

**IMPACT OF BEE PRODUCTS MARKETING STRATEGIES ON FOREST  
CONSERVATION IN TABORA MUNICIPALITY, TANZANIA**

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REQUIREMENTS FOR DEGREE OF MASTER OF ARTS IN NATURAL  
RESOURCE ASSESSMENT AND MANAGEMENT (MANRAM) OF THE  
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**2020**

**CERTIFICATION**

The undersigned certifies that he has read and hereby recommends for acceptance by the Open University of Tanzania a dissertation titled: ***Impact of Bee Products Marketing Strategies on Forest Conservation: A Case of Tabora Municipality.***



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(Supervisor)

27<sup>th</sup> Jan 2020

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Date

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## DECLARATION

I, **Magreth Mazengo**, do hereby declare that this dissertation is my own original work and that it has not been presented to any other University or Institution of Higher Learning for a degree or similar award.

.....

Signature

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Date

## **DEDICATION**

This dissertation is dedicated to the commemoration of Allan Erick. Although he encouraged me to pursue my master's degree, unfortunately enough he was unable to see my graduation. However, I consecrate this dissertation to my supervisor, Professor Deus Ngaruko and the committee who inspired to pursue this master's degree and kept me on track. Finally, this is dedicated to my husband who encouraged me to pursue my dreams and finish my dissertation.

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## **ABSTRACT**

This dissertation is set out to investigate the impact of bee products marketing strategies on forest conservation in Tabora Municipal. It aimed to examine bee products, assess bee products marketing strategies supporting forest conservation; and assess the impact of bee products marketing strategies on forest conservation in the study area. The field survey was conducted in Igombe Dam Forest Reserve as IBM-SPSS version 21 software statistical analysis was used. A total number of 33 respondents were randomly drawn to fill the household level questionnaires. Meanwhile all households do not produce pollen and bee venom while 82% produce honey. The findings showed that direct contact and exchange of information with their customers was the only marketing strategy people use to sell the bee products. The study concluded that the majority of bee products are not produced to meet bee products marketing strategies, and offer new products to the consumers are marketing strategy that have great role to play on selling bee products. Finally, the study recommended the provision of education, community involvement and implementation of laws for better management of bee products marketing strategies and forest conservation.

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## LIST OF ABBREVIATIONS AND ACRONYMS

ADPA	Association for the Development of Protected Areas
BTI	Beekeeping Training Institute
CBFM	Community-Based Forest Management
COR Theory	Conservation of Resources Theory
FAO	Food and Agriculture Organization
GDP	Gross Domestic Products
HMF	Hydroxyl Methyl Fur aldehyde
IFAD	International Fund for Agricultural Development
MNRT	Ministry of Natural Resources and Tourism
NBP	National Beekeeping Policy
NWBP	North West Beekeeping Province
PFM	Participatory Forest Management
TFSA	Tanzania Forest Services Agency
TShs	Tanzanian Shillings
URT	United Republic of Tanzania
US \$	United States Dollar
VLFRs	Village Land Forest Reserves
WMA	Wildlife Management Areas

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Chapter Overview**

This chapter consists of background to the research problem, statement of the research problem, objective of the study, research questions and significance of the study. It is also having the scope, limitations; of the study as well as organization of the study.

#### **1.2 Background to the Research Problem**

Tropical forests are facing annihilation worldwide. This is due to unsustainable harvesting of their timber and non-timber products for economic gains and also due to burning for various reasons, including clearing for agricultural use. Over the past decade, more than 13 million ha of tropical forest were cleared every year, and the largest proportion of this is the tropical dry forest type (Mooney *et al.* 1995, Bawa *et al.* 2009). This accelerating loss of biotic diversity can lead to extinction which is irreversible. About 44% of the world's vascular plant species and 35% of terrestrial vertebrates are endemic to 25 hotspots of biodiversity, some of which are tropical forests (Margules and Pressey, 2000), yet none of the hotspots have even one-third of its original geographic extent still intact (Thomas *et al.*, 2004). In fact the hotspots currently occupy only about 1.4% of the earth's land area (Brummitt and Lughadha, 2003). Large proportions of tropical dry forests were deforested or degraded in the recent past (Mooney *et al.* 1995; FAO, 2003), mainly for sale of timber or conversion

to agricultural land. In 1995, it was estimated that 15 million hectares of the world's tropical forests were being destroyed every year since the 1960s (FAO, 2003). Therefore, there is an urgent need to put conservation measures in place (Burgess *et al.* 1998; Brummitt and Lughadha, 2003).

In Africa, most of the communities living near the tropical forests are poor and they consider the forests as their natural heritage and a source of making a living. They are the forests' "rightful custodians". This has resulted in hostility between organizations fronting for conservation and the local people, except in cases where the communities have been involved in the process. Thus, there is an increasing need to formulating ways in which such communities can derive a living from these biodiversity-rich ecosystems without adversely affecting their integrity (Gordon and Ayiemba, 2003; Raina *et al.* 2010). This trend, coupled with extensive education and involvement of these custodians, has proven to be the best way of achieving the delicate balance between conservation and sustainable exploitation (Raina *et al.* 2009).

Tanzania Mainland has 48.1 million hectares (ha) covered with forests and woodlands representing 55% of total land area. About 93% of the total forest area is woodland and 7% is composed of mangroves, coastal forests, humid montane forests and plantations (URT, 2013). Tanzania's forests and woodlands support beekeeping which plays roles in socioeconomic development as source of income for communities living adjacent to these resources. Due to this, the industry has received primary attention in recent years (Famuyide *et al.* 2014). Beekeeping provides local

people and the government economic incentives for the protection of natural habitats and a useful activity in any forest conservation initiatives (Lalika, 2008; Agera, 2011). There is a strong link between forests and woodlands and traditional beekeeping which provides an incentive for sustainable forest management. According to Campbell *et al* (2007), the dominance of different vegetation types provide the basis for beekeeping as a highly significant (culturally, socially and economically) forms of land use in miombo woodlands.

One of the most significant developments in PFM in Tanzania has been the effort to strengthen indigenous knowledge and practices in managing and protecting forests. According to MNRT (2009), although the Forest Policy emphasis on the development of an enabling legal and policy environment that encourages the spread and adoption of PFM, many parts of Tanzania have a long and established history of sustainable CBFM. Forests have been reserved by rural communities for a range of objectives, including cultural, traditional, ceremonial and more utilitarian purposes such as the conservation of dry season grazing areas. There have been few attempts to document these traditional practices, or to assess their effectiveness in the light of growing demands for land and natural resources. Wiersum (2000) further pointed out that indigenous knowledge plays an important role in local decision-making with regard to management of forest resources, which involves not only technical practices, but also social institutions that organize technical practices.

Inspite of the significance of beekeeping, there is little or no empirical evidence on the potential of beekeeping for income generation and forest management in most regions of the world. Most of the available research material is in the form of

scientific documents with little information in the direction of rural development or forest conservation. Thus, there is need for information on the relevance of beekeeping to forest conservation; this information can be used by stakeholders in both beekeeping and forestry. This study intended to fill that gap by assessing the impact of bee keeping market strategies on forest conservation in Tabora region, Tanzania.

### **1.3 Statement of the Research Problem**

Forest reserves and woodlands in Tabora Municipal Council face the same threats of exploitation as other tropical forests in the developing world. They are undergoing degradation from the majority of population who depend on them, mainly for building poles (Gordon and Ayiimba, 2003), charcoal production and collection of firewood. Additionally, they are also used for fuel and carving wood, herbs, hunting of wildlife and water collection. Even after some of these activities were forbidden, they still occurred illegally. For this reason, community-driven conservation projects have been undertaken to ensure that the communities can draw a livelihood from this vital ecosystem without destroying it. These include Beekeeping Training Institute (BTI) which trains different communities about beekeeping practice within the Inyonga East Forest Reserve (URT, 2013). Among the projects to augment other initiatives is apiculture. This is intended to replace the traditional practice of destroying portions of trees in order to harvest naturally occurring honey in the forest: such human activity is no longer allowed in this protected forest.

Although many studies worldwide have been carried out on the effects of forest isolation on pollination services of various types of bees and other insects (e.g. Bawa, 1990, Klein *et al.* 2003; Ricketts, 2004; Kremen *et al.* 2004; Mayfield, 2005; Priess *et al.* 2007; Ricketts *et al.* 2008), none has addressed the impact of beekeeping practices on the condition of forest resources in rural areas. This study provided an understanding on the impact of beekeeping practices specifically bee products marketing strategies on the conservation of forest in Tabora Municipality. The study also used a case of Igombe Dam Forest Reserve preserved by Tanzania Forestry Services Agency (TFS). Specifically, this study identified the different activities associated with beekeeping and determined the bee products to ensure sustainable use of forest resources. Further, the study assessed marketing strategies on forest conservation. Finally, the findings of this study were put in form basis for proper implementation of PFM in Tanzania by providing facts to assist policy makers and other stakeholders regarding beekeeping practices and sustainable forest management.

#### **1.4 Objectives of the Study**

The research objectives covered both the general and the specific objectives.

#### **1.5 General Objectives**

The overall objective of this study was to investigate the impact of bee products marketing strategies on forest conservation, in Tabora Municipality, Tanzania.

#### **1.6 Specific Objectives**

This study is guided by the following specific objectives:

- i. To examine bee keeping activities done in forest reserve.
- ii. To assess the bee products found in the study area.
- iii. To assess marketing strategies supporting forest conservation in forest reserve.

### **1.7 Research questions**

This study will answer the following questions.

- i. What is the bee keeping activities done in the study area?
- ii. What is the bee products found in the study area?
- iii. What are the marketing strategies on forest conservation in the study area?

### **1.8 Significance of the Study**

Principally this study intended to help academicians including students, lecturers and researchers to obtain knowledge of the role of beekeeping practice in forest conservation and then to facilitate them in conducting further research.

However, this study planned to provide knowledge to forest managers, planners and decision makers on the relationship of beekeeping and forest conservation by showing them the impact of beekeeping on the forest status.

Finally, this study intended to provide a useful baseline for proper implementation of PFM in Tanzania by providing facts to assist policy makers and other stakeholders regarding beekeeping practices, sustainable forest and natural resources management as a way of implementing the sustainable development goals.

