



# HONEY VALUE CHAIN DEVELOPMENT IN RUVUMA REGION, TANZANIA - MASTER THESIS FOR SOKOINE UNIVERSITY OF AGRICULTURE

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**HONEY VALUE CHAIN DEVELOPMENT IN RUVUMA REGION, TANZANIA**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN  
ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS OF SOKOINE  
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**2020**

## **ABSTRACT**

Tanzania is the second leading honey producer in Africa after Ethiopia. It contributes to both foreign earnings and employment in the country. Despite positive impacts of honey in the society, there is still less attention on actors and linkages of value chain, performance and contribution of honey value chain actors to the economy. This study assessed honey value chain development in Ruvuma region, using Songea and Nyasa districts as study areas. The study mapped actors along the value chain, determined nodes' profitability, assessed the business environment of the value chain and honey production trend in the study area. A sample of 16 groups of producers, 22 individual producers, 24 traders and 3 industries were selected randomly for this study. Questionnaires, checklists and interviews were the main primary data collection methods. Data was analyzed using descriptive analysis, Value Chain Analysis (VCA) and Gross Margin Analysis. In this study three actors were determined; producers, traders and consumers. The results showed two distribution channels; 92% sold their honey to local customers in the village and 16% sold their honey to traders. Honey was mainly consumed locally, this was due to lack of market information to the actors. The Gross Market Margin of individual producers was 11% and group producers was -22% which was lower compared to that of traders 43% implying that producers had higher costs of production compared to the traders. Several business environment components such as rules and regulations, custom and norms, transportation and supporting functions were assessed. Three governmental and one non-governmental supporting functions namely; TFS, SIDO, TAFF and Caritas were identified and their roles towards improving the value chain activities were assessed. Nonetheless skill improvement and value addition is yet a major hindrance to honey value chain development. The study suggests that more education should be provided to producers on market prices for profit maximization.

**DECLARATION**

I, Msolla Patricia Andrew, do hereby declare to the Senate of Sokoine University of Agriculture that this research dissertation is the result of my own original work done within the period of registration and that it has neither been submitted nor being concurrently submitted in any other institution.

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## **DEDICATION**

I dedicate this work to my beloved parents, Dr. Andrew Mshindo Msolla and Prof. Susan Nchimbi Msolla who gave me invaluable education opportunities.

## TABLE OF CONTENTS

<b>ABSTRACT .....</b>	<b>ii</b>
<b>DECLARATION.....</b>	<b>iii</b>
<b>COPYRIGHT .....</b>	<b>iv</b>
<b>ACKNOWLEDGEMENT .....</b>	<b>v</b>
<b>DEDICATION.....</b>	<b>vi</b>
<b>TABLE OF CONTENTS .....</b>	<b>vii</b>
<b>LIST OF TABLES .....</b>	<b>xi</b>
<b>LIST OF FIGURES .....</b>	<b>xiii</b>
<b>LIST OF APPENDICES .....</b>	<b>xv</b>
<b>LIST OF ABBREVIATIONS AND ACRONYMS .....</b>	<b>xvi</b>
 <b>CHAPTER ONE .....</b>	 <b>1</b>
<b>1.0 INTRODUCTION .....</b>	<b>1</b>
1.1 Background.....	1
1.2 Problem statement .....	2
1.3 Justification of the study.....	3
1.4 Objectives.....	3
1.4.1 Main objective.....	3
1.4.2 Specific objectives.....	3
1.5 Research questions .....	3
 <b>CHAPTER TWO .....</b>	 <b>4</b>
<b>2.0 LITERATURE REVIEW .....</b>	<b>4</b>
2.1 Beekeeping sector in Tanzania.....	4



2.2	Bees' products demand in Tanzania.....	5
2.3	Value chain concept .....	5
2.3.1	End markets.....	6
2.3.2	Business enabling environment.....	6
2.3.3	Supporting functions .....	6
2.3.4	Vertical and horizontal linkages.....	7
2.4	Gross profit margin analysis.....	7
<b>CHAPTER THREE.....</b>		<b>9</b>
<b>3.0</b>	<b>MATERIAL AND METHODOLOGY .....</b>	<b>9</b>
3.1	The study area.....	9
3.2	Description of study areas .....	9
3.2.1	Geographical location and topography.....	9
3.2.2	Economic activities in Songea and Nyasa districts .....	10
3.3	Research design and sampling.....	10
3.4	Data collection and analysis .....	11
<b>CHAPTER FOUR.....</b>		<b>13</b>
<b>4.0</b>	<b>RESULTS AND DISCUSSION.....</b>	<b>13</b>
4.1	Mapping honey value chain actors and linkages .....	13
4.1.1	Honey value chain actors in Songea and Nyasa districts .....	13
4.1.1.1	Characteristics of honey producers in Songea and Nyasa districts .....	14
4.1.1.2	Characteristics of honey traders in Songea and Nyasa districts...	16
4.1.1.3	Contribution of beekeeping to the income of producers in Songea and Nyasa districts.....	16

4.1.1.4	Value chain activities at producer's node in Songea and Nyasa districts .....	17
4.1.1.5	Technology used by producers.....	18
4.1.1.6	Value addition activities by honey producers in Songea and Nyasa districts .....	19
4.1.1.7	Marketing information .....	19
4.1.1.8	Source of finance.....	21
4.1.2	Honey value chain activities at trader's node in Songea and Nyasa districts .....	22
4.1.2.1	Honey value addition activities done by traders in Songea and Nyasa districts .....	23
4.1.3	Processors.....	24
4.1.4	Profitability analysis of actors along honey value chain in Songea and Nyasa districts .....	27
4.2	Factors influencing honey value chain actors in Songea and Nyasa districts .....	28
4.2.1	Rules and regulations .....	28
4.2.2	Grading system.....	29
4.2.3	Transportation .....	30
4.2.4	Customs and norms .....	30
4.2.5	Research development in beekeeping .....	30
4.2.6	Supporting functions .....	31
4.2.7	Challenges faced by supporting functions in Songea and Nyasa district...	33
4.2.8	Challenges faced actors along the value chain in Songea and Nyasa districts .....	34
4.2.8.1	Challenges faced by producers in Songea and Nyasa districts ....	34
4.2.8.2	Challenges faced by traders in Songea and Nyasa districts .....	35

4.2.8.3 Challenges faced by honey processors in Dar es Salaam and Mafinga .....	35
4.3 Production trend and analysis.....	36
<b>CHAPTER FIVE .....</b>	<b>39</b>
<b>5.0 CONCLUSION AND RECOMMENDATIONS .....</b>	<b>39</b>
5.1 Conclusion.....	39
5.2 Recommendations .....	39
<b>REFERENCES.....</b>	<b>41</b>
<b>APPENDICES .....</b>	<b>45</b>

## LIST OF TABLES

Table 1:	Honey producers by gender categories in Songea and Nyasa districts.....	15
Table 2:	Socio-economic characteristics of honey producers and traders in Songea and Nyasa districts .....	16
Table 3:	Income of beekeepers per year in Songea and Nyasa districts .....	17
Table 4:	Source of labour and apiary location of honey producers in Songea and Nyasa districts .....	17
Table 5:	Price characteristics of honey producers in Songea and Nyasa districts .....	18
Table 6:	Types of beehives used by honey producers in Songea and Nyasa districts ..	19
Table 7:	Honey producers market information awareness in Songea and Nyasa district.....	20
Table 8:	Honey traders market information awareness in Songea and Nyasa district ..	20
Table 9:	Honey producer's source of finance in Songea and Nyasa districts .....	21
Table 10:	Traders source of honey in Songea and Nyasa districts.....	23
Table 11:	Regions traders sold their honey in Ruvuma .....	23
Table 12:	Markets and honey sources for the processors in Dar es Salaam and Mafinga .....	25
Table 13:	Honey value addition activities done by processors in Dar es Salaam and Mafinga .....	25
Table 14:	Price characteristics of processors Dar es Salaam and Mafinga .....	26
Table 15:	Producer's Gross Margin of in Songea and Nyasa district along honey value chain in 2019 .....	27
Table 16:	Trader's Gross Margin in Songea and Nyasa district along honey value chain in 2019 .....	28
Table 17:	Training services to traders and producers in Songea and Nyasa districts .....	32

Table 18: Community support from different organization in Songea and Nyasa districts .....	33
Table 19: Challenges faced by honey producers in Songea and Nyasa districts .....	34
Table 20: Challenges faced by honey traders in Songea and Nyasa districts .....	35
Table 21: Challenges faced by honey processors in Dar es Salaam and Mafinga .....	36
Table 22: Honey and Beeswax production in Songea and Nyasa districts .....	36

**LIST OF FIGURES**

Figure 1:	Honey value chains in Songea and Nyasa districts .....	14
Figure 2:	Honey Value exported from 2012 – 2020 in Tanzania .....	37
Figure 3:	Honey Value imported from 2012 – 2020 in Tanzania.....	37
Figure 4:	Honey balance of trade in Tanzania from 2012 – 2020 .....	38

## **LIST OF PLATES**

Plate 1:	Office of beekeepers group supported by TAFF in Songea district .....	22
Plate 2:	Honey packages used by traders in Songea district .....	24
Plate 3:	Honey with clove additive from Honey care limited in Dar es Salaam.....	26

## LIST OF APPENDICES

Appendix 1:	Questionnaire for producers .....	45
Appendix 2:	Questionnaire for honey traders .....	50
Appendix 3:	Questionnaire for industries.....	54
Appendix 4:	Checklist for TFS.....	58
Appendix 5:	Checklist for focus group discussion with VNRCs/Village Chairperson/VEO .....	59
Appendix 6:	Tanzania honey export from 2012 – 2020.....	60
Appendix 7:	Honey export destination countries from year 2012 – 2020 in Tanzania .....	60
Appendix 8:	Honey import data from year 2012 – 2020 in Tanzania.....	62
Appendix 9:	Honey balance of trade from 2012 - 2020.....	62



## **LIST OF ABBREVIATIONS AND ACRONYMS**

BTI	Beekeeping Training Institute
DFO	District Forest Officer
GDP	Gross Domestic Product
GM	Gross Margin
FAO	Food and Agriculture Organization of United Nations
FGD	Focus Group Discussion
FORVAC	Forestry and Value Chains Development program
ITC	International Trade Centre
Kg	Kilogram
MNRT	Ministry of Natural Resource and Tourism
NGO	Non-Governmental Organization
SIDO	Small Industries Development Organization
SPSS	Statistical Package for Social Sciences
SUA	Sokoine University of Agriculture
SWOT	Strengths Weaknesses Opportunities and Threats
TAFF	Tanzania Forest Fund
TFS	Tanzania Forest Services Agency
VCA	Value Chain Analysis
VEO	Village Executive Officers
VNRC	Village Natural Resource Committee

## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 Background

Honey is natural sweetener which can as well be used for nutritional and medicinal purposes (Dafar, 2018). It is one of the most important products of apiculture industry produced in almost all countries in the world (Sarka, 2017). World honey production is over 1.1 million tonnes per annum and is predicted to increase (Gu and Zhang, 2015). China, Mexico, Turkey, Russia and United States are major producers of honey accounting to about 55% of the world production (FAO, 2014). Globally, honey demand is exceeding supply and is becoming more valuable. This is due to increasing awareness level and health consciousness among consumers. (Nega and Eshete, 2018).

