with other crops such as bananas, coffee, and vegetables. According to Pérez et al. (2017), vanilla can be cultivated with other crops/plants to provide support and shade. Many producers cultivate vanilla with secondary crops such as rubber, clove, pepper, *Jatropha curcas*, or coconut that serve as support and shade for the vanilla vines. This is becoming a strategic product to promote the sustainable development of rural communities by gaining additional income through crop integration. Vanilla is among the horticulture crops, which are intercropped with other crops for support and to provide shade (Chuan-hong et al. 2021; Embassy of the Kingdom of the Netherlands 2017). This indicate that the vanilla can be cultivated mixed with other crops for the provider of shade as well as the addition source of income to the farmers.

iii. People

The survey results indicate that the majority of vanilla producers in Kilimanjaro were not certified to certification standards, but 77.5% of the vanilla farmers received training on organic farming and good agricultural practices. In addition, key informants argue that vanilla farmers produce vanilla organically without the application of chemicals, and other processors restrict farmers from cultivating vanilla mixed with coffee in order to avoid chemical contamination. Furthermore, one key informant argues that there is a possibility of cultivating vanilla mixed with coffee because there is a variety of coffee which is produced organically (without the application of chemicals, and pesticides that is organic coffee production). According to the EOS Research Paper (2012), there has been an increase in consumer preference and demand for naturally produced food. Also, for vanilla consumers, there is a demand for a natural vanilla product, and even organic. Moreover, the demand for organic vanilla in the world is increasing due to an increase in consumer preference and conciseness on the health issue.

Irrigation water

The results from key informants and exporters show that there is a potential area for vanilla production in Kilimanjaro, and the availability of water for irrigation. This was confirmed by the survey results, which indicated that 95% of farmers irrigate their farms and 92.5% of farmers use furrows to irrigate. According to Pérez et al. (2017), vanilla needs water throughout the whole season for growth. There is a need to implement appropriate irrigation systems is not an exclusive aspect of the cultivation of vanilla for the supplementation of water during dry periods.

Other opportunities

According to the results of the interview with UWAVAKI, LGA Siha, extension officer Hai and Siha, and exporter (TABARO Terminal Handling company) mentioned, other opportunities in the vanilla value chain include providing income to the farmers due to the high price of the crop, employment for the youth in production and transportation, low cost of storage, and reducing the level of poverty among the farmers. According to Pérez et al. (2017), vanilla is a spice crop with a high value and it ranks as the third most expensive spice in the world. The price per ton is USD (\$) 6,534 for the processed vanilla.

5.4.2 Constraints in vanilla production

Low production and productivity

The survey results show that 27.5% and 72.5% of the vanilla farmers indicate there are challenges such as low productivity of vanilla by ranking the problem as serious and less serious. In addition, survey results show that the average green vanilla production is 46.88 kilograms per hectare. This is in line with key informants (NiRC, LGA Siha, UWAVAKI, Extension officer Siha and Hai, and exporters (TAHA association, and TABARO Terminal Handling company) explaining the challenges which face vanilla smallholders in production, including low production and productivity. For example, production per plant is 4 kilograms, but farmers produce 1 to 0.75 kilogram per plant. This was conducted by the United Republic of Tanzania report (2017), which indicates that the average yield of vanilla per hectare in Kilimanjaro (2016/17) is 1.5 tons/hectare, which is higher than all other regions in Tanzania. This indicates there is low production of vanilla compared to the recommended production per unit area. In addition, according to analysis done

by Fintrac in Uganda on the vanilla value chain, there is room to increase the productivity and profitability of the crop through improved technology and proper marketing (KIT 2012).

Water demand

The interview with the key informants pointed out the challenges which face farmers were the insufficient amount of water for irrigation especially in the dry period. The survey results indicate 17.5% (7) and 80% (32) of the farmers say there is a serious and less serious demand for water for irrigation. According to Shepherd (2007), vanilla needs water throughout the whole season for growth. Hence, the need to implement appropriate irrigation systems is not an exclusive aspect of the cultivation of vanilla for the supplementation of water during dry periods. This has been confirmed by Pérez et al. (2017), who stated that most smallholder farmers grow it under rainfed conditions, and a small number of farmers use irrigation schemes.

Abortion of the fruit

The result of the survey shows 15% and 85% of the farmers indicate there is serious and less serious abortion of fruit. In addition, the majority of farmers mentioned other challenges related to abortion of fruit caused by heavy rainfall and there is poor knowledge of fertilization, which leads to the dropping of the fruits and flowers. This argument was also supported by interviews with key informants (NiRC, LGA Siha, UWAVAKI, Extension officer Siha and Hai), and exporters (TAHA association, TABARO Terminal Handling company) who explained that there is inadequate training for farmers on fertilization, and heavy rainfall which leads to the dropping of fruit/pods. According to Abhishek (2019), argues that the abortion rates vary between production cycles and vanilla needs proper time for fertilization in order to reduce the rate of dropping of the flower. This indicate there is abortion of fruit due to the poor knowledge of the farmers in fertilization and when there is high rainfall.