### **1.9 Limitations of the Study**

The impact of bee products was limited to bee product marketing strategies that are used to sell the products. Also, the study highlighted marketing strategies that favor forest conservation. Language obstacle was among the limitations that occurred during pre-testing of the study. The study adjusted and overcome it by translation of instruments that were used by some of the respondents. For instance, some household questionnaire surveys were written in Kiswahili language in order for the respondents to manage the language. Nonetheless, the financial resource and time forced the original budget to become sufficient to fully support the research in terms of intensity and coverage. This was rectified by minimization of the number of respondents that fastened the distribution and collection of questionnaires from respondents' localities.

### **1.10 Scope of the Study**

The study was conducted in Tabora Municipality Council, Tanzania. Igombe forest reserve had been selected to represent the whole of Tabora Municipality Council. Moreover, the researcher visited forest reserve area; and viewed how bee keeping and forest conservation were managed.

### **1.11 Organization of the Study**

This dissertation is presented in five chapters. Chapter one introduces the study by giving the background to the research problem, statement of the problem, objectives of the study and research questions. It also presents the significance of the study, limitations of the study. Chapter two presents literature review, theoretical review,

empirical review, conceptual framework and research gap. Chapter three describes research methodology, research design, sampling technique, data collection methods as well as data analysis techniques. Chapter four deals with research findings and discussion while chapter five presents conclusions and recommendations

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Overview

This chapter discusses the conceptualization of key terms; furthermore the chapter highlights the theory guiding this study. It also discusses the empirical works that have been done at different geographical areas. In the end the chapter explains the conceptual framework guiding this study and research gap.

#### 2.2 Definition of Key Terms

##### 2.2.1 Bee products

Bee products are the products from beekeeping activity. Beekeeping (or apiculture) is the maintenance of bee colonies, commonly in man-made hives, by humans. Most such bees are honey bees in the genus *Apis*, but other honey-producing bees such as *Melipona* stingless bees are also kept. A beekeeper (or apiarist) keeps bees in order to collect their honey and other products that the hive produce (including beeswax, propolis, flower pollen, bee pollen, and royal jelly), to pollinate crops, or to produce bees for sale to other beekeepers. A location where bees are kept is called an apiary or "bee yard" (Mapolu, 2005).

Bee products include honey, nectar, beeswax, pollen, bee bread, propolis, royal jelly, bee venom, bee hive air. During this study all the type of bee products will be considered (*ibid*).

### **2.2.2 Marketing Strategies**

Marketing strategy is a long-term, forward-looking approach to planning with the fundamental goal of achieving a sustainable competitive advantage (Bakel, 2008).

Scholars continue to debate the precise meaning of marketing strategy. Consequently, the literature offers many different definitions. On close examination, however, these definitions appear to center on the notion that strategy refers to a broad statement of what is to be achieved.

Strategic planning involves an analysis of the company's strategic initial situation prior to the formulation, evaluation and selection of market-oriented competitive position that contributes to the company's goals and marketing objectives (Humburg, 2009).

Strategic marketing, as a distinct field of study emerged in the 1970s, and built on strategic management that preceded it. Marketing strategy highlights the role of marketing as a link between the organization and its customers. This study considered marketing strategies that used in beekeeping for supporting forest conservation (*Ibid*).

### **2.2.3 Forest Conservation**

Forest conservation is the practice of planting and maintaining areas for the benefits and sustainability of future generations. The conservation of forest also stands and aims at a quick shift in the composition of tree species and age distribution. The

forest conservation involves the upkeep of the natural resources within a forest that is beneficial to both humans and environment (Pawi *et al.* 2015).

This study assessed how marketing strategies used to sell bee products may help in forest conservation.

## **2.3 Theoretical Literature Review**

There are different developed theories on conservation of resources through different human activities. Among of them are the Conservation of Resources Theory (CoRT), Forest Transition Theory and Land Rent Theory. These selected theories guided this study to verify the impact of beekeeping practice on the conservation of forest resource.

### **2.3.1 Conservation of Resources Theory (CoRT)**

Conservation of resources (CoRT) theory begins with the tenet that individuals strive to obtain, retain, foster, and protect those things they centrally value. CoRT follows an understanding that cognitions have an evolutionary-based built-in and powerful bias to overweight resource loss and underweight resource gain (Hobfoll *et al.* 2018). Following this basis, CoRT theory shows that stress occurs (a) when central or key resources are threatened with loss, (b) when central or key resources are lost, or (c) when there is a failure to gain central or key resources following significant effort. At its core, CoRT theory is a motivational theory that explains much of human behavior based on the evolutionary need to acquire and conserve resources for survival, which is central to human behavioral genetics. Like other social animals, humans must acquire and conserve both personal strengths and social bonds (Hobfoll *et al.* 2018).

Unlike other animals, however, humans can create complex tools to ensure their survival and have the advantage of complex language to communicate, which aids survival and social bonding. Thus, people employ key resources not only to respond to stress, but also to build a reservoir of sustaining resources for times of future need. Furthermore, the obtaining and retaining of personal, social, and material resources creates in people, families, and organizations the sense that they are capable of meeting stressful challenges. It is a critical tenet of CoRT theory that individual appraisal is secondary to what is centrally valued and universal among people. Among these commonly valued resources are health, well-being, family, self-esteem, and a sense of purpose and meaning in life. How these appraisals are expressed differs culturally but always reflects the same core elements (Hobfoll *et al.* 2018).

In the current study, CoRT (Conservation of Resources Theory) was used as a framework to make assessment on the impact of bee products marketing strategies on forest conservation in Tabora Municipality Council. The measure used in this study human behaviors of conserving resources for survive. These includes bee keeping involvement, practice of bee keeping, period of bee keeping, number of bee hives possessed by individuals or groups and respondents' consideration on their bee keeping. Finally, this theory helped to explain how people value and conserve more forest resource as the beekeeping activities conducted in the forest generated income to them.

### **2.3.2 Forest Transition Theory**

This study has employed Forest Transition Theory as one of the guiding theories. The forest Transition Theory was propounded by Mather (1992). Originally, Mather developed this idea based on a basic sequence of natural resource destruction and conservation or the depletion-melioration model proposed by Whitaker (1940) and Friedrich (1904 in Whitaker, 1940). This model argues that, at an early stage, natural resource destruction is inevitable to meet the human needs. Rising demand and price of natural resources incentivized people to conserve and to restore their natural resources.

Then, foresters apply and develop further that idea in the context of deforestation. Forest transition theory focuses more on the temporal changing of forest cover or a change in forest cover trend over time (Lambin & Meyfroidt, 2010). The notion of this theory is to investigate “the transition point at the time of the lowest forest covers in a given region” (Mather, 1992). Other simple understanding of this concept is: the change in forest cover from shrinking to expanding forest areas (Mather, 1992) or shifting from deforestation to reforestation (Lambin & Meyfroidt, 2010; Mather & Needle, 1998). Transition happens when declining forest cover trend reverse into increasing forest cover trend. After the stage when forest cover is still high and deforestation rate is low, as the development taking place, then forest cover and deforestation rate are low due to scarcity of forest. At the end, an increasing forest rent could stimulate the transition by incentivizing forest plantation or reforestation/Afforestation.

Forest Transition theory is generally considered taking place in one cycle of transition, from high forest cover to the lowest point of the forest cover, then increasing of forest cover. So, the U-shaped curve model basically consists of two trends or periods: forest decline and forest recovery (Grainger, 1995), usually in the form of U-shaped or a reverse J-shaped curve (Perz, 2007). For most countries, decreasing forest cover is an inevitable effect of their development processes. At early stage of development, an increasing population and demand of food will bring a significant pressure for forest land because of agricultural land expansion. Then, as countries develop further, an increasing demand for forest products and services will incentivize the process of reforestation.

Economic development path by which forest transition may occur is the focus of this study. *Economic development path*; after extracting forest resources for development, generally, economic development generates off-farm opportunity jobs that, in turns, will attract rural people off of their land-based economic activities (Rudel *et al.* 2005). Rural labor scarcity will induce reforestation or land conversion from agriculture into forestland uses. Furthermore, development could also develop better agricultural technology and agricultural intensification. This circumstance will push agricultural activities limited in the most suitable area; and then reforestation may have more land to take place. Concentration agricultural activities only in marginal land can be possible as the consequences of higher agricultural input prices and/or lower agricultural output prices (*ibid*).

In the contemporary study, Forest Transition Theory was deployed as a context to analyze bee products produced by the respondents at the study area. It analyzed

honey, bee wax, pollen, porpoise, royal jelly and bee venom. However, this theory guided the study in explaining the marketing strategies of bee products which attracted Afforestation and reforestation and thus to increased forest conservation in the study area.

### **2.3.3 Land Rent Theory**

Adopting this theory for the forestry sector, some scholars developed its theoretical explanation (Chomitz & Gray, 1996; Schneider, 1995; Walker, 2004). However, we should note a working paper by von Amsberg (1994) who already considers von Thunen model for his forestry research. The key to explaining changes in land uses and land cover is changes in land rent of different uses (Angelsen, 2007; Hyde et al. 1996). Particularly, forest could be conserved when land use for forest can generate the maximum value compared to other possible land uses. On the other side, reforestation could be encouraged in a given land if its land use for being reforested can compete with other land uses.

In this study, Land Rent Theory examine marketing strategies used to sell the bee products, influencing of marketing strategies on forest conservation and impact of bee products marketing strategies on forest conservation. Thus, this theory guided the study in explaining the way the use of forest land as a land on which beekeeping activities are conducted can be easily protected and conserved as human generated income from there.

## 2.4 Empirical Literature Review

### 2.4.1 Bee Products and their Importance in Forest Management

The role of bees in agriculture, maintaining biodiversity, sustainable livelihoods and food security has been widely demonstrated. Nevertheless, the potential of beekeeping is very often not exploited in forestry activities and development programs, since the benefits of bees and beekeeping are obscure to stakeholders. Deforestation and forest fragmentation are two of the most widely recognized, vital factors responsible for the degradation of the environment globally (Lalika, 2008) in Tanzania. Available information on the composition of forests, especially in the natural-resource-dependent areas, indicates a gloomy trend. The continuing forest loss is an indication of the imbalance between human needs and wants and nature's capacity. Tanzanian country has potential and abundant areas for the development of beekeeping (URT, 2005).

