ANALYSIS OF FACTORS AFFECTING MARKETING OF HONEY IN TABORA AND DAR-ES-SALAAM REGIONS

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BY

GLADNESS ALLAN MKAMBA

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ABSTRACT

The main objective of the study was to analyse factors affecting marketing of honey in order to identify interventions which can promote its production and trade. Results obtained indicated that, in Dar-es-salaam city, factors affecting sales include quality, colour, availability and originality of honey, packaging facilities and seasonal changes. Similarly, these factors affect the external markets. Also consumers' income affects the sales of honey. High Hydroxymethylfurfuraldehyde (HMF) and water insoluble solids beyond tolerant limit for table honey were found in most of the honey samples, and aldrin in one sample. Poor harvesting, processing, storage and transportation were reported as sources of contamination, caused by lack of knowledge on honey quality standard, inadequate laboratory facilities for honey and inefficient marketing information system. There is a correlation between margins and selling prices which means that price changes are not being passed on to subsequent marketing channel levels; producers found to get the highest share of consumer price in the marketing channel. It has been concluded that consumers' preferences, education level for both trader and consumer, income of the consumer, quality and natural state of honey have effect on sale of honey. HMF and water insoluble solids in honey are major problems facing both traders and producers in meeting National and International standards. Inefficient marketing information system led to wrong information on the price and standard of honey by beekeepers. Marketing of honey was responding well, however retailers earning was not reflecting marketing costs, meaning that the price rises artificially. To improve the marketing of honey, beekeepers and traders have to learn market behaviour and consumer preferences. There is a need for training and capacity building for beekeepers, traders and

extension personnel; to disseminate educational materials and information on quality standards and price; make possible for beekeepers to access appropriate tools and equipment. To set grade standards and establish quality controls programs for inspection and law enforcement; facilitate promotion of Tanzanian honey, by supporting honey traders in organizing or attending National and International honey shows; to carry out market survey /research and honey quality analysis.

DECLARATION

I, Gladness Allan Mkamba, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my original work and has not been submitted for a higher degree in any other University.

Signature:.....

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DEDICATION

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ABBREVIATIONS AND ACRONYMS

CPI	Centre for Promotion of Imports
EU	European Union
FAO	Food and Agriculture Organization.
FDA	Food and Drug Administration
GCLA	Government Chemistry Laboratory Agency
HACCP	Hazard Analysis Critical Control Point
HMF	Hydroxylmethylfurfuraldehyde
IBRA	International Bee Research Association
ICRAF	International Centre for Research in Agroforestry
ILRI	International Livestock Research Institute
JFM	Joint Forest Management
Km^2	Square kilometer
MNRT	Ministry of Natural Resources and Tourism
NBKP	National Beekeeping Programme
NBP	National Beekeeping Policy
NGO	Non-governmental Organization
NSGPR	National Strategy for Growth and Poverty Reduction
NWRC	Njiro Wildlife Research Centre
PI	Progressive Intervention
PSRP	Poverty Reduction Strategy Paper
RBO	Regional Beekeeping Officer
TAS	Tanzania Assistance Strategy

TAZARA	Tanzania Zambia Railway Authority
TBS	Tanzania Bureau of Standards
TCCIA	Tanzania Chamber of Commerce and Agriculture
TShs	Tanzanian Shillings
SIDP	Sustainable Industrial Development Policy
SME	Small and Medium Enterprise
SUA	Sokoine University of Agriculture
VAT	Value Added Tax
URT	United Republic of Tanzania
USD	United States Dollar
USDA	United State Department of Agriculture

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Beekeeping is one of the universal agricultural endeavours. Bees are found on all continents, outside of Antarctica. Bees play a dual agricultural role by both producing honey and aiding in the pollination of flowering crops. Although much work and study has focused on improving the practice of beekeeping, or apiculture, it is still possible and prevalent to manage beehives at a very low level of technological and capital input. Bees cosmopolitan distribution, multipurpose nature and relative simplicity in management combine to make them a natural agricultural supplement for many types of farm system in developing countries (Keinath, *et al.*, 2000).

Beekeeping offers great potential for development and is comparatively less demanding in terms of investment, labour and time (Apiconsult, 2003). Expected output and results from beekeeping include increased household income; improved nutritional security; poverty alleviation; employment opportunities; increased raw material for processing food industries; increased government revenues through levies and taxes; improved biodiversity and enhanced environmental resilience. Beekeeping gives local people and government machinery an economic incentive for the retention of natural habitats such as forests, and is therefore an ideal activity in any forest conservation programme.

According to Sanford (1988), the world's honey production is about one million tonnes a year and is increasing and that there is a vast potential for beekeeping development in the tropics and subtropics. For example in China the number of bee

colonies can be increased from the present 6.7 million producing 155,000 tonnes of honey yearly to 20 million colonies and to increase annual production to 400,000 tonnes of honey (Sanford, 1988). This implies that in most beekeeping countries honey production is still below its potential level, and as world beekeeping expands there is a concomitant opportunity for significantly increasing production of bee products (Sanford, 1988).

Tanzania is endowed with favourable environment for the production of honey, beeswax and other bee products. The Miombo and Acacia woodlands, which are found throughout the country, are ideal for developing a bee-keeping industry. Over 95% of beekeeping is practised in Savannah Forests "Miombo Woodlands" (MNRT, 2001a), including the highest producing districts of Sikonge, Urambo and Tabora rural, all in Tabora region, and Mpanda in Rukwa region. Manyoni and Lindi are among the most potential honey producing districts which are not yet exploited (Table 1).

Table 1: Honey production potentials and actual production in selected districts in Tanzania

High producing area			Medium producing area			Un-exploited areas		
District	Potential (Tons)	Actual (tons)	District	Potential (tons)	Actual (tons)	District	Potential (tons)	Actual (tons)
Kahama	4 000	500	Kondoa	3 000	300	Lindi	8 000	50
Mpanda	8 000	1 500	Kiteto	2 000	250	Songea	6 000	50
Sikonge	6 000	2 000	Babati	1 200	150	Iringa	5 000	40
Urambo	6 000	1 400	Kibondo	4 000	250	Biharamulo	4 000	15
Nzega	4 000	400	Handeni	3 000	150	Kasulu	4 000	5
Tabora	5 000	1 200	Kigoma	3 000	100	Newala	4 000	15
Chunya	6 000	400	Arumeru	1 500	100	Tunduru	4 000	15
Manyoni	8 000	600	Rufiji	2 500	50	Singida	3 000	5
Bukombe	5 000	800	Nkasi	1 500	50	Hai	2 500	5

Source: MNRT (2001b)

In Savannah forest in central Tanzania, beekeeping is one of the sources of income to many poor farmers. An individual can earn up to Tshs 1 149 954 per year from honey (MNRT, 2000). It is estimated that Tanzania has about 9.2 million honeybee colonies where production potential of bee products is about 138 000 tons of honey and 9 200 tons of beeswax per annum. These are worthy US $ 138 million and US $ 18.4 million, respectively (using average prices of the year 2003, i.e. US $ 1 per kg. of Honey and US $ 2 per kg. of beeswax) (URT, 1998a).

Although Bradbear and Kihwele (1990) estimates that production stands at about 4,860 tons of honey and 324 tons of beeswax, which are only about 3.5% of the existing potential of bee-keeping industry, a study carried out by Ministry of Natural Resources and Tourism (MNRT, 2001a) revealed that the production is between 10 000 and 15 000 tons of honey and 660 and 1 000 tons of beeswax per annum, which indicates that there is an increase in production in Tanzania. Table 2 below shows estimated production and values for years 1995-1999.

Table 2: Honey production figures and their values for years 1995-1999

Year	Honey	
	Weight in tons	Value in US $
1995	4,500	4,050,000.00
1996	8,475	7,627,500.00
1997	12,225	11,002,500.00
1998	15,000	13,500,000.00
1999	16,875	15,187,500.00
Total	57,075	51,367,500.00
Mean	11,415	10,273,500.00

1.2 Problem statement and justification

While increased production and export of bee products in Tanzania is essential for increasing the contribution of the beekeeping sector to the national economy, marketing of the products has been a problem to the beekeeping industry (MNRT, 2001b). Existing reports (MNRT, 2004 and 2005) show that there is a lot of honey and beeswax which are not marketed in the districts due to lack of efficient and effective marketing system, and this frustrates beekeepers. Furthermore, buyers are not aware of what quantity is available, and when and where it can be obtained. At the same time beekeepers are desperately looking for buyers.

It has also been observed that there is an increasing concern by consumers on the quality of food products that are free of contaminants (FAO, 1981 and EU, 1998). In the case of honey, quality specifications including essential composition and quality factors requirements as stated in the Codex World standard for honey adopted by the 17th Session of the Codex Alimentarius Commission (FAO, 1981 and EU, 1998) requires that honey be free from any kind of contamination. In 2004, the MNRT reported that no areas with chemical residue problems had been identified in Tanzania. However, some exporters are reported to have exported honey which was tested and found to be contaminated with chemicals, antibiotics, and a relatively higher level of HMF than permitted for table honey (Mapolu, M. personal communication, 2005).

Non-existence of infrastructures like organized markets, Beekeepers Associations, quality control mechanisms, pricing policy, etc. enable buyers and exporters to take

advantage of the situation and not to be interested in investing to improve upon the infrastructures. This situation has led to less bargaining power, losses in sales (especially abroad) and revenue. It has also developed, among traders, exporters and beekeepers, a marketing behaviour in the districts that is more speculative and therefore "unreliable". In such a marketing condition, it is obvious that the highest producing region such as Tabora region will not benefit from their bee products.

Ideal marketing should suggest to producers what to produce, direct the development efforts of the processing industry, and inform the customers about the availability, quantity, quality, price, and distribution of products. Ideal marketing therefore makes the products and services available to customers in the most desirable and efficient way (FAO, 1996). Practical beekeepers, research scientists and extension workers continue to concentrate their collective effort mainly on increased productivity with little regard to marketing. This study therefore analyses factors affecting marketing of honey.

1.3 Objective

1.3.1 Main objective of the Study

The main objective of this study is to analyse factors affecting marketing of honey in order to identify interventions which can promote production and trade of bee products.

1.3.2 Specific objectives

The specific objectives are:

(i) To determine factors affecting sales of honey at both local and external markets;

(ii) To assess the quality of honey from source to market/collection centres if it meets the National and International standards;

(iii) To identify and examine possible sources of honey contamination;

(iv) To identify and examine distribution channels of honey and its effect in marketing efficiency;

(v) To propose interventions to improve honey grading, pricing mechanism and marketing.

1.3.3 Research questions

(i) What are the factors affecting sales of honey in both local and external markets?

(ii) Is the quality of honey meeting National and International standards?

(iii) What are the possible sources of honey contamination?

(iv) What are the distribution channels of honey commonly found in Tanzania and what are the problems facing them?

(v) What are the prices and price mechanism at different levels of the market chain?

1.4 Hypotheses

Preferences by consumers, information dissemination systems, distribution channels, honey grading and pricing system have significant effect on marketing of honey.

1.5 Conceptual framework

Conceptual framework (Figure 1) shows factors affecting marketing system of honey which include primary and secondary factors. Primary factors form the basic set of instruments used in marketing in order for the product to reach the markets, satisfy the wants of customers and make profit (FAO, 1996). Secondary factors, on the other hand, facilitate the primary factors. Both primary and secondary factors can lead to poor marketing of honey, but through interventions such as appropriate policy, legal institution, good infrastructure, and well-established information system, an enabling environment could be provided that would improve marketing of honey.

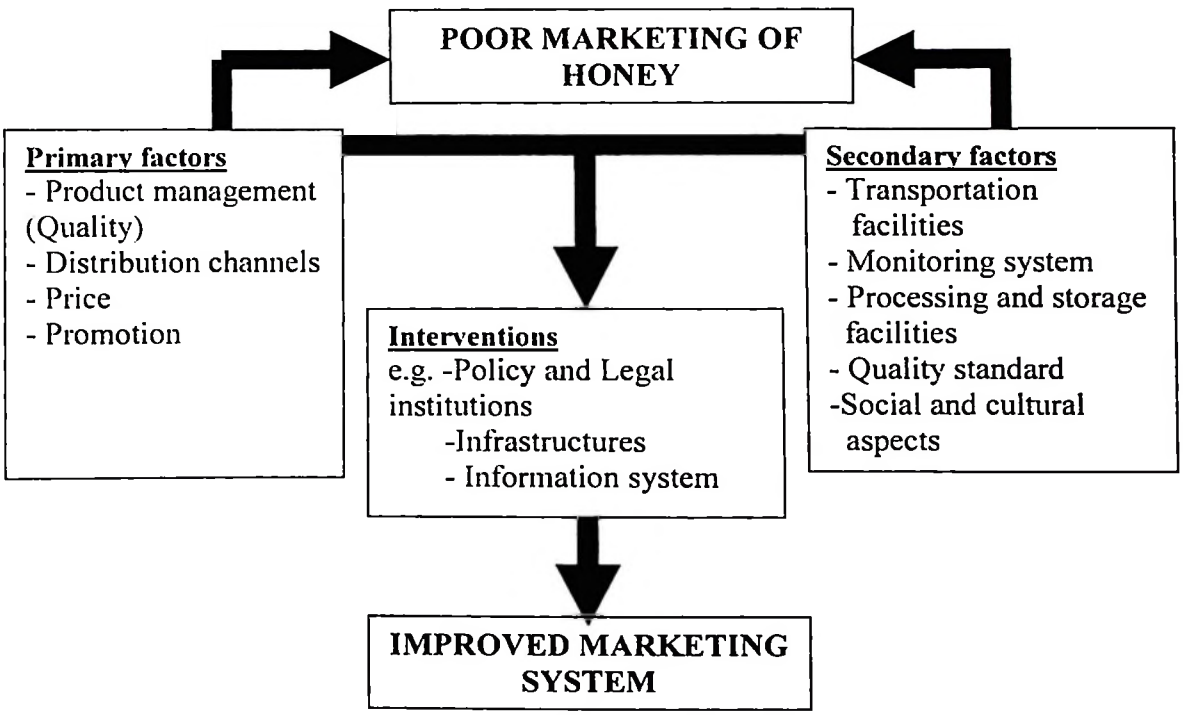

Figure 1: Conceptual framework: Factors affecting marketing of honey

CHAPTER TWO

2. 0 LITERATURE REVIEW

2.1 The role of beekeeping in socio-economic and environment conservation

Beekeeping is an art and science of harnessing bee and plant resources for the production of hive or bee products (honey, beeswax, propolis, royal jelly, brood, bee venom, pollen, live bees) and pollination services. It has been practiced for socio-economic development and conservation of biological diversity (Kihwele *et al.*, 1999). It is a source of food (honey, pollen, and brood), medicine, and raw materials for various industries. It also provides employment and income to beekeeping stakeholders.

According to Progressive Intervention (PI) (2003) an Irish non-profit organization, beekeeping is important in Africa for many reasons. First and foremost beekeeping is a high impact sector for growth potential in most African countries. This means that there is great opportunity to improve and create livelihoods for poor communities. There is also potential to create new employment opportunities in the honey supply chain in beekeeping equipment, transport, processing, packing and distribution. PI reported that two to three beehives can provide a household with an annual income of EUR 200-400 and the average annual income in sub-Saharan Africa is just EUR 250. This has an immediate impact on food security and living standards.

Local market demand for honey has been reported to remains steady and export market opportunities for African honey are emerging in Europe and the Gulf States. There are

also opportunities for progressive and commercial beekeepers to develop other marketable bee products such as beeswax, bee pollen, propolis and royal jelly.

The honey industry in Tanzania can become one among major foreign exchange earners if its products are marketed efficiently. It is estimated that beekeeping in Tanzania generates about USD 1.7 million each year from sales of honey and beeswax, and employs about 2 million rural people (MNRT 2001b). Therefore, improved marketing of bee products will improve the income and food security of Tanzanian communities and hence contribute to the achievement of the national goal of poverty reduction. Agricultural producers (here add parenthetically, beekeepers) commonly agree that the 'marketing problem' is low prices for their output, and while they also agree that a better way of marketing their products exists, they often fail to consider alternative marketing strategies or incorporate marketing as a part of their farm planning process (Sanford,1988).