Other challenges

Other challenges mentioned by farmers in the survey were low profit gained by farmers due to low prices, and inadequate seedling/cutting (*marando*). This was also mentioned by most key informants during interview respondents explain the challenges which face the majority of vanilla producers, including low profit received by the farmer and inadequate seedling/cutting.

5.5 Food quality and export market requirement

This part will interpreted the result in the quality of vanilla, and certificate standard requirements for export of the processed vanilla.

5.5.1 Produce quality

The study found that for the export market, vanilla quality and quantity are the key issues to be considered. The interview with TABARO Terminal Handling Company argues that other parameters should be met for the export of vanilla, including the required level of moisture content, chemical residue level should be below the minimum requirement, and laboratory test. In addition, the interview with the TAHA association mentioned the requirements for markets include volume based on customer demand, moisture content level, minimum chemical residue level, vanillin content should be above 1.6% of dry weight, and pod size based on customer demand. This has been confirmed by Abhishek (2019), who explains that overall vanilla market demand depends on the food quality and size of vanilla pods, which

can be categorized into different grades. Markets such as the European Union, particularly Germany, prefer grade "A", whereas the United States prefers grade "B" or "C" quality products and certification based on ISO regulation 5565-2:1999 or Organic Certification (Abhishek 2019; Hänke et al. 2018; Hänke and Fairtrade International 2019; Hachman 2017).

5.5.2 Certification standard requirement

The interview results show that the quality of the processing vanilla depends on the requirements of the buyer or consumer. For example, other buyers/consumers prefer Organic Certified Produce, Phytosanitary certification, or Global GAP. The TAHA association confirmed that processors should have a company which is registered, certificates such as Phytosanitary certificates, certificates of origin, and other customers require organic certification, Global GAP or bill of land. In addition, TABARO Terminal Handling Company argues more export market focus on organic farming, certified organic and customers are willing to pay a premium price for organically certified vanilla products. The cooperative for the processor needs to be registered and qualified to process the vanilla according to the quality standards set by the Tanzania Food and Drug Authority (TFDA), which is the government organisation which insures the company meets the quality requirements of the product. This supports the finding by Abhishek (2019); Hänke et al. (2018); Hänke and Fairtrade International (2019) and Hachman (2017) that the export market for vanilla requires certification based on ISO regulation 5565-2:1999 or Organic Certification.

5.6 Opportunities and constraints for export market

This part interpret the result on the opportunities of vanilla for export market which includes variety cultivated, and market demand for the processed vanilla. In addition, the constraints includes difficult to comply with certification standards, price fluctuation, reactive order, and unstable markets.

5.6.1 Opportunities for export market

Variety cultivated

The study shows that the majority of farmers cultivate the same variety of vanilla, which is *Vanilla planifolia*. This has been confirmed by an interview with a processor and exporter who explained that farmers cultivate the same variety in Bukoba, Madagascar and Comoro. In addition, the source of this cutting (*marando*) was from Bukoba, where they grow the same variety, which is *Vanilla planifolia*, for the local and export markets. This is supported by Martin et al. (2020) that Bourbon Vanilla is the most popular variety grown mainly in Madagascar, Mexico, Indonesia, Tanzania, and Uganda. It is also characterized by having thin bean types, quite rich, sweet, and dark-colored pods. This also aligns with Richard (2010) explains vanilla (*Vanilla planifolia* A.) commonly known as 'Bourbon' and accounts for 75% of vanilla products sold in the international markets.

Market demand

The study identified that there is an increased demand for vanilla in the local market due to the increase in awareness among local consumers. They use processed vanilla pods for baking, cakes, etc., and other farmers' process vanilla locally for consumption at the family level. Other processors and exporters argue that there is an increase in demand for value-added vanilla through extraction of vanillin instead of selling their processed pods. In addition, NEI company Ltd., and TABARO Terminal Handling Company mentioned there is a demand for processed vanilla, especially in the export market. This has been confirmed by

TABARO Terminal Handling Company point out that there is a readily available market for vanilla but only for organically certified products and they offer a premium price.

This aligns with the EOS Research Paper (2012) which indicates there is an increase in consumer preference and demand for naturally produced food. From fair trade products to organic products, branding a product as all-natural is almost a prerequisite for a spot on the shelf. Likewise, for the vanilla consumer, there is a demand for a natural vanilla product, and even organic. Moreover, the demand for organic vanilla in the world is increasing due to an increase in consumer preference for natural and organic vanilla.