Most African countries practice beekeeping as a source of income and is reported to contribute to livelihood improvement (Mbeiyererwa, 2014). In Africa, the main honey producing countries are Ethiopia, Kenya and Tanzania. FAO (2016) estimated that honey production in 2006 was 164 185 tonnes where by Ethiopia contributed 25%, Tanzania 17% and Kenya 15%. That means Tanzania is one of the largest producers of honey in Africa. The country has high number of honeybees' colonies because of its high biodiversity and favorable climatic conditions. Beekeeping activities provides about 33% of household income in miombo woodlands (Ntalwira *et al.*, 2017). Currently, honey and beeswax production is estimated at 4 860 and 324 tonnes per annum respectively, and potential is 138 000 and 9 200 tonnes respectively implying that annual production is only 3.5% of the potentials. Major challenges facing beekeeping activities in Tanzania are; low extension services, market instability, low social infrastructure and low capital (Munuo, 2015). The Government, Development Partners, Private Sectors and Non-Governmental

Organizations (NGO's) introduced several interventions to support beekeeping development for the purpose of improving quantity and quality of bees' products in the country.

## **1.2 Problem Statement**

Tanzania's 88% of forest is miombo woodland. Miombo woodlands provide necessary ecological conditions for honeybees, ensuring the availability of nectar between the flowering seasons. However, bees' products production is still low compared to the potentials (URT, 2013). Ruvuma is one of the regions with high potential for beekeeping development. For example, Songea district has potential for producing and trading 6000 tonnes of honey per annum but only 50 tonnes is produced. Similarly, Tunduru district has a potential of producing 4000 tonnes, but only 15 tonnes is produced.

Omari (2010) analyzed honey value chain and value addition activities for traditional beekeeping in Kongwa district and reported that there is great potential in Dodoma if markets, beehives and skills and knowledge are improved. Songo (2015) evaluated honey value chain in Bukombe district, Shinyanga and reported that value addition activities was the main challenge hindering beekeeping sector . There are few studies in Ruvuma region on beekeeping, the few studies For example, Msalilwa (2016) assessed the performance and contribution of beekeeping enterprise to livelihoods in Ruvuma. Ngaga *et al.* (2005) evaluated the role of beekeeping in poverty reduction and environmental conservation. However, in most of these studies a comprehensive assessment of the entire honey value chain is lacking. Most of them focused on the contribution of beekeeping to household's income and business enterprises, with less attention on actors and linkages of value chain, performance and contribution of honey value chain actors to economy. This study provided information by mapping of actors, roles and responsibilities, economic potentials,

profitability (costs and benefits), production level, processing technologies, value addition activities at each nodes and along value chains, strengths, weaknesses, opportunities and threats (SWOT) in each node, the extent and trend of honey production and how it influenced the livelihood of the people.

### **1.3 Justification of the Study**

Results from this study provide knowledge and better understanding on actors and their linkages, profitability, value addition activities for unlocking the honey value chains. The information is expected to assist policy makers to create a better business environment for the actors. The results from this study also adds value to the existing literature concerning beekeeping activities

### **1.4 Objectives**

#### **1.4.1 Main objective**

The overall objective was to assess honey value chain development from Ruvuma region.

#### **1.4.2 Specific objectives**

- i. To map honey value chain actors and linkages of in the study area;
- ii. To assess the business environment of honey value chain in the study area and;
- iii. To assess the extent of honey production and trend in the study area.

### **1.5 Research questions**

- i. Who are the actors and how are they connected and organized?
- ii. What kind of technology is used and are there any value addition mechanisms?
- iii. What are the challenges faced by the actors in each node in a value chain?
- iv. What is the level of production in the study areas?

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.1 Beekeeping sector in Tanzania**

Beekeeping sector in Tanzania has been managed without a policy since 1949, when it was formally formed under department of Agriculture. Due to socio-economic and environmental changes, it raised a concern for environmental conservation on sustainable development of beekeeping industry. It was later decided that a separate beekeeping policy document be formulated in order to have a vision and a better coverage of beekeeping cross-sectoral issues which are the foundation for formulation of new beekeeping legislation to implement the policy (MNRT, 1998).

Forest and Beekeeping Division (FBD) is one of the Divisions in the Ministry of Natural Resources and Tourism. This sector is directed by the National Forest and Beekeeping Policies implemented in March 1998, whose overall goals are to enhance the contribution of the forest and beekeeping sector to the sustainable development of Tanzania and the conservation and management of her natural resources for the benefit of present and future generations. The National Forest and Beekeeping Programme is a ten-year framework (2001-2010) which guides implementation of the Forest and Beekeeping Policies. The Forest Act (No. 14 of 2002) and Beekeeping Act (No. 15 of 2002) provides legal framework for the management of forests and bee resources (MNRT, 1998). The beekeeping Act (No. 15 of 2002) was enacted by the Parliament in April 2002. The objectives were (a) to make provisions of the orderly conduct of beekeeping (b) to improve the quality and quantity of bee products (c) to prevent and eliminate bee's diseases and bees pests (d) to improve revenue collection.

## **2.2 Bees' products demand in Tanzania**

Demand for honey as food and medicine is increasing. About 50% of honey produced is sold locally for honey beer and honey wine production and about 10% of honey produced is consumed locally as industrial honey in confectioneries and pharmaceutical industries. The prices in the rural areas ranges from USD 1.5 to USD 2.5 per kg. In the cities price ranges from USD 4 to 7 per kg. Moreover, only a few small quantities of beeswax are used locally in candle making and batik. In rural areas 1kg of beeswax is sold at a range of 3 to 5 USD (ITC, 2015).

According to ITC (2015) Tanzania has a potential of exporting over 5000 tonnes of honey but a larger percent is traded locally and only 5% is exported. The main buyers for honey were European Union (EU), Oman, United Arab Emirates (UAE), Rwanda, Kenya and Germany and the price ranges from 1.8 to 4.5 USD per kg. The main buyers of beeswax are Japan, United States of America (USA) and Germany. Prices of beeswax ranges from 4.5 to 7.5 USD per kg. FAO (2014) reported that Tanzania honey export declined between year 2010 and 2013, additionally exports to European Union dropped from 385 metric tonnes to 327 metric tonnes, where Belgium and Germany were the primary buyers. However, most literature do not provide a critical analysis on how the business is organized, how much the country exported/imported, country of destination/origin and the challenges encountered.

## **2.3 Value chain concept**

Value chain incorporates a range of activities and services needed to bring products or services from production to its final market (Kumar and Rajeev, 2016). According to Zamora (2016) value chain categorizes and identifies value addition activities, primary activities (i.e. production, marketing and sales) support functions (i.e. administrative and

management), cost and value of a sector or an organization. Value Chain Analysis (VCA) is an effective way to determine the interaction between actors in a business. VCA identifies trends of production, consumption system, competition, mechanisms to upgrade activities (value addition) and links producers and consumers at local, national and in the global economy (Hasan and Ahmed, 2017). According to Piboonrungrroj *et al.* (2017) value chain structure has five elements; end markets, business enabling environment, supporting function, vertical and horizontal linkages which influence the activities taking place in a value chain as explained below.

### **2.3.1 End markets**

End markets are usually the initial point of the value chain analysis. They are people and not a location. They help determine the characteristics such as price, quality, quantity and timing of the products.

### **2.3.2 Business enabling environment**

Business enabling environment includes norms, customs, laws, regulation, policies and public infrastructure. Business enabling environment can both hinder and facilitate the performance of the value chain (Piboonrungrroj *et al.*, 2017).

### **2.3.3 Supporting functions**

Supporting functions play a crucial role in value chain upgrading. They include financial services and cross cutting services. According to Nandi *et al.* (2018) not all services can be provided by value chain actors and so the supporting function come in handy in service provision. The supporting functions themselves need supplies, training and financing therefore the VCA need to identify opportunities to improve service access to value chain actors so as to simultaneously reinforce the supporting functions rather than deflating them.

### 2.3.4 Vertical and horizontal linkages

Vertical linkages are crucial for moving a products or services to the end market. They ease the delivery of benefits, services, skills and information up and down the chain. Horizontal linkages facilitate collective learning and risk sharing by increasing the potential for innovation.

### 2.4 Gross profit margin analysis

Gross Margin (GM) is expressed as percentage of sales. It is a measure of the proficiency of a business using its raw materials and labour during the production process. The higher the profit margin the more efficient a business is. GM is a great way to gain insight on how well the business generates and regains money (Bansal, 2014). According to Muligan (2017), GM is easy to use because it does not need major calculations, less time consuming and works well with large inventories. Muligan (2017) concluded that, although GM provides important information about how much an enterprise can make on its sales, it is still not the best measure of profitability of an enterprise as whole because it excludes financial cost and overhead expenses.

Various studies in Tanzania have employed the use of GM model. For example the study conducted by Sanga (2016) who assessed the value chain of black wattle in Njombe and Lushoto Districts. Chanzi (2016) also employed GM model in the evaluation of economics of small-scale paddy and sugarcane production in Kilombero District. The formula for calculating GM shown in Equation 1.

$$\text{GM}_i = (\text{ATR}_i - \text{ATC}_i) \dots \dots \dots (1)$$



Whereby;

$GM_i$  – Gross Margin of each chain actor

$ATR_i$  = Average total revenue of each chain actor

$ATC_i$  = Average Total cost (Total variable cost) of each actor

$i$  = Value chain Actors

## **CHAPTER THREE**

### **3.0 MATERIAL AND METHODOLOGY**

#### **3.1 The study area**

This study was conducted in Ruvuma region in Songea and Nyasa Districts. The districts were selected because they had significant amount of beekeeping activities and the potentials for value chain development were higher. Dar es Salaam was also selected because was one of the demand side of the bees' products.

#### **3.2 Description of study areas**

##### **3.2.1 Geographical location and topography**

Songea district is a regional headquarter and one of the five districts in Ruvuma region. It lies between Longitudes 35°30' and 10°35'. It is bordered to the East by Namtumbo district, South by Mozambique and to the West by Mbinga district. The district covers 16 727 km<sup>2</sup> characterized with hilly topography with altitude ranging from 980 and 1 100 m above sea level. According to 2012 population census, Songea district had a population of 173 821 (Songea Municipal Council, 2015).