Bees are also vital for pollinating crops and contributing to the upkeep of the fragile African environment. Many of the woody perennials and various herbaceous plants are important sources of nectar and/or pollen for honeybees. During foraging of nectar and pollen the bees become important pollinators of many agricultural crops and forest trees (Crane, 1985).

Several research findings show that honeybees are excellent pollinators that improve the quality and quantity of fruits and seeds of agricultural and wild plants (Kihwele, 1990; Bradbear, 1991; Luoga, 1993; Kumar and Kurmar, 1996; Kihwele *et al.*,

2001). Beekeeping is likely to improve the quality of life and revenue of small farmers. In addition to harvesting beehive products, farmers will realize high yields from their agricultural crops. A large variety of food crops grown in Southern Tanzania depend on bees for pollination in varying degrees (Pulsegrove, 1972; 1974; Kihwele *et al.*, 2001). In the absence of pollinating insects, particularly bees, the loss in yields may range from 10% in tomatoes to 100% in avocados, onions and sunflowers (Gibbs and Muirhead, 1998).

Agriculture industry considers a well established beekeeping industry important for the maintenance of successful fruits, vegetables, nuts and other crops/seed production because of the pollination services it provides. Inadequate pollination, on the other hand, can be a cause for reduced yields and or delayed yields (MNRT 2005). Therefore, effective pollination through honeybees can contribute significantly to agricultural production and improved household income.

Dadant and Sons (1975) reported that, in a country with developed agricultural systems, like in USA, the value (in terms of cash and food production) of pollination rendered by honeybees is ten times greater than the combined value of honey and beeswax. It is estimated that managed honeybee colonies are annually responsible for the pollination of agricultural crops valued between USD 4-8 billion (MNRT, 2005). MNRT also reported that according to the USA Department of Agriculture about one-third of the human diet is derived directly or indirectly from insect pollinated plants and about 80% of the insect pollination is accomplished by honeybees.

According to Gibbs and Muirhead (1998), in Australia, the market value of the pollination services to society is estimated to be between USD 606 million and 1.21 billion per annum (estimates as at 1989). In New Zealand, the estimated total annual value of honeybee pollination to primary production, based on 1992 data, was USD 3.1 billion. The value was contributed by vegetable/ seeds, fruits crop and replacement nitrogen from pollinated pasture legumes (Gibbs and Muirhead, 1998).

Beekeeping activities can alleviate poverty and hence helping in environmental conservation. Mkamba (2004) noted that there is a clear cause-and-effect relationship between poverty and deforestation. Poverty leads to deforestation which leads to environmental degradation. This in turn leads back to poverty. Therefore investment in the development of a reliable income generating activity which is environmental friendly like beekeeping is vital for forest protection. Mkamba (2004) also pointed out that many forest plants may not be of value as timber or may be prohibited from being used, but important source of food for bees. The bees provide mankind an alternative income generating activity to meet their livelihood requirements.

Beekeeping as an activity offers great potential for development in almost all African countries (Apiconsult 2003). It is easy and cheap to start, hence gives local people an economic incentive for the retention of natural habitats such as forests and therefore is an ideal activity in any forest conservation programme. However, most importantly, market links for the beekeeping products have to be established; otherwise any initiative to improve beekeeping will not succeed.

2.2 Policies and strategies which favour sustainable beekeeping enterprises in Tanzania

The current national development and sector policies in Tanzania such as Tanzania National Development Vision 2025 [http://www.tanzania.go.tz/vision], Poverty Reduction Strategy Paper (URT, 2000), National Forestry Policy (URT, 1998a) and National Beekeeping Policy (URT, 1998b), the National Trade Policy (URT, 2003a), and the Small and Medium Enterprise Policy (URT, 2003b) provide conducive environment for sustainable beekeeping enterprises.

2.2.1 Tanzania National Development Vision 2025

The formulation of the Tanzania Development Vision 2025 (URT, 1999) emanated from Government after the realization that earlier development policies and strategies did not match with the principles of a free market economy and the ongoing global technological development. The objective of Vision 2025 is to awaken, co-ordinate and direct peoples efforts and minds towards sectors that will enable the country to attain development goals and succeed in the global economic competition. Poverty alleviation is the main target for Vision 2025 and is spelt out in five main goals:

- High quality livelihood,
- Peace, stability and unity,
- Good governance,
- A well educated and learning society, and
- A strong and competitive economy.

This vision was operationalised through the Poverty Reduction Strategy Paper (PSRP) (URT, 2000), and the Tanzania Assistance Strategy, that provided a framework for external contributions to the fight against poverty. The PRSP (2000-2003) has recently been revised and renamed National Strategy for Growth and Poverty Reduction 2005 (NSGPR) or *'Mkakati wa Kukuza Uchumi na Kupunguza Umaskini Tanzania (MKUKUTA)'* (URT 2005a).

2.2.1.1 Poverty Reduction Strategy Paper

The Government prepared the PRSP to outline strategies and activities that have an impact on poverty alleviation. The strategy states that a substantial reduction in the number of people with low income requires macroeconomic stability and development of rural areas as well as export growth and expansion of the private sector. Further, it encourages farmers to organize themselves in groups or co-operatives, in order to qualify for credits from financial institutions (URT, 2000).

2.2.1.2 Tanzania Assistance Strategy

The Tanzania Assistance Strategy (TAS) is another government initiative which provides a selection of priority action areas, basic elements promoting local ownership and leadership, and views on building partnerships. These include agriculture and food security, roads, education, health, rural water supply, management of the environment and natural resources, employment, private sector development, and a number of cross cutting issues (MNRT, 2004).

The Strategy underlines the importance of agricultural development, in light of the fact that agriculture accounts for around half of the national income, and is the source of three quarters of merchandise exports and also provides a source of livelihood for about 80 percent of Tanzanians. This strategy encourages donors and development partners to support projects and activities such as beekeeping, which aim at poverty alleviation and sustainable natural resources management (MNRT, 2004).

2.2.1.3 National Strategy for Growth and Poverty Reduction (NSGPR) 2005

The government has begun implementing a new five year (2005-2010) broad-based pro-poor growth strategy, NSGPR, which is a predecessor of the first generation of poverty reduction strategy, the PRS (2000-2003). The strategy differs greatly from PRS as it has shifted from priority sector approach and adopted an outcome-based approach focusing on growth and reduction of poverty; improved quality of life and social well-being; and good governance and accountability. NSGPR recognizes natural resources as one of the most important resources for promoting high economic growth and reducing poverty. It underscores the need to develop effective mechanisms to ensure equitable access and use of the environment and natural resources especially for vulnerable social groups. It also calls for identification of most binding constraint to access and use of natural capital (Mpanda, 2006).

2.2.2 The Cooperatives Development Policy

One of the objectives of the cooperatives development policy is to create conducive environment in which people are free to get together and cooperate in exploiting their resources for social and economic development. The policy advocates the

transformation of farming and other related activities, from subsistence to commercial enterprises.

The policy also aims at assisting farmers and beekeepers to undertake critical problem analysis and assessment of the available alternative opportunities, production costs, and market trends so that they can understand and allocate their resources more efficiently by producing relatively high value crop and livestock products (URT, 1997). Furthermore, the policy puts emphasis on processing, value adding, and improvement of the quality of products. District cooperative officers are posted in each district in the country to assist in the formation of cooperative/association groups, marketing of bee products and linkages with domestic and international buyers.

2.2.3 The National Trade Policy 2003

In line with the National Development Vision and goals, the trade policy aims at transforming the economy from an inefficient supply-constrained entity into a competitive export-led economy which is responsive to integration and supportive of meaningful participation in the global economy through strategic trade liberalization. The policy seeks to promote a diversified and competitive export sector, enhance efficient domestic production so as to achieve a long-term current account balance, and consequently stimulate higher rates of growth and development (MNRT, 2004).

The policy promote the building of a diversified competitive economy to enhance the generation of foreign exchange, encouragement of higher value-added primary exports, promote domestic production and technological change consistent with the required

productivity increase. This is operationalised through lowering and removal of tariffs such as export tax on bee products, facilitation of import licensing and registration, development and enforcement of quality standards (through the Tanzania Bureau of Standards (TBS)), export promotion and export facilitation (MNRT, 2004).

The trade policy is supported by the Sustainable Industrial Development Policy (SIDP) (1996-2020), the Small and Medium Enterprise Development Policy (SME) of 2003 and the National Micro Finance Policy of 2000 (MNRT, 2004). They place specific emphasis on promotion of small and medium industries and enterprises through supporting the existing and new promotion institutions, simplifying taxation, registering and licensing of Small and Medium Enterprises (SMEs) and improving access to financial services. The Microfinance policy covers provision of financial services to small and micro enterprises in rural areas as well as in the urban sector that are involved in legal economic activities. These polices create a very favourable environment for the promotion of production and trade in the bee products, which are potential exports and foreign exchange earners in the country (MNRT, 2004).

2.2.4 Tanzania Chamber of Commerce, Industries and Agriculture

TCCIA is a board which deals with, among other things, identification of potential business opportunities for the purpose of promoting business interactions among Tanzania firms particularly between the small and medium enterprises on one hand and large corporate on the other. Currently TCCIA is working with AMKA (an NGO) to promote marketing of bee products (MNRT, 2004).

2.2.5 National Forestry Policy

The overall goal of the National Forest Policy is to enhance the contribution of the forest sector to the sustainable development of Tanzania and the conservation and management of her natural resources for the benefit of present and future generations (URT, 1998b). To implement the National Forest Policy, the National Forestry Programme and Legislation have been developed. The Programme calls for much of the responsibility of natural resources management to be decentralized to local levels including district councils, wards villages and individuals where new forms of partnership with the Central Government are being encouraged for conservation and income generation and profit sharing. Income generation activities such as beekeeping are introduced to help improve the incomes of communities, men and women beekeepers, in line with the Tanzania overall development goals.

A programme of Participatory Forest Management has been introduced and operationalised through the Joint Forest Management (JFM) and Community Based Forest Management (CBFM). Under JFM, agreements have been developed to involve communities in the management and utilization of forest resources. Involvement of communities in forest management including beekeeping has increased benefits accrued to communities and has also led to considerable improvement in incomes. The Community Based Forest Management programme encourages communities to set up forest reserves from the general lands for economic activities such as beekeeping. These initiatives provide an excellent opportunity for ownership of forest resources and increasing production of bee products (MNRT, 2004).

2.2.6 National Beekeeping Policy and Strategy Framework

The National Beekeeping Policy (NBP) approved in 1998 contains the vision and mission of beekeeping development in Tanzania. The Policy clearly identifies the bottlenecks, as being inefficient beekeeping practices, use of unproductive processing and packaging techniques, which have negative affect on the quality and quantity of bee products, and the protection of the environment (URT, 1998a).

In 2001 the Government of Tanzania developed and approved a National Beekeeping Program (NBKP), a strategy tool to implement the beekeeping policy. NBKP came up with strategies and action plan to tape the potential of bee products for the benefit of present and future generations. Marketing of bee products is one of the important aspects to support the beekeeping industry.

In 24th April 2002 the Beekeeping act was passed by Parliament to protect and direct appropriate beekeeping practices, maintenance of quality of bee products, protection of bee resources, bee fodder and consumers of bee products; however the act has yet to be practiced.

2.3 The concept of market and marketing

2.3.1 Definition

2.3.1.1 Market

Market is the overall demand for a product at a given price, place and time, under specific standards and conditions. Sometime it is used as a verb meaning to actively promote products or market development or product sales (FAO, 1996). Kracmar

(1973) defines the market in a business sense as 'aggregate demand of buyers for product or service'.

2.3.1.2 Marketing

According to Kohls and Unl (1990), marketing in agriculture refers to the performance of all business activities (marketing functions) involved in the flow of goods and services from the point of initial agricultural production until the same goods are in the hands of the ultimate consumer. To some people, marketing is synonymous to selling (of commodities), buying, pricing and sales promotion. Variations in notions on marketing and definitions of marketing are due to the stage of development. Variations are also due to different ways people use to study marketing. Despite of these variations marketing can be defined as: "set of activities by which the demand structure for goods, ideas and services is managed in order to facilitate the exchange process satisfactorily" (Ngaga, 2005).

According to Kracmar (1973) by these definitions it means that the performance of an economic system will depend very much on the efficiency and effectiveness with which the marketing functions are carried out. Also Kracmar pointed out that efficiency in economic studies is a broad concept subject to definitions and interpretations. The concept ranges from simple notion of the ratio of outputs to inputs to the complex notion of the maximization of total welfare. The ways inputs and outputs of marketing system can be measured has been given by Kohls and Uhl (1990) who cites labour, packaging, machinery and energy to be marketing resources

needed to perform the marketing functions and on the other hand marketing output include time, place, form and possession utilities.

A common means of measuring market efficiency is to examine marketing margins. This is an attempt to evaluate economic or price efficiency. The overall marketing margin is simply the difference between the farm-gate price and the price received on retail sale. That difference can then be considered to be the cost of marketing and all that is entailed in getting the product from the producer to the consumer in the desired form (ILRI, 1995). In an efficiently operating market, the competitive environment should keep the marketing margin to a minimum. Market prices should then reflect two elements: the actual costs of marketing plus normal profit margin. A normal profit is one which provides returns to investment comparable to available rates of interest plus some compensation for the risk borne by the marketer (ILRI, 1995).

2.4 Marketing and markets of honey

Marketing is an important aspect of the honey industry. This aspect is considerably undermined by many people who feel that the focus should be on production and then simply selling the outcome of production to customers (Hilmi, 2005). Certainly production is a very important aspect, especially in the case of organic honey, where production procedures and processing have to be maintained. But, equally important, marketing has to be considered and given the same importance (Hilmi, 2005).

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2.4.1 Internal markets for honey

The internal market for honey in Tanzania is not well established. However, demand for honey is increasing as food and as an authentic ingredient in various foods and as a product with healing qualities. About 50% of honey produced is sold locally for the production of honey beer and honey wine, and about 10% is consumed locally as industrial honey in confectioneries and pharmaceutical industries (MNRT, 2001a).

Honey is used at household levels as a substitute for sugar in tea or porridge, as a supplementary food for lactating mothers, and as an appetizer (Kimbi *et al.*, 1998). According to Krell (1996), honey is commonly consumed in its unprocessed state i.e. liquid, crystallized or in comb. In these forms it is eaten as food or incorporated as an ingredient in various food recipes. The traditional use of honey in food preparations has been substituted, in most cases, by sugar and various sugar syrups derived from starches. It is used in baked products, confectionery, candy, marmalades, jams, spreads, breakfast cereals, beverages and milk products.

According to Kihwele (1991), honey being an anti-biotic, is used as medicine by traditional healers. In conventional medicine, honey is used as carrier for other drugs. When honey is used pure or when mixed with other ingredients, it cures coughs, stomach problems, ulcers, malaria and burns (Klima, 1968; Ntenga & Mugongo, (1990); Krell, 1996; Lema, 1997; Kiondo, 1998; Liseki & Mmbaga, 1998). In its pure and unprocessed state, honey helps against infections, promotes tissue regeneration and reduces scarring (Armon, 1980; Dumronglert, 1983). Salem (1981)

reported successful treatment of various gastrointestinal disasters using honey. It is also used in moisturing and nourishing cosmetics creams (Krell, 1996).

In many regions in Tanzania, honey was or is the only, or the most accessible source of fermentable sugar. The traditional preparation and consumption of honey beer brew is still common in some parts of non-Islamic Africa. An additional nutrient base is generally provided for by yeast, which may add characteristic flavours as well (Krell, 1996). According to Klima (1968) and Kiondo (1998), for the *Wambulu* and *Wabarbaiq* people in Mbulu District, marriage proposals are only accepted if they are preceded with agreed amount of honey that is used as part of dowry. This honey is then used to prepare local brew, which is consumed during wedding celebrations. Honey is also believed to be a symbol of sweet life. Two families in conflict have to make a local brew which is then brought to the elders who act as mediators. After resolving the conflict, the two families drink this brew as a sign of reconciliation. For *Wameru*, honey is used as a symbol of peace in conflict resolution. This local brew is, also commonly used in traditional ceremonies during circumcision, and also as a source of cash (Lema, 1997).