5.6.2 Constraints for the export of vanilla

Certificate standards

The survey results show the majority of vanilla farmers are not certified according to certification standards, and 77.5% of the farmers receive training on organic farming and good agricultural practices. This is also explained by Key Informants LGA that most vanilla farmers are not registered and certified to any certification standards such as Global GAP or Organic production, although they receive training on organic farming and good agricultural practice. In addition, the results of an interview with an exporter explain that most of the vanilla processors are not certified by ISO, GAP or organic. This has been confirmed by Hänke et al. (2018) for the export markets, where vanilla requires the producer to comply with certification standards based on customer requirements.

Certification is a procedure by which a third party (the certifier or certification body) gives a certificate that shows that the product or service conforms to specified food quality requirements standards. Food quality standards mean the product is free from environmental, other contaminants and sources harmfully toxicity (physical, chemical, or biological) for the human health. Moreover, farmers faced difficulties entering the international market because of compliance issues with regulatory requirements. In addition, Bijman et al. (2007) make a synthesis about the constraints that smallholders face when they want to link to new markets or become more competitive in existing markets. According to Abhishek (2019), the challenges which mostly face farmers in accessing the export market were unfamiliar with the right requirements for accessing the global market, and poor consolidation to comply with regulatory standards.

Other challenges

Other challenges mentioned by farmers in the survey were price fluctuation for green vanilla, and low profit gained by farmers due to low prices. This was also mentioned by most key informants and exporters during interviews, the challenges which face the majority of the vanilla producers include price fluctuation, reactive orders, unstable markets (lack of contract farming), and smuggling of vanilla to Uganda.

This is also aligned with the findings of Wiley (2017), who explain that the vanilla market is associated with extreme price volatility, which is compounded by such low prices during the "bust" face of the market, which makes farmers switch to alternative crops (Hänke & Fairtrade International 2019). Despite the high-value crop with a high price, the profit/income obtained from vanilla production by smallholders is still below the minimum due to limited capacity and capabilities, and producer association to explore new market opportunities. According to Chuan-hong et al. (2021), some government programs and aid donors

are still concentrating on how to increase agricultural production without facilitating the marketing of farm produce to the market. The aim of establishing and registering producer organizations was to create better conditions to lowering transaction costs, obtaining market information, gaining access production technologies and better integrate high-value markets of their produce.

5.7 Summary using SWOT

Table 8 shows the summary of interpreted result using SWOT (Strengths, Weaknesses, opportunities, and Threats) of the vanilla value chain and export markets in the Kilimanjaro region from a combination of different methods of data collection.

Table 8: Summary of interpretation of result using SWOT tool

Strengths	Weaknesses
<ul style="list-style-type: none"> • Add income to the farmer due to high price • Sustainable farming system by produce organically • Mixed cropping with bananas, coffee or trees • Potential area for vanilla production 	<ul style="list-style-type: none"> • Poor knowledge on certification standards • Inadequate supply of seedling/cutting to farmer • Low vanilla production and productivity • Lack of consistence supply • Low price received by farmers • Abortion of fruit due excessive rainfall and poor fertilization • Insufficient amount of water for irrigation especially dry period • Restriction to cultivation of vanilla with coffee • Poor knowledge on production
Opportunities	Threats
<ul style="list-style-type: none"> • High demand for organic produced vanilla both local and export • Variety cultivated • It is high paid crop due to organic offers premium price • Contract farming • Employment to the people to work on their farms 	<ul style="list-style-type: none"> • Effect Covid 19 on export vanilla leads to fall of price • Poor export market information • Most of famers and processors are not certification standards (Global GAP, Organic) • Reactive order (argent order)

Source: Author's compilation (2021)

5.7 Reflection

This part reflects my role as a researcher throughout the entire process of my research. It covers the research methodology on desk study, surveys, and interviews, experiences gained, challenges faced, and lessons learned during the process of my research. The research aimed to determine the factors which hinder producer associations from accessing export markets for their processed vanilla products, and suggest recommendations for the Kilimanjaro region, Tanzania.