Nyasa district is one of the districts in Ruvuma region. It lies between Latitudes 10° 15' North and 11° 34' South and Longitudes 34° 24' West and 35° 28' East. The district covers a total of 3 811 square km of land and water. It borders Mozambique to the south and Malawi to the west and to the east by Mbinga district. The topography is characterized by hilly areas with attitude ranging between 800 and 1 500 meters above sea level. According to 2012 population census, the population in Nyasa district was 146 160 out of whom 71 392 were male and 77 442 are female (Nyasa District Council, 2015).

### **3.2.2 Economic activities in Songea and Nyasa districts**

In Songea district, the main source of income is agriculture. Cash crops cultivated are maize, tobacco, sunflower, cashew and coffee. The remaining portion is in other sectors such as trade, carpentry, masonry, mining, fishing and beekeeping (Songea Municipal Council, 2015).

Nyasa is endowed with rich natural resources including fertile land, rivers, Lake Nyasa, forests, woodland and wildlife. Agriculture contributes to about 70% of the district's Gross Domestic Product (GDP). Coffee, cashew nuts and maize are main cash crops while maize and paddy are both cash and food crops. Fishing is mostly practiced in the village along the shores of Lake Nyasa were engaged mainly on non-agricultural income generating activity (Nyasa District Council, 2015).

### **3.3 Research design and sampling**

The sampling unit for this study were groups and individuals practicing beekeeping. A total of twelve villages were selected, six in Nyasa namely; Liuli, Litumba-kuhamba, Nkalachi, Puulu, Mango and Mbamba bay and six in Songea namely; Peramiho B, Litowa, Ndongosi, Mhukulu-lilai, Matimila and Kikunja. These villages were selected because beekeeping activities were actively done. A sample of 16 groups of beekeepers, 22 individual beekeepers, 24 traders and 3 processors were selected for this study. Two market centres were visited to interview the traders. Key informants were purposively selected and interviewed in each sample villages; Village Executive Officers (VEO), Village Natural Resource Committee (VNRC), Tanzania Forest Agency Services (TFS) and District Forest Officers (DFOs) from both districts. In Dar es Salaam, processors and supporting functions were the key actors for this study.

### **3.4 Data collection and analysis**

Reconnaissance survey was conducted to enable the researcher to familiarize with the study area. The purpose of reconnaissance was to identify research sites and collect preliminary information that helped to plan field data collection. In addition, questionnaires (Appendix 1, 2 3) and checklists in Appendix 4 were pre-tested during reconnaissance to identify weaknesses and correct them before actual data collection. Both primary and secondary data were collected in this study. Primary data was collected through key informant interviews using checklists, Focus Group Discussion (FGD) and household questionnaires and Secondary data was collected from existing literature such as books, newspapers, journals and articles.

Descriptive analysis was used to obtain central tendencies and general characteristics of the actors, Gross Margin Analysis was used to determine profitability among the actors and Value Chain Analysis was used to analyze the activities involved in the value chain.

#### **Objective 1: Mapping of value chain actors and linkages of honey in the study area**

This objective was about understanding actors and how they were involved in bringing a product from production to consumption are linked. This activity was implemented in both producer (Songea and Nyasa) and demand (Dar es Salaam) sides along the chain. Focus Group Discussions and interviews were used to identify actors, their activities involved between actors, how they were organized and connected, and profitability in each node, what value addition activities done. Each node along the value chains was assessed to determine weaknesses, technology used, gender and youth involvement. Secondary actors (Supporting functions) such as non-governmental and governmental organizations were

also identified. Descriptive analysis helped to obtain central tendencies, to describe the general characteristics of actors in the value chain. Gross margin also helped to determine the profitability along the value chain and market margin analysis determined the market share among actors.

**Objective 2:** To assess the business environment of honey value chain in the study area

This objective was about to collect relevant data on business environment. The data included grading systems used, taxation level, regulations, informal rules and taboos. Other information that was collected were supporting functions which are capacity building activities, networking, financing mechanisms, researches and how are used to support honey value chains. This information was collected from the actors along value chains.

**Objective 3:** To assess the extent of honey production and trends in the study area

Statistics/information on trend and extent of honey production in the two districts was gathered from the District Forest Offices which helped to know the level of production. Also the export and import data of honey was collected from Tanzania Forest Services Agency (TFS) and Tanzania Revenue Authority (TRA) so as to get insight on the trend. Qualitative analysis was used to analyze the information gathered, generate trends and factors for the trends.

## **CHAPTER FOUR**

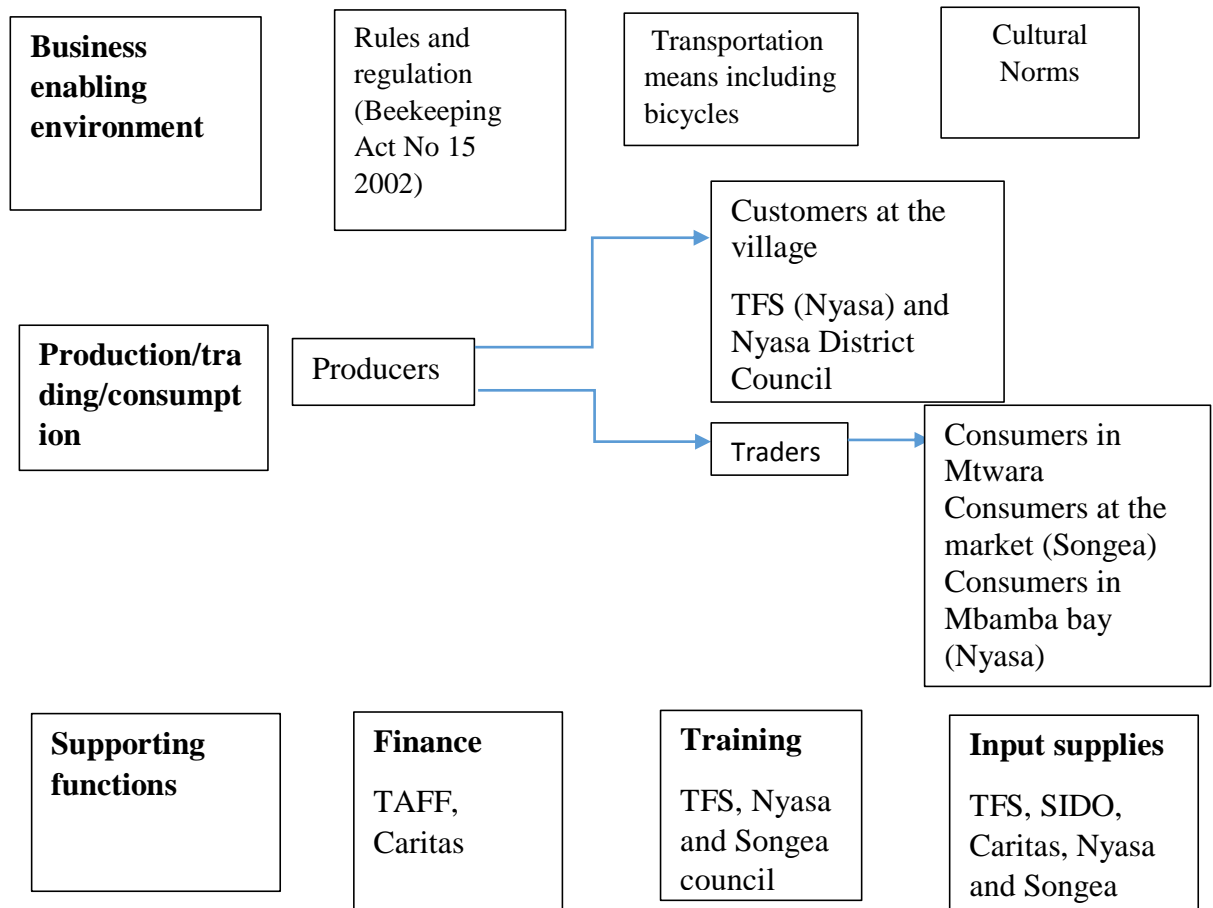
### **4.0 RESULTS AND DISCUSSION**

#### **4.1 Mapping honey value chain actors and linkages**

##### **4.1.1 Honey value chain actors in Songea and Nyasa districts**

Value chain actors are those who are directly involved in value chain activities. In this study the main value chain actors identified were; honey producers, traders and local consumers. In this study, two channels were observed in this value chain as elaborated in Figure 1. In channel 1, honey is sold directly to local consumers in the village. The results indicate that 92% of producers sold their honey to local consumers in the village. This is because most producers do not have information about other markets except the villages and also most producers their production was still low therefore they were unable to meet demand of external customers.

In channel 2, about 15% of producers sold their honey to traders then to consumers, of which three producers sold their honey to a trader located in Mtwara town. One producer reported to have sold honey in Mbamba bay, and one producer to the market in Songea town. Also 2.6% and 2.6% of producers sold their honey to both Tanzania Forest Services (TFS) and the Nyasa District Council respectively. Other two components determined in this value chain are business environment and supporting functions, which will be discussed in objective 2.



**Figure 1: Honey value chains in Songea and Nyasa districts**

#### **4.1.1.1 Characteristics of honey producers in Songea and Nyasa districts**

Table 1 shows producers gender distribution. The results indicate that, in Songea district there was a higher number of men in groups compared to women. This is due to the nature of the work itself, most of its harvesting activities was done using tradition methods during the night due to lack of protective gears. This result is in line with the study conducted by Kuboja *et al.* (2017) on honey value chain in Bukombe district which observed that only few women participated in beekeeping activities because of the nature of work involving tree climbing when hanging beehives and harvesting honey is said to be dangerous and not suitable for women. On the contrary, in Nyasa district, women were high in number

compared to men in the groups. Most of them reported to have been encouraged with education given to them by the village officers. The results in Table 2 indicates that most of producers had age range from the 31 to 45 (46%) and 46 to 60 (38%) which is an active working age group. Beekeeping is a labour intensive job which most of its activities were performed in forest therefore requires energetic experienced people who are committed. The remain were youth (8%). The reason why the youth were less engaged in beekeeping was because they still cannot view beekeeping as a commercial business. Also, about 81% of producers had primary education, 13% had college education and the remaining 6% had secondary education. On marital status, the results show that majority of the producers (83%) were married. This finding was similar to the study conducted by Gebrehiwot (2015) on honey production and marketing in Ethiopia, who found out that 93% of producers were married. This is because most are diversifying to more economic activities to incur more income to sustain their families.

**Table 1: Honey producers by gender categories in Songea and Nyasa districts**

District	Group Name	Number of people in the group	Number of men in a group	Number of women in a group
Songea	Kikundi cha uamsho	8	8	0
	Kanyaga twende	25	10	15
	Mtumbati	10	10	0
	Amani	12	10	2
	Magunga	6	4	2
	Kikundi cha nyuki	10	2	8
	Nguvu kazi	4	4	0
Nyasa	Kikundi cha Faraja	30	0	30
	Kikundi cha Ujamaa	40	7	33
	Kikundi cha Njomlole	10	5	5
	Mneke	14	8	6
	Jiendeleze	10	6	4
	Jitegemee	15	12	3
	Jitume	30	0	30
	Muongano	12	5	7
	Upendo	35	7	28



#### 4.1.1.2 Characteristics of honey traders in Songea and Nyasa districts

Results indicates that majority of traders (79%) were male and the rest were 20%. Table 2 shows that most of the traders age ranged from 20 – 30 (41%) which is the youth because most of them prefer do business as their source of income. Also, in education level 75% had primary education, 12% had secondary education and 12% had university education.