FAO (2000) reported experience from Viet Nam that domestic markets can be increased through creating knowledge of quality to consumers. It also reported that in Viet Nam total production of honey in 1998 was 4500 tones out of which 3500 tones were exported and 1000 tones were used in the domestic markets. It was expected that consumption by local market would increase to 2000 tones in year 2000 as the domestic knowledge about quality of honey was increasing. The Viet Nam

experience also revealed that the export price for honey was lower than the domestic price. Whereas the export price was between 0.95 and 1.45 USD per kg, the domestic market price was between 1.5 and 3 USD.

To win the local markets it is important not only to understand the quality, but also local consumers' preferences. For example FAO (2000) case study in Viet Nam reported that labelled and packed quality is sometimes regarded as industrial honey that has lost its natural quality, however labelled honey is important if the honey is to be sold in supermarkets. For this reason, prospects for the development for a niche market for pure, natural, certified honey for the domestic market should be studied.

2.4.2 International markets of honey

According to Honey Update article (2005) China is still the largest raw honey supplier into the world market, and world honey prices are usually defined by Chinese honey prices. Regarding international market prices, the highest quality table honey price is 1 200 US $/ ton, while industrial honey is only about 1 000 US $/ ton (FBD, 2005).

Tanzania honey is well known in the world market because of its flavour and its organic nature. The main buyers of Tanzania honey are the European Union member countries especially the UK, Germany and The Netherlands. Other countries include the United Arab Emirates, Oman and Kenya (FBD, 2005).

2.4.3 Quality assurance system of honey

Products should meet the requirements of the final consumer who takes into consideration prevailing national and international standards such as that of Europe known as Hazard Analysis Critical Control Point (HACCP) Standard of 1, January 1996. This is a preventative food safety system in which every step in the manufacture, storage and distribution of a food product is scientifically analyzed for microbiological, physical and chemical hazards.

The preventative food safety system stipulates that: "foodstuff companies shall identify each aspect of their activities which has a bearing on the safety of foodstuffs and ensure that suitable safety procedures are established, applied, maintained and revised on the basis of the HACCP system". All EU food processors are legally bound to have a HACCP plan or work on a HACCP system. The HACCP system is applicable to companies that process, treat, pack, transport, distribute or trade foodstuffs. These companies are forced to understand the possible hazards associated with food production at all stages, from growth, processing, manufacture and distribution, until the point of consumption. This includes macro-biological (vermin), microbiological (viruses, bacteria, moulds), toxicological (chemical contamination with pesticides), or physical (wood, metal, glass, plastic or fabric) risk.

Grange (1967) reported that in the United States, voluntary U.S. grade standards are issued under the authority of the Agricultural Marketing Act of 1946, which provides for the development of official U.S. grades to designate different levels of quality.

These grade standards are available for use by producers, suppliers, buyers, and consumers. As in the case of other standards for grades of processed fruits and vegetables, these standards are designed to facilitate orderly marketing by providing a convenient basis for buying and selling, for establishing quality control programs, and for determining loan values. The standards also serve as a basis for the inspection and grading of commodities by the Federal Inspection Service, the only organ authorized to approve the designation of U.S. grades as referenced in the standards, as provided under the Agricultural Marketing Act of 1946 (Grange, 1967).

U.S Department of Agriculture (USDA) grades of honey are based on four factors: moisture content, flavour, absence of defects, and clarity. Absence of defects means degree of cleanliness and absence of particles of wax, propolis, or other visible materials. Clarity refers to freedom from pollen grains, air bubbles, or other suspended materials. The following is a brief explanation of the requirements for each of the four US standards (EU, 1998).

US Grade A or US Fancy

(i) Contains not more than 18.6 percent moisture.

(ii) Possesses a good flavour for the predominant floral source or sources.

(iii) Is free from defects.

(iv) Is clear.

US Grade B or US Choice

(i) Contains not more than 18.6 percent moisture.

(ii) Possesses a reasonably good flavour for the floral source or sources.

(iii) Is reasonably free from defects.

(iv) Is reasonably clear.

US Grade C or US Standard

(i) Contains not more than 20.0 percent moisture.

(ii) Possesses a fairly good flavour for the floral source or sources.

(iii) Is fairly free from defects.

(iv) Is fairly clear.

In June of 2003 the European Union banned imports of honey from the United States into EU member countries. The main reason for the ban was that, there existed differences in the regulatory approach taken by the European Union and the United States in guaranteeing product purity. Concerned about both the trade barrier itself and the potential "black-eye" given to the long-standing positive reputation for quality that U.S. honey enjoys worldwide, the U.S. honey industry, the National Honey Board and the U.S. Food and Drug Administration crafted a proposal to demonstrate and assure the purity of U.S. domestic honey to the European Community. In late September 2004, the European Commission accepted the proposal and re-listed the United States as a third country eligible to export honey to the European Union (FAO, 1981).

An article from Tattler "Tales from the Farm" by Paetz (2003) reported that the U.S. Customs Service (Customs) and the Food and Drug Administration (FDA)

announced that they had discovered bulk imports of Chinese honey that were contaminated with low levels of chloramphenicol, a potentially harmful antibiotic and unapproved food additive. The contaminated honey was detected during an investigation into a widespread scheme to evade payment of U.S. anti-dumping duties on bulk imports of Chinese honey. The honey update article of January 2004 reported that Chloramphenicol contamination was still an issue, and nitro-furans contamination was becoming a larger problem. The 2004 Chinese honey crop picture was still cloudy. It was still not known as to how much uncontaminated raw honey they were going to produce and whether they will contaminate the clean honey they produce by blending it with the large supply of chloramphenicol contaminated honey and ultra - filtered sweetener they still have.

2.4.4 Quality assurance system of honey in Tanzania

The international markets for Tanzanian honey and beeswax are highly competitive in terms of quality. In 1991, Tanzania honey won 100% quality test for "organic honey" in UK (URT, 1998a). However, quality control need legal directives that will have to be adhered to by all people handling the honey before it reaches the consumer. These legal directives need clear mission and vision of the beekeeping policy concerning development and control of quality standards for honey (URT, 1998a).

According to the Beekeeping policy (URT, 1998b) one of the objectives of the beekeeping sector is to improve quality and quantity of honey, beeswax, and other bee products and to ensure sustainable supply of the same. Observing marketing

requirements such as quality of the product, and delivering a product that has the same standard as that provided in the samples and targeting suitable markets can result to market penetration. This can be achieved through ensured consistent production and supply of the product with high quality (MNRT 2001b).

In 2004 MNRT and the Belgian Government commissioned a study to identify possible interventions for support in three selected districts namely Kigoma, Kibondo and Rufiji. The study came up with recommendations including the need to enhance bee products quality assurance capacity. However, the study did not carry out any laboratory tests on the quality of bee products. In addition, areas covered by the study are fairly small relative to the potential areas for beekeeping in the country with different ecological, social, economic and cultures. Therefore more studies involving testing the quality of the products are required to cover different parts of the country in order to generate information that is more representative of the whole country.

2.4.5 Distribution channels of honey

Distribution channels comprise the means through which the products are sold and delivered to the customers. The analysis of marketing channels is intended to provide a systematic knowledge of the flow of the goods and services from their origin (producer) to their final destination (Consumer) (Mendoza, 1995). Mendoza further explained that, in carrying out these functions, marketing agents achieve both personal financial gain and consumers' needs. The price the consumer pays for the

goods (the physical commodity) and services compensates the marketing agents for their efforts.

A study conducted by MNRT in 2001 revealed that there are three different distribution channels of honey. Channel one represents an area with beekeepers being served by a cooperative society or association. Here beekeepers are provided with containers to pack their honey and transport their honey from harvesting camps to central processing and packaging plants.

Channel two shows the movement of honey from beekeepers that are not members of a co-operative society. Individual beekeepers under this channel solely depend upon their own resources. Nothing is provided free apart from the word of the extension worker. Every beekeeper work on his/her own and may only share the camp. After harvesting, beekeepers transport their honey to villages. At village level, a beekeeper waits for buyers of honey. If it happens that there are no buyers, the beekeeper may remain with honey for several months.

Channel three shows a typical group of beekeepers or exporters like M/S Goldapis Co.Ltd. who is currently serving in Inyonga and Uruila in Mpanda. Beekeepers under this channel sign a contract with the "would be buyer" who supplies them with all necessities required for production of high quality honey. After harvest, beekeepers agree to repay the cost of supplies in form of honey and also sell all their honey to the contracted party.

2.4.6 Product pricing

One of the most difficult but most important aspects of marketing product effectively is setting the price correctly to ensure that it is enough to meet expenses and allow business to grow and not to discourage consumers. Retailers, brokers and distributors will also have an interest on how you price your products since it must allow them to make profit while distributing the product (White, 1992). The price has great influences on decisions to buy a particular product. Each price that the seller might charge will lead to a different level of demand and will therefore have a different impact on product marketing (Kotler, 1985).

According to Chautin (2005) the objective of pricing is to maximize profits while remaining competitive in the marketplace. Pricing can be based on either the cost price or market price (What will the market pay?). Regardless of the pricing method used, it is critical to know all costs involved in the delivery of the product or service to avoid possible under pricing and operating losses. If the market will not support a price level sufficient to cover costs, it will be necessary to investigate whether costs can be lowered or alternatively, if it may be necessary to abandon the business.

With cost-oriented pricing, the producer tries to recover all the expenses of bringing the product to the market including raw materials, processing, labour costs, delivery costs, plus profit. Competition-oriented pricing also aims at recovering product costs, and delivery cost, plus profit, but may adjust profit to establish a purchase price that equals or "beats" market rivals (FAO, 1996). In some circumstance a producer may be forced to sell at a price lower than the costs of production to maintain her or his

market share. For example in a case where the consumer demand is so weak, the products may have to be sold at a loss. On the other hand high demand may lead to products scarcity and increased price (FAO, 1996).

Mlambiti (1999) in his study, 'Structural patterns in the marketing of selected fruits and vegetables in Morogoro district, the place of cooperative marketing', revealed that potential sources of pricing inefficiency was lack of information and lack of standards It also revealed that optimization of markets depends very much on the existence of an environment that allows technical and pricing efficiency to be attained. This is an environment that allows: (a) a demand driven flow of inputs and outputs, (b) availability of market information and (c) existence of no barriers to market entry or exit.

2.4.7 Marketing information on honey

Market efficiency requires market transparency which refers to the availability of relevant market information, its distribution among buyers and sellers, and its adequacy in terms of price sharpening-quality comparison and risk reduction or uncertainty about the future (Ashimogo, 2001). Limited infrastructure and little experience in market economy increase the importance and demand for good market information system. Effective and efficient information and collection and dissemination systems need to be put in place at national and district levels through which information on bee products can get to target groups. Marketing information system provides reliable information on demand, supply, products, distribution channels, promotion, prices competition and their trends (FAO, 1996).

Marketing communication can be done through producer and middlemen to consumers and *vice versa*. Regional broadcasts may be among the most effective means for communicating price and consumer information (FAO, 1991). Trade fairs are well known as international promotional platform and meeting point for traders, exporters, importers, wholesalers, and selling and promotion organizations. Within informal markets, product and price information transmitted by word-of-mouth may be the only promotion required for sales (FAO, 1996). The market information helps to ensure reliable production by creating links between the rural producers and markets, hence improving market efficiency.

2.5 Constraints faced in marketing of honey in Tanzania

According to URT (1998b), constraints faced by beekeepers and traders in Tanzania include: lack of appropriate equipment, poor storage packaging facilities, obsolete technologies used, poor honey handling methods used to maintain quality and quantity, Insufficient supporting services offered to the beekeepers and traders and unavailability of credit and marketing information. The development of the industry has been further hampered by inadequate extension services and poor research facilities.

2.5.1 Lack of capital

The development of the beekeeping sector has been dominated by a high dependence on the private sector. Public financing, and sectoral self-financing mechanisms have remained undeveloped. Private sector financing has been low due to lack of appropriate financing mechanisms. Support from the development partners has also been minimal.

Moreover, some existing international financing mechanisms, e.g. "debt-for-nature-swaps", have not been easy to be adopted by the government which has been unable to raise enough local funds to meet the required conditions (URT, 1998a).

Lack of financial capital has influence on the level and adequacy on production, processing and storage facilities of the honey. This in turn impacts on the quality and quantity of honey (URT, 1998b). According to Lema (1991), the initial capital needed to start beekeeping is very little but most beekeepers can not afford to buy facilities required due to lack of even the small capital required (Kimbi *et al.*, 1998). According to Kihwele (1983), about 15-20% of the honeybee colonies are not harvested every year due to lack of bee protective and scarcity of appropriate containers. Some beekeepers could only harvest 50% of their colonies due to lack of storage containers that are used for carrying honey from the field and for marketing.

2.5.2 Lack of extension services

The problem of inefficient beekeeping extension services is among the most critical problems in East Africa resulting in low productivity (Masalu, 1997). Due to this problem, goods and services of the beekeeping sector have remained low in terms of quality and quantity. The number of beekeepers is still small, and as a result the national production of honey is less than 5% of the production potential (URT, 1998a).

A well-functioning beekeeping extension service is a prerequisite for the promotion of beekeeping. The current extension service is poorly staffed and fragmented. This

fragmentation is due to the fact that each of the different department of natural resources management and agriculture has its own services. All these departments lack both human and financial resources, and extension messages delivered to farmers/beekeepers are sometimes conflicting due to lack or coordination between different services being inadequate. Inadequate extension materials and facilities are also hampering extension work (URT, 1998a).

According to Aidoo (1999), extension and regulatory programmes have played important roles in helping beekeepers succeed. This include technical support or stock development, training the beekeepers to extend beekeeping skills and information, providing support services for marketing such as quality assurances.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Description of study area

The study areas were Dar-es-salaam region as a market centre and Tabora region as a production area. The two sites were selected because of the close market relationship between them. According to Cosmas (2003), Dar-es-Salaam sold 68 percent of the honey from Tabora region which is the leading producer of honey in Tanzania. In Tabora, the study areas included nine villages of three major honey producing districts: Uyui, Sikonge and Urambo. In Dar-es-salaam the area of study covered Temeke, Ilala and Kinondoni districts.

3.1.1 Dar-es-salaam Region

3.1.1.1 Geographical Locations and vegetation cover

Dar-es-salaam region is situated at an altitude of about 14 m above sea level. The region is bordered by the Indian Ocean on east and surrounded by the coast region on the other sides. The region has a total land of 1 350 Km^2; out of this about 20 Km^2 is forest reserves and 900 Km^2 is suitable for agriculture.

3.1.1.2 Population size and administrative units

Dar-es Salaam is a commercial city, with a population of 2.5 million according to 2002 Census Data and annual average growth rate of 4.3% (URT, 2003c).

Administratively it is divided into three municipalities namely Kinondoni, Temeke and Ilala.

3.1.1.3 Climatic condition

Dar-es-Salaam has a coastal climate typical of equatorial regions, characterized as "hot and humid", with small seasonal and daily variations in temperature. The region is hot, with average mean temperature of 35°C during the months January to March. This decreases to 25°C during June to August. The rainfall regime is bimodal with two rainy seasons and two dry seasons. The "short rains", are in October to December with monthly average rainfall of about 567 mm, and "long rains" are between March and May with a monthly mean rainfall of about 250 mm.

3.1.1.4 Social-economic activities

Dar-es Salaam is inhabited by people of different ethnic backgrounds from different parts of the country. About 945 Km^2 of the total area of the region comprises of rural setting which is suitable for agriculture. However 80% of the residents depend on food from other regions, because food produced within the region is not enough to meet the demand. Dar-es-Salaam dwellers are employed workers, farmers and/or peasants and business persons who are permanently or temporally living in the city.