Beekeeping preserves nature, agriculture, sustains livelihoods and provides food security. These important roles of beekeeping notwithstanding, the potentials of beekeeping are apparently not exploited in forestry activities. Bee products provide healthy, high-nutrient food, safe medicines (apitherapy) and raw material for industries. For example, honey is used in food processing industries as sweeteners or antioxidants and wax is utilized in batik making. Forests, being areas with no direct agricultural activity, provide a source of organic nectar. Without the pollinating activities of bees, over 100, 000 species of plants would have become extinct. *Pterocarpus angolensis*, *Dalbergia nitida* and *Bethalietia excelsa* (Brazil nut tree)

are examples of trees conserved through beekeeping. In the United Republic of Tanzania, bee forest reserves have been established with exclusive access for beekeepers (Agera, 2011).

Also, in Tanzania, woodland is conserved in Mpika and Samfya Districts primarily to train farmers in beekeeping technologies in order to generate income from sale of honey. The Gwalek Forest of Nepal covers an area of 2571 hectares and has diverse flora and fauna with a high potential for beekeeping. Within the Mau Forest in Kenya, the bee has established some symbiotic relationships that have maintained the health of the forests for centuries (Agera, 2011). Existence of high beekeeping potential is a function of the presence of virgin forests and a low human population density that provides an environment conducive for beekeeping. The development of beekeeping activities for income generation and forest management is handicapped by poor transport, infrastructure and marketing systems for bee products (Kihwele *et al.* 2001; Ngaga *et al.* 2005).

Improved marketing of bee products will enhance increased income and food security at household and national levels thereby achieving the national and UN development millennium goals of poverty alleviation and natural resource management (URT, 2005). Further, the importance of beekeeping as an income-generating activity pivots on the fact that many people use honey as food, medicine and for sale. Beekeeping offers a great potential for development and is comparatively less demanding in terms of investment, labor and time.

Beekeeping is advocated to improve human welfare by alleviating poverty through increased household income: it is a source of food and nutritional security, raw materials for various industries, medicine, increased government revenue through levies and taxes, improved biodiversity conservation and enhancing environmental resilience (Kihwele *et al.* 1999; MNRT, 2004). Beekeeping gives local people and the Government economic incentive for the retention of natural habitats, and is an ideal activity in any forest conservation programme (Mwakatobe, 2001; OkosoAmaa *et al.* 2004).

The Convention on Biological Diversity, adopted at the 1992 Earth Summit in Rio de Janeiro, was among the earliest international meetings to acknowledge the need to protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use. This has been re-emphasized in the past few years in various conservation forums. For this reason, there is also an increasing tendency towards conservation initiatives where both the local people and the government have a say. Non forestry sector employment including beekeeping has been an option to reduce local forestry decency thus to increase forest conservation. (Glaser *et al.* 2003; Ngece, 2003; Tinga, 2004).

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Although there are reports of beekeeping being used to improve the status of poor communities, none specifically targets beekeeping in order to conserve a forest. In Kenya, charcoal burning in Mwingi District was successfully reduced by introducing beekeeping as an alternative economic activity; as a result, incomes per household have increased up to 120% from their initial earnings from traditional beekeeping (Raina *et al.* 2009). It has become a good example for other areas, and a motivation for this present study. In endeavoring to promote beekeeping with the intention of encouraging forest conservation, research is necessary in order to ensure the community involved gets maximum benefit from their efforts. Earlier, a report by Latham (2002) gave a detailed description of locally available plants that could be maintained by beekeepers in Southern Tanzania in order to conserve natural flora in an area that is largely converted from woodlands to agriculture.

#### **2.4.2 Marketing Strategies of Bee Products**

Beekeepers, both new and experienced, have a focus on production. They concentrate on the production of bee products and relative high output of such bee products. High output means that they can sell more bee products and earn more

money. A production focus is good, but without selling bee products there would be little or no production. Selling bee products involves transaction that is the beekeeper will exchange, for example honey for money, with someone who is in need of the honey (Martin, 2005; Baker, 2005).

A market is where transactions take place it is where bee products are exchanged for money. It can be a location, for example a village market, a retailers shop, a roadside stall. In these markets it is where bee products are sold and consumers are able to choose and buy the bee products. In other words it is where “suppliers” (beekeepers, retailers and so on) meet “demanders” (consumers). Other markets are those, for example that occur when a beekeeper sells his or her bee products to processors or to a retailer. The supplier is the beekeeper and the demander is the processor or retailer. These demanders are normally referred to as a business consumer. Note that markets are found at every stage of the supply system. The supply system is the system that takes bee products from production to consumption (Martin, 2005).

In markets exchanges take place and bee products are exchanged for money. A beekeeper depends on money to be able to survive. A beekeeper has to offer a certain quantity of products to be able to make enough money to survive. But importantly what the beekeeper has to earn is profit. Profit is the difference between what the business had paid to make the bee product and make it available to the consumer, costs, and the price it receives for the bee products. Without making a profit, beekeepers will not generate enough money to be able to survive and continue in operation. Profit is the sum of money over and above the costs that the beekeeper has

paid to produce and sell the bee product. So a beekeeper needs to obtain a price for a product that is higher than his or her costs. (*ibid*).

Marketing can be defined as carrying out of all operations and tasks that enable a beekeeper to sell bee products. It involves all those operations including: choosing the products, starting production, managing production, harvesting, handling, sorting, packaging, storing, transporting, processing, financing, associations, deciding how to sell, where to sell and when to sell, costing the marketing operations and sustainability (Hekima, 2005).

In marketing, beekeepers have to understand a wide range of issues such as which markets to sell in, what transport to use, whether or not to put bee products in storage, what are consumer tastes, what prices can be expected etc. Clearly all these issues will require decisions to be made by the beekeeper. These decisions may be risky and may bring about great uncertainty. Typically a wrong decision can ensure that a bee business may have problems, such as not being able to sell bee products, lack of money etc. A manner of reducing such risk for beekeepers is ensuring that they understand marketing has the same importance as bee keeping itself: production of quality bee products will have little value if bee products are not marketed properly; good marketing will have little value if the production of bee products is of low quality

#### **2.4.3 Impact of Beekeeping on forest conservation**

The majority of population depend on forests and woodlands, they are often subjected to high pressure hence deforestation due to clearance for agriculture,

charcoal making, wildfires, overgrazing, persistent reliance on wood fuel for energy, lack of efficient production and marketing; overexploitation of wood resources; and poor land use plans and non-adherence to existing ones (URT, 2013). The forest and woodland resources thus need sustainable management for the benefit of the present and future generations.

Since the colonial era, forests and woodlands in Tanzania have been managed without full participation of the local communities and other relevant stakeholders living around the resources. The Tanzania Forest Policy of 1998 advocates for promoting the participation of communities in management of the forests and woodlands through the establishment of Village Land Forest Reserves (VLFRs) where the communities become both managers and owners of the resources (MNRT, 2009). The policy is enacted by the Forest Act of 2002, which provides the basis in law for communities to own, manage, or co-manage forests under a wide range of conditions and management arrangements. The Forest Act is notable in embracing the principle of subsidiarity, stating its aim as “to delegate responsibility for the management of forest resources to the lowest possible level of local management consistent with the furtherance of national policies” (URT, 2002).

Local communities, therefore, have an important role in improving forest condition and their participation can contribute significantly to effective management of these resources. Involvement of communities and other stakeholders in forest management in Tanzania through Participatory Forest Management (PFM) have been going on in many parts of the country and have generally made good progress in some places.

PFM was adopted by the Government in order to ensure sustainability of forest resources and generation of benefits to local communities (Monela *et al* 2000; Adams and Hutton, 2007). This was a significant step to increase attention to local communities' access rights and improvement of management of forest resources (Abdallah *et al* 2012).

All forest ecosystems contain indigenous species and races of bees, and some now contain introduced honeybee species. Not all indigenous bee species can be exploited by people for honey and wax, but in every forest ecosystem, there is usually one or more indigenous honeybee or stingless bee species that may be useful to man for honey production. In the past, honey hunting seems to have been practiced in forests everywhere, and the value of forests for humans has almost always included their contribution to honey production. Forest trees and other flowering plants provide food and habitat for bees, and by pollination, bees enable them to reproduce. In addition to pollen and nectar, bees also collect propolis, honeydew and water, and trees provide nesting places for the bees.

Today's overexploitation of tree resources has many consequences that are documented elsewhere, but has also led to decreased populations of honeybees. Loss of honeybee colonies not only deprives local people of sources of food and income, but there will be consequences from lack of pollination leading to reduced biodiversity. It is impossible to value the role of bees as pollinators of trees in natural ecosystems, and understanding of the pollination of economically important crops is only partially understood. Yet, most plants need an animal to visit their flowers in

order for them to produce fertilized seeds, fruit, and future generations of the plant. Around half of the animal pollinators of plants are bees.

An example, where lack of pollinators has come to light is in the Amazon, where the destruction by fires of the habitat of the bee pollinators of Brazil nuts (*Bertholletia excelsa*) is cited as one possible reason for the decline in Brazil nut production (Mori and Prance, 1990b). The detrimental consequence of habitat destruction, lack of pollinators, and subsequent loss of plant reproduction and habitat regeneration has been well described (Roubik, 1995). The Tanzania National Beekeeping Programme (2001-2010) reports that bees are disappearing from many areas in the country due to the decreasing of availability of bee fodder, caused by an increase in deforestation (MNRT, 2001).

In Africa, Asia, Central and South America it is often the most poor and most remote people, with few other livelihood options, who practice beekeeping. Many of these poorest people are living in areas that are rich in natural resources, such as tropical forests and woodlands, and beekeeping is a feasible way for them to create food and income using the natural resources around them. Beekeepers and honey hunters are sometimes perceived to cause damage to forests, through the careless use of fire during harvesting and because they kill trees to make beehives. Beekeepers in some parts of Africa make bark hives by peeling cylindrical sections of bark from mature trees, which then die. The Forest Department/IRDP Beekeeping Survey explored this issue in the Zambia's North West Province from 1987-1992 (Claus, 1992).

The three species most used for making bark hives, *Cryptosepalumexfoliatumpseudotaxus*, *Brachystegiaspiciformis* and *Julbernardiapaniculata* were also excellent nectar species. The researchers also estimated that 3.1 trees/km<sup>2</sup> were destroyed by beekeepers in the whole province but this figure was later challenged by the honey trading company NWBP who believed the Beekeeping Survey had overestimated the number of beekeepers and therefore the number of trees harvested (Muzama, 1996). Despite this discrepancy researchers argued that even if the higher figure was accurate this was still well within the forests capacity to regenerate sustainably.