**Table 2: Socio-economic characteristics of honey producers and traders in Songea and Nyasa districts**

Variables	Producers		Traders	
	Frequency	Percentage	Frequency	Percentage
	n = 48		n = 24	
<b>Age distribution</b>				
20 – 30	4	8.4	10	41.7
31 – 45	22	45.9	7	29.2
46 – 60	18	37.8	4	16.8
60>	4	8.3	3	12.8
<b>Marital status</b>				
Married	40	83.3	21	87.5
Single	7	14.6	3	12.5
Divorced	1	2.1	0	0
<b>Level of education</b>				
Primary	39	81.2	18	75.0
Secondary	3	6.2	3	12.5
College	6	12.5	3	12.5

#### 4.1.1.3 Contribution of beekeeping to the income of producers in Songea and Nyasa districts

The results in Table 3 shows that farming, pastoralism, fishing and petty business were other income generating activities in addition to beekeeping. Beekeeping activities contributed the least to the total annual income of the producers compared to other activities. This is contrary to what Ntalilwa *et al.* (2017) found on the study conducted in

Mlele District which observed that beekeeping was one of the main and leading income generating activity.

**Table 3: Income of beekeepers per year in Songea and Nyasa districts**

Income generating activity	Average income per year (TZS)			
	Songea	Percent	Nyasa	Percent
Petty business	2 100 000	54.6	5 000 000	18.5
Farming	1 402 963	36.5	20 980 000	77.7
Fishing	0	0	450 000	1.7
Pastoralism	244 000	6.3	333 333	1.2
Beekeeping	98 416	2.5	248 436	0.9

#### 4.1.1.4 Value chain activities at producer's node in Songea and Nyasa districts

The Results in Table 4 indicate that 88% of the beekeepers groups used family labour, and the remaining 13% used hired labour to implement their beekeeping activities. About 90% used family labour and the remaining used hired labour. Financial resources availability was a limiting factor for the producers to hire labour so they would rather do the activities themselves. Use of hired labour increase efficiency in implementing beekeeping activities.

**Table 4: Source of labour and apiary location of honey producers in Songea and Nyasa districts**

Variables	Group producers		Individual producers	
	Frequency	Percentage	Frequency	Percentage
	n = 16		n = 22	
<b>Source of labour</b>				
Family labour	14	87.5	20	90.9
Hired labour	2	12.5	2	9.1
<b>Apiary location</b>				
Private	13	81.2	21	95.5
Government	3	18.8	1	4.5

Factors that guided producer's prices were production cost and season variation. During honey harvesting, prices were lower because of ease availability and vice versa. The results in Table 5 indicates that 81% of groups reported that season variation was considered when setting the price, and 19% considered production cost. Also producers were asked who set the prices and about 87% of beekeepers groups said producers set the prices and 12% said buyers set the prices. Moreover, out of 22 individual producers 22% said the buyers set the prices and 77% said the producer sets the price. But in most cases they ended up negotiating for the price. Additionally producers reported not to be satisfied with the price because the price was too low.

**Table 5: Price characteristics of honey producers in Songea and Nyasa districts**

Variables	Group producers		Individual producers	
	Frequency	Percentage	Frequency	Percentage
	n = 16		n = 22	
<b>Factors for price determination</b>				
Production cost	3	18.8	4	18.2
Seasonality	13	81.2	17	77.3
None	0	0	1	4.5
<b>Who sets the price</b>				
Buyer	2	12.5	5	22.7
Seller	14	87.5	17	77.3
<b>Price satisfaction</b>				
Yes	16	100	6	27.3
No	0	0	16	72.7
<b>Reason for unsatisfaction</b>				
Price too low	16	100	16	72.7
None	0	0	6	27.3

#### 4.1.1.5 Technology used by producers

Results in Table 6 indicates that out of 16 groups 87% of producers were using modern hives, 6% were using traditional hives and the remaining 6% used both modern and traditional hives. In addition, out of 22 individual producers 50% were using modern hives

and 45% used traditional hives. A large percent of groups were using modern hives compared to individual producers, which most of them use traditional hives. This is because groups are given more priority when it comes to extension services and aids, because it is easier to provide services, manage and do a follow up in a group than individually. In groups, hives range from 4 – 500 hives, the group with fewer hives had only 4 hives because the group was still new and never received any aid which a different case from the group with 500 hives, because they had an experience of 9 years and have received aids.

**Table 6: Types of beehives used by honey producers in Songea and Nyasa districts**

Variables	Group producers		Individual producers	
	Frequency	Percentage	Frequency	Percentage
	n = 16		n = 22	
<b>Type of hives</b>				
Modern	14	87.5	11	50.0
Traditional	1	6.2	10	45.5
Both	1	6.2	1	4.5
<b>Type of harvesting method</b>				
Traditional	16	100	21	95.5
Modern	0	0	1	4.5

#### **4.1.1.6 Value addition activities by honey producers in Songea and Nyasa districts**

The only value addition activity performed by producers was packaging (18%). The improved packaging materials were reported to be expensive therefore majority of producers used konyagi bottles to package honey because they were cheaper compared to the improved ones. Konyagi packaging material were bought from people within the localities and the improved ones were bought from industries in Dar es Salaam.

#### **4.1.1.7 Marketing information**

Table 7 indicate that 62% producers and 75% of traders were not accessing market information. Others (8%, 12% and 6%) of producers received the information through

friends, Government and customers respectively. This means that fewer beekeepers and traders access information on prices and market condition.

**Table 7: Honey producers market information awareness in Songea and Nyasa district**

Variables	Group producers		Individual producers	
	Frequency n = 16	Percentage	Frequency n = 22	Percentage
<b>Market Information</b>				
Yes	6	37.5	6	27.3
No	10	62.5	16	72.7
<b>Market Information</b>				
<b>From</b>				
Friends	3	18.8	4	18.2
Government	2	12.5	0	0
Customers	1	6.2	1	4.5
Direct visit to markets	0	0	1	4.5
None	10	62.5	16	72.7

Table 8 shows that only 25% of traders accessed market information. And they all got the information from friends. About 75% have not received any marketing information. This implies that there is a greater need for the stakeholders including government to provide necessary market information to traders. Moreover, out of all three processors, only one got from the government and two from friends.

**Table 8: Honey traders market information awareness in Songea and Nyasa district**

Variables	Traders		Processors	
	Frequency n = 24	Percentage	Frequency n = 3	Percentage
<b>Market Information</b>				
Yes	6	25.0	3	100
No	18	75.0	0	0
<b>From</b>				
Friends	6	25.0	2	33.3
Government	0	0	1	66.7

#### 4.1.1.8 Source of finance

Table 9 indicates that 93% of the groups financed their activities using own equity. There was only one group whose beekeeping activities were financed by both Tanzania Forest Fund (TAFF) and own equity. Plate 1 shows the office of the group funded by TAFF. This was the only group with an office, others did not have. Most beekeepers revealed that they do not know how and where to access financial resources. This study observed that financial needs were diverse depending on the actor's activities. Most of the actors along the value chain indicated that the level of finance needed ranged from TZS 3 000 000 to 5 000 000. Both Individual beekeepers and group beekeepers expressed the need of modern beehives, hand-on processing facilities and trainings to produce packaging materials.

**Table 9: Honey producer's source of finance in Songea and Nyasa districts**

<b>Variables Source of finance</b>	<b>Group producers</b>		<b>Year</b>	<b>Amount</b>	<b>Individual producers</b>	
	<b>Frequency</b>	<b>Percentage</b>			<b>Frequency</b>	<b>Percent age</b>
	<b>n = 16</b>				<b>n = 22</b>	
Self-Own equity	15	93.8	0	0	22	100
Own equity and government	1	6.2	2018	5 000 000	0	0



**Plate 1: Office of beekeepers group supported by TAFF in Songea district**

#### **4.1.2 Honey value chain activities at trader's node in Songea and Nyasa districts**

According to the results, traders set prices basing on two factors, buying cost and seasonality. In months when honey supply was not sufficient the price was high and vice versa. Also, the results in Table 10 shows that 37% of traders got their honey from middlemen, 29% got their honey from producers and the remaining 33% got their honey from both middlemen and producers.

The main source of honey for most traders was from Tabora because they had more communication with producers from that region compared to producers in Ruvuma. This shows how much the value chain in Ruvuma is fragmented, because of low market information system. Results in Table 11 shows that 91% sold their honey in Songea and 12% in Mbamba bay and the remaining 4% in Mbinga. No trader had other market apart from Ruvuma, which is a limitation to them in terms of profitability.

**Table 10: Traders source of honey in Songea and Nyasa districts**

Variables	Traders n = 24	
	Frequency	Percentage
<b>Source of honey.</b>		
Producers	9	37.5
Middlemen	7	29.2
Both producers and middlemen	8	33.3

**Table 11: Regions traders sold their honey in Ruvuma**

Region	Traders	
	Frequency	Percentage
Songea	22	91.7
Mbamba bay	3	12.5
Mbinga	1	4.2

#### **4.1.2.1 Honey value addition activities done by traders in Songea and Nyasa districts**

Value addition activities are any activities that add value to the product at any stage in the supply chain. All traders added value to their products. The main value adding activity was packaging. Moreover, 96% of traders were using used packages, such as Konyagi and medicinal bottles and 4% used improved packaging materials. The reason why most traders re-use bottles was because they were cheap and easy to get. A Konyagi bottle costs TZS 300 – 500. Plate 2 shows an example of packages used by traders in Songea district.





**Plate 2: Honey packages used by traders in Songea district**

#### **4.1.3 Processors**

There were Government own processor (Sao hill in Mafinga) and two private processors located in Dar es Salaam (Honey care Limited and Follow the honey Limited). The sources of honey for these processors were from own apiaries and only one got their honey from producers. This was because some had bad experience with honey from producers. They said majority of the producers supplied honey with poor quality and the supply was not guaranteed. Furthermore, Table 12 shows that 33% sold their products in an internal market only, mainly in Dar es Salaam, Arusha and Tanga and 66% sold in both internal and external market particularly in Europe, United States and Australia.

Out of three processors, two got their packaging materials out of Tanzania. About 66% got their packaging materials from Kenya, 33% got packaging materials from both China and United States. This was because most packaging materials in Tanzania had low quality and expensive. Only one processor got the packaging materials from Dar es Salaam.