3.1.1.5 Infrastructure

The city is linked to other parts of the country by three trunk roads (Dar-es-Salaam-Tunduma, Dar-es-Salaam- Mwanza and Dar-es-Salaam – Tanga) and three railway lines (TAZARA, Central and Moshi – Tanga) and the city is served by a network of

1,150 km of roads with density 0.83 km/km^2. However, most of these roads are poorly maintained.

3.1.2 Tabora Region

3.1.2.1 Geographical location

Tabora Region is located in the Mid –Western part of Tanzania. It shares a border with Shinyanga Region in the North, Singida region in the East, Rukwa and Mbeya regions in the South and Kigoma Region in the west. This region forms part of the vast central plateau of Tanzania.

3.1.2.2 Population size and administrative units

According to 2002 census data, Tabora region has a human population of 1.7 million with an annual average population growth of 3.6% (URT, 2003c). It is divided into six administrative districts namely: Igunga, Nzega, Tabora Urban, Uyui, Sikonge and Urambo with a total of 18 Divisions, 133 Wards and 455 villages.

3.1.2.3 Climatic conditions and vegetation cover

The weather of Tabora region is warm with marked coolness during the day season – night. The mean maximum monthly temperature varies between 27^{0}C and 32^{0}C and the minimum monthly temperature range from 15^{0}C to 18^{0}C. Rain season starts between September and October and extends to April. Temperatures in the region reach the highest peak in October then falling gradually to its lowest in May and August. Rainfall season is between November and April, with variable and unpredictable patterns. In most areas the average rainfall is 700mm in the Northeast

and 1000mm in the Western part. About 56% of Tabora Region (4 284 030 hectares) is covered with Miombo woodlands that provide a wide range of benefits. The natural vegetation of the region is dry woodland mainly made up of *Brachystegia, Isoberlinia* and *Julbernadia* species.

3.1.2.4 Socio-Economic activities

Agriculture is the major economic activity in the region. Main cash crops grown are tobacco, cotton and rice, while maize, sorghum/millet, cassava, groundnuts, beans and sweet potatoes are the major food crops. Other sectors in the economy in the region are primary sectors, either agriculture related or natural resource based activities. These include Agro-Industries, Forestry and Beekeeping (URT, 2005b). The region has a potential of producing 5,000 tons of honey, however its actual production is 2,100 tons per year (MNRT, 2001b). Livestock keeping is ranked as the second vital economic activity in the region. Tabora is popular for cattle, goats and sheep rearing. In 1999 large scale gold mining activity has been established in Nzega district.

3.1.2.5 Infrastructure

Although Tabora region has a lot of developmental potential, its infrastructure is still underdeveloped. The communication system of the region consists of railways, air and road transport. The railways which traverses the region to the east, west, north and southwest forms the key means of transport into or out of the region. The air communication connects the region to Dar-es-salaam, Kigoma and Mwanza. There are two trunk roads traversing the region: the Singida to Kahama via Nzega and

Mbeya to Shinyanga via Tabora and Nzega. The condition of the roads has deteriorated due to poor maintenance.

3.2 Data Collection

3.2.1 Primary data collection

Primary data was collected using structured and semi structured questionnaires, participant observation, focused group discussions and laboratory tests for the quality of honey. The data were collected in two phases, the first phase was a preliminary survey where familiarization with the research area was made and general information on the beekeeping was collected and also the questionnaires were tested and modified accordingly. The second phase was the actual survey which involved the administering of the questionnaires, collection of samples and tests were done.

3.2.1.1 Reconnaissance survey

Reconnaissance survey was conducted so as to provide a general picture of the research area. The aim was to identify location of the research sites and sample size of interviewees including honey producers, traders and consumers.

3.2.1.2 Questionnaire survey

The questionnaires were designed to obtain both quantitative and qualitative data. Both open and closed-ended questions were used in order to elicit information. Four types of questionnaires were designed and administered to four different target groups: producers, wholesalers, retailers and consumers (Appendices 1 - 4). Data collected included information on distribution channels and their problems, prices,

costs, factors affecting sales, consumption rate, consumers' preferences, quality, source of contamination of honey, and means of communication. The survey was done by visiting beekeepers and market centres/areas and data was collected from beekeepers, wholesalers, retailers and consumers.

3.2.1.3 Participant observation

Supplementary information was collected through personal observation in the field and in the market for the purpose of cross-checking information obtained from the questionnaire survey such as information on type of hives used, storage facilities etc. According to Katani (1990), most information can be obtained by close observation on what is happening on the ground and in such a situation the researcher has to be keen on what respondent is reporting and what the researcher is seeing.

3.2.1.4 Focus Group Discussion (FGD)

Checklists of probe questions were designed to collect information from key informants or focused groups (Appendix 5) to cross-check the information given by respondents during the questionnaire survey. The key informants included government leaders, beekeeping/forest staff and relevant NGOs leaders from village to national level.

3.2.1.5 Laboratory test

Twenty honey samples collected from beekeepers and retailers were tested for essential composition and quality factors requirements for honey (Appendix 6). Chemical and metal compositions in honey were tested at Sokoine University of

Agriculture (SUA) laboratory, and the Government Chemist Laboratory Agency (GCLA) was used to test pesticides and antibiotics residues. The decision on the parameters and methods to be used in testing the samples was made after consultation with various institutions like University of Dar-es-Salaam (UDSM), Sokoine University of Agriculture (SUA), Tanzania Bureau of Standards (TBS), Government Chemist (GC) and the bee products Inspection Centre under the Tanzania Wildlife Research Institute (TAWIRI).

Laboratory Agency (GCLA) in Tanzania was used to test the samples because during consultations with traders, it was found that apart from those using overseas laboratories, most of them use Government Chemistry. The samples were tested for pesticides and antibiotics using only five standards for pesticides including P,P' DDE [1,1-dichloro-2-(P-chlorophenyl)-2-(O-chlorophenyl)ethylene], P,P'DDD [1,1-dichloro-2,2-bias(4-chlorophenyl)ethane] O,P'DDE [1,1-dichloro-2,2-bias(4-chlorophenyl)ethylene] and O'PDDD (1,1-dichloro-2-(P-chlorophenyl)-2-(o-chlorophenyl)ethylene], and Aldrin, and only Chloramphenical and Phenol for antibiotics which were available.

3.2.2 Secondary data collection

Secondary data was obtained from Regional and Districts beekeeping offices in Tabora and Dar-es-salaam, Njiro Wildlife Research Centre (NWRC), Africare (NGO), and the Ministry of Natural Resources and Tourism (MNRT). Data was also collected through literature search, from reports, project documents, and other relevant documents from training institutions including Sokoine University of

Agriculture Morogoro and Forestry Training Institute Olmotonyi. Internet were also visited and browsed for available literature on international marketing and honey markets.

3.2.3 Sampling procedures

The sample comprised of 91 producers from 9 villages in Uyui, Urambo and Sikonge; 6 wholesalers or middlemen at the production sites and 7 from the markets nodes; 32 consumers and 32 retailers at markets nodes in the city were selected. Purposive sampling method was used in sample selection since there were no records on producers, wholesalers, traders and consumers and in order to get at least a reasonable number of respondents required as a representative for statistical analysis.

Therefore for districts and villages selection was done based on their significance in honey production and accessibility. The highest 3 honey producing districts were selected, and from each district 3 highest honey producing and easily accessible villages were selected. Beekeepers were selected based on their famous on production of honey and availability during the interview. Wholesalers or middlemen who were available and willing to be interviewed at the production sites and from the markets nodes were selected. For the sampling of retailers and consumers, honey markets in Kinondoni, Ilala and Temeke districts were surveyed and retailers and traders were identified selected and interviewed. Also one consumer/buyer attended by each sampled retailer was selected and interviewed. Ten honey samples were

collected randomly from among the interviewed beekeepers, and another ten from retailers at the market sites.

3.3 Data analysis

3.3.1 Descriptive and inferential statistical data analysis

In this study data collected by questionnaires was analyzed using the Statistical Package for Social Sciences (SPSS) computer programme. Descriptive statistics such as percentages, frequencies and cross tabulations were used in analyzing factors affecting sales in the local markets and source of contamination of honey.

Regression analysis was used to measure the relationship among variables. In the regression model, amount of honey consumed or demanded was assumed to be a function of consumer's income, price of honey and season of the year. Regression model used contained an admixture of quantitative and qualitative variables known as analysis of covariance (ANCOVA) model. The regression equation is specified as follows: $Q = \alpha + \beta_1 D_1 + \beta_2 \mathrm{P}_h + \beta_3 S + \mu$. The description of the regression model including its variable is as shown in Table 3.

Table 3: Description of regression model

Variable name	Description	Expected relationship
Q - litres of honey demanded	Dependent variable measured as litres of honey demanded per month	-
D_I – consumer's monthly income	Dummy variable that measured the category of the honey consumer's monthly income 1– Higher income earners with more than Tshs 100 000/= per month 0 – Otherwise	Positively related to Q. Higher income earners consume more honey than lower income earners
P_h – price of honey	Independent variable that measure the price of honey.	Negatively related to Q. As P_h increases Q decreases
S – season of the year	Dummy variable indicating season of the year that honey is consumed with:- 1 – Wet season 0 – Dry season	More honey is consumed during Wet season than during Dry season
α - Constant	-	-
μ - Error term	-	-
B – Regression coefficients		

3.3.2 Gross margin analysis

The gross margin analysis was employed in order to establish relative profitability of the honey or the sharing of the consumer's price among stakeholders of the marketing chain of honey. This was done by evaluating cost and prices at different levels of the market chain i.e. producer, wholesalers and retailers. For each level the gross margin equation is given by:

GM =TR –TMC Where: GM = Gross Margin,

TR = Total Revenue and

TMC = Total marketing costs.

3.3.3 Marketing margin analysis

In this study, marketing margin analysis was employed to make a comparison of prices at different levels of the marketing chain i.e. retailers and wholesalers. The marketing margin analysis was employed in order to ascertain the efficiency of the marketing of honey. The wholesale margin used were based on the difference between the wholesale trader price and the farm-gate or producer price, and the retail margin is the difference between the price the retail trader pays to the wholesale trader and the retail price charges to consumers. Margin was expressed in monetary terms and percentage known as a price spread and percentage margin respectively.

Also degree of pricing efficiency was assessed using correlation analysis to test extend to which marketing margins are statistically associated/correlated with buying and selling prices. That is, to examine the extent to which market participants pass on price changes to subsequent marketing channel levels i.e. wholesalers and retailers. This is a common means of measuring market efficiency in order to evaluate price efficiency. For each level the marketing margin was expressed as:

$Mm = Ps - Pb$ Where: Mm = Marketing margin,

P_s = Selling price of honey in a specified market level

P_b = Price of honey in a proceeding market level

The marketing margins were also calculated as the percentage of consumer prices.

Marketing margin percentages are given by: $M_m = \frac{Ps - Pb}{CPs} \times 100$

CPs = Consumer price of honey or retailer price to the end consumer

3.4 Limitations of the study

Majority of respondents in the study area did not keep records of their activities or products; this posed a big problem during the related data collection exercise. Therefore, collection of the required data/information depended mainly on the memory and recollection of respondents, which was quite difficult for many of them. As a result, probing had to be employed in order to get close approximations that would at least reflect the reality. On the other hand some respondents, especially traders, purposely declined to provide information on income generated from trading activities. However, most of them were willing to cooperate after being convinced that the information they give was meant for research purposes only and that their privacy would be respected.

Another problem was the difficulty experienced in estimation of market fees charged on honey business since majority of the traders were found selling honey among many items, which together with other marketing costs were required to assist in calculating the gross margin. In this respect, the value/volume of honey traded in a given period, say one month, and relative to other items was used as a basis for getting relative contribution of honey to total sales and subsequent market fee that was supposed to be paid.

Limited required standards for pesticide and antibiotic test and lack of equipment for color determination in Tanzania laboratories. In addition to this problem the testing costs was found to be very high, especially those charged by Government Laboratory Chemistry Agency.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Factors affecting sales of honey in the local market

4.1.1 Originality of honey

Most of the honey preferred by consumers in the Dar-es-Salaam comes from Tabora region. According to the respondents interviewed about 72% reported that consumers preferred honey from Tabora region, and about 22% from Iringa, Manyoni and Kigoma. The remaining 6% reported that consumers preferred honey from anywhere (Table 4).

Table 4: Responses by retailers on sources of honey preferred by consumers and sold in Dar-es-Salaam region

Origin	Number of Respondents	Percent
Tabora	23	71.9
Iringa	3	9.4
Manyoni	3	9.4
Kigoma	1	3.1
Anywhere	2	6.2
Total	32	100.0

When respondents were asked for their views on the reasons for the preference of honey from Tabora they reported that it was due to its availability compared to honey from other regions, and hence consumers were used to it. This can be explained by the results in Table 5 which shows sources of honey sold in the Dar-es-Salaam region. About 84% of the honey sold in Dar-es-Salaam was bought from Tabora region, and only 16% comes from Manyoni, Dodoma, Mpanda and Kigoma. These

results are similar to the findings by Cosmas (2003) who reported that most of the honey sold in the city was from Tabora region which was the leading producer of honey in Tanzania. The region actual production is 2,100 tons per year (MNRT, 2001b).

Table 5: Responses by retailers on sources of honey sold in Dar-es-Salaam region

Origin	Number of Respondents	Percent
Tabora	27	84.4
Dodoma	1	3.1
Manyoni	2	6.3
Mpanda	1	3.1
Kigoma	1	3.1
Total	32	100.0

4.1.2 Colour of honey

It was found that the consumers interviewed (59%) preferred light amber coloured honey, 22% extra light amber and 9% dark coloured honey (Table 6). The preference of light amber coloured honey by Dar-es-Salaam consumers may be due to the availability of that type of honey as discussed in 4.1.1 on the preference of honey in relation to its originality. Tabora honey from miombo woodland produce light to extra light amber honey. Some consumers believe that the extra light and light amber coloured honey has not been cooked and therefore natural, while dark coloured honey has been heated and therefore lost its natural quality. This could explain why only 9% of the sampled consumers preferred dark honey. Exposure of honey to heat and storage time may affect honey colour. White (1984) supports this when he say

that honey can become darker as a result of storage, although at widely differing rates. Generally, honey is temperature sensitive and darkening of honey occurs more rapidly when honey is stored at high temperatures.

However this belief may not be true in some cases since the color of honey is mainly characterized by its floral source including minerals. For example, honey from mangrove forests covered the coast areas is as dark as honey which is heated, although this honey was not found during the study.

From the findings the 9% of the consumers interviewed had no colour preference implying that colour has no influence on their consumption.

Table 6: Responses on colour of honey preferred by consumers in Dar-es-Salaam region

Colour of honey	Number of Respondents	Percent
Dark coloured	3	9.4
Light amber	19	59.3
Extra light	7	21.9
Any colour	3	9.4
Total	32	100.0

4.1.3 Price of honey

The selling price of honey in Dar-es-Salaam region ranged from Tshs 2 000 to 4 000 per litre with a mean of Tshs 3 000 per litre (Table 7). This selling price of honey appeared reasonable to most (66%) of the consumers (Table 8). Consumers interviewed indicated willingness to pay Tshs 3 500 per litre which is above the

mean. This indicates that the price of honey had no significant effect on demand as also statistically proven in 4.1.6. When consumers asked for their views on the price, they seemed to be more concerned on quality and safe attributes rather than on price.

Table 7: Price of honey at retail level in Dar-es-Salaam region

	Minimum	Maximum	Mean	Std. Deviation
Selling price of honey per litre	2 000	4 000	3 019	570

Table 8: Responses on Consumers' feelings about the existing price of honey in Dar-es-Salaam region

Price	Number of Respondents	Percent
Very high	1	3.1
High	10	31.3
Reasonable	21	65.6
Total	32	100.0

4.1.4 Seasonality on sales

The study revealed that Tabora honey producers (79.1%) sell more honey during the dry season and only about 8.8 % sell more during the wet season, (Table 9). The reasons given were that many traders are found during the dry seasons than during the wet season. This is because most of the honey is harvested during dry seasons. The study also revealed that some producers sell their honey immediately after harvesting (dry season) to meet their household requirements. Some sell their product at the camp sites to avoid transportation and storage costs. However, 12.1% of the producers spread out their selling to cover the whole year. This implies that they had no specific selling season.