Initially, the research process started with choosing the research topic, followed by writing a research proposal through close supervision and coaching with my supervisor. After completion and submission of the proposal, the next step follows, which was data collection, results, analysis, discussion, conclusion, and recommendation. Before the beginning of data collection, the survey questionnaire was tested on eight (8) people, of which six (6) people responded in Google form and two (2) in survey hard copy forms. The aim of the testing was to get comments for improvements. During the survey questionnaire testing phase, some repeated questions, unclear questions, and mistakes were identified and corrected. Finally, data collection was started with the help of the field research assistant in Tanzania on behalf. The data collection was the most difficult and challenging part of my research, which was caused by the Covid 19 restriction on travel back to my home country (Tanzania) to collect the field data instead of hiring research assistance. However, the description of the research work was introduced to the research assistant and we made an agreement on the amount of money required for the data collection. In addition, the planning and scheduling for data collection were done together with a research assistant. The collection of survey data was done in parallel with online semi-structured interviews with key informants and exporters. However, there were changes made at the onset of data collection of about one week due to the research assistant getting an emergency responsibility to attend.

The interview was conducted with respondents using Zoom and WhatsApp calls. In interview data collection, some changes and modifications were made based on the information and available respondents in the field. Initially, the research study was planned to collect information from fifteen (15) interviewees by using semi-structured interviews, but changes were made to ten (10) respondents. However, during data collection there was added one (1) experienced exporter (TABARO Terminal Handling Company) to cover the gap in market information. Initially, the research set out to interview one (1) importer of vanilla in order to get information on the market side. Moreover, research also planned to collect data using FGD, but due to the effect of the Covid situation, facilities, season of harvesting, scattered of the farmers, and planning, the use of that method was instead replaced by the addition of extra questions in the survey questionnaire and interview to cover the information intended to be collected from FGD.

The biggest challenges faced during the data collection were: some interviewees claimed that they were not allowed to give some information until allowed by their company, some importers did not reply to my email and also accepted my call (6 importers), poor internet connection led to be difficult in communication during the on-line interview and sometimes connecting and disconnecting or some delay in communication, some respondents did not respond at the planned time/schedule, and delayed onset of data collection due to the field assistant attending to other emergency work assigned by the supervisor.

Apart from the challenges faced in the process of data collection, there are also achievements and lessons learned in interviews, surveys, results, and thesis writing in the vanilla value chain. Among the lessons learned were that the vanilla sector needs more transformation in production, marketing, and research to insure that farmers are benefiting from the production of vanilla and are encouraged to produce it in

the Agribusiness way. In addition, this research helped me to improve my communication skills, decision making, and skills in report writing, which will help me to improve my career as a consultant and chain facilitator. However, most of the stakeholders, such as LGA, exporters, and UWAVAKI association, were very much interested in the research and requested the results of the research as well as the research report. Moreover, I used most of the time for organizing the survey data, processing of interview information and thesis writing. In close contact with the research assistant and research supervisor. I managed to come up with this concrete research work which will help to address the challenges of vanilla smallholders, producer associations and other stakeholders in the vanilla sector.

CHAPTER SIX: CONCLUSION

This chapter responds to the research main questions based on the interpretation of the results and analysis of the challenges facing UWAVAKI Association in accessing the export market for its vanilla products to utilize the opportunities to reap the maximum profit in the global market.

6.1 Current vanilla value chains

The current vanilla value chain in the Kilimanjaro region consists of different stakeholders, including actors such as, input supply (Agro shops, Red cross, NEI company Ltd.), producer are farmers, processor (NEI company Ltd., and UWAVAKI association), exporter (NEI company Ltd.), consumer (Local and international), and chain supporters (LGA, NiRC, TFDA, Irrigator's Organisation (IO), Pangan Water Basin, Ministry of Agriculture, NMB bank, and TAHA association). The vanilla chain map also shows that there is no direct link between the UWAVAKI Association and importers of processed vanilla outside the country (international markets). The producer association uses a middle man for exporting processed vanilla, which reduces the amount of profit received by the association and farmers. In addition, the chain governance in the vanilla value chain was characterized by a market structure where the price, product requirements were determined by international consumers (world market) and there was poor coordination among the stakeholders.

The opportunity in the vanilla value chain in the Kilimanjaro region identified was the production of vanilla without the application of chemical and inorganic fertilizers (applied organic fertilizer and mulching). Vanilla requires at least 45% of shade, which leads to most farmers mixing vanilla with coffee, bananas, and a few with trees. This helps the farmers to produce vanilla in a sustainable way by conserving the environment, adding extra profit and producing chemical-free products for the people. In addition, other opportunities were the presence of a potential area for production, an increase in demand for vanilla in the local market due to the increase in awareness among the local consumers, an increase in demand for value-added vanilla through extraction of vanillin instead of selling their processed pods, sources of water for irrigation, providing income for the farmers due to the high price of the crop, employment for the youth in production and transportation, and reducing the level of poverty among the farmers.

Finally, constraints on the production of vanilla include low production and productivity, abortion of fruit caused by heavy rainfall, inadequate amount of seedling/cutting material, and poor knowledge of fertilization, which leads to the dropping of the fruits and flowers.