Furthermore, the processors were using Tanzania Food and Drugs Authority (TFDA) and Tanzania Bureau of Standards (TBS) to assess and control quality of the honey. In addition, all processors added value to their products through improved packaging and labelling as shown in Table 13. One processor added additives to their honey. Plate 3 shows an example of honey with additives (honey with cloves). Factors influencing selling prices were production, transportation costs and quality of honey as indicated in Table 14.

**Table 12: Markets and honey sources for the processors in Dar es Salaam and Mafinga**

Variables	Frequency	Processors (n = 3)	Percentage
<b>Source of honey</b>			
Producers	1		33.3
Own apiaries	2		66.7
<b>Market</b>			
Internal	1		33.3
Both external and internal	2		66.7

**Table 13: Honey value addition activities done by processors in Dar es Salaam and Mafinga**

Variables	Frequency	Processors (n = 3)	Percentage
<b>Value addition activities.</b>			
Packaging	3		100
Labelling	3		100
Additive addition.	1		33.3
<b>Source of packaging material</b>			
Dar es salaam	1		33.3
Kenya	2		66.7
Both China and United States	1		33.3

**Table 14: Price characteristics of processors Dar es Salaam and Mafinga**

Variables	Processors	
	Frequency	Percentage
<b>Factors for setting the price</b>		
price	2	66.7
Transportation cost	2	66.7
Production cost	2	66.7
Quality of honey		
<b>Satisfaction of the price</b>		
Yes	1	33.3
No	2	66.7
<b>Reasons for unsatisfaction</b>		
Price too low	2	66.7

**Plate 3: Honey with clove additive from Honey care limited in Dar es Salaam**

#### **4.1.4 Profitability analysis of actors along honey value chain in Songea and Nyasa districts**

Profitability analysis was used to determine the economic viability of the honey business. The Gross profit margin for group producers was -22% and individual producers was 11% as shown in Table 15. The negative gross margin of the group producers implied that costs of production were higher than sales i.e. revenues.

This is attributed to the usage of the modern beehives which had higher investment cost compared to traditional hives. Also most groups had poor management and some had conflicts among members. The overall gross profit margin of producers was low compared to that of traders. Low market prices were cited to be one of the reasons for the low profitability.

**Table 15: Producer's Gross Margin of in Songea and Nyasa district along honey value chain in 2019**

<b>Item</b>	<b>Groups Amount</b>	<b>Individuals Amount</b>
Transportation	40 000	58 000
Beehives	210 000	20 000
Protective gears	75 000	107 500
Packaging	5 500	50 000
Labor	95 000	70 000
Beeswax	15 000	22 500
Storage facility	8 250	4 500
Total	448 750	332 500
Average production per year	46.6	47
Selling price per kg	7875	7 955
Total Revenue	366 975	373 885
Gross profit	-81 775	41 385
Gross margin	-22%	11%

Results in Table 16 indicate that trader's gross profit margin was 43%. The costs associated were purchasing and packaging costs. Traders had higher gross profit margin than producers, which means that their production cost were reasonably lower compared to selling price of their products. These results will help to create efficient strategies and solutions to increase the profitability among actors in the value chain.

**Table 16: Trader's Gross Margin in Songea and Nyasa district along honey value chain in 2019**

<b>Item</b>	<b>Amount</b>
Purchase per year	100.8
Buying price	6 500
Packaging	30 737.5
Total cost	685 937.5
Sales per year	98.8
Selling price per kg	12 208.33
Revenue per year	1 206 183
Gross profit	520 245.5
Gross margin	43

## **4.2 Factors influencing honey value chain actors in Songea and Nyasa districts**

### **4.2.1 Rules and regulations**

From Beekeeping Act (No 15 of 2002), there are general beekeeping regulations that people in beekeeping business need to adhere. Regulation 11 requires registration of apiary/bee product dealers or traders required to pay TZS 25 000 for dealers in local market and TZS 50 000 for export market. About 66% of the traders were registered and 33% were not. This because most of them were still new to the business and not aware of the procedures required for the registration. Also out of 16 groups only 5 were unregistered. Few groups were not registered because they were newly formed and therefore still in the process of registration. Regulation 51 grant of export /import permit for any apiary or bee products trade across the border. It was observed that all two had export permit of which its payment depends on the quantity of the product. Regulation 6 requires the use of bee smokers during

harvesting. This regulation was not adhered by some producers because very few producers possessed bee smokers. Most of them reported they used fire and pesticides during harvesting. Regulation 7 is prohibition of bark hives. About 51% of producers possessed traditional beehives and the reason given was they did not have funds to buy modern beehives. Regulation 13 requires honey to be stored in hygienically clean jars or other suitable food containers and should be labelled when in the market. However field observation revealed that honey was mostly stored in Konyagi and medicine bottles/containers and only few were labelled their honey. This was because most producers sold their product at village level therefore reported that there were no need to label their products. Also some said the required packaging materials were expensive.

#### **4.2.2 Grading system**

Grading system is a process of classifying or ranking something in a particular scale. Tanzania Bureau of Standards (TBS) and Tanzania Food and Drugs Authority (TFDA) are the agencies for testing and grading the standards of food and drugs. Four components are usually done to test the grade of honey; (i) description (ii) colour (iii) consistency (iv) flavour and aroma. Various tests were reported to test the components. According to the results, no grading system has been used or observed to both producers and traders in the study area. However quality check was commonly done by traders to assess whether the product is pure or not. The traditional quality check employ match box and paper to check whether honey was mixed with water or not. This traditional technology was used by majority of the traders (95%) in the sample area. For the match box technique, honey is applied on a match stick, if it does not light up then it means honey is mixed with water. Regarding paper technique, honey is poured on the paper, if it wets the paper then honey is mixed with water. These were basic tests and sufficient to grade honey depending on the

level of water. However, other cheaper grading systems could be applied to test other things like pesticides and other chemicals.

#### **4.2.3 Transportation**

Most producers install beehives in forests located a distance from their homesteads or villages. Few used bicycles as means of transportation and majority walked. Majority of producers failed to take their products to the market due to long distance required to travel. Moreover, traders also failed to reach the producers in villages due to travel costs especially during the rainy seasons. Similar findings were observed from the study conducted by Songo. (2015), who found out that poor roads was the main challenge faced by producers and traders in Bukombe District.

#### **4.2.4 Customs and norms**

For many years beekeeping has been regarded as an activity that only men can practice and endure the difficulties that were involved with it such as harvesting honey during the night. In this study most female producers agreed that this hindered their participation in beekeeping over the years. But due to education given to them, the number of women in beekeeping is increasing.

#### **4.2.5 Research development in beekeeping**

Various researches have been conducted in Tanzania concerning beekeeping that has helped in coming up with solutions facing the sector. Both governmental and non-governmental organizations are enabling different researchers and students by funding them. Sokoine University of Agriculture (SUA) has worked with various institutions and programmes in doing researches that would help the development of Beekeeping sector. For example Forest and Value Chains Development Programme (FORVAC) is working

with SUA through conducting several researches for the development of honeybee products value chains. Beekeeping Training Institute (BTI) in Tabora is an institution focusing on promoting the development of beekeeping industry. It facilitates the development of research proposals, reviewing and soliciting research findings.

#### **4.2.6 Supporting functions**

Supporting functions are those services implemented by the government, Non-Governmental organizations (NGOs), companies or bank that provide help and support to enable development of the honey value chain. Supporting function includes capacity building, networking, financing mechanisms and researches. The main providers of the supporting functions identified in the study area were Tanzania Forest Funds (TAFF), Tanzania Forest Services Agency (TFS), Small Industries Development Organization (SIDO) and Caritas.

Various training and extension services were provided to producers. Results in Table 17 indicate that about 68% group producers reported to have received training from the government. Only 40% of the individual producers received trainings mainly from the government. About 50% of groups were facilitated financially and or with beekeeping equipments. The equipment included hives, protective gears and smokers. These support were provided to groups and not to individual beekeepers. Training and coaching on marketing of products and value addition activities could also be provided to the beekeepers



**Table 17: Training services to traders and producers in Songea and Nyasa districts**

Variable	Group producers		Individual producers		Traders	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
	n = 16		n = 22		n = 24	
<b>Training</b>						
Yes	11	68.8	9	40.9	8	33.3
No	6	31.2	13	59.1	16	66.7
<b>Type of training</b>						
Production and maintenance	11	68.8	9	40.9	11	68.8
<b>From</b>						
Government	11	68.8	9	40.9	11	68.8

Furthermore, some of the supporting organizations were interviewed and information on their extension services were provided. A non-governmental organization, Caritas was identified. Caritas is a charity organization in Songea funded 8 groups in Ruvuma region. Caritas nurtures the groups with trainings and skills needed for beekeeping activities. They also provided the groups with beehives and other hand-on facilities for their beekeeping activities. One of the challenges faced by Caritas was lack of experts which requires them to pay TZS 30 000 to TFS officials to assist them in giving training to the groups they were funding. Table 18 shows community support provided by various organizations to producers in Songea and Nyasa district.

**Table 18: Community support from different organization in Songea and Nyasa districts**

<b>Name of organization</b>	<b>Songea Number of modern beehives</b>	<b>Village</b>	<b>Name of organization</b>	<b>Nyasa Village</b>	<b>Number of modern beehives</b>
TFS	5	Kikunja	TFS	Litumba-Kuhamba	20
TFS	5	Mipingi	TFS	Nkalachi	30
TFS	5	Ndilima			
		Litembo			
TAFF	80	Namatuhi			
TAFF	23	Peramiho			
TAFF	20	Mpandangindo			
TAFF	14	Mlete			
Caritas	10	Mhepai			
District Council	22	Mhukulu lilai			

**Source: Songea District Council, 2020**

Out of all interviewed traders, 33% have agreed to have received extension education on marketing and packaging and 66% have not received any education pertaining honey. This indicates that still there is a large need of education to be given to traders especially on marketing.

#### **4.2.7 Challenges faced by supporting functions in Songea and Nyasa district**

##### **Inadequate resources**

Regular consultation of producers at their premises requires adequate resources such as (money and transportation means). Inadequate resources was one of the common challenges mentioned facing services providers. Due to poor follow-ups, it becomes difficult to trace and get accurate information especially on production trend.

##### **Poor cooperation from producers**

Most producers provide wrong/false information on their production. This indicates that a better relationship between the officials and actors should be established to create trust and better communication between them.

#### **4.2.8 Challenges faced actors along the value chain in Songea and Nyasa districts**

##### **4.2.8.1 Challenges faced by producers in Songea and Nyasa districts**

Various challenges faced producers .The challenges included fire, theft, insects, rotten hives, lack of education, lack of capital, lack of protective gears, poor or lack of market, distance, poor road, weather change, conflicts among group members, lack of grading systems and high prices of beehives. The most common challenge was lack of capital, lack of education and poor road as indicated in Table 19. Most producers showed willingness into investing in beekeeping but they lacked financial resources and knowledge into doing so. With exception of conflicts among group members, all challenges were similar to both group and individual producers.