Serious late season fires can cause considerable damage to forests and where these are caused by honey hunters or beekeepers, it is due to carelessness in the use of fire to create smoke during honey harvest, or from campfires, as honey hunters and beekeepers always camp in the forest while they are collecting honey. However the survey undertaken in Zambia's North West Province also showed that beekeepers were strong advocates for forest conservation, as they value dense woodland and are keen to avoid damaging late fires? Clauss (1992) noted, "Beekeepers are generally worried about late fires between August and October which widely scorch the flush and above all the flower of the most important nectar species like *Cryptosepalumexfoliatumpseudotaxus*, *Brachystegiaspp.* And *Copaifera*". Early burning is a conventional forestry management practice that is employed to prevent late season wild fires, and it is reported that beekeepers understand and are supportive of this practice.

The beekeepers of Zambia's North West Province have managed to achieve good market access for their bee products through the company NWP, and the prices they receive for their honey are enhanced because they have achieved organic certification. This adds further credence to the environmentally sound techniques of these beekeepers because Soil Association Organic certification inspectors deny organic certification to activities that cause forest destruction. Evidence suggests that the beekeepers that have a clear financial gain from protecting the habitat of the bees are interested in forest conservation. What is not documented is the extent to which other beekeepers throughout the world are interested in and invest in forest conservation (Oxfam, 1995).

Forest Departments in some countries have banned people from making local-style log or bark beehives, as they perceive this to be a cause of tree destruction. This is a short sighted move as with no alternatives, this can seriously reduce the level of beekeeping which affects people's livelihoods, may reduce the potential bee population and yet local-style beehives can remain in use and productive for many years. There is often little interaction between the forestry and beekeeping sectors (*ibid*).

Beekeepers rarely own the land and forests where their bees forage. This is typical because in some societies, ownership of land is only secured through clearing forest and using the land to cultivate crops. Beekeeping, whilst important for income generation, does not create sufficient wealth to buy land. Rather, beekeepers recognize the value of communally owned forests or open access woodland for

beekeeping and take advantage of these resources. They have a stake in the maintenance of these areas of forest. Honey hunters and beekeepers are often knowledgeable about which trees are valuable for bees. Sometimes they tell that the special taste of a honey is because it comes from the nectar of a particular tree species. In many countries of Africa and Asia, trees holding wild nests of bees are regarded as valuable, and beekeeper families often have traditional ownership of such trees, even though they have no ownership of surrounding land (*ibid*).

There are examples of beekeepers planting trees for bee forage, claiming usufruct ownership to individual trees that hold wild bee nests. Anecdotal evidence suggests that people who clear trees if they are being used to support beehives leave small clusters or strips of natural vegetation alone, and firewood and charcoal cutters may avoid areas where beehives have been sited because they are afraid of being stung. There are also examples of local-style hives acting as deterrents to elephants: on the Laikipia Plateau in Kenya, log hives were used to ‘mine’ a favourite elephant foraging area of fever tree *Acacia xanthophloearegrowth* (Vollrath, 2002).

The multipurpose value of trees and forests is increasingly well appreciated, and beekeeping provides one of the most benign ways of obtaining a harvest from natural forests. Apiculture’s unique feature as an activity is the fact that its continuation, through pollination, fosters the maintenance of an entire ecosystem, and not just a single crop or species. Beekeeping is practiced by a variety of different techniques that can be selected and adapted depending upon the situation of resource-poor farmers. Honey and beeswax are products that people can harvest which can be of world quality, and for which there are significant local and international markets. A

significant proportion of honey produced in Africa is used to make beer and is valued for its medicinal and cultural properties. Beekeeping should always be taken into account when the economic importance of trees and forests are being calculated (*ibid*).

The only route towards valuing forest beekeeping is to measure the income earned from the sales of bee products. The Tanzanian National Beekeeping Programme<sup>11</sup> describes beekeeping in Tanzania as a dynamic forest-based industry that is currently threatened by forest resource depletion but has the potential to earn foreign exchange. Table 6 shows the income earned over a 12-year period. The Tanzania National Beekeeping Programme explains that at prevailing costs and profit margins, an ordinary beekeeper keeping an average of 150 local-style beehives can earn more than US\$200 a year. This figure is comparable with income earned from beekeepers in Zambia (IFAD, 1997). Other site specific figures of income are available but these rarely incorporate the costs of production.

The forests of Inyonga area are some of the least disturbed, wild ecosystems in Africa. They are located between the protected areas of Katavi National Park, Rukwa-Lukwati Game Reserve and Ugalla Game Reserve. Beekeeping is traditionally practiced in the area. However, immigration and environmentally destructive activities are posing a threat to these valuable ecosystems. Those responsible for protecting the area were attempting to disallow beekeepers access to the protected area, which in the meantime was being expanded. The Association for the Development of Protected Areas (ADPA) stepped in to assist the Government of

Tanzania to tackle the problem and a multi stakeholder workshop was held to explore some opportunities for improvement (*ibid*).

A major outcome of the workshop was a much clearer appreciation that beekeeping is environmentally friendly and contributes directly to the effective protection of the whole ecosystem by ensuring the long-term protection of the forests, whilst generating income for local communities and it relies on local knowledge and skills. Given the existing links between the beekeepers and ‘Goldapis’, a Tanzanian company that is marketing bee products, beekeeping also offers a highly viable income stream to local people.

This consequently led to the creation of Bee Reserves within the forests that would be protected and managed by beekeepers for their purposes. This provides them with a strong incentive to maintain and manage these forests.

#### **2.4.4 Importance of Beekeeping in Tanzania**

Beekeeping in Tanzania participate the main position in socio-economic development and environmental conservation which include forest conservation. It is a foundation of food (e.g. honey, pollen, and brood), raw materials for numerous industries (e.g. beeswax candles, lubricants), medicine (honey, propolis, and bee wax and bee venom) and the basis of income for beekeepers (Monela *et al.* 2000). It is estimated that the division makes about US\$ 1.7 million each year from transactions of honey and beeswax and use about 2 million rural people. It is an important income generating activity with the high potential for improving incomes, especially for communities leaving nearby to forests and woodlands. Beekeeping also acts as a

major role in improving biodiversity and increasing crop production through pollination (Mwakatobe, 2001).

Beekeeping in Tanzania is carried out using traditional methods that account for 99% of the total production of honey and beeswax in the country. Fairly accurate 95% of all hives are habitual including log and bark hives. Others are reeds, gourds, pots to mention the few. For the duration of the colonial and early independence period, the making of bee products was higher than what we have now and was among the vital non-wood products from the forests with a higher involvement to the national GDP and international trade (Kihwele, 1991). Then again, today the industry has weakened in exports to an insignificant level despite its high potential. Tanzania (i.e. then Tanganyika) was an important basis of beeswax during the Germany colonial period (Ntenga, 1976). The production of beeswax from Tanzania increased from 320 to 905 tons from 1906 to 1952. Honey was estimated at an annual average production of 10,000 tons all utilized locally (Smith, 1958).

Following independence in 1961, a marketing organization of honey and beeswax was formed. According to Ntenga (1976), Tanzanian exports averaged 368 tons of beeswax and 467 tons of honey. During the 1996/97 period, the 2annual exports dropped to 359 tons of beeswax and 2.46 tons of honey (Tanzania Customs Department, 1997). According to Seegeren (1996), in 1984 world honey sell abroad totaled 270 000 tons of which 60% came from the tropics. Prices varied between US \$ 0.7 and 2.5 kg-1. Beeswax, which, among other things, is used in the manufacture of cosmetics, candles, foundation sheets for hives, medicines, and polishes, had a

good and very stable market. In 1990 world market prices varied between US\$ 2 and 3 kg-1. Beeswax production varies from 0.2 to 0.5 kilograms hive-1 year-1 when frames are used and 0.5 to 2 kilograms hive-1 year-1 when the honey is pushed and all combs are melted.

Bee products include; honey, beeswax, royal jelly, propolis and pollination services (URT, 1998a). It is essential earnings generating occupation with the high possibility for improving incomes, especially for communities exit nearby the forests and woodlands. In Miombo woodlands of Tanzania (Monela *et al.*, 2000) initiate that household derives more than 50% of their cash from advertising forest or non-wood products such as honey, wild fruits, charcoal, and firewood. Honey becomes visible to be the woodland formations with a very high major involvement in cash income in six villages of Tabora, Dodoma, Iringa, and Morogoro (Monela *et al.*, 2000). In Tanzania, traditional beekeeping is credited for almost all production of honey and beeswax (Mwakatobe, 2001).

Moreover playing wider domestic roles in the bees and bee-products industry in Tanzania, beekeeping is also a good source of foreign exchange earnings. The information currently available indicates that during the year 1996/1997, Tanzania exported 359 tons of beeswax and 2.46 tons of honey worth US\$ 1 019 020 and US\$ 2 058 respectively (BDP, 2005; Tanzania Customs Department, 1997). Numerous authors (Kihwele & Bradbear, 1989; TFAP, 1988; Mlay, 1997) have estimated that the production of bee products could increase by 50% if its potential could be optimally exploited.

The total of suitable beehives raised in Tabora, Handeni, Manyoni, Kondoa, and Kibondo due to Beekeeping Development Programme from an average of six per person in 1998/99 to 62 in the year 2004 (URT, 1998b). On the other hand, traditional beehives made from barks of trees decreased from an average of 200 per person in 1998/99 to two in 2003/04 (MNRT, 2001a). On average, honey production using suitable beehives increased from 174.5 kilograms in 1998/99 to 407 kilograms in 2003/04 per hive per year (MNRT, 2001a). This increased the average income per person from 180 000 TShs. in 2000 to 266 313 TShs. in 2004 (MNRT, 2001a).