6.2 Vanilla export market

The export markets produce quality and quantity, which are the major issues to consider. For the vanilla export market, quality parameters considered are vanillin content, size of vanilla pods, moisture content, level of chemical residues, quantity based on customer demand, and laboratory analysis. In addition, the certification standards are also considered, such as Phytosanitary certificates, registered companies, certificates of origin, the Tanzania Food and Drug Authority (TFDA), Global GAP or Organic certification. Moreover, most of the export markets focus on organic farming, certified organic and customers pay a premium price for organically certified vanilla products.

The major constraints include the majority of vanilla producers in Kilimanjaro are not certified to any certification standards, most processors are not certified to ISO, Global GAP or organic certificates, price fluctuation of the vanilla, reactive order, and unstable market due to lack of contract farming. These were the factors which limited the opportunities to access the export market for processed vanilla. Hence, this led to difficulty investing in vanilla production.

CHAPTER SEVEN: RECOMMENDATIONS

This study aimed to provide recommendations to vanilla producers association on accessing exporting markets for the processed vanilla and possibility of getting premium price to maximize the profit to the smallholder farmers. The recommendation targeted to UWAVAKI association as the commissioner of the study and collaborate with other stakeholders such as certification boards, and banks (NMB or TADB banks) for the financial.

7.1 Recommendations given to different vanilla stakeholder

7.1.1 UWAVAKI Association and Certification board

The UWAVAKI association should identify their membership farmers, coordinate and supervise the training of the farmers on the food quality and certification standards. On the other hand, the Certification Board engagement is recommended to conduct awareness to the vanilla smallholders through organized trainings, meetings, and registration of the identified farmers. The time frame for all the activity was one (1) year from 2022 to 2023.

7.1.2 UWAVAKI Association

The UWAVAKI association needs to make an agreement with the farmers and support the farmers to cover the cost of certification. The cost of certification will be deducted from the farmers after the sale of the vanilla due to the additional income they will receive after exporting their produce. The time frame for the supporting programme was two (2) years, including the year for the training (2022 to 2024).

7.1.3 UWAVAKI Association and banks (NMB banks or TADB banks)

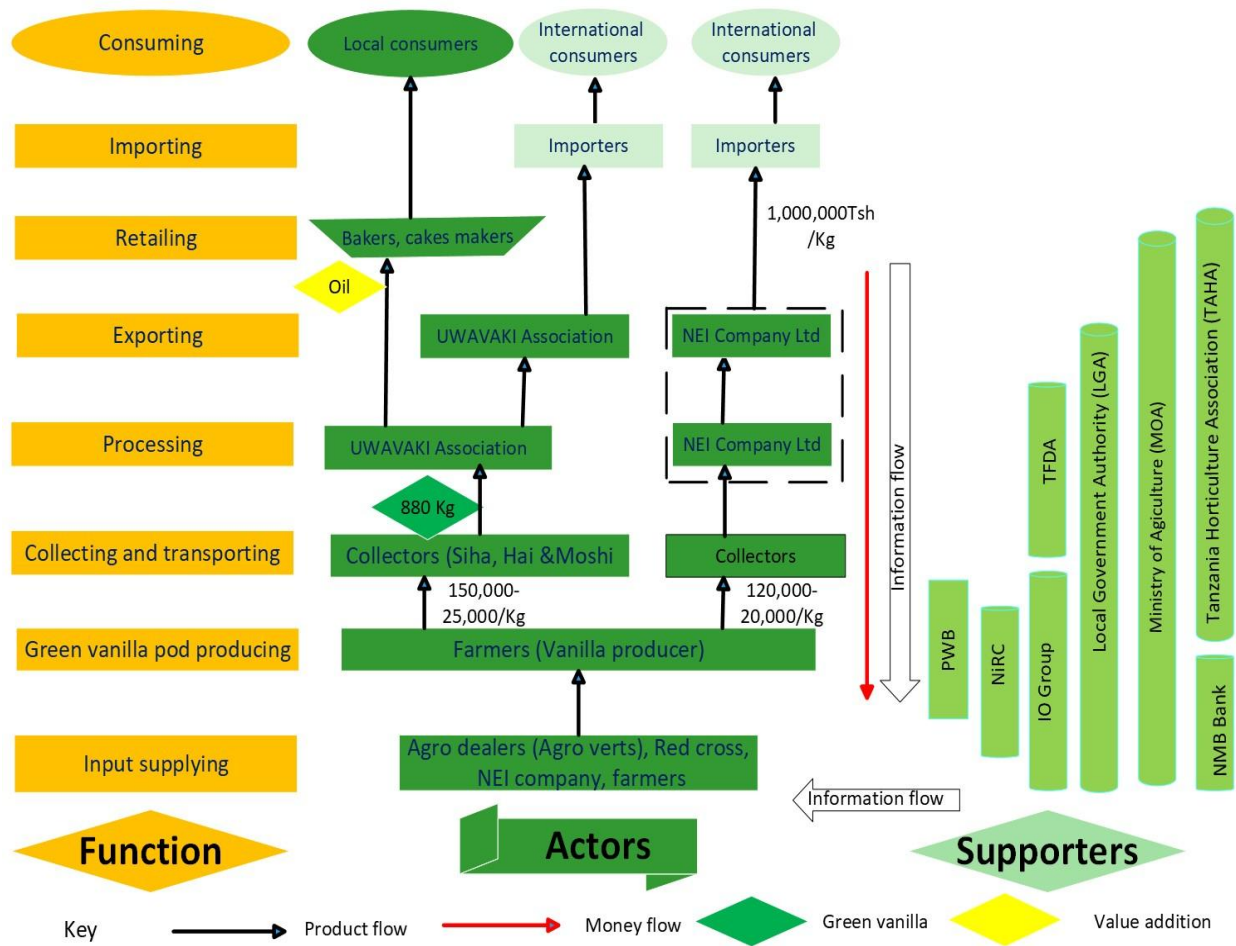
It is recommended that UWAVAKI association can take loans for the establishment of a seedling center in each district so that they can sell the seedlings to the farmers.