**Table 19: Challenges faced by honey producers in Songea and Nyasa districts**

**Table 19: Challenges faced by honey producers in Songea and Nyasa districts**

<b>Variables Challenges</b>	<b>Group Frequency</b>	<b>Percentage</b>	<b>Individual Frequency</b>	<b>Percentage</b>
Lack of capital	11	68.8	17	77.3
Theft	1	6.2	1	4.5
Insects	1	6.2	1	4.5
Rotten hives	1	6.2	2	9.1
Inadequate education	11	68.8	17	77.3
Lack of protective gears	10	62.5	13	59.1
Fire	7	43.8	13	59.1
Market problem	6	37.5	9	40.9
Distance	6	37.5	10	45.5
Hives expensive	10	62.5	7	31.8
Group conflict	2	12.5	0	.0
Poor road	11	68.8	19	86.4
Weather	3	18.8	1	4.5

#### 4.2.8.2 Challenges faced by traders in Songea and Nyasa districts

Table 20 shows challenges faced traders and most traders said the business was too slow. People only bought honey for medicine application or consumption, as a result honey may stay up for more years without being purchased. For that reason, more education should be given to people on the importance of honey and how it can be used on a daily basis as an alternative for sugar.

**Table 20: Challenges faced by honey traders in Songea and Nyasa districts**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
Packaging materials expensive	13	54.2%
Packaging material unavailability	8	33.3%
Slow business	22	91.7%
Low quality	8	33.3%
Konyagi bottles unacceptability by customers.	6	25.0%
Poor consistency from leaders.	4	16.7%

#### 4.2.8.3 Challenges faced by honey processors in Dar es Salaam and Mafinga

Table 21 shows challenges faced by processors. One was poor quality of honey from producers. One the processors explained how most of the producers add water to their honey which has been limiting them into selling their honey to the external markets. Moreover, impurities from pesticides used by producers when harvesting honey were commonly found in honey which restricted their exportation of honey to countries abroad. Thus more education should be given to producers on proper ways to harvest honey as well as laws and regulations should be strict to prohibit such incidences.

**Table 21: Challenges faced by honey processors in Dar es Salaam and Mafinga**

Variables	Processors	
	Frequency (n = 3)	Percentage
<b>Challenges</b>		
Poor quality from producers	1	33.3
Expensive packaging material	1	33.3
Tax for imported machines too high	1	33.3
Poor relationship with officials.	2	66.7

#### 4.3 Production trend and analysis

Table 22 shows the production trend of honey in Nyasa and Songea district. Significant increase is observed from both districts in year 2016/2017. It was due to good weather conditions that led to the increase of the production. Data on beeswax is generally missing because most of the producers throw beeswax away unaware of its value. However, the records on production below is only for the producers who chose to report their data.

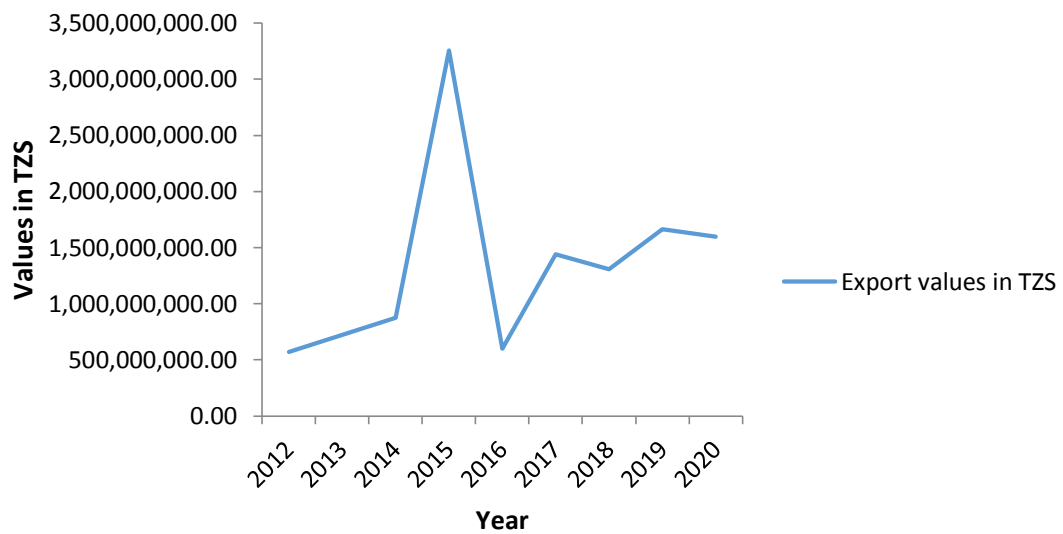
**Table 22: Honey and Beeswax production in Songea and Nyasa districts**

Year	Songea		Nyasa	
	Honey(Ltr)	Beeswax(Kg)	Honey(Ltr)	Beeswax(Kg)
2014/2015	835	-	1708	9
2015/2016	800	-	1442	13
2016/2017	1043.8	-	2972	21
2017/2018	890	-	-	-
2018/2019	754	-	-	-
2019/2020	624	344	-	-

**Source: Songea and Nyasa council**

#### Honey export data in Tanzania

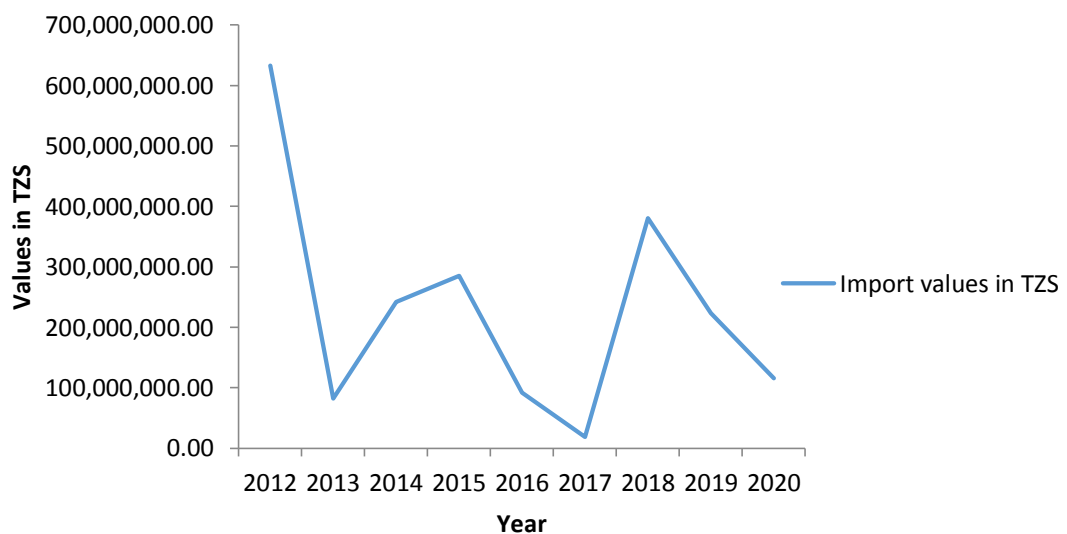
Figure 2 shows the export trend from 2012 to 2020. The significant increase of export value from year 2015 to 2017 was noticed, which is a great achievement. Countries of destination of honey from Tanzania were Oman, Kenya, Germany and Belgium which had larger values and exported metric tons of honey compared to other countries.



**Figure 2: Honey Value exported from 2012 – 2020 in Tanzania**

#### **Honey import data in Tanzania**

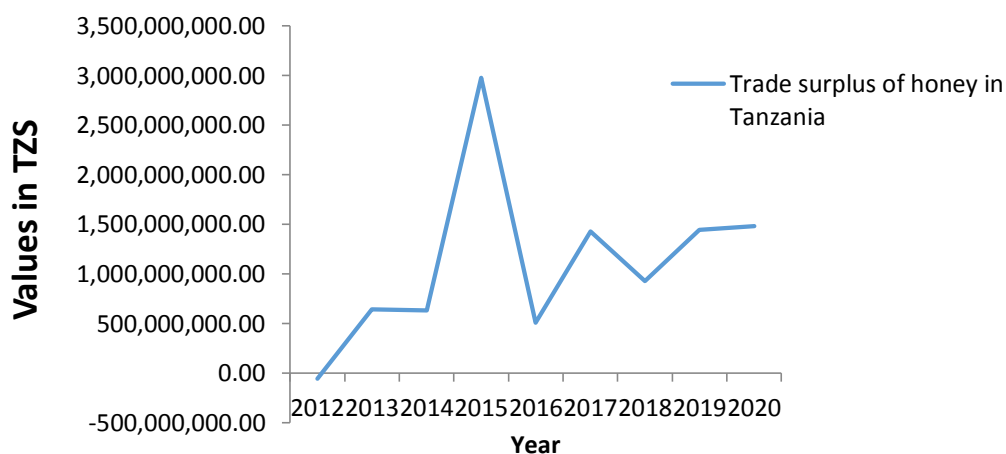
Figure 3 indicate values in Tanzania of honey import in Tanzania from 2012 – 2020. Highest importation level was observed in 2012, but decreased ever since then. The countries of origin were mainly imported from were United States, United Kingdom and United Arab Emirates.



**Figure 3: Honey Value imported from 2012 – 2020 in Tanzania**

### Balance of trade

Balance of trade is the difference between a country's imports and exports of a particular product or service. When a country exports more than it imports, it is called *trade surplus* but when the imports exceeds the export level it is called *trade deficit*. Figure 4 shows the balance of trade from 2012- 2020 in Tanzania. The balance of trade was 9 981 483 226.1 which means that the country has a trade surplus because it exported more than it imported honey which is good for employment and economic growth and it also means that there is a greater demand of honey from the country in the external market therefore the production needs to be high enough to meet the demand. And that can be achieved by fully exploiting the potential that the country has in the beekeeping sector. However, there is still a large amount of honey that imported from other countries despite having a large potential in the country. Most of the honey exported was natural honey and most of the honey imported was processed honey such honey with additives. This is due to the quality, packaging and other value addition activities that attract people to import processed honey from other countries. Therefore due to that case, industries in the country should also process honey with high quality and improve the value addition activities to meet the demand of consumers.



**Figure 4: Honey balance of trade in Tanzania from 2012 – 2020**

## **CHAPTER FIVE**

### **5.0 CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Conclusion**

Despite honey having great potential, it is still characterized with low production. The potential of honey in the country is yet to be fully exploited. This study mapped the value chain, assessed the business environment of the value chain and analyzed the production trend.

The results indicated that majority of the producers sold honey to consumers in the village. The value chain was fragmented and there was no good relationship between the actors. Market information was very limited as a result the actors had no place to sell their products. Results also pointed out that majority of the producers were aware of the rules and regulation but failed to adhere to some them such as; the use of traditional beehives. This was because majority had little or no fund to own modern hives.