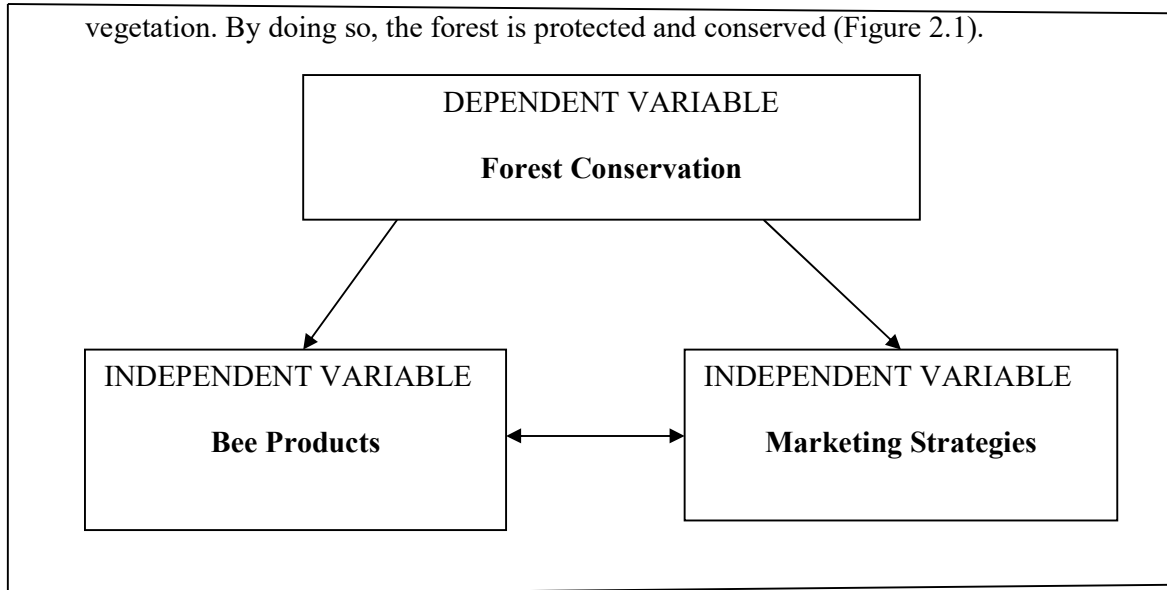
Between 1994/1995 and 2003/2004 a total of TShs. 26.1 billion was collected as revenue from forest products like wood fuels, bee products, catchments, and environmental values and other forest products. Others came from the following sub-sectors mainly Fisheries, wildlife, beekeeping, and tourism. The export of forestry products generated US\$ 52.3 billion (MNRT, 2004). There are other non-wood forest products of economic significance and with the potential for growth such as gums, resins, bark, tannin, aromatics, latex, natural dyes, fruits, nuts, fiber, spices, medicinal plants and bee products include honey, beeswax, royal jelly, propolis and pollination service (FAO, 1992). In 1988 honey exports earned US \$ 800 000 and wattle exports US \$ 4 million (URT, 1998a).

In 2005, the government continued to put into practice the National Forestry and Beekeeping programme by carrying out estimation in Tabora, Mtwara, Lindi, and Shinyanga regions. Also during that specific period, the government continued to support community contribution in forestry conservation and beekeeping in 13

villages around Angai forestry reserve in Arusha District as well as demarcating beekeeping areas in Uyui and Handeni Districts in Tabora and Tanga regions respectively. In 2005, a total of 141 267 000 trees were planted in all regions linked to 133 271 038 trees in 2004. The increase was due to the sensitization of trees planting and its importance (URT, 2005).

## 2.4 Conceptual Framework

Beekeeping practice is the activity that generating income as well as help in forest conservation. Marketing strategies are targeting to increase the quantity of bee products by increasing the farming scale and increase the quality of their products. By doing so, beekeepers tend to increase the number of trees, preventing bush fires and other harmful products in the forest as well as to increase different species of the vegetation. By doing so, the forest is protected and conserved (Figure 2.1).



**Figure 2.1: Impact of bee products marketing strategies on forest conservation**

**Source:** Modified from Agwanda and Amani (2014)

#### **2.4.1 Bee Products**

This is termed as independent variable that consists of honey, wax, pollen, propolis, loyal jelly and bee venom. The bee keepers are not able to produce pollen, propolis, loyal jelly and bee venom because they are lowly exploited (Mwakatobe, 2001).

#### **2.4.2 Marketing Strategies**

It is also an independent variable that comprises of increased the product added value, offer new products to the consumers; and direct contact and exchange of information with their consumers. The major market strategy is direct contact and exchange of information with their consumers but increased the product value and offer new products to the consumers are minimally acceptable and do not appear to be a friendly marketing strategies.

#### **2.4.3 Forest Conservation Measures**

These are regarded as dependent variables and primary drivers for the impact of bee products marketing strategies in rural areas. They consist of good forestry coverage, different species of vegetation, prevention of bush fire and other harmful activities; and presence of supporting agencies. These factors highly brought impact on forest conservation except different species of vegetation that has a minimal impact.

## **2.5 Research gap**

Studies from Tanzania that have been carried out by Kihwele, Ngaga *et al.* Mwakatobe; and Hekima on bee keeping have dealt with financing of bee keeping, importance of bee keeping, bee keeping technologies, infrastructures and bee keeping training. So far, there is little empirical evidence on the potential of beekeeping for income generation and forest management in most regions of the worlds. No one has highlighted the impact of marketing strategies used beekeeping on the forest conservation. Most of the available research material is in the form of scientific documents with little information in the direction of rural development or forest conservation. Thus, this study deals with impact of bee products marketing strategies on forest conservation particularly in rural areas in Tabora Municipality is geared to fill gap.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Overview**

This Chapter describes the research methodology that was used in the study. It describes the research design, area of the study, sampling techniques and sample size; data collection methods as well as data analysis techniques.

#### **3.2 Research Design**

This study employed descriptive approach to inquiry quantitative forms so that the overall strength of a study brought post-measurement of change. The aim of this research design is to obtain information from widely scattered respondents, which could be analyzed, patterns extracted from it and comparison of variables made (Bell, 1993).

#### **3.3 Study Site Description**

The study was conducted in Igombe Dam Forest Reserve in Tabora Municipality in Tanzania. Tabora is a regional hub in Western Tanzania located on the crossroad of the main railway lines connecting Dar es Salaam on the coast with Lake Tanganyika and Lake Victoria in the interior.

Tabora is an important transportation, industrial, commercial and educational hub for western parts of Tanzania. Igombe dam forest reserve is the forest preserved by TFS

in Tabora region. In this forest different local people conduct the beekeeping activities. Apart from that, Igombe dam forest reserve is used to produce different bee products to be sold. The bee products from the beekeeping conducted in this area are sold within the surrounding areas.

### **3.4 Target Population**

The targeted population for this study is the beekeepers conducting their activities in Igombe Dam Forest Reserve. Specifically, the study target producers, workers, and consumers from the study area. However, the study targeted the key informants who were the forest officers' in Igombe Dam Forest Reserve. The study also considered other people who involved in beekeeping production and forest protection in order to get reliable information.

### **3.5 Sampling Techniques and Sample Size**

This study combined both purposive and random sampling as the techniques of getting samples for the study. Purposive sampling was used in identifying leaders of Igombe Dam Forest Reserve, producers and key informant from TFS in the study area. The leaders and producers helped in providing the information concerning bee keeping production, marketing strategies used in selling bee products and the status of the forest in the study area. The key informants helped in gaining information about the impact of beekeeping on forest conservation and in interpretation of the study results. Random sampling was used to get sample from consumers of bee products in the area. Thirty three (33) consumers were randomly selected.

### **3.6 Sources of Data**

Data were obtained from both primary and secondary data. Primary data was obtained from questionnaires, interview with beekeepers and key informant. Primary data also were obtained from direct observation on the field in the study area. Secondary data were be obtained from books, official documents, journals, beekeeping policy of Tanzania and other publications that are relevant to this study.

### **3.7 Data Collection Methods**

Different methods and instruments were used in the collection of data. These include administration of questionnaire, interview, observation and documentary literature review. Digital camera also was used to capture some pictures during the observation. In order to accomplish this objective of the study, this was to examine bee keeping activities in the study area. The data for this objective was collected through questionnaire survey, oral interview and direct field observation. Oral interviews were involve the set of questions which were guided the respondents who were living around the study area for many years, after getting support from the local people to know them and leaders in the local government office concerned the period of bee keeping activities. These people were explained the situation before and after opening of quarries in the study area. Also, the direct field observation trip was first organized to the study area in order to interact with respondents and the local government officer to have a fair knowledge of the problem relating to the bee keeping activities such as bee keeping involvement, practice of bee keeping, respondents' consideration on their bee keeping and the number of bee hives possessed by individuals or groups. Also, for the reason to achieve this objective of

the study, which was assessing the bee products found in the study area. The data for this study was collected through Questionnaires Survey, Oral Interviews and Field Observation. The questionnaire surveys for the households' members were used open and close ended questions. The questionnaires were administered to the household respondents to get their views and perception on the assessing the bee products found in the study area. These questionnaires were based on how the bee products produced by the respondents in the study area. The interview was used to collect data of the objective through interviewing the respondents which included honey and bee wax. Also, the interview was helped the researcher to collect data from the key informants in order to supplement those data collected from the households. Meanwhile, the field observation was organized to the study area in order to give the researcher overview of the current situation condition of the study area concerned the bee products produced by the respondents. Finally, the point of achieving this objective of the study which was focused on assessing Marketing Strategies supporting Forest Conservation in the study area. The data for this study was collected through questionnaires survey and oral interview. The questionnaires were survey for the households' members was used open and closed ended questions. The questionnaires were directed to the households' respondents to get their inspections and awareness on the Marketing Strategies supporting Forest Conservation on selling the Bee Products like an increased in the added value, offer new products to the consumers and direct contact and exchange of the information with their consumers; also, there was the influencing of Marketing Strategies on Forest Conservation in the study area particularly pollination of bees among the forest tree, Afforestation, forest

protection and reduction of forest dependence and finally, there was assessment of impact of Marketing Strategies on Forest Conservation in the stud area which was good forest coverage, different species of vegetation, prevention of bush fires and other harmful activities and presence of supporting agency in the study area.

### **3.8 Data Analysis Methods**

Quantitative data analysis was done from individual responses that were randomly sorted in order to develop an objective knowledge that aimed at generalizing of both independent and dependent variables. The nature of data was replicated and grouped coherently with the research objectives and research questions were structured. The data collected was summarized by using frequency tables, pie charts and bar graphs for easy management and interpretation. In this study quantitative approach was used in statistical data analysis.

#### **3.8.1 Identification of Bee Products**

Statistical analysis method was employed to summarize the information obtained from producers and Igombe dam forest reserve leaders' interviews and this helped in description of marketing strategies on the area conservation.