In addition, the UWAVAKI association should provide planting materials to the farmers at a subsidized price in order to encourage many farmers to cultivate vanilla and make agreements on how to cover the extra cost of the seedlings/cuttings. The time frame for implementing it was five (5) years, from 2022 to 2027.

7.2 Proposed value chain map to link producer association to export market

Figure 18 shows the proposed vanilla value chain with the above recommendation can lead to increased production, access to the export market, value addition, consistent supply, and strong chain governance.

Figure 18: Proposed vanilla value chain map in Kilimanjaro region



Source: Author's (2021)

7.3 Future research

- ❖ The future research is required to understand compatibility of vanilla and coffee in organic production system
- ❖ Also further study on contract scheme that will work for vanilla farmers.

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Annex

Annex 1: Questioner for the farmers

Part A: Background information

1. Name of a farmer? Phone number
2. Gender? ☐ Male ☐ Female
3. Age of the farmer?
4. In which district and village is your farm located? District Village
5. What is the size of your farm? (Ha)

Part B: Vanilla production

6. What is a size of farm you are cultivating vanilla? (Ha)
7. What types of variety are you growing? ☐ *Planifolia* ☐ *Tahitiensis*
8. Where do you source planting materials? ☐ Own farm ☐ Other farmers' ☐ NGO (Red cross) ☐ Private company (NEI Ltd)
9. What type of farming do you practice? ☐ Mixed cropping ☐ Organic farming ☐ Agro forestry ☐ Conventional farming
10. Do you have certificate standard? ☐ Yes ☐ No If yes what are type of certification
.....
11. What other crop do you grow together with vanilla? ☐ Coffee ☐ Banana ☐ Beans
☐ Maize ☐ Both coffee and banana
12. Do you irrigate your farm? ☐ Yes ☐ No (If yes go to 12.1)
- 12.1 What types of irrigation? ☐ Drip irrigation ☐ Furrow irrigation ☐ Sprinkler irrigation (overhead irrigation) ☐ None
13. What is the average production of vanilla per season? (Kg/Ha)

Part C: External support for your vanilla production

14. Where did you get support from? ☐ Government
☐ Association/cooperative ☐ private company ☐ NGO's
15. What kind of support? ☐ Planting material ☐ Training ☐ Market information ☐ Inputs ☐ Financial ☐ Water tank
16. What kind of Training do you receive? ☐ Organic farming ☐ Good agriculture practice ☐ marketing ☐ food quality ☐ others (Please specify).....

Part D: Constraints vanilla farmers' face in Kilimanjaro region

17. What are the constraints faced by vanilla farmers? (Please tick in appropriate box, based on the impact on the farming)

Constraints	Impact level			
	More serious	Serious	Less serious	Not serious
High crop water demand				
Low productivity				

Abortion of fruit				
High demand for labor				
Difficult to comply with certification				
Others; (Please specify)				

Annex 2: Semi- structure Interview leading question(s)

A. Key informants (NiRC, LGA, Village extension officer, IO)

1. Who are the key stakeholders and their function/roles in vanilla value chain?
2. Who are the actors who have power in vanilla value chain?
3. What is the type of farming system and vanilla production?
4. What are the certification standards used by the farmers & processors?
5. Who is responsible for ensuring the certification standards are met?
6. What are the supporting and hindering factors affecting vanilla value chain and marketing?