Furthermore, inadequate resources such as finance was a major problem to the supporting functions. This limited them into doing their follow-ups to producers in the village as a result, records such as annual production were not well acquitted. Study also observed that beekeeping contributed the least (3%) to the total annual income of producers compared to other socio-economic activities done in the study area. This was because most beekeepers were not business oriented as honey was mostly sold at the village level.

#### **5.2 Recommendations**

The following are recommendations to develop honey value chain in the study area.



### **Relationship between officials and actors**

The study indicated that the relationship between official and actors in value chain was not well established. Therefore a good relationship between actors and officials is required, to help build trust and actors will be comfortable to explain their problems and not hide any important information from them. For instance villagers should be able to work with Village Executive Officers (VEO) in combating issues like thieves and fire which are some major concerns from the beekeepers.

### **Adequate resources to supporting functions**

According to the results major problems hindering the governmental supporting functions was inadequate resources. It limited them from doing follow-ups and extension services. Therefore the government should assist and set aside an adequate budget to natural resource department for them to perform their work effectively and efficiently.

### **Capacity building**

Adequate training and coaching on production, maintenance and marketing should be given to actors. For instance information on beekeeping calendar is very important as some beekeepers harvested honey at a wrong time.

### **Access to finance**

Majority of beekeepers have potential but they lack resources (finance and equipments) which resulted into the use of poor technology both in producing, harvesting and marketing their products. This has lowered their production level. Both governmental and non-governmental institutions should be encouraged to support the actors.

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## APPENDICES

### Appendix 1: Questionnaire for producers

#### Honey value chain development from Ruvuma Region

This questionnaire is for MSc study purposes. The information and data that will be obtained from this field survey will be used to draft MSc ENAREC Dissertation for submission to SUA

Questionnaire Number.....

Date of interview.....

District.....Village.....

Name of the Group (if applicable).....

Is the group registered (1) Yes (2) No

Year it started.....

#### Section A: General information:

1. Name of the respondent  
.....
2. Number of people in the  
group.....
3. Age in years.....
4. Gender: 1 = male[ ], 2 = female[ ]
5. Marital status:  
1= Married [ ], 2= Single [ ], 3= Divorced [ ], 4= Widowed [ ], 5= Separated [ ]
6. Level of education:1 = No formal education[ ]; 2 = Primary school [ ];  
3 = Secondary  
school[ ]; 4 = College [ ], 5 =University [ ], 6 = others [ ] (specify)...
7. How many people in your household.....

### Section B: Information on honey production

7. What are major economic activities do you engage in as your main source of income?

1= Agriculture [ ], 2= Business/petty trading [ ], 3= Agro-processing [ ], 4= services [ ]

], 5= honey production [ ], 6= others (specify) .....

8. Experience of working with honey production.....

9. What are source of labour? 1=family labour [ ], 2=hired [ ], contract [ ].

10. What are your earnings in the past 5 years?

Years	2015	2016	2017	2018	2019
kg/Litre					

a. How much do you charge per litre

b. Do you produce your honey in private or government area?

c. Who finances your activities?

11. Where do you sell honey? Specify.....Distance to the market (how far is it).....

12. Do you receive any extension services? 1= Yes [ ], 2= No [ ].

If yes, what type and from who?.....

13. Please indicate the costs involved in honey production activities before selling:

S/N	Activity	Days	Cost
1			
2			
3			
4			

14. How much do you pay the following items when marketing your produce?

S/N	Activity	Cost (TZS)
1		
2		
3		
4		

15. Do you have any grading system?

### Section C: Information on livelihood issues relating to honey production

16. Rank your livelihood activities according to its contribution to your household needs?

S/N	Livelihood activity
1	
2	
3	
4	

17. Do you think honey production activities contribute to your livelihood 1 = Yes [ ]  
2 = No

18. If yes to question 17 above, in what ways does it support you? Please mention.....

19. Has there been a shift in your economic/livelihood activity? Yes [ ] No [ ]

20. When did you change your occupation/livelihood activity .....

21. What used to be your occupation/livelihood activity .....

22. Are you satisfied with your current occupation/livelihood? Yes [ ], No [ ].

Explain.....

23. Where do you normally sell your honey? 1 = consumers [ ], 2 = middlemen  
[ ], 3 = wholesalers [ ], 4 = retailers [ ], 5 = others [ ] (specify)-The name  
.....

24. How much income do you usually generate per year .....

25. How often do you engage in honey production activities in a year?

1 = Dry season [ ], 2 = When in need of money [ ], 3 = All the time [ ].

26. Have you ever received training on how to improve honey production?

1=Yes [ ], 2= No [ ]

27. Mention the training and who trained you and when

Training	Who	When

28. Do you get market information? 1 = Yes [ ], 2 = No [ ]

29. If yes to question 28 above, how do you obtain such pieces of information?

1 = friends [ ], 2 = from media [ ], 3 = direct visit to the markets [ ], 4 = others [ ]  
]specify.....



30. Who sets the price for honey products when selling?

1=buyer [ ], 2=seller (producer) [ ], 3=others [ ]

(specify).....

31. What factors are considered in setting up the price of honey? (Please

rank) 1 = production costs [ ], 2= transportation costs [ ], 4 quality [ ], 5  
=seasonality

[ ], 7=others (specify).....

32. Who determines the price?

33. Are you satisfied with the current honey prices? 1 = Yes[ ], 2 = No [ ]

If no why?

1 = price is low [ ], 2 = operational costs are very high [ ], 3 = buyers offer price  
which

are in their favor [ ], 4 = others  
specify).....

34. How will you describe the road network to your community? 1= Poor [ ], 2=Good[ ].

#### Section D: Information on honey value chain

35. Which value addition activities you perform as producer?

36. Mention the link between you and other actors in the value chain?

Name of the link	What do they do (Training, Law enforcers, etc.	Strength of the link (1 = very strong [ ], 2 = strong [ ], 3 = weak [ ], 4 = very weak [ ], 5 = none [ ]	Communication means	How much do you trust (1 = very much [ ], 2 = much [ ], 3 = little [ ], 4 = very little [ ]
e.g Mohamed Enterprise				

37. Who do you perceive as having greater power in the honey value chain?

1 = producers [ ], 2 = traders [ ], 3 =processors [ ] 4 = consumer [ ]

38. How do you assess the current performance of the honey value chain?

1 = best [ ], 2 = good [ ], 3 = worse [ ], 4 = worst [ ]

39. How do you think the performance of the value chain can be improved?

- 1) .....
- 2) .....
- 3) .....

40. As producer, do you have any association in your area? 1 = yes [ ], 2 = no [ ]

41. If yes to question 37 above, mention the associations/organization and provide the benefits of the association/?

Name of the association/organization	function (Training, financial support, etc.	Strength of the association (1 = very strong [ ], 2 = strong [ ], 3 = weak [ ], 4 = very weak [ ], 5 = none [ ]	Communication means	How much do you trust (1 = very much [ ], 2 = much [ ], 3 = little [ ], 4 = very little [ ]

42. What are the main challenges while undertaking the honey production?

- 1) .....
- 2) .....
- 3) .....

43. What do you think should be done to make your work easier?

- 1) .....
- 2) .....
- 3) .....

44. Which laws/by-laws/informal laws/taxes affect you production activities – Mention them?

Types of the laws/by-laws/informal laws/taxes	How they affect the business	Propose suggestion to mitigate the effect

45. What factors influence/ affect your business?

## Appendix 2: Questionnaire for honey traders

### Honey Value Chain Development from Ruvuma Region

This questionnaire is for MSc study purposes. The information and data that will be obtained from this field survey will be used to draft MSc ENAREC Dissertation for submission to SUA

Questionnaire Number.....

Date of interview.....

District.....Village/Town .....

#### Section A: Personal information of a respondent:

1. Name of the respondent.....
2. Respondent age in years.....
3. Gender: 1 = male [ ], 2 = female [ ]
4. Marital status: 1= Married [ ], 2= Single [ ], 3= Divorced [ ], 4= Widowed [ ], 5= Separated [ ]
5. Level of education.....

#### Section B: Information on trade sources, costs and pricing

6. Is honey transportation/ trading your main economic activity? 1 = Yes [ ] 2 = No [ ]
7. For how long have you been doing this business.....
8. Have you received any training? 1 = Yes [ ], 2 = No [ ]
9. Mention the training and who provided the training

Training	Who	When

10. What are the source(s) of honey

1 = producers [ ], 2 = transporters [ ], 3 = processors/industry [ ], 4 = others [ ]  
(specify)...

11. Mention villages where you get most of your honey:

Name of the village	Ward	Quantity mostly supplied	1. Group 2. individual

12. Where do you sell your honey?

Where	Quantity mostly sold	Buying price(per kg)	Selling price(per kg)

13. Do you sell outside Tanzania? 1=Yes [ ], 2=No [ ],

14. If yes which country .....

15. How much income do you usually generate per annual.....

16. What is the mode of the trade?

1 = Contract [ ], 2 = first come / first served [ ], 3 = others [ ] (specify)...

17. What was the mode of payment? 1 = cash [ ], 2 = credit [ ], 3 = other [ ] (specify)...

18. Please provide details of your costs you have incurred in your business last year 2018

ITEM	UNIT COST	
Fuel		
Vehicle repair		
Wages eg driver		
Communication		
Road licences/fee		
Transit pass fee		
Other		

19. Is there any variability in the volume of honey between seasons

1 = yes [ ], 2 = no [ ]

20. What were your earnings for the past 5 years?

2019	2018	2017	2016	2015

### Section C: Information on livelihood activities

21. Has there been a shift in your economic/livelihood activity? Yes [1] No [2]
22. When did you change your occupation/livelihood activity .....
23. What used to be your occupation/livelihood activity .....
24. Are you satisfied with your current occupation/livelihood? Yes [ ], No [ ].  
Explain.....  
.....
25. Do you get information on your product required to be market? 1 = Yes [ ], 2 = No [ ]
26. If yes to the question above, how do you get such information?  
1 = friends [ ], 2 = through media [ ], 3 = processors/factory [ ], 4 = others (specify)...