#### **3.8.2 Marketing Strategies of Bee keeping**

Quantitative data obtained from producers and key informants' interviews was analyzed by using descriptive method.

#### **3.8.3 Impact of Marketing Strategies of Bee Products on Forest Conservation**

Statistical analysis conducted basing on the data from primary and secondary sources. Responses from the questionnaires were coded, summarized and analyzed

using the IBM Statistical Package for Social Sciences (SPSS) version 21.0. The analysis involved computation of frequencies (numbers and percentages) of the distributions. It was also used to obtain descriptive statistics to draw a conclusion for the study. The research findings were organized and accessible in the form of words and numbers by using frequency tables, histogram, charts, and simple percentage method.

### **3.9 Validity and Reliability**

The study used data collections instruments including questionnaires, interviews, and observations in order to ensure effective data collection and the validity of the data. The use of quantitative approach helped to demonstrate validity and open up new perspectives about the topic under investigation. The obtained data was also compared to similar data available to ensure reliability.

### **3.10 Ethical Considerations**

In this study, the researcher ensured that there was confidentiality of the data provided by the respondents. The researcher also ensured the anonymity of the participant's identities. In addition, given that this study is sensitive by touching the impacts of bee products marketing strategies on forest conservation area as well as feelings of the respondents, confidentiality was considered. First, interview with the key informants was conducted in the conducive place at Igombe Dam Forest Reserve and TFSA and working place of business people, second; the respondents were well informed on the purpose of the research that is for acquiring an academic master degree and also to inform policymakers to make the intervention where it is

necessary for assessing the impacts of bee products marketing strategies on forest conservation at large.

## **CHAPTER FOUR**

### **RESEARCH FINDINGS AND RESULTS**

#### **4.1 Overview**

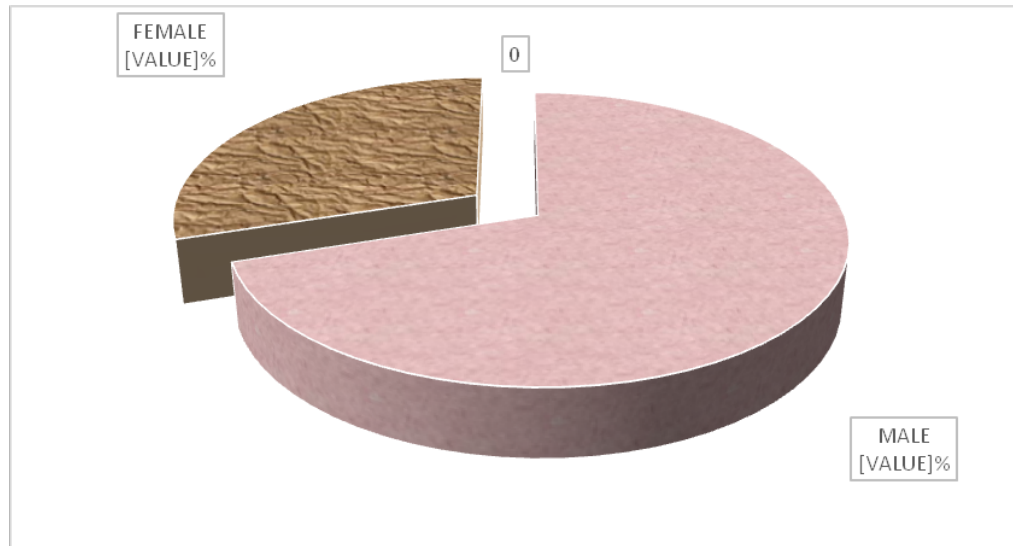
It was the intention of this study to apply Forest Transition Theory to predict the impact of bee products marketing strategies on forest conservation. However, the study intended to apply Conservation of Resources Theory and Land Rent Theory that were set to identify bee products and investigate the behavior of the respondents as tied to a series of questions related to their respective objectives.

#### **4.2 Demographic Characteristics**

In this study the demographic characteristics of respondents that were considered involved gender, age, marital status and education level. These variables were important to this research as they provided the basis for comparison with other variables studied in this research about bee products marketing strategies on forest conservation.

##### **4.2.1 Gender of the Respondents**

The results in Figure 4.1 show that men have a higher representation than women, where among all people involved in bee keeping at the study area 70% were males while 30% were females. However, it indicated that most of households in which respondents were drawn were dominated by men as opposed to women, since households were taken as respondents.



**Figure 4.1: Gender of the Respondents**

#### 4.2.2 Age of the Respondents

The majority of the respondents were at the middle age group between 40-50 years (36.4%) followed by a group of mature and presumed productive age between 29-39 years (33.3%). However, the minorities of respondents were young, energetic and productive persons aged between 18-28 years and the elderly persons aged 50+ years who occupied 15.2% each.

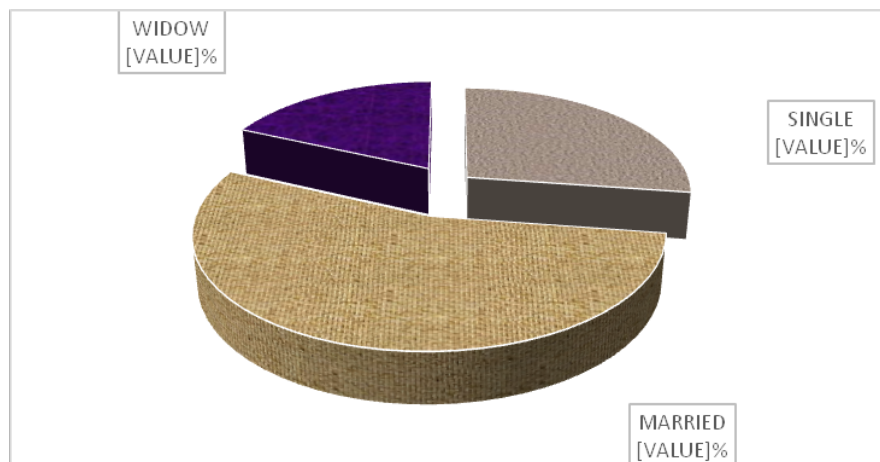
**Table 4.1: Age of the Respondents**

Age group	Respondents	Percent
18-28 years	5	15.2
29-39 years	11	33.3
40-50 years	12	36.3

50+ years	5	15.2
Total	33	100.0

#### 4.2.3 Marital Status

The results of this study showed that the majority [54.5%] of the respondents were married while the unmarried (single) were 27.3% and widowed who were the minority comprised 18.2% as presented in Figure 4.2.

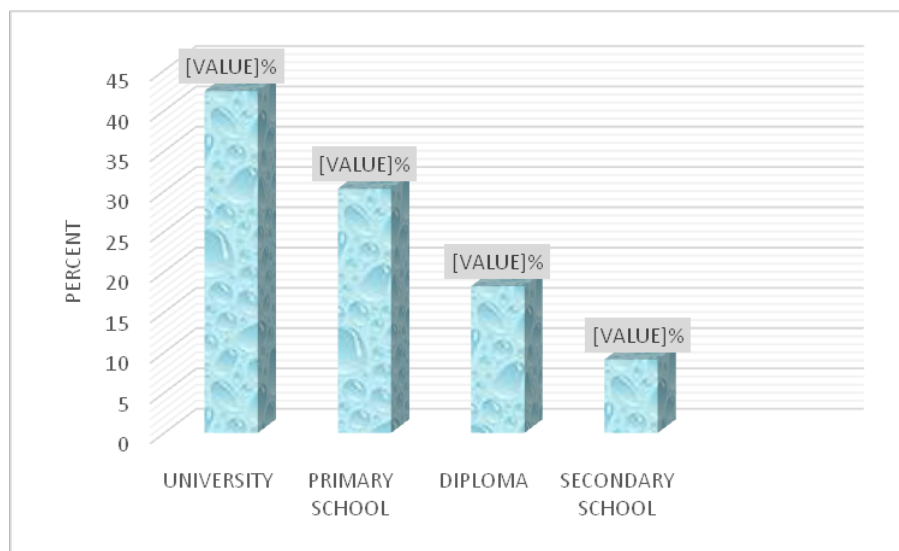


**Figure 4.2: Marital Status of the Respondents**

#### 4.2.4 Education Level

The results show that the majority of the respondents were educated up to the university level (42.4%), followed by primary school level (30.3%). Meanwhile, 18.2% attended diploma courses and the minority of the respondents were those who were educated up to secondary school level (9.1%). As it is illustrated in Figure 4.3,

level of education plays a major role in development of any society economically, socially, culturally and politically. Proper education on bee products marketing strategies influences forest conservation. Since the majority of the respondents' education ranges from diploma to the university, it can also bring an impact of bee products marketing strategies on forest conservation



**Figure 4.3: Education Level of the Respondents**

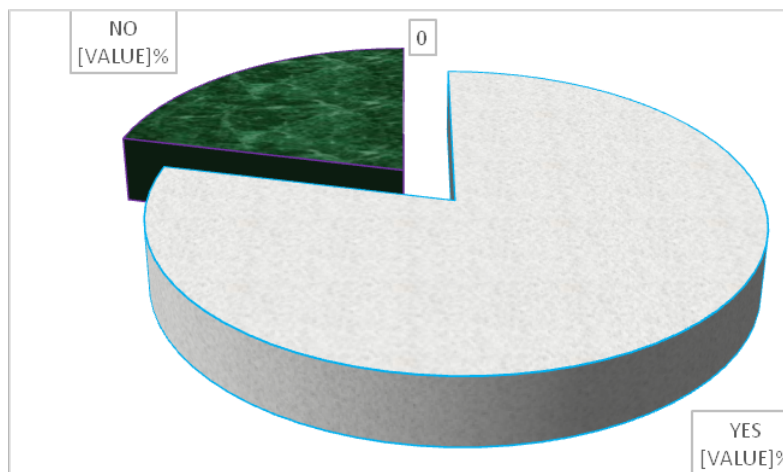
### 4.3 Bee keeping Activities in the Study Area

The study intended to identify bee keeping activities existing in Tabora Municipal Council. *Conservation of bees and forest Resources* were consecutively identified in various ways. These include bee keeping, practice on bee keeping and period for bee keeping. Others are the respondents' consideration on bee keeping and bee products

produced by the respondents. The results' scenarios were illustrated under numerous phenomena.