B. Processor (UWAVAKI)

1. What is the function/role of your company/association on the vanilla value chain?
2. How do you source vanilla, amount required and price? (Kg)
3. What are the type of processing and amount possessed per season? (Kg)
4. What is the market for the vanilla you process?
4. What are the supporting and hindering/challenges factors affecting sourcing of vanilla?

C. Exporters (NEI, TABARO Terminal Handling Company, and TAHA Association)

1. Brief description of the company/organisation and their function/role in vanilla value chain?
2. What are the types of value addition to the product before export?
3. How do you source vanilla, variety, amount required, and price for export? (Kg)
4. What are the food quality requirement for export market?
5. What are the export market requirements for the processed vanilla?
6. What are the supporting and hindering factors affecting vanilla export marketing?

Annex 3: List of respondents during field survey

S/N	Name of a farmer	District	Village	Phone number
1	ELIBARIKI LAZARO MAIMU	SIHA	FUKA	0657284301
2	WILLIUM OBEN MUSHI	SIHA	LOMAKAA	0763665554
3	SARIELI EBUELI MMARI	SIHA	NRAO KISANGARA	0762966854
4	GEOFREY HOSEA MMARI	SIHA	NRAO KISANGARA	0753602683
5	PENDAELI E. MMARI	SIHA	NRAO KISANGARA	0743575738
6	PATSON S KIMARO	SIHA	NRAO KISAGARA	0753602683
7	LATYANKIRA S. KIMARO	SIHA	LOMAKAA	0759959848
8	MCH. ELISHIRIA Z. MMARI	SIHA	NRAO KISANGARA	0767736448
9	KAANABORA MMARI	SIHA	KOBOKO KASKAZINI	0753742315
10	ELIZABETH MMARI	SIHA	KOBOKO KASKAZINI	0655261254
11	ELIKIRA D. KILEO	SIHA	KOBOKO KASKAZINI	0766799378
12	CHRISTINA ISACK MMARI	SIHA	KOBOKO KASKAZINI	0623992758
13	EMMA ELIA MMARI	SIHA	NRAO KISANGARA	0784489874
14	PHILBARTH M MMARI	SIHA	KOBOKO KASKAZINI	0621051094
15	GEOFREY ALFAYO MMARI	SIHA	NRAO KISANGARA	0745800037
16	JOHN NICKORAS MMARI	SIHA	KOBOKO KASKAZINI	0652171595
17	AICHI G. MAIMU	SIHA	FUKA	0753393355
18	ELIZABETH GERSON MAIMU	SIHA	FUKA	0756678566
19	ELIZABETH EBENEZER MMARI	SIHA	KOBOKO KASKAZINI	0742171508
20	GERALD PAULO MMARI	SIHA	NRAO KISANGARA	0762321441
21	ERNEST NEHEMIA KIMARO	HAI	NKWANSIRA	0757323408
22	LILIAN E. NDOSI	HAI	NKWANSIRA	0710844460
23	RISHA WINGAELI NDUMI	HAI	NKWANSIRA	0679090832
24	WIDIMI DAUSEN MUNISI	HAI	NKWA	0743336127
25	MATHAYO WINGAELI NDOSI	HAI	NKWANSIRA	0679090832
26	JOSHUA M NKINI	HAI	KYUU	0713036680
27	GEOGRE A. MUNUO	HAI	KYUU	0757066378
28	ELIA FREDSON ULOMI	HAI	NKWANSIRA	0755850044
29	SOLOMONI SWAI	HAI	NKWANSIRA	0674240229
30	EVARIST ELIASALI SWAI	HAI	NKWANSIRA	0744526323
31	MATHAYO BOAZ KWEKA	HAI	NKWANSIRA	0656238138
32	JOHNSON S. TARIMO	HAI	NKWANSIRA	0755525341
33	SHEKIYANDUMI HERMAN SWAI	HAI	NKWANSIRA	0756718986
34	ELISANTE NDOSI	HAI	NKWANSIRA	0757982941
35	SIFAEI PHILEMON SWAI	HAI	NKWANSIRA	0744688008
36	VENANCE LEMARA KIMAKA	MOSHI DC	OKASENI	0754466729
37	EMANUEL RAPHAEL MUSHI	MOSHI DC	OKASENI	0759731311
38	PETER JEROME URIO	MOSHI DC	KIMANGANUNI	0763375682
39	VICTORIA ALEX SANGAWE	MOSHI DC	KIMANGANUNI	0754925112
40	FRUGENCE D MUSHI	MOSHI DC	KIMANGANUNI	0754660293