### Section D: Information on honey value chain

27. How do you assess the linkage between you and other actors in the value chain?  
1 = very strong [ ], 2 = strong [ ], 3 = weak [ ], 4 = very weak [ ], 5 = none [ ]
28. Who do you perceive as having greater power in honey value chain?  
1 = producers [ ], 2 = traders [ ], 3 = processors [ ], 4 = none [ ]
29. How do you assess the current performance of the honey value chain?  
1 = best [ ], 2 = good [ ], 3 = worse [ ], 4 = worst [ ]
30. What are the value added activities do you perform in your business?  
.....
31. How do you think the performance of the value chain can be improved?  
.....  
.....
32. What are the main challenges while transporting honey?  
.....  
.....
33. What do you think should be done to make your work easier?  
.....  
.....
34. Do you have any association? If yes for how long

35. Name of the association.

Name of the association/ organization m	function (Training, financial support, etc.	Strength of the association (1 = very strong [ ], 2 = strong [ ], 3 = weak [ ], 4 = very weak [ ], 5 = none [ ]	Communica tion means	How much do you trust (1 = very much [ ], 2 = much [ ], 3 = little [ ], 4 = very little [ ]

36. Which laws/by-laws/informal laws/taxes affect you production activities –  
Mention them?

Types of the laws/by- laws/informal laws/taxes	How they affect the business	Propose suggestion to mitigate the effect

37. What factors influence/affect your business?

### Appendix 3: Questionnaire for industries

#### Honey Value Chain Development From Ruvuma Region

This questionnaire is for MSc study purposes. The information and data that will be obtained from this field survey will be used to draft MSc ENAREC Dissertation for submission to SUA

Questionnaire Number.....

Date of interview.....

Name of the industry .....

District.....Village.....

#### Section A: General information of a respondent:

1. Name of the respondent .....

Respondent's position in the industry .....

Year it started .....

2. Age in years.....

3. Gender: 1 = male [ ], 2 = female [ ]

5. Level of education: 1 = No formal education[ ]; 2 = Primary school [ ]; 3 = Secondary school[ ]; 4 = College [ ], 5 =University [ ], 6 = others [ ] (specify).....

#### Section B: Information on honey business

6. Specify the source of raw materials and market for each product

S/No	Product(s)	Buying price of raw materials (TZS)	Selling price of product (TZS)	Source (category and place)	Market
1					

7. Please indicate the costs involved in your business:

S/No	Item/Activity	Cost (TZS)
1	Transport	
2	Packaging	

8. What are your earnings in the past five years (TZS)?

2015.....2016..... 2017..... 2018..... 2019.....

9. For how long have you been doing this business .....

10. Where do you get your raw material and packaging?

.....

11. Do you have any agents?

12. Where do you sell your products?(record)

13. Do you export? If yes where

14. Do you think honey business is profitable and why?

.....

15. Do you receive any extension services? 1= Yes [ ], 2= No [ ].

If yes, what type and

source.....

16. Have you ever received training on how to improve honey production?

1=Yes [ ], 2= No [ ]

17. Do you get market information? 1 = Yes [ ], 2 = No [ ]

18. If yes to question 17 above, how do you obtain such information?

1 = friends [ ], 2 = from media [ ], 3 = direct visit to the markets [ ], 4 = others [ ]

specify.....

19. Who sets the price for the honey when selling/buying raw material?

1=buyer [ ], 2=seller (trader) [ ], 3=others [ ]

(specify).....



20. What factors are considered in setting up the price ? (Please rank) 1 = production costs [ ], 2= transportation costs [ ], 3= quality [ ], 4=others (specify).....
21. Are you satisfied with the current honey prices? 1 = Yes[ ], 2 = No [ ] If no, why?  
1 = price is low [ ], 2 = operational costs are very high [ ], 3 = buyers offer price which are in their favor [ ], 4 = others (specify).....
22. What is the availability of inputs for processing? (glue, lacquers, stains and its affordability)
23. What technology is available? Do you know of any advance technology available elsewhere?
24. What is the status of skilled human resources?
25. Do you invest in R&D?
26. How do you rate the quality of honey you buy from the producers and/or traders:  
Very good[ ], Good [ ], Fair [ ]. Explain your choice .....
27. Are there any grading systems and quality check for your products? If Yes, Mention them.....
28. What factors do you think influence/affect your business?  
.....
29. Any other comments, .....
30. Which specific role have you played in adding value to honey marketing system?
31. How do you assess the linkage between you and other actors in the value chain?  
1 = very strong [ ], 2 = strong [ ], 3 = weak [ ], 4 = very weak [ ], 5 = none [ ]
32. Who do you perceive as having greater power in honey value chain?  
1 = producers [ ], 2 = traders [ ], 3 =processors [ ] 4 = consumer [ ]
33. How do you assess the current performance of the honey value chain?  
1 = best [ ], 2 = good [ ], 3 = worse [ ], 4 = worst [ ]
34. How do you think the performance of the value chain can be improved?  
.....
35. As a manufacturer, do you have any association in your area? 1 = yes [ ], 2 = no [ ]

36. If yes, to question 31 above,
37. What is the name of the association .....
38. What are the benefits of the association/organization?  
.....
39. What value added activities do you perform in your business?  
.....
40. What are the main challenges facing honey trade?  
.....
41. What do you think should be done to make your work easier  
.....  
.....
42. What laws govern your business and how they affect you?

Types of the laws/by- laws/informal laws/taxes	How they affect the business	Propose suggestion to mitigate the effect

#### Appendix 4: Checklist for TFS

##### Honey Value Chain Development from Ruvuma Region

This questionnaire is for MSc study purposes. The information and data that will be obtained from this field survey will be used to draft MSc ENAREC Dissertation for submission to SUA

1. Name of the key informant .....
2. Title/position.....
3. What areas is honey mostly produced? (Private , government)
4. What is the trend in production, quantity and income over the years to the present?
5. How many people /groups are registered in honey production (Trend) and companies (enablers)?
6. Who are the key producers and traders?
7. Where honey is mostly sold? (Record)
8. Are there any administrative laws hindering the honey production and training?
9. Are there any changes in taxation, if yes. Why?
10. How much do you charge for fees both producers and traders?
11. Do you provide any services/support? If yes, mention and provide detailed information

Service/support	Duration/time	Frequency/trend	Place(village/district)
e.g beehives	2013	400 beehives	

12. What laws govern honey production?
13. Do people comply to rules and laws provided?
14. Any challenges that you face?
15. What can be done to improve honey sector?

**Appendix 5: Checklist for focus group discussion with VNRCs/Village  
Chairperson/VEO**

**HONEY VALUE CHAIN DEVELOPMENT FROM RUVUMA REGION**

This questionnaire is for MSc study purposes. The information and data that will be obtained from this field survey will be used to draft MSc ENAREC Dissertation for submission to SUA

1. Which are the main key actors involved in the chain and how can they be categorized?
2. Where do producers sell their honey?
3. Who sets the price?
4. What types of supplies and services feed into the value chain?
5. Who is your major source of information regarding price, supply, and demand?
6. Discussion on credit received, source and challenges associated with their ability to access credit (terms and conditions, interest charges payment schedule and timeliness of the credit).
7. Which NGO's or social groups are operating here? And which of them have been most helpful?
8. Where do honey producers get financial/technical help?
9. Major challenges faced by the actors?
10. Any suggestions on what should be done to improve the value chain?
11. Do they use government or private areas for their honey production activities?

**Appendix 6: Tanzania honey export from 2012 – 2020**

<b>Year</b>	<b>Tonnes</b>	<b>Value in TZS</b>
2012	216125	572 325 015.8
2013	377490	723 379 262.4
2014	169711.6	874 897 673.4
2015	243957	3 257 994 832
2016	227029.1	600 243 307.3
2017	340950.9	1 442 677 751
2018	399974.5	1 306 751 523
2019	499786.8	1 665 252 553
2020	374647.3	1 595 290 490
<b>Total</b>	<b>2860472</b>	<b>12 052 857 339.90</b>

**Source: TRA (2020)**

**Appendix 7: Honey export destination countries from year 2012 – 2020 in Tanzania**

<b>Destination Country</b>	<b>Net Weight(In Tonnes)</b>	<b>Value(In Tshs)</b>	
			2 382
Oman	222 497.14	407 630.81	
			1 316
Kenya	907 455.00	608 648.00	
			547
Netherlands	81 732.00	816 106.53	
Denmark	102.00	262 417.10	
			797
United Arab Emirates	46 958.75	717 059.41	
			711
Italy	137 838.00	045 909.73	
			28
Hong Kong	22 604.00	639 809.82	
			1 162
Belgium	208 352.00	527 532.69	
Finland	8.00	70 616.77	
			1 669
Germany	365 110.00	643 082.70	
			1
Jamaica	468.00	306 065.85	
			7
Japan	488.00	641 171.74	
Nigeria	44.00	451 776.24	
			7
Republic of South Africa	802.00	641 937.76	
			99
Saudi Arabia	64 057.00	029 582.70	

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Singapore	0.50	8 925.23
Somalia	54 740.00	117 300 000.00
Sweden	208.00	1 929 209.93
United States	17 220.00	146 916 238.24
United Kingdom	2 655.75	33 543 025.70
Iraq	13 000.00	12 208 059.25
China	91 841.60	765 146 046.76
Korea	56.00	248 348.92
Morocco	216.00	450 669.30
Norway	38 800.00	270 472 566.34
Russian Federation	252.00	330 461.38
Uganda	19 400.00	9 020 000.00
Canada	109 512.00	336 029 108.20
Ireland	48 000.00	120 298 786.08
Spain	116.00	1 056 835.82
Iran, Islamic Republic of	2 324.00	21 272 269.44
France	20 400.00	104, 762 140.82
Qatar	6 901.50	99 815 284.67
Seychelles	325.00	964 645.46
Rwanda	170 799.00	402 310 000.00
Yemen	74.00	96 763.80

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**Source: TRA (2020)**

**Appendix 8: Honey import data from year 2012 – 2020 in Tanzania**

<b>Year</b>	<b>Net weight in Tones</b>	<b>Value in TZS</b>
2012	182473	632 335 806.6
2013	40531.41	82 311,279
2014	106277.3	241 768 324.9
2015	69482.94	285 204 411.4
2016	66271.95	91 979 393
2017	13484.88	18 235 146
2018	156157.8	380 765 366.1
2019	127833.7	223 283 069.5
2020	95515.58	115 491 317.3
<b>Total</b>	<b>858028.6</b>	<b>2 071 374 113.80</b>

**Source: TRA (2020)**

**Appendix 9: Honey balance of trade from 2012 - 2020**

<b>Year</b>	<b>Export</b>		<b>Import</b>	
	<b>Net weight in Tones</b>	<b>Value in TZS</b>	<b>Net weight in Tones</b>	<b>Value in TZS</b>
2012	216125	572 325 015.8	182473	632 335 806.6
2013	377490	723 379 262.4	40531.41	82 311 279
2014	169711.6	874 897 673.4	106277.3	241 768 324.9
2015	243957	3,257 994 832	69482.94	285 204 411.4
2016	227029.1	600 243 307.3	66271.95	91 979 393
2017	340950.9	1 442 677 751	13484.88	18 235 146
2018	399974.5	1 306 751 523	156157.8	380 765 366.1
2019	499786.8	1 665 252 553	127833.7	223 283 069.5
2020	374647.3	1 595 290 490	95515.58	115 491 317.3
<b>Total</b>	<b>2860472</b>	<b>12 052 857 339.90</b>	<b>858028.6</b>	<b>2 071 374 113.80</b>

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