#### 4.3.1 Bee keeping involvement

The respondents were asked if they were involving in bee keeping at Igombe Dam Forest Reserve. As it is observed in Figure 4.4 the majority said yes by 78.8% while the minority of the respondents said no by 21.2%. This can be regarded and seen that most of the respondents have a behavior of bee keeping for their personal strength and social bonds. They are also capable of meeting the financial and social stressful challenges in their area of vicinity.



**Figure 4.4 Summary of Bee keeping involvement**

#### 4.3.2 Practice of Bee Keeping

From Table 4.2 the respondents were asked if they practice bee keeping as individuals or in groups. The results showed that the majority of the respondents practice bee keeping as individuals (75.8%) while the minorities do it in groups

(24.2%). This can be seen and indicated that the majority of the respondents have a behavior of conserving bee resource for their survival.

**Table 4.2 Practice on Bee Keeping**

Practice	Respondents	Percent
Individual	25	75.8
Group	8	24.2
Total	33	100.0

#### **4.3.3 Period for Bee Keeping**

The respondents were asked to name the periods they have been keeping bees. As it is revealed on Table 4.3, the respondents showed that the majority of them had been keeping bees for more than three years (39.4%). These were followed by the minority, both one to three years and less than one year who occupied 30.3% each. From these results it implied that most of the respondents in the study area adequately motivated and need to acquire and conserve bee resource for their survival.

**Table 4.3: Percentage Distribution of Period for Bee Keeping**

Period Of Bee Keeping	Respondents	Percent
Less than one year	10	30.3
One to three years	10	30.3

Above three years	13	39.4
Total	33	100.0

#### 4.3.4 Number of Bee hives possessed by Individuals or Groups

The question asked intended to identify the number of bee hives possessed by either individuals or groups in the study area. The results from the respondents showed that the majority of the respondents have 6-10 bee hives (33.3%) followed by respondents with more than 20 bee hives (27.3%). Other respondents have 1-5 bee hives (21.2%) while the minority have 11-20 bee hives (18.2%) as shown on Table 4.4. this can be shown that the respondents in the study area are not only responding to stress, but also build a reservoir of sustaining bee resource for the future need.

**Table 4.4 Percentage Distribution of Number of Bee hives**

Number of Bee Hives	Respondents	Percent
1-5	7	21.2
6-10	11	33.3
11-20	6	18.2
Above 20	9	27.3
Total	33	100.0

The study observed bee hives that are more than twenty as it is shown on Plate 4.1. These bee hives increases the production of bee products. They are recommended for production.

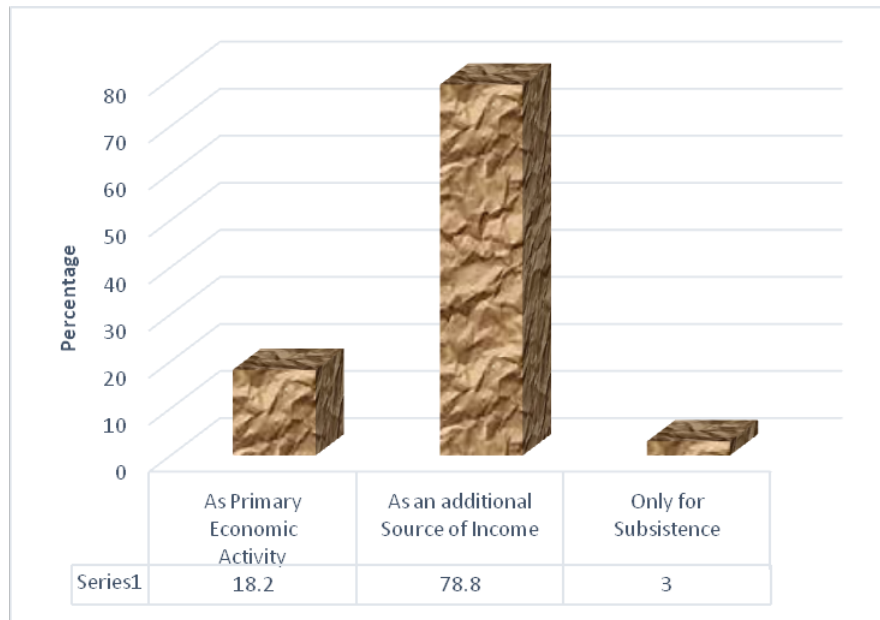


**Plate 4.1: Bee hives as observed in Igombe Dam Forest Reserve**

#### **4.3.5 Respondents' Consideration on their Bee Keeping**

The question requested expected to examine the respondents' consideration on their bee keeping and see if it was for primary economic activity, additional source of income and subsistence. The results from the respondents showed that the majority of the respondents consider bee keeping as an additional source of income by 78.8% followed by 18.2% of the respondents who considered bee keeping as their primary economic activity throughout their life and the minority of them consider it only for subsistence by 3% as shown in Figure 4.5. From these results it implied that the rising demand and price of both forest reserve and bee resources incentivized people in the study area to conserve and restored their natural resources. However, it is

confirmed that people in the study area valued and conserved more forest resource as the bee keeping activities conducted in the forest generates income to them.



**Figure 4.5: Summary of Respondents' consideration on their Bee keeping**

#### **4.4 Bee Products produced by the Respondents**

This study desired to assess bee products found in the study area. From Table 4.5 the respondents were asked to name the products produced by the respondents. The results showed that the majority said yes to honey by 82% while the minority said no by 18%. On bee wax the minority said yes (18%) while the majority said no by 82%. The majority of the respondents rejected by saying no to the rest of the products such as pollen, propolis, royal jelly and bee venom by 100% each. This indicates that the major bee product at the study area is honey followed by bee wax while other bee products are not produced in the study area.

**Table 4.5 Percentage Distribution of Bee Products produced by the Respondents**

<b>Bee Products produced by the Respondents</b>						
	Honey	Bee wax	Pollen	Propolis	Royal jelly	Bee venom
YES	82.0	18.0	0.0	0.0	0.0	0.0
NO	18.0	82.0	100.0	100.0	100.0	100.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

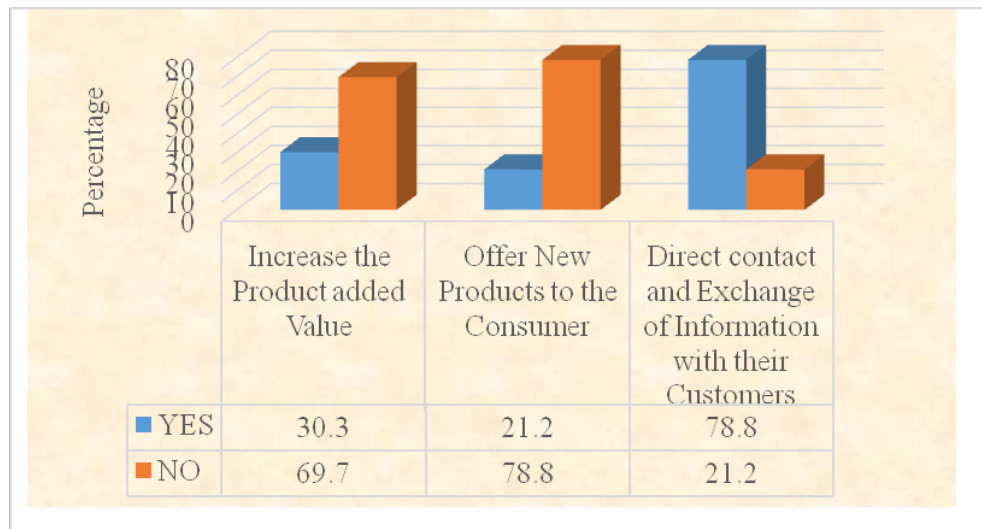
#### **4.5 Marketing Strategies supporting Forest Conservation**

To assess marketing strategies supporting forest conservation in Tabora Municipal Council was also among the specific objectives of this study. The study aimed to assess marketing strategies used to sell the bee products; and it targeted to assess marketing strategies used to sell the bee products, the influence of marketing strategies on forest in the study area and impact of marketing strategies on forest conservation. The following are the outcome and what were revealed from the respondents.

##### **4.5.1: Marketing Strategies used to sell the Bee Products**

The study planned to assess the marketing strategies such as an increase in the product added value, offer new products to the consumers; and direct contact and exchange of information with their consumers. As discovered in Figure 4.6, the outcomes display that the minority of the respondents said yes to the increase the product added value by 30.3% though the majority of them rejected by saying no

(69.7%). This indicates that the majority of the respondents do not use increase the product added value as a strategy to sell the bee products. Nonetheless, the minority of the respondents said yes to the strategy that offers new products to the consumers to sell bee products (21.2%) whereas the majority said no (78.8%). This proposes that most of the households rejected the market strategy that offer new products to the consumers to sell bee product compared to a very few who accepted. Finally, the majority of the respondents said yes for direct contact and exchange of information with their customers marketing strategy to sell the bee products by 78.8% even though the minority said no (21.2%). This can be inferred that the percentage of the respondents who agreed is greater than those who disagreed at a very larger difference. Also, most of the households use direct contact and exchange of information with their customers marketing strategy to sell the bee products.



**Figure 4.6: Summary of Marketing Strategies supporting Forest Conservation**

#### 4.5.2: Influence of Marketing Strategies on Forest Conservation

The study sought to find out the influence of marketing strategies on forest in the study area particularly pollination of bees among forest trees, Afforestation, forest protection; and reduction of forest dependence as it is shown on Table 4.5. The findings revealed that 21.2% of the respondents said yes while 78.8% said no for pollination of bees among forest trees. Meanwhile, 36.4% said yes and 63.6% said no for Afforestation. Further, 84.8% said yes and 15.2% said no to forest protection. Finally, 66.7% of the respondents said yes while 33.3% said no for reduction of forest dependence as shown on Table 4.5. From these results it can be inferred that the majority of respondents did not accept that marketing strategies influences pollination of bees among forest trees; and Afforestation in the study area. Nevertheless, the majority of the respondents accepted that marketing strategies influence forest protection; and reduction of forest dependence.