Annex 4: List of interviewees

INTERVIEWEES CODE	INSTITUTION	GROUP/POSITION	CONTACTED PERSON (S)	PHYSICAL ADDRESS
KI-1	NiRC-Kilimanjaro Irrigation office	Vanilla chain Supporter	Martin Isdory Francis	Moshi- Kilimanjaro
KI- 2	Siha District (DAICO)	Agriculture Officer (DAICO)	Habibu Ally	Siha- Kilimanjaro
KI- 3	Village Extension office-Siha	Village Extension Officer (VEO)	Magreth Oisso	Siha-Kilimanjaro
KI- 4	Masama Magharibi- Hai	Village Extension Officer (VEO)	Elibariki Saria	Masama Magharibi- Hai
KI- 5	Hai District	District Irrigation Technician	Chuwa	Hai- Kilimanjaro
KI- 6	Village Extension office-Moshi	Village Extension Officer (VEO)	Magnua Mwangata	Moshi - Kilimanjaro
KI- 7	UWAVAKI Association	Chairman of UWAVAKI Association	Hamadi Mushi	Kilimanjaro
EX- 8	TAHA Association	Marketing officer	Izack Lyimo	Kilimanjaro
EX- 9	TABARO Terminal Handling company	Manager	Murshid Byeyombe	Bukoba
EX- 10	NEI company ltd	Agronomy	Iddy	Kilimanjaro

Annex 5: Certificate of vanilla laboratory analysis



Kampala, 30th December 2019

Dear Customer,

Please find enclosed the results of the requested analysis of the sample.

<u>Sample received on:</u> <u>Customer's Description:</u> <u>Our reference:</u> <u>Sampling by:</u> <u>Start analysis:</u> <u>Page:</u>	24 th December 2019 Vanilla beans June 2019, Batch No: 003/2019 Size of pods 18cms – 12cms - Spills 19/12/211 Customer 27 th December 2019 1/1
--	---

Certificate of Analysis

Chemistry:

Moisture Content (Gr-herb-moisture) %	23.7
Vanillin Content (UV/VIS-Vanilla-Vanillin) % on Fresh weight basis	2.1
Vanillin Content (UV/VIS-Vanilla-Vanillin) % on Dry weight basis	2.7

Thanking you for your confidence.

Yours Sincerely,


Winnie Nakasayi Kwanuka
 Quality Assurance Manager


Julius Mubambi
 Head of Laboratory

Test results mentioned on this certificate refers only to the item tested.
 The results apply to the sample as received.
 Test results shall not be reproduced except in full, without a written approval of Chemiphar (U) Limited.
 Chemiphar (U) Limited guarantees that all above mentioned results are obtained by use of methods identical or equal to official recognized test methods. The codes mentioned next to the test method refer to internal identification of the test method.
 Data concerning the measurement uncertainty of the test methods (if applicable) is available in the laboratory.

If you have any doubt about the authenticity of this certificate, please e-mail us at info@chemiphar.net

Chemiphar (U) Ltd
 P.O.Box 15525 Kampala - Plot 224-226, Kyzyune Road - Kiggundu Zone - Kasungu
 Tel.: +256-(0)392-268 832 - Mob: +256(0)756-582 315 - email: info@chemiphar.net
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Source: Fieldwork 2021

Annex 6: Certificate of registration for processor according to TFDA

TANZANIA FOOD AND DRUGS AUTHORITY

TFDA 
Tanzania Food & Drugs Authority

REGISTRATION CERTIFICATE OF PREMISES
Made under Section 21(3) of the Tanzania Food, Drugs and Cosmetics Act, Cap 219

This is to certify that the premises owned by **M/S VANILLA PROCESSING CENTER** of P.O. Box 1736, Kilimanjaro located at **SHIRINJORO VILLAGE, MNADANI** in Hai District in Kilimanjaro region, have been registered to be used as **Food Processing Premises for Processing Of Food Additive** in premises with registration number **TFDA0317/F/PRE/REG/0041**.

Subject to the following conditions:-

1. The premises and the manner in which the business is to be conducted must conform to requirements of the Tanzania Food, Drugs and Cosmetics Act, Cap 219 or any other written law related to the premises registration at all times failing of which this certificate shall be suspended or revoked.
2. Any change in the ownership, business name and location of the registered premises shall be approved by the Authority.
3. This certificate is not transferable to other premises or to any other person.
4. This certificate shall be displayed conspicuously in the registered premises.

07 August, 2017
DATE


DIDAS K. MUTABINGWA
For DIRECTOR GENERAL

Source: Fieldwork 2021)

Annex 7: Field work Pictures



Vanilla smallholders in Siha district



Vanilla production mixed with coffee and bananas in Hai district



Source: Field data collection (2021).