Table 9: Responses by producers on season of the year with more sales in Tabora region

Season	Number of Respondents	Percent
Wet season	8	8.8
Dry season	72	79.1
Constant throughout the year	11	12.1
Total	91	100.0

While beekeepers experienced more sales in the dry seasons, retailers interviewed 46.9% experience more sales on wet seasons, while only 25% experienced more sales during dry seasons (Table 10). This may be due to the fact that bee products are subject to seasonal variations (MNRT, 2005). Harvesting is done during the dry season, therefore during this time there is more supply of honey hence high competition, compared to wet seasons when there is scarcity which leads to low competition. However, 28.1% of the respondents did not experience any variations in sales.

Table 10: Responses by retailers on season of the year with more sales in Dar-es-salaam region

Season	Number of Respondents	Percent
Dry season	8	25.0
Wet season	15	46.9
Constant throughout the year	9	28.1
Total	32	100.0

Based on the information provided in Table 11 there is an increase of honey consumption by consumers during the wet seasons. The average consumption in the wet season ranged from 1 to 6 litres with a mean of 2 litres while during dry season

ranged from 1 to 3 litres with a mean of 1 litre. Most of the respondents (71.9%) when asked for the reasons of consuming more honey during wet seasons they said that they need more honey for nutritional and medicinal purposes (Figure 2).

Table 11: Responses by consumers on amount of honey consumed during wet and dry seasons of the year in Dar-es-salaam region

	Minimum honey consumption (lts)	Maximum honey consumption (lts)	Mean consumption honey per month (lts)
Wet season	1.0	6.0	2.047
Dry season	1.0	3.0	1.391

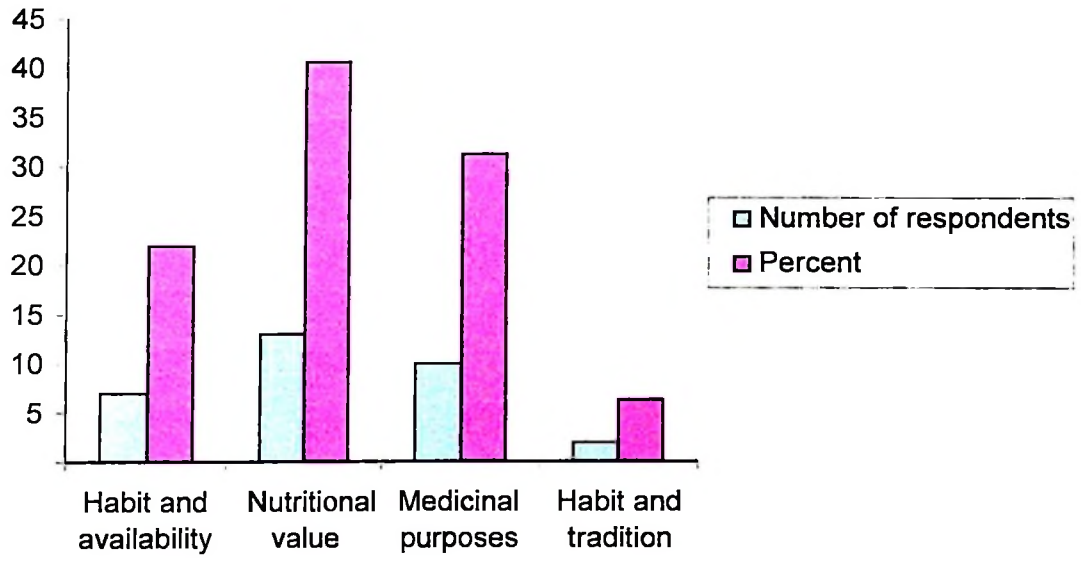

Figure 2: Responses by consumers on reason for consuming more honey on wet season

The results are similar to what is reported by MNRT (2001b) that honey is mainly consumed during wet season to provide relief for colds and flu. This could be due to the reason that many diseases such as colds and flu that are believed to be cured by

using honey erupt during wet seasons. Honey can also be consumed for nutritional purposes, in order to provide carbohydrate for the body which is mostly required to provide heat during the cold season.

4.1.5 Regression model results

Regression analysis ($Q = \alpha + \beta_1 D_1 + \beta_2 P_h + \beta_3 S + \mu$) was used to measure the relationship between the amount of honey consumed or demanded and consumer's income, price of honey and season of the year. Two variables out of the three used in the regression model were significant to the consumption of honey (Table 12).

Table 12: Regression model results (Dependent variable is average consumption per month)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
(Constant)	.915	.457		2.003	.055*
Price of honey per litres	2.324E-05	.000	.020	.134	.894
Average income earned per month	.637	.248	.381	2.569	.016*
Season honey consumed mostly	1.090	.229	.624	4.767	.000**

$R^2 = 0.524$, F = 10.255, Standard error of the estimate = 0.5973,
** Significant at 0.01; * Significant at 0.05

According to the results of the regression model in Table 12 the effect of honey price show that, consumption will decrease by $2.324 * 10^{-05}$ litres for every shilling increase in price, however the t-value is not statistically significant, which means that price of honey is statistically insignificant to the amount of honey consumed. This implies that sales remain constant irrespective of an increase in prices. The response to price in this study was different to what is reported by Kotler (1985) that each price the seller might charge will lead to a different level of demand and will therefore have

a different impact on product marketing. However this result conforms to findings in section 4.1.3 where respondents interviewed were willing to pay above the mean price of honey. The consumers seemed to be more concerned with quality and safe attribute rather than price.

The regression model also shows that higher income earners in Dar-es-Salaam consume an average of 0.637 litres of honey more than lower income earners at 5% level of significance. This indicates that consumption of honey is statistically significant and positively related to consumers' income. This implies that the better-off a consumer is the more is she/he will be able to buy a greater quantity of honey compared to a consumer in the lower income bracket.

Likewise, the result conform with what is reported by Baconawa (2005) that usually, only people in the upper levels of society can afford to buy bee products. He reported that 30 percent of the population in Philippines, which needed this nutritious food, cannot buy it. The results (Table 12) also show that honey is consumed relatively higher during wet seasons than dry seasons by an average of 1.090 more litres per month (at 1% level of significance). This supports the results in section 4.1.4, which indicated that there was an increase in honey consumption in wet season.

4.1.6 Factors influencing consumption of honey

During the survey, respondents were asked as to why they consumed honey. From their responses (Table 13), it was revealed that most people consume honey for nutritional requirements (56%) and medicinal value (31%). It further shows that 12%

of the consumers interviewed use honey as a substitute for jam, sugar or soft drinks as observed in section 4.1.8.

Table 13: Responses on reasons for consuming honey by consumers in Dar-es-Salaam

	Number of Respondents	Percent
Medicinal value	10	31.3
Nutritional requirements	18	56.3
Substitute for sugar, jam and soft drink	4	12.4
Total	32	100.0

In addition to the observed medicinal and nutritional values, respondents mentioned some other factors that were likely to affect consumption of honey. These were poor quality honey (28.1%) and poor honey packaging facilities (15.6%). Poor storage and inappropriate containers were observed during the survey and it was found that most of the traders and producers stored their products in inappropriate containers like used plastic and konyagi bottles. Some of the producers use rusty drums which resulted into contamination of honey. It was also found that honey was stored in hot places. Transportation which takes several days to reach the markets was also reported by traders. Such delay could cause the HMF of the honey to rise since the honey is exposed to high temperature of the day, hence lowering product quality. Other reasons mentioned by respondent were unaffordable prices (18.8 %), poor availability (15.5%) (Table 14).

Table 14: Responses by consumers on factors affecting consumption of honey in Dar-es-Salaam region

Factor	Number of Respondents	Percent
Poor availability	5	15.6
Poor quality	9	28.1
Higher prices	6	18.8
Poor packing facilities	5	15.6
Poor availability, high prices and poor packing facilities	4	12.5
Poor availability and packaging facilities	3	9.4
Total	32	100.0

Possibility of fermentation was reported to be the least appealing characteristic of honey by 37.5% of interviewed respondents (Table 15). Fermentation in honey is caused by osmophilic yeasts, which cannot occur in honey that has a carbohydrate content > 83%, a moisture content < 17.1%, and a storage temperature < 52 °F (11 °C) or in honey that has been heat-treated. Properly extracted, treated and stored honey therefore should not ferment (White, 1992). Fermentation of honey can be avoided by harvesting ripe honey only and not exposing it to air by storing it in appropriate containers with airtight lids. It is also important to ensure that traders or beekeepers do not add water to the honey for the selfish purpose of increasing the quantity.

Table 15: Responses on least appealing characteristics of honey by consumers in Dar-es-Salaam region

Characteristic	Number of Respondents	Percent
Possibilities of fermentation	12	37.5
Granulation	12	37.5
None	8	25.0
Total	32	100.0

Out of the respondents interviewed 37.5% also indicated that granulation was among the least appealing characteristics of honey. The response may have been due to limited knowledge by the consumers, of the characteristics of honey, because granulation or crystallization is a natural process that occurs in honey. Honey is a supersaturated sugar solution out of which the glucose tends to crystallize. The glucose/water content ratio and presence of nuclei for crystal growth helps to determine the rate of crystallization. Crystallization is most rapid at 57°F (14 °C) and can easily be reversed by heating (FAO, 1981).

4.1.7 Consumers' feelings on honey compared to its substitutes (jam, sugar and soft drinks)

Consumer respondents were asked to give their feelings about different aspects related to honey and its substitutes as summarized in Table 16. According to the respondents, 53.1%, reported unsatisfactory on the availability of honey compared to its substitutes. This was obvious due to the fact that honey was not readily available in most of the shops when compared to the availability of its substitutes i.e. jam, sugar or soft drinks.

Another reason may be due to scarcity of the honey in wet season as explained in section 4.1.5. MNRT (2005) argued that like any biological product, bee products are subject to seasonal variations. These variations together with low production affect the amount available for sale or consumption. A retailer who wants to sell the products throughout the year may face problems especially when processing and

storage are not efficient. Seasonality of products results into inconsistent marketing. Under such situations traders are often temporarily forced out of the business.

Packaging was also found to be a problem as shown in Table16. About 71% of the respondents reported to be unsatisfactory as opposed to packaging of the substitutes where 100% of the respondents were satisfied. Likewise the hygiene of the honey was reported unsatisfactory by 53.1% of the respondents interviewed. This is supported by the observations reported earlier that inappropriate containers were being used. However 100% of the respondents were satisfied on the nutritional requirements, medicinal value and taste of honey, this confirm to the observation made in section 4.1.6 that most of honey consumers in Dar-es-salaam region consumed the honey for nutritional requirements and medicinal value.

Table 16: Consumers' feelings about different aspects related to honey and its substitutes in Dar-es-Salaam

Item	Satisfactory		Unsatisfactory	
	N	%	N	%
Price				
Honey	22	68.8	10	31.3
Substitute	21	70.0	9	30.0
Availability				
Honey	15	46.9	17	53.1
Substitute	25	83.3	5	16.7
Packaging				
Honey	10	30.3	22	70.7
Substitute	30	100.0	0	0.0
Hygiene				
Honey	15	42.5	17	53.1
Substitute	30	100.0	0	0.0
Nutritional value				
Honey	32	100.0	0	0.0
Substitute	17	56.6	13	43.4
Medicinal value				
Honey	32	100.0	0	0.0
Substitute	13	43.4	17	56.6
Taste				
Honey	32	100.0	0	0.0
Substitute	28	93.4	2	6.6

Table 17 results show that beside nutritional and medicinal values, natural taste of honey was also regarded as one among the most appealing characteristic of honey relative its substitutes.

Table 17: Responses on Most appealing characteristics of honey by consumers in Dar-es-Salam region

Characteristic	Number of Respondents	Percent
No artificial ingredient	6	18.7
Its medicinal value	12	37.5
High nutritional value	7	21.9
Sweet taste	7	21.9
Total	32	100.0

4.2 Honey quality ascertainment for the market

4.2.1 Pesticides and antibiotic residues in honey

In this study, 10 samples of honey collected from the production sites, and 10 from marketing sites were tested for pesticides and antibiotic residues. Out of the twenty samples tested, only one of the samples was found to contain Aldrin, an organochloride pesticide calculated to be 33.86 ppb. This sample was collected from Mwananyamala, one of the market sites in Kinondoni District. All samples collected from the production sites were found to be free from pesticides or antibiotics.

The source of the Aldrin in the honey was probably the use of containers earlier used to store the chemical. It could also be due the fact that some unfaithful traders add water to maximize their profit and in so doing they may use contaminated water. However, the amount of Aldrin found in the sample is still below the accepted level of 50 ppb for organochlorides (Appendix v). The twenty samples were also screened

for Chloramphenical and antibiotics phenol, and none were found to be present in any of the samples.

4.2.2 Moisture content in honey

The results (Table 17) show that out of the twenty samples of honey tested for moisture content 2 were found to have 20.3% and 20.8% moisture content respectively, which were above the tolerant limit of 20% required for table honey. However, the amount of moisture was still within the limit of 22% for industrial honey.

The samples with higher water contents were collected from the market site at Buguruni in Ilala and Mwananyamala in Kinondoni. The sample of honey with the lowest water content of 11.3 % (Table 18 and 19) was collected from Kizengi village in Uyui district, one of the production sites. The results of this sample from Kizengi village indicate that the training provided to the beekeepers through the support from Beekeeping Development Project financed by NORAD/TANZANIA bilateral funds has had a positive impact. The Kizengi village is one of the villages under the project support.

According to the findings of this study, moisture content of honey from production sites was insignificant. On the bases of the results in Tables 19 and 20, the means of water content for honey from the market and production sites are 17.8% and 15.9 % respectively. These means are within the tolerable limit of moisture content for table honey of 20%.

Table 18: Analysis of chemicals content in honey from the production and market sites in Tabora region and Dar-es-Salaam city

Sample No	Sample Origin	% Moisture	Acidity mg/Eq/kg	% Simple sugar	HMF mg/kg	% Insoluble solids m/m
Production sites						
1	Nsongoro	16.74	21.00	88.00	21.5568*	0.46
4	Igalula	18.54	28.75	80.00	33.2334*	0.38
6	Kipanga	15.06	19.25	93.00	28.443*	0.14
8	Usoke	17.36	21.75	81.00	16.77	0.33
10	Kizengi	11.31	24.00	92.00	20.958*	0.19
12	Malongwe Stat.	17.37	26.00	89.00	38.3233*	0.28
13	Kanyamsanga	13.69	21.00	87.00	21.8562*	0.08
15	Ugalla reserve	16.22	23.25	88.00	33.5328*	1.07
18	Malongwe Vil.	17.65	26.25	77.00	22.2754*	0.67**
20	Ugalla village	14.91	33.50	81.00	35.78*	0.27
Market sites						
2	Tandika	18.33	22.50	75.00	21.4969*	0.99**
14	Buguruni-1	17.56	25.75	82.00	21.2524*	0.56**
3	Buguruni-2	20.29*	50.00*	74.00	36.9759*	0.92**
5	Ilala	17.12	26.75	89.00	22.455*	0.07
7	Street vender	17.50	29.25	99.00	32.634*	0.67**
9	Kisutu	15.30	24.75	72.00	26.4969*	0.46
11	Temeke	17.54	28.25	87.00	30.8382*	0.08
16	Kinondoni	16.36	27.50	88.00	18.23	0.66**
17	Mwananyamala	20.75*	28.25	87.00	20.3592*	0.25
19	Kariakoo	17.02	27.75	86.00	15.69	1.20
Tolerant Limit						
	Table	max 20	max 40	min 60	max 20	max 0.5
	Industrial	max 22	max 50	min 65	max 40	max 0.5

* Level beyond tolerant limit for table honey ** beyond tolerant limit for table and industrial honey

Table 19: Status of chemical content in honey from the Production sites in Tabora region

	N	Minimum	Maximum	Mean	Std. Deviation
% of Moisture content	10	11.31260	18.53730	15.8845800	2.17929054
Free Acidity in mg/Eq/kg	10	19.25	33.50	24.4750	4.29219
% of Simple sugar	10	77.00	93.00	85.6000	5.46097
HMF content in mg/kg	10	16.76640	38.32330	27.2723560	7.51140287
%Water insoluble solids content in m/m	10	.08	1.07	.3870	.29334

Table 20: Status of chemical content in honey from the market sites in Dar-es-Salaam region

	N	Minimum	Maximum	Mean	Std. Deviation
% of Moisture content	10	15.29645	20.75380	17.7771150	1.66261722
Free Acidity in mg/Eq/kg	10	22.50	50.00	29.0750	7.61491
% of Simple sugar	10	72.00	99.00	83.9000	8.27916
HMF content in mg/kg	10	15.68856	36.97590	24.6430540	6.86027554
%Water insoluble solids content in m/m	10	.07	1.20	.5860	.38240

4.2.3. Free acidity in honey

The twenty samples of honey tested for free acidity, only one sample collected from Buguruni market in Ilala district was found to have an amount of free acid of 50mg/Eq/kg which is beyond the tolerable limit for table honey of 40mg/Eq/kg (Table 18). However, the amount is within the limit for industrial honey of 50mg/Eq/kg. The means of free acid content in honey collected from the market was higher than that of the honey collected from the producer sites. These were 29mg/Eq/kg and 24.5 mg/Eq/kg respectively. The results seem to be due to poor

handling, processing or use of inappropriate containers which have been a problem to most of the honey traders. This is supported by the findings presented in section 4.1.7 where respondents indicated that poor quality of honey was due to poor packaging facilities.