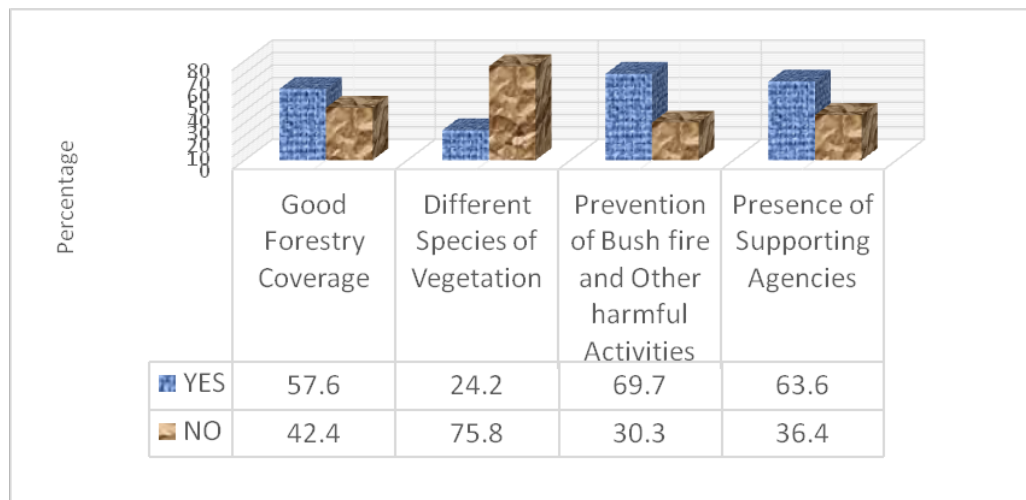
**Table 4.6: Percentage distribution of Influence of Market Strategies on Forest Conservation**

<b>Influence of Market Strategies on Forest Conservation in the Area</b>				
	Pollination of Bees among Forest Trees	Afforestation	Forest Protection	Reduction of Forest Dependence
YES	21.2	36.4	84.8	66.7
NO	78.8	63.6	15.2	33.3
Total	100.0	100.0	100.0	100.0

#### 4.5.3: Impact of Marketing Strategies on Forest Conservation

This study wanted to assess the impact of marketing strategies on forest conservation in Tabora Municipal Council. The impacts were outcomes implemented in the respondents' society through practice and sensation. They were based on good forestry coverage, different species of vegetation, prevention of bush fire and other harmful activities; and presence of supporting agencies. *Conservation of Resources* methods how people value and conserve more forest resources. However, it deals with the extent to which the respondents' capabilities to accept the suggested impacts of bee products marketing strategies on forest conservation for improvement. The respondents replied by indicating on yes at the statements they approved on and no for disagreed statements. Figure 4.7 illustrates this scenario and the results obtained from the respondents shows that 57.6% said yes and 42.4% said no for good forestry coverage. This implies that the majority of the respondents agreed while a very few of the respondents disagreed on the increasing of forest cover change. For the different species of vegetation impact, the results showed that 24.2% said yes and 75.8% said no. This suggests that a very few of the respondents are aware on the occurrence of different species of vegetation whereas most of them are not aware. Most of them are also not aware of the increasing of vegetation species. However, the results show that 69.7% of the respondents said yes although 30.3% said no for prevention of bush fire and other harmful activities. This implies that the majority of the respondents have push agricultural activities limited in most suitable area and then reforestation have more land to take place hence both Afforestation and reforestation have brought to the increase of forest conservation. Moreover, a very

few of the respondents are concentrating in agricultural activities in marginal lands through conducting bush fire and other harmful activities. Furthermore, the results on presence of supporting agencies shows that 63.6% of the respondents agreed but 36.4% refused. Therefore, the result denotes that the majority of the respondents are aware of the presence and work done by supporting agencies while the minorities are not aware. Generally, bee product marketing strategies such as good forest coverage, prevention of bush fire and other harmful activities; and presence of supporting agencies have positive impact on forest conservation while different species of vegetation strategy is not as the illustration is shown on Figure 4.7.



**Figure 4.7: Summary of Impact of Marketing Strategies on Forest Conservation**

#### 4.6 Summary

The present chapter has dealt with the study findings and results. This chapter particularly dwelt on descriptive analysis of sample characteristics as well as the

quantitative of the study variables. The data presentation and analysis focused on testing the three research questions to achieve the desired objectives of the study. The qualitative analysis was used to examine the relationship of the interested variables.

## **CHAPTER FIVE**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Overview**

This chapter presents conclusions of the study findings and results presented in chapter four. Finally, the chapter presents recommendations for administrative actions and recommendations for further study.

#### **5.2 Conclusions**

The findings of the study revealed that bee products marketing strategies have brought impact of forest conservation in Tanzania. The evidence showed that rural population growth has led to poor bee products because it does not match with the existed advanced development.

The first objective of this study identified bee keeping activities existing in Tabora Municipal Council. The study concluded that the majority of the population are involved in bee keeping and they are regarded this economic activity as an additional source of income. However, the majority of the rural inhabitants of Tabora Municipal Council are mainly practice bee keeping individually for more than three years while they are mostly possessing 6-10 bee hives.

The basis of objective two was to determine the bee products existing in Tabora Municipal Council. The study has shown that bee products existed in Igombe Dam

Forest Reserve in Tabora Municipality were mainly honey and bee wax. The rural dwellers of Tabora Municipal Council do not produce pollen, propolis, royal jelly and bee venom because of insufficient marketing strategies on forest conservation. From these findings it can be concluded that the majority of bee products are not produced to meet bee products marketing strategies.

The final objective of this study was to assess marketing strategies supporting forest conservation in Tabora Municipal Council. The study assessed increase the product added value, offer new products to the consumers (production diversification); and direct contact and exchange of information with their customers as marketing strategies used to sell bee products. The findings from this study indicated that direct contact and exchange of information with their customers was actively involved in marketing strategies in Tabora Municipal Council. The rest of the determined strategies including increase the product added value; and offer new products to the consumers (production diversification) were poorly involved. The study concluded that increase the product added value; and offer new products to the consumers are marketing strategies that have a great role to play on selling bee products because they are very important strategies. Another aspect that was assessed in this objective was the influence of marketing strategies on forest conservation. This involved pollination of bees among the forest trees, Afforestation, forest protection; and reduction of forest dependence. The findings from this study indicated that pollination of bees among the forest trees and Afforestation were poorly influencing forest conservation. In another hand forest protection; and reduction of forest dependence were actively influencing forest conservation. The study concluded that

pollination of bees among forest trees and Afforestation has a great role to play on forest conservation.

Conversely, the study assessed impact of marketing strategies on forest conservation. These impact were good forestry coverage, different species of vegetation; prevention of bush fire and harmful activities; and presence of supporting agencies. The findings revealed that marketing strategies have a minimal impact on different species of vegetation. On the supplementary hand good forestry coverage; prevention of bush fire and harmful activities; and presence of supporting agencies have impact on forest conservation at a large scale. Consequently, the study can generally be concluded that at a very large extent there is positive impact of marketing strategies on forest conservation in Tabora Municipal Council.

### **5.3 Recommendations**

The following recommendations were drawn on the basis of this study.

**5.3.1** Provision of education. Since education is a contemporary and socialize tool which improve raising awareness, exchange of information and communication, it should be provided to the bee keepers in order to increase bee products. Nevertheless, education provided should raise awareness on increasing number of bee hives in order to increase bee production.

**5.3.2** Implementation of government laws, bylaws, regulations and policies related to bee products marketing strategies on forest conservation. It should involve increase the product added value; and it should offer new products to the consumers (production diversification).

**5.3.3** Tanzania Forest Service Agency should provide education; community involvement and capacity building in order to enable people implement their roles on bee production. It should also increase awareness to people so as to keep bees in areas where pollination of trees among forest trees can take place easily and where Afforestation was done.

**5.3.4** Policy makers and planners should consider the immediate adoption of proper planning and management in order to increase efficiency and effectiveness in bee products marketing strategies on forest conservation.

#### **5.4 Recommendations for Further Research**

This study dealt only with impact of bee products marketing strategies on forest conservation in Tabora Municipal Council. It is suggested that, further research should be done to assess socio-economic impact of bee products on forest conservation or other related aspects on bee keeping.

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## APPENDICES

### Appendix 1: Questionnaire for random respondents

#### Introduction

I, MazengoMagreth a student of Open University of Tanzania carrying out research on *“The impact of bee product marketing strategies on forest conservation at Igombe forest reserve in Tabora region, Tanzania”*. I kindly request your participation in this study and give your opinion. Provide clear and appropriate answer in the space provided. The information obtained will be treated with high confidentiality and will be used only for academic purposes.

#### Section A. General Information

##### 1. Gender

- a. Male
- b. Female

##### 2. Age

- a. 18-28
- b. 29-39
- c. 40-50
- d. 50+

3. Marital status: Single [    ]    Married [    ]    Widow [    ]    Separated [    ]  
Divorced [    ]

##### iv. Level of education

University level [    ]    Primary level [    ]

Diploma level [ ] Non-Formal education [ ]

Secondary level [ ]

**A. Information on Bee products**

v. Are you a bee keeper?

a. Yes [ ]

b. No [ ]

vi. Do you practice bee keeping as an individual or in a group?

a. Individual

b. Group

7. For how long have you been a bee keeper?

a. Less than one year

b. One to three years

c. Above three years

8. How many bee hives you possess as an individual or group?

a. 1-5 bee hives

b. 6-10 bee hives

c. 11-20 bee hives

d. Above 20 bee hives

9. How do you consider your bee keeping

a. As my primary economic activity

b. As an additional source of income

c. Only for subsistence

10. What are the bee products do you produce?

- a. Honey
- b. Bee wax
- c. Pollen
- d. Propolis
- e. Royal jelly
- f. Bee venom

**Section B: Information about bee products marketing strategies**

11. Which marketing strategies do you use to sell the bee products?

- a. Increase the product added value
- b. Offer new products to the consumers (production diversification)
- c. Direct contact and exchange of information with their customers

12. How do the market strategies influence forest in the area?

- a. Pollination of bees among forest trees
- b. Afforestation
- c. Forest protection
- d. Reduction of forest dependence

**Section C: Information about the Impact of Bee products marketing strategies on forest conservation**

13. What it is the impact of bee products marketing strategies on forest conservation?

- a. Good forestry coverage
- b. Different species of Vegetation
- c. Prevention of bush fire and other harmful activities
- d. Presence of supporting agencies

**THANK YOU FOR YOUR CO OPERATION**