4.2.4 Simple sugars

All the twenty samples of honey tested were found to have amount of simple sugars as ranging from 75% to 99% (Table 18) which is higher than the 60% minimum amount required for table honey. The means for the amount of sugar found from the samples of honey collected from the producer and market site were almost the same: 85.6 % and 83.9% respectively (Table 19 and 20).

4.2.5 Hydroxymethylfurfuraldehyde (HMF) content in honey

The results summarized in Table 18 show that for the twenty samples of honey tested only 3 were found to have low HMF content of 16.8mg/kg, 18mg/kg and 15.7mg/kg which were within the tolerant limit of 20mg/kg for table honey. These samples were collected from Usoke (16.8mg/kg) a production site, and from Kinondoni (18mg/kg) and Kariakoo (15.7mg/kg) market sites. The remaining 17 samples had HMF content above the tolerant limit of 20mg/kg for table honey but within the tolerant limit of 40mg/kg for industrial honey. The sample with the highest HMF content of 38mg/kg was collected from Malongwe station a production site and the lowest HMF content of 16mg/kg was from Kariakoo a market site (Table 19 and 20). According to the results, HMF is a problem from the production to the market sites. It is a compound that results from the breakdown of simple sugars (such as glucose or fructose) at pH

5 or lower, therefore HMF will be raised if the honey is exposed to warm conditions which lowers the quality of honey. In the production site the results are supported by the fact that some beekeepers heat honey to facilitate the straining process. This was also reported by MNRT (2004) that in Kigoma beekeepers generally process honey by boiling.

Poor storage facilities and transportation of honey from the production site to the markets have been reported to be one of causes for lower quality of honey. MNRT (2001a, 2004) studies on marketing of bee products reported that delayed and prolonged transportation periods of bee products by Tanzania Railways had caused honey to lose its original quality especially that of HMF content. It further pointed out that the beekeepers and traders stored honey in hot places and transported the honey to the market during hot weather and high levels of humidity.

4.2.6 Water insoluble solids

The results in Table 18 show that 6 samples of honey out of the twenty tested for water insoluble solid contents were found to have the water insoluble solid contents beyond the tolerable limit of 0.5m/m required for table and industrial honey. The honey samples were collected from Tandika (0.99%), Buguruni-1 and 2 (1 and 0.6%), Street vender (0.7%), and Kinondoni (0.7%) market sites and Malongwe village (0.7) producer sites. The mean for the honey samples collected from the market sites of 0.59 is higher than that of the producer sites which is 0.39% (Table 19 and 20).

The results reveal that the water insoluble solid content in honey is a big problem at the market sites. This supports the feelings expressed by consumers in section 4.1.8 who reported hygiene of honey as being unsatisfactory. The existing of these water insoluble solid contents may be due to inappropriate handling of honey, not well strained or dirty containers. MNRT (2004) study revealed that most of filtered honey in Kibondo, Kigoma and Rufiji districts was stored in plastic containers and un-lacquered metal drums and covered with material made of jute and synthetic bags. The covering materials expose honey to moisture absorption and contamination from dusts, dissolving metals, rust and insects.

4.2.7 Metal contaminants in honey

The samples of honey were tested for ash content and two metals, Zinc and Cooper were tested. According to the results, the ash content in honey was found to be ranging from 0.026% to 0.223% with a mean of 0.102% and 0.023% to 1.045% with a mean of 0.224% from the production sites and market sites respectively. The ash content was within the tolerable limit for table honey which is 0.65.

The results also show that Cooper content of the honey collected from the production site ranged from 0.8 to 0.99 mg/kg with a mean of 0.102 mg/kg (Table 21 and 22), and for that collected from the market sites ranged from 0.04 mg/kg to1.6 mg/kg with a mean of 0.643 mg/kg (Table 23). The Copper content in the samples was within the tolerable limit of 2 mg/kg. It also indicates that Zinc content ranged from 0.13 mg/kg to 2.87 mg/kg with a mean of 0.88 mg/kg and 0.26 to 2.31 mg/kg with a mean of 1 mg/kg from honey collected from the production and market sites

respectively. The Zinc contents in the samples were within the tolerable limit of 5 mg/kg for table honey.

Table 21: Metals content in honey from the Production and market sites in Tabora region and Dar-es-Salaam region

Sample No	Sample Origin	% Ash	Copper mg/kg	Zinc mg/kg
Production sites				
1	Nsongoro	0.12	0.51	1.55
4	Igalula	0.06	0.55	2.87
6	Kipanga	0.06	0.61	0.76
8	Usoke	0.08	0.11	0.60
10	Kizengi	0.04	0.08	0.24
12	Malongwe station	0.03	0.30	0.33
13	Kanyamsanga	0.22	0.14	1.03
15	Ugalla reserve	0.10	0.35	0.70
18	Malongwe	0.14	0.84	0.13
20	Ugalla village	0.19	0.99	0.59
Marketing sites				
2	Tandika	0.58	0.22	2.30
3	Buguruni-2	1.05	1.60	2.31
5	Ilala	0.05	0.04	0.54
7	Street vender	0.09	0.41	1.87
9	Kisutu	0.05	0.13	0.59
11	Temeke	0.08	0.81	0.67
14	Buguruni	0.02	0.04	0.31
16	Kinondoni	0.05	1.38	0.26
17	Mwananyamala	0.15	0.70	0.89
19	Kariakoo	0.13	1.10	0.29
Tolerant Limit				
	Table honey	max 0.6	max 2	max 5
	Industrial honey	max 1		

Table 22: Metal contents in honey from the production site in Tabora region

	N	Minimum	Maximum	Mean	Std. Deviation
% of Ash content	10	.026	.223	.102	.064
Copper content in mg/kg	10	.080	.990	.448	.309
Zinc content in mg/kg	10	.130	2.870	.880	.811

Table 23: Metal content in honey from the Market site in Dar-es-Salaam region

	N	Minimum	Maximum	Mean	Std. Deviation
% of Ash content	10	.023	1.045	.224	.333
Copper content in mg/kg	10	.040	1.600	.643	.570
Zinc content in mg/kg	10	.260	2.310	1.003	.829

4.3 Source of honey contamination and course of low quality

The results in Table 24 show that 43% of the sampled producers think that the source of contamination was poor harvesting and processing, followed by 29%, who are for inappropriate containers, 13% for heating and 15% who think that the source of contamination is due to poor handling and storage or adding to honey contaminated water. Pesticides contamination was the last stated source with only about 2%.

Table 24: Responses by producers on sources of honey contamination/ low quality in Tabora region

Source	Frequency	Percentage
Not known	5	4.1
Heating of honey	16	13
Inappropriate container	35	28.5
Poor harvesting and processing	53	43.1
Adding water	9	7.3
Poor handling and storage	3	2.4
Pesticides contamination	2	1.6
Total	123	100.0

4.3.1 Contamination of honey due to poor harvesting and processing

The idea that the contamination of honey was due to poor harvesting and processing, is supported by the fact that most of the sampled beekeepers in the three districts interviewed revealed that they still relied on indigenous knowledge in harvesting, for example, using local smokers with uncontrolled smoke and ashes. Such smoke and ashes mix with honey and adversely affect its quality.

Similarly MNRT identification report (2004) reported that in Kigoma, Kibondo and Rufiji honey contamination was due to the use of inappropriate technology in harvesting, processing, storage and packaging. The reasons pointed out were lack of training on appropriate techniques and quality standards. This was also observed during this study as most beekeepers interviewed in all districts (91%) reported having inadequacy information and knowledge on required honey quality (Table 25) and only 7% reported to be aware of the required standards for honey quality.

Table 25: Responses by producers on the awareness of the required standard for quality honey

	Number of Respondents	Percent
Aware of required standard for quality of honey	8	7.7
Not aware of required standard for quality of honey	84	92.3
Total	91	100.0

4.3.2 Contamination of honey due to inappropriate containers

The findings from this study confirm that inappropriate containers were among the source of contamination. Most of the producers reported that they had problems in

getting appropriate containers due to reasons indicated in Table 26. About 65% reported that lack of financial capital was a reason for failure to obtain appropriate containers, 13 % reported scarcity of containers during harvesting time as the reason, and 11% complained that the price of the storage facilities was unaffordable by most local beekeepers.

Table 26: Responses by producers on problems in getting packaging facilities

	Frequency	Percent
Limited capital	59	64.8
High price of containers	10	11.0
Transport cost	4	4.4
Scarcity during harvesting time	12	13.2
Not provided any more	6	6.6
Total	91	100.0

4.3.3 Low quality of honey due to heating

Beekeepers heat honey during straining to make it more liquid, hence easy to strain and takes less time. Beekeepers who were asked to give reasons for heating the honey while they knew that they were making it loose its quality, they responded by saying that even if the honey is heated will fetch the same price as the one not heated, as traders buy it for making sweets and local beer. This implies that since there was no difference in the price between the heated and non heated honey, beekeepers did not see the reason of adopting appropriate methods for straining.

The worst thing is that there are no quality control mechanisms in place to ensure that the producer do not reduce the quality of the honey by heating. In this study

findings indicate that this was attributed mainly by extension personnel having difficulties in delivery extension services, including inspection and effective communication.

4.4 Efficiency analysis for the honey marketing system

4.4.1 Marketing channels for honey

In order to understand how honey move, through various channels, it is necessary to identify the roles of various marketing participants involved. Survey results show that there were six marketing channels of honey in the area of research as follows:

(i) Producer - Consumer: Consumers purchased honey directly form producers. Beekeepers reported and others were seen during the survey selling honey to their neighbours from their homesteads. In Malongwe village beekeepers were seen selling honey at the railway station.

(ii) Producer – wholesaler (regional) – consumer/export: Beekeepers sold their honey to wholesalers from Tabora town. For example Murkesh and Asali Company were reported to buy honey at the production sites and sell some of it to consumers in Tabora town. Also Fidah Hussein and Mohamed enterprise were reported to buy honey direct from the beekeepers as wholesalers and export the product.

(iii) Producer – retailer – consumer: It was reported by some of the beekeepers that they take their honey to Dar-es-Salaam and Arusha and sell it to traders who strain and pack it in small containers and then sell it as retailers to consumers.

(iv) Producer – wholesaler (regional or inter-regional) – retailer – consumer: for example it was found that Africare was buying honey from the beekeepers acting as an agent for urban based traders. Africare pack it in small containers and sell it to retailers from Tabora town or other regions like Arusha, Dar-es-Salaam etc., and these finally resell the honey to consumers.

(v) Producer – wholesaler – wholesaler (regional or inter-regional) – retailer – consumer: for example Murkesh a honey trader reported to buy honey from the beekeepers as a wholesaler and sell it to Fidah Hussein enterprise a wholesaler who then exports the product. It was also reported by Asali company that he get honey from small traders (walanguzi) and then sells it to retailers who resell the honey to consumers

(vi) Producer – wholesaler (regional trader) – wholesaler (inter-regional trader) – consumers: for example Asali company reported to buy honey from the beekeepers as a wholesaler and sell it to traders from Dar-es-Salaam and Arusha who act as distributors or wholesalers. These wholesalers resell the honey to consumers.

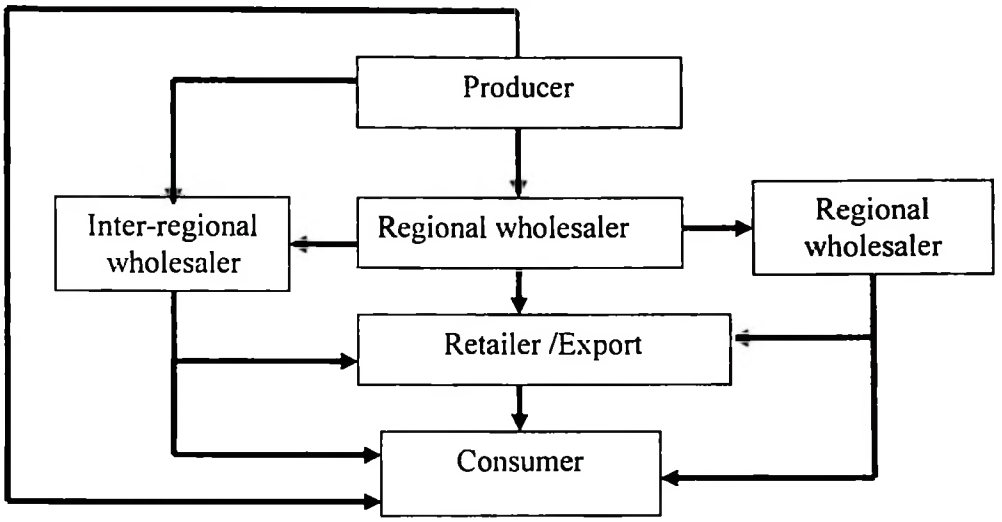

Figure 3: Marketing channels for honey

Beekeepers interviewed were aware on the cost that is to be incurred by taking the product to the market; this includes storage facilities, transportation or physical distribution which involves transportation between different centres and storing the product while in transit etc. However, the beekeepers cannot adopt the shortest channel since they cannot afford all these costs. Therefore this shows the importance of having middlemen in the marketing the honey, since producers can eliminate the middlemen, but not their functions. When a producer attempts to perform these functions, his production costs tend to increase and this in turn may increases the prices, hence affect marketing efficiency, and when some of these tasks are delegated to middlemen, the production costs tend to decrease.

Marketing study by MNRT (2001) indicated three honey marketing channels commonly found in Tanzania and one of the channels represents an area with beekeepers being served by a cooperative society or association where the

beekeepers are provided with containers to pack their honey and transport to move their honey from camps to central processing and packing plant. The Tabora beekeepers co-operative society is not operating anymore; instead it has signed a contract with a private company (Loonie Company) to buy honey from the members of the association on it's behalf for five years.

According to the information gathered from the management of the cooperative society during the survey of the study, the company has failed to get market for the product collected (14920 and 8920 litres of honey collected in 2004 and 2005 respectively) since 2004. Therefore beekeepers are now depending only on few private traders who are also willing to provide them with containers on condition that they sell honey to the price dictated.

4.4.2 Information transmission

After liberalization of the agricultural marketing system, the price of various agricultural products including honey is supposed to be determined by market forces (supply and demand). Currently therefore, there is no direct control by the government of the prices for honey or their pricing mechanism. Sampled beekeepers were requested to explain how they obtained information regarding honey prices. Survey results show that beekeepers interviewed received price information through various sources as depicted in Table 27. It was found that the majority of sampled beekeepers (62%) obtained price information by cross checking with several middlemen followed by friends or neighbours (31%) and through paying direct visits to market places (4%) and through Tabora Beekeepers Association (3%).

Due to lack of extension agents, beekeepers depend mainly on middlemen to obtain price information. It was observed, during the study, that beekeepers were not aware if the price they were getting was the price exists which in the market, neither were they aware whether their earnings cover the production costs. Beekeepers were also getting wrong information about standards of the product and the market. This is similar to what was reported by Mlambiti (1975) that potential source of pricing inefficiency is lack of information and lack of standard. MNRT (2004) also agreed that there were inadequate information delivery systems for sharing market information due to lack of experts in marketing at MNRT. As such no data on markets are collected and analyzed so to be able to advise beekeepers and other stakeholders.

Table 27: Ways of getting information on market price by producers

	Number of Respondents	Percentage of total number of Producers Percent
Direct visit to the market place	4	4.4
Cross check with several middlemen	56	61.5
Hear from friends	28	30.8
Association	3	3.3
Total	91	100.0

4.4.3 Gross Margin Analysis

The study tried to ascertain the level of market efficiency by evaluating costs and prices at different levels of the market chain, including wholesale at local market, wholesale at export levels, and retail level. Gross margins were calculated and used in assessing relative profitability of the product at the different levels of the market chain.

The results in Tables 28, 29 and 30 indicate that gross margin of the selling price at the retail level of 18% was the highest followed by wholesale level for export of 9% p and wholesale level for local market of 8..8%. Share of consumer price was found to be highest for producer of 33.3% followed by retailer of about 18.2%, wholesaler at the level of export of 6.1% and wholesaler at local market level of 3.8%.

Table 28: Marketing costs and gross margin for honey at wholesale levels (local market)

Cost item	Cost in Tshs per litre	% of the selling price	% of the consumer price
Product cost	1 000.00	71.43	33.33
Commission agent fees	2.00	0.14	0.07
Produce council fee	37.50	2.68	1.25
Transportation costs	200.00	14.29	6.67
Storage costs	4.95	0.35	0.17
Packaging containers	40.00	2.86	1.33
Shrinkage	0.09	0.01	0.00
Total marketing costs	1284.54		
Selling price	1 400.00	100.00	
Gross margin	115.46	8.25	3.85

Table 29: Marketing costs and gross margin for honey at wholesale level (export)

Cost item	Cost in Tshs per litre	% of the selling price	% of the consumer price
Product cost	1 000.00	48.34	33.33
Cost of containers	190.00	9.19	6.33
Cost of quality testing	5.56	0.27	0.19
Cost of transportation	200.00	9.67	6.67
Cost of forwarding agents	55.70	2.69	1.86
Export fee by MNRT	1.67	0.08	0.06
Storage cost	2.95	0.14	0.10
Processing cost	5.00	0.24	0.17
Shrinkage costs	102.00	4.93	3.40
20% VAT	322.58	15.59	10.75
Total marketing costs	1 885.46		
Selling price	2 068.50	100.00	
Gross margin	183.04	8.85	6.10

Table 30: Marketing costs and gross margin for honey at retail level

Cost item	Cost in Tshs per litre	% of the selling/ consumer price
Product cost	1 700.00	56.67
Market fees	100.00	6.67
Council produce fee	37.50	1.25
Commission agent fees	200.00	6.67
Transportation costs	10.00	0.33
Storage costs	4.95	0.17
Packaging containers	200.00	6.67
Shrinkage	102.00	3.40
Total marketing costs	2 454.45	
Selling price	3 000.00	100.00
Gross margin	545.55	18.18

The share of consumer price for the producer of about 33% seems to be high, but it should be understood that this is not a profit but a total share which include the costs for production and packaging which are not known. Therefore from the results we can not say that producers are benefiting from the share received unless we know the actual production, processing and packaging costs at that level and at that particular area.

According to the results in Tables 28, 29 and 30 all levels of the marketing chain are able to make profits, although the gross margin for the retail level of 18% is very high compared to the gross margin at the wholesale levels both for local market and export which are 8.8% and 8.2% respectively. This implies that the marketing costs at wholesale levels are not equally shared with retail levels. The retailers' earnings were not reflecting marketing costs, meaning that the price rises artificially. Margin analysis in African agricultural markets shows that, in most cases, traders' profit margins (gross margin) amount to less than 10% of the selling price (ILRI, 1995).

The results also indicate that transport for the wholesale level for local market of 6.7% and the wholesale level for export of 9.7% share of the total marketing cost was highest than other costs, followed by packaging (containers) of 1.3% and 6.3% for the wholesalers for local market and export respectively. This is different at retail level where the packaging (6.7%), commission agent (6.7%) and market fees (6.7%) costs were higher than transport (0.3%). This is because wholesalers are the ones collecting the product from the producers' camps away from villages to the retailer, while retailer only incurs small cost to transfer the product to the market. MNRT (2004) study also revealed problems associated with unreliable transport and the bad condition of the roads which increased the transportation costs.

4.4.4 Marketing margin analysis

The marketing margins were calculated based on wholesale and retail market levels. The marketing margin is the difference between the buying price and the price received on sale. That difference was considered to be the cost of marketing and what is incurred in getting the product from the producer to the consumer in the desired form.

4.4.4.1 Buying and selling prices of honey in the marketing channel

(i) Wholesale trade in local markets in Dar-es-Salaam and Tabora region

The results in Table 31 indicate that buying price of honey ranged from Tshs 850 to 1 250 per litre with a mean of Tshs 1 000 and the selling price ranged from Tshs 1 100 to 1 750 per litre with a mean of Tshs 1 400.

Table 31: Buying and selling prices means at wholesale level in local markets of Dar-es-Salaam and Tabora region

	Minimum	Maximum	Mean	Std. Deviation
Buying price of honey per litre (Tshs)	850	1 250	1 000	157.00
Selling price of honey per litre (Tshs)	1 100	1 750	1 400	277.49

(ii) Wholesale traders at export level

The results in Table 32 indicate that buying price of honey ranged from Tshs 900 to 1 100 per litre with a mean of Tshs 1 000 and the selling price ranged from Tshs 1 650 to 2 946 per litre with a mean of Tshs 2 068.50.

Table 32: Buying and selling prices means at the level of wholesale (export)

	Minimum	Maximum	Mean	Std. Deviation
Buying price of honey per litre (Tshs)	900	1 100	1 000.00	48.80
Selling price of honey per litre (Tshs)	1 650	2 946	2 068.50	493.49

(iii) Retail trade in Dar-es-salaam city

The results in Table 33 indicate that buying price of honey ranged from Tshs 1 000 to 2 500 per litre with a mean of Tshs 1 700 and the selling price ranged from Tshs 2 000 to 4 000 per litre with a mean of Tshs 3 000.

Table 33: Buying and selling prices means at retail level in Dar-es-salaam city

	Minimum	Maximum	Mean	Std. Deviation
Buying price of the honey on sell per litres (Tshs)	1 000	2 500	1 700	356.27
Selling price of honey per litres (Tshs)	2 000	4 000	3 000	570.00

The results in Tables 32 and 33 indicate that the retail level price is better than the export wholesale price.

4.4.4.2 Price spread and percentage margin

According to the results in Table 34 the marketing margin for the level of retail of Tshs 1 300 (43.3% of the consumer price) was the highest followed by wholesale level for export of Tshs 1 068 (35.6% of the consumer price) and Tshs 400 (13.3% of the consumer price). These results concur with findings presented in section 5.4.3 on gross margins. The marketing margins covers the marketing services for wholesale level for local market amounting to Tshs 284.54, wholesale level for export of Tshs 885.46, and retail level of Tshs 754.45 with a balance as a profit in each level as calculated in Table 30, 31 and 32 of section 5.4.3. This therefore, indicates a positive return for both wholesale and retail levels although retailers are earning more than wholesalers.

Table 34: Marketing margins for honey at wholesale and retail levels

	Wholesale level for local market	Wholesale level for export	Retail level
Buying price (Tshs)	1 000.00	1 000.00	1 700.00
Selling Price (Tshs)	1 400.00	2 06.00	3 000.00
Marketing margin (Tshs)	400.00	1 068.00	1 300.00
Marketing margin percentage of consumer price	13.33	35.61	43.33

4.4.4.3 Pricing efficiency

Correlation analysis was carried out to test the extent to which buying price, selling price, and the marketing margins are correlated to one another at the level of the wholesalers and retailers. According to Silomba (2000) if marketing margin are independent of prices and thus constant in absolute terms, price change are being passed on to the next market channel level and vice versa. Independent margins are statistically indicated by a low correlation between the margin and prices, and this corresponds to a situation in which selling and buying prices are highly correlated.

(i) Retail trade in Dar-es-salaam region

A correlation analysis between margin, selling and buying prices in Table 35 shows that marketing margin is statistically correlated with the selling price ($r = 0.684$; $P = 0.01$). Whilst it is not significantly correlated with buying price ($r = 0.073$). The result indicates that about 68% of the variation in the margin is explained by selling price. Furthermore, the results show that selling is significantly correlated with buying price ($r = 0.54$; $P = 0.01$), as 54% of the variation in selling prices is explained by buying prices and the remaining percentage (46%) is explained by other factors such as marketing costs.

Table 35: Correlations between buying price, selling price and marketing margin at the retail level

		Buying price of honey per litre	Selling price of honey per litres	Marketing margin
Buying price of honey per litres	Pearson Correlation	1	.544(**)	.073
	Sig. (2-tailed)	.	.001	.690
	N	32	32	32
Selling price of honey per litres	Pearson Correlation	.544(**)	1	.684(**)
	Sig. (2-tailed)	.001	.	.000
	N	32	32	32
Marketing margin	Pearson Correlation	.073	.684(**)	1
	Sig. (2-tailed)	.690	.000	.
	N	32	32	32

** Correlation is significant at the 0.01 level (2-tailed).

(ii) Wholesale trade in local markets in Dar-es-Salaam and Tabora region

Analysis of correlation between margin, selling and buying in Table 36 shows that the marketing margin is statistically correlated with the selling price ((r = 89; P=0.009). Whilst it is not significantly correlated with buying price at 0.01 level of significance (r = 0.61; P = 0.101). Furthermore, results show that selling and buying prices are highly correlated with each other (r = 88; P = 0.010). These results show that 89 % and 88% of the variations in margin and selling prices are influenced by selling and buying prices respectively. This means that 11% and 12% of the variations in the selling and buying prices respectively are due to other factors such as marketing costs.

Table 36: Correlations between buying price, selling price and marketing margin at wholesale level in local markets

		Buying price of honey per litre	Selling price of honey per litre	Marketing margin
Buying price of honey per litre	Pearson Correlation	1	0.883(**)	0.606
	Sig. (1-tailed)		0.010	0.101
	N	6	6	6
Selling price of honey per litre	Pearson Correlation	0.883(**)	1	0.890(**)
	Sig. (1-tailed)	0.010		0.009
	N	6	6	6
Marketing margin	Pearson Correlation	0.606	0.890(**)	1
	Sig. (1-tailed)	0.101	0.009	
	N	6	6	6

** Correlation is significant at the 0.01 level (1-tailed).

(iii) Wholesale traders at export level

Analysis of correlation between margin and selling and buying prices in Table 37 indicates a high correlation between marketing margin and selling price (r = 0.995; P = 0.000). Whilst it is not significantly correlated with buying price (r = 0.20; P = 0.668). Furthermore, results show that selling and buying prices are not correlated to each other (r = 29; P = 0.522). These results show that 99.5% of the variations in margin are influenced by selling prices and also that only 29% of the variation in the selling price is influenced by the buying price and 71% of the variations is due to other factors such as marketing costs (fees, transport, packaging, handling, warehousing, labour etc).

High correlation between margins and selling price indicates that for the two levels of marketing channels (retail and wholesale), price changes are not being passed on

to the subsequent channel levels. These results support the findings presented in 4.5.3 that gross margin for the retail level was very high compared to the gross margin at the wholesale levels both for local market and export. This implies that retailers earning from honey are not reflecting marketing costs, meaning that the price rises artificially.

Table 37: Correlations between buying price, selling price and marketing margin at the level of wholesale (export)

		Buying price of honey per litre	Selling price of honey per litre	Marketing margin
Buying price of honey per litre	Pearson Correlation	1	0.294	0.200
	Sig. (1-tailed)		0.522	0.668
Selling price of honey per litre	Pearson Correlation	0.294	1	0.995(**)
	Sig. (1-tailed)	0.522		0.000
Marketing margin	Pearson Correlation	0.200	0.995(**)	1
	Sig. (1-tailed)	0.668	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusions

In Dar-es-salaam most of the people were found to be aware of the medicinal and nutritional values, and the natural state of honey. However, sales of honey in the market in Dar-es-salaam city are affected by various factors such as quality, colour, packaging facilities, availability, originality and seasonality of honey. Similarly, these factors affect the external markets. In addition, the income of consumers also seems to affect the sales of honey.

HMF and water insoluble solids content in honey was found to be a problem facing both traders and producers in meeting the required National and International standards of honey. However, despite the fact that the honey samples were collected from areas where beekeepers were also involved in tobacco growing which involved using pesticides, the honey was found to be free from pesticide residue contamination.

Possible contamination sources both in the market and production sites include inappropriate containers, poor harvesting and processing techniques, and purposely mixing honey with other ingredients like sweetener or water. This is due to lack of knowledge on honey quality standards, lack of adequate laboratory facilities for honey testing and inefficient marketing information system

Six marketing channels of honey were identified in the area of research: (i) Producer – Consumer; (ii) Producer – wholesaler (regional) – consumer/export; (iii) Producer – retailer – consumer; (iv) Producer – wholesaler (regional or inter-regional) – retailer – consumer; (v) Producer – wholesaler – wholesaler (regional or inter-regional) – retailer –consumer; (vi) Producer – wholesaler (regional trader) – wholesaler (inter-regional trader) – consumers.

Problems faced at the wholesale level was transport cost which was found higher than other marketing costs followed by packaging, while at retail level packaging, commission agent and market fees ranked very high. However, honey traders have positive returns at each level of the marketing channel that is wholesale and retail, this suggesting that marketing of honey was responding well.

Analysis of correlation between marketing margins and prices indicates that for the two levels of marketing channels (retail and wholesale) price changes was not being passed on to the subsequent channel levels. This implies that retailers' earnings were not reflecting marketing costs, which in turn means that the price rises artificially.

5.2 Recommendations

5.2.1 Recommendations for immediate implementation

Honey traders and producers should improve on the limiting factors for consumption of honey in order to attract more customers in the honey industry. Traders and producers are becoming aware of the market behaviours and consumer preferences

which can be used to improve the product or introduce new branded products that meet buyers' expectation and requirements at appropriate prices and time.

Government should facilitate training and capacity building of beekeepers and extension personnel by exposing them to modern methods and appropriate techniques for improving quality of honey. Also make it possible for beekeepers to access appropriate tools and equipment, storage materials and credit. Educational materials and dissemination of information on quality standards to beekeeping stakeholders also need to be improved.

Information about availability of stocks, buyers, prices and sellers is vital in effective marketing systems. This could be achieved through deliberate collection and analysis of market data and information at village, district and national levels and the development of effective dissemination systems to deliver the information to beekeeping stakeholders.

The government has to set grade standards for use to facilitate orderly marketing by providing a convenient basis for buying and selling, also for establishing quality controls programs to serve as a basis for quality control inspection and law enforcement. To facilitate promotion of Tanzanian honey, by supporting honey traders in organizing or attending National and International honey shows.

5.2.2 Recommendations for further research

- Carrying out market surveys/research in order to provide beneficiaries and stakeholders with effective marketing information and documentation on both domestic and export markets.
- Carrying out quality analysis of honey in the country in order to be able to establish grading system of honey.
- Carrying out a survey and identify the pesticides which are commonly used in the country in order to obtain their standards for testing.

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APPENDICES

Appendix 1: Questionnaire for honey producers

A. Identification variables

Questionnaire number .....

1. Date of interview

   .....

2. Name of the respondent

   .....

3. Address of respondent

   .....

   .....

4. Age of the respondent"

   .....

5. Sex
   i. Male ( )
   ii. Female ( )

6. Education level
   i. No formal education ( )
   ii. Primary education ( )
   iii. Secondary education ( )
   iv. Post secondary education ( )

7. Technical Training Courses attended

   .....

   .....

   .....

B. Information about trading of honey

1. How many bee hives do you have? (Types of hive and number) - ***Observe the volume of the hive.***

Type of Hive.....Number of hives..... Observed comment.....

Type of Hive.....Number of hives..... Observed comment.....

Type of Hive.....Number of hives..... Observed comment.....

Type of Hive.....Number of hives..... Observed comment.....

2. How much honey do you produce per annum (Average per each hive above)?

Type of Hive.....Amount produced in litres .....

Type of Hive.....Amount produced in litres .....

Type of Hive.....Amount produced in litres .....

Type of Hive.....Amount produced in litres .....

3. How much honey do you consume per annum?

---

4. How much honey do you sell per annum?

---

5. How much do you sell your product per litres in TSH?

---

6. How do you get information on market price?

(i) Direct visit to the market place

(ii) Cross-check with several middlemen

(iii) Hear from friends

(iv) Radio

(v) Television

7. To whom do you sell your honey?

(i) Private traders ( )

(ii) Cooperative ( )

(iii) Neighbours ( )

(iv) Others specify

---

8. Why selling to the one selected.....

---

9. How much did you sell to the one selected above in the last three years?
(Amount in litres)

Buyers	Year 2002	Year 2003	Year 2004
Private traders			
Cooperative			
Neighbours			
Others			

10. How are you getting linked to the buyers

.....

11. What are the constraints of getting linked to buyers?

.....

12. Which season of the year do you make more sales?

i. Dry season ( )
ii. Wet season ( )
iii. Constant throughout the year ( )

13. How much are you selling during dry season (Average)..... litres. and how much in wet season ..... litres

14. What do you think are the reasons for selling more on the season selected above?

.....

.....

15. For how long (in days) do you store the product you sell?

.....

16. How do you ensure quality of your product? (Consider hygiene and nutritional value).

.....

17. How do you pack your product? (containers used)

.....

18. Where do you get the package facilities?

.....

19. Are there any problems in getting the package facilities?

---

20. What do you think is the sources of honey contamination?

---

21. Are you aware of any National or International required standard for quality honey? If yes please list the particular standard(s).

---

22. Do you face any problems in marketing your products?

    Yes ( )

    No ( )

23. If Yes, what are the major problems

    (i) Production is not sufficient

    (ii) Price is too low

    (iii) Transport problems

    (iv) Other(s) (specify

---

24. What are you doing to solve the problem selected above..... .....

---

25. How much capital are you using to run the business

---

26. How much capital would be needed and for what purpose

---

27. Where do you experience problems most in the product enterprise?

    (i) Production ( )

    (ii) Marketing ( )

What are the problems?

---

28. What are your opinions on what should be done to improve the honey marketing system?

---

29. How much are you getting (Average) per year from each activity mentioned above in Tshs

NA.	ECONOMIC ACTIVITY	AMOUNT GAINED IN TSHS
i		
ii		
iii		
iv		
v		

30. Are there any other income generating activities you are doing apart from beekeeping? Mention them.

.....

.....

Appendix 2: Questionnaire for honey wholesalers/middlemen

C. Identification variables

Questionnaire number .....

1. Date of interview

   .....

2. Name of the respondent

   .....

3. Address of respondent

   .....

   .....

4. Age of the respondent

   .....

5. Sex
   i. Male ( )
   ii. Female ( )

6. Education level
   i. No formal education ( )
   ii. Primary education ( )
   iii. Secondary education ( )
   iv. Post secondary education ( )

7. Technical Training Courses attended

   .....

   .....

D. Information about trading of honey

1. How long have you been in honey business? (Years)

   .....

2. Do you export honey?
   i. Yes ( )
   ii. No ( )

3. What are the reasons for exporting/not exporting honey (consider answer in question 2)

.....

4. Amount of honey you sold for the past three years in local and/or external market

	AMOUNT IN LTS	PLACE	AMOUNT IN LTS	PLACE
YEAR	LOCAL	REGION	EXTERNAL	COUNTRY
2002				
2003				
2004				

5. What type of honey with regard to color do you sell?

(i) Darker-coloured ( )

(ii) Light amber-coloured ( )

(iii) Extra light amber-coloured ( )

(iv) All of the above ( )

6. Which color of honey is more preferred?

.....

7. What is the fraction of the amount of honey preferred do you sell

.....

8. What do you think are the reasons of preferring the type of honeys selected above?

.....

9. What do you do to ensure that you satisfy your costumers with the honey they preferred?

.....

10. Where do you buy the honey you sell?

i. From beekeepers ( )

ii. From wholesaler ( )

iii. From cooperative societies ( )

iv. Others (please specify) ( )

11. How are you getting linked to the producers

.....

What are the constraints of getting linked to producers?

.....

12. From which district does your honey come from?

NA.	DISTRICT	AMOUNT IN LTS
1.		
2.		
3.		

13. How many kilometres is the buying place far from the selling place?

.....

14. How many average days does it takes for a consignment of honey to reach the selling place from the buying place

.....

15. What was the buying price?

.....

16. Which means of transport do you use in transporting your products?

Local market

.....

Export market

.....

17. How much does transport cost you? (Transportation cost and quantity)

.....

18. Do you face any other competitors when you are buying? If yes who are your competitors?

.....

.....

19. What is the selling price per litre in Tsh?

.....

20. How do you determine the price?

i. Market price ( )
ii. Total cost plus profit margin ( )
iii. Just below the market price ( )
iv. Above the market price ( )
v. I am not sure ( )

21. Why using the above methods for determining the price?

.....

22. To whom do you sell your product?

i. To your permanent customers ( )
ii. Any individual customer who need the product ( )
iii. Group of customers or co-operative societies. ( )
iv. Supermarkets ( )
v. Others (hotels, restaurants, airlines and/or tourism centres) ( )
vi. All of the above ( )

23. How are you getting linked to the consumers

.....

24. What are the constraints of getting linked to consumers

.....

25. How much honey on average do you sell per day?

i. Less than 10 litres ( )
ii. Between 10-50 litres ( )
iii. Between 50-100 litres ( )
iv. More than 100 litres ( )

26. Which season of the year do you make more sales?

i. Dry season ( )
ii. Wet season ( )
iii. Constant throughout the year ( )

27. How much are you selling during dry season (Average)..... litres. and how much in wet season ..... litres

28. What do you think are the reasons for selling more on the season selected above?

.....

.....

29. What is your experience on the amount of honey you supply?

i. Enough to cover the demand ( )
ii. Not enough due to high demand ( )
iii. Normally exceed the demand ( )
iv. I am not sure ( )
v. Unpredictable ( )

30. For how long (in days) do you store the product you sell?

.....

31. How much is the storage cost per day?

.....

32. Do you face any competition in selling your product? If yes who are your competitors?

.....

.....

33. Do you pay any tax? If yes, specify the kind of tax you pay and the amount for each kind

.....

.....

34. How do you ensure quality of your product? (Consider hygiene and nutritional value).

.....

.....

35. What do you think is the sources of honey contamination?

.....

.....

36. How do you pack your product?

.....

.....

How much does packing cost you per 20 litres

.....

37. How much does labelling cost you per 20 litres

.....

38. Are you aware of any National or International required standard for quality honey? If yes please list the particular standard(s).

.....

.....

39. Do you face any problems in marketing your products?

Yes ( )

No ( )

40. If Yes, what are the major problems

(v) Production is not sufficient

(vi) Price is too low

(vii) Transport problems

(viii) Other(s) (specify)

---

41. What are you doing to solve the problem selected above

---

42. How much capital are you using to run the business

---

43. How much capital would be needed and for what purpose

---

44. Which do you think is an appropriate and easier way of obtaining this capital?

i. Loan from financial institutions ( )

ii. Financial assistance from donors or friends/relatives ( )

iii. Own equity ( )

Other ways (specify) ( )

---

45. How do the following international market regulations affect your business?

(Rank from the most important to least important) (1 = most important and 5 = least important)

i. Tariffs ( )

ii. Export quota ( )

iii. Export duties ( )

iv. Export licensing procedures ( )

v. Quality and Health standards requirements ( )

46. Which problem(s) do you face in your business?

.....

.....

47. What are your opinions on what should be done to improve the honey marketing system?

.....

Appendix 3: Questionnaire for honey retailers

E. Identification variables

Questionnaire number .....

1. Date of interview

   ---

2. Name of the respondent

   ---

3. Address of respondent

   ---

4. Age of the respondent"

   ---

5. Sex
   i. Male ( )
   ii. Female ( )

6. Education level
   i. No formal education ( )
   ii. Primary education ( )
   iii. Secondary education ( )
   iv. Post secondary education ( )

F. Information about trading of honey

1. How long have you been in honey business? (Years)

   ---

2. What type of honey with regard to color do you sell?

   (v) Darker-coloured ( )
   (vi) Light amber-coloured ( )
   (vii) Extra light amber-coloured ( )
   (viii) All of the above ( )

3. Which color of honey is more preferred?

---

4. What do you think are the reasons of preferring the type of honeys selected above?

---

5. What do you do to ensure that you satisfy your costumers with the honey they preferred?

---

6. Where do you buy the honey you sell?
   i. From beekeepers ( )
   ii. From wholesaler ( )
   iii. From cooperative societies ( )
   iv. Others (please specify) ( )

7. How are you getting linked to the distributors

---

8. What are the constraints of getting linked to distributors?

---

9. From which region of Tanzania does your honey come from?

---

10. From which region the honey is more preferred by your customers

---

11. How many kilometres is the buying place far from the selling place?

---

12. What was the buying price?

---

13. How much does transport cost? (Transportation cost and quantity)

---

14. Do you face any competitors where you are buying? If yes who are your competitors?

---

15. How much do you sell your product per litre in Tsh?

---

16. How do you determine the price?
    i. Market price ( )
    ii. Total cost plus profit margin ( )
    iii. Just below the market price ( )
    iv. Above the market price ( )
    v. I am not sure ( )

17. Why using the above methods for determining the price?

.....

18. How much honey on average do you sell per day?
    i. Less than 10 litres ( )
    ii. Between 10-50 litres ( )
    iii. Between 50-100 litres ( )
    iv. More than 100 litres ( )

19. Which season of the year do you make more sales?
    i. Dry season ( )
    ii. Wet season ( )
    iii. Constant throughout the year ( )

20. What do you think are the reasons for selling more on the season selected above?

.....

21. What is your experience on the amount of honey you supply?
    i. Enough to cover the demand ( )
    ii. Not enough due to high demand ( )
    iii. Normally exceed the demand ( )
    iv. I am not sure ( )
    v. Unpredictable ( )

22. For how long (in days) do you store the product you sell?

.....

23. How much is the storage cost per day?

.....

24. Do you face any competition in selling your product? If yes who are your competitors?

.....

25. How much do you pay for selling place par day? (Lease)

.....

26. Do you pay any tax? If yes, specify the kind of tax you pay and the amount for each kind

.....

.....

27. How do you ensure quality of your product? (Consider hygiene and nutritional value).

.....

.....

28. What do you think is the sources of honey contamination?

.....

37. What are you doing to solve the problem selected above

.....

38. How much capital are you using to run the business

.....

39. How much capital would be needed and for what purpose

.....

40. Which do you think is an appropriate and easier way of obtaining this capital?

i. Loan from financial institutions ( )

ii. Financial assistance from donors or friends/relatives ( )

iii. Own equity ( )

iv. Other ways (specify) ( )

.....

41. How do the following international market regulations affect your business? (Rank from the most important to least important) (1 = most important and 5 = least important)

vi. Tariffs ( )

vii. Export quota ( )

viii. Export duties ( )

ix. Export licensing procedures ( )

x. Quality and Health standards requirements ( )

42. Which problem(s) do you face in your business?

.....

43. What are your opinions on what should be done to improve the honey marketing system?

.....

Appendix 4: Questionnaire for honey consumers

G. Identification variables

Questionnaire number .....

1. Date of interview

   ---

2. Name of the respondent

   ---

3. Address of respondent

   ---

4. Age of the respondent"

   ---

5. Sex
   i. Male ( )
   ii. Female ( )

6. Education level
   i. No formal education ( )
   ii. Primary education ( )
   iii. Secondary education ( )
   iv. Post secondary education ( )

B. Information about honey consumption

1. Do you consume honey?
   i. Yes ( )
   ii. No ( )
2. If yes what makes you consume honey
   i. Traditional attitudes ( )
   ii. Medicinal values ( )
   iii. Nutritional requirements ( )
   iv. Low price ( )
   v. High price of substitutes (e.g. jam) ( )
   vi. Other reason(s) (specify) ( )

3. How many litres of honey on average do you buy per month?

.....

4. What do you think are the reasons of selling more on the season selected above

.....

.....

5. Which season of the year do you consume honey most?

   i. During dry ( )

   ii. During wet ( )

   iii. Constant consumption throughout the year ( )

6. What do you think are the reasons for consuming more on the season selected above?

.....

.....

7. What type of honey color do you prefer most? (Please rank in your order of preference)

   i. Darker-coloured ( )

   ii. Light amber-coloured ( )

   iii. Extra light amber-coloured ( )

   iv. All of the above ( )

8. Why do you prefer your choice above?

.....

9. How much are you willing to pay for the type of honey you preferred (Tshs per litre)?

.....

10. Where do you get most of your honey product?

    i. From street vendors ( )

    ii. From your permanent supplier(s) ( )

    iii. From shops/markets/supermarkets ( )

    iv. From hotels ( )

    v. Direct from the producers ( )

    vi. Other sources (specify) ( )

11. Why do you prefer your choice above?

.....

12. What is your average income per month?
    i. Less than 50 000 Tsh per month ( )
    ii. Between 50 000 – 100 000Tsh ( )
    iii. More than 100 000Tsh ( )

13. How much do you pay for a litre of natural honey?

    .....

14. How do you feel about this price?
    i. Very high ( )
    ii. High ( )
    iii. Reasonable ( )
    iv. Cheap ( )
    v. Very cheap ( )

15. How do you consume honey?
    i. As a drink ( )
    ii. With food (such as bread) ( )
    iii. With tea (in place of sugar) ( )
    iv. As medicine ( )
    v. Other ways (specify) ( )

16. What do you consider as substitute for honey? (Please rank them in an ascending order of preference indicating the price of each per unit)

    .....

17. What is the most appealing characteristic of honey that is over and above the substitute?

    .....

18. What is the least appealing characteristic of honey that put it lower than the substitute?

    .....

19. What is the most limiting factor that limit your consumption level of honey (tick where appropriate)
    i. Poor availability ( )
    ii. Higher prices ( )
    iii. Poor quality of honey ( )
    iv. Unsafe for human use due to poor storage and facilities used for parking ( )
    v. Other reasons (Please mention) ( )

20. How do you feel about the following items related to honey in the market? (Tick where appropriate)

Item	Satisfactory	Unsatisfactory
Price of honey		
Availability of honey		
Price of substitute		
Availability of substitute		
Packaging of honey/product outlook		
Packaging of substitutes		
Hygiene for honey		
Hygiene for substitutes		
Nutritional value of honey		
Nutritional value of substitutes		
Medicinal value of honey		
Medicinal value of substitutes		
Taste of honey		
Taste of substitutes		

Appendix 5: Questionnaire for Checklist for Region Beekeeping /Forest Officers and NGOs Leaders

H. IDENTIFICATION VARIABLES

Questionnaire number .....

1. Date of interview

   ---

2. Name of the respondent

   ---

3. Address of respondent

   ---

4. District

   ---

5. Region

   ---

6. Profession level
   - i. Degree ( )
   - ii. Diploma ( )
   - iii. Certificate ( )
   - iv. Others ( )

I. OTHER ISSUES

1. Region/district population and socio-economic profile
2. Status of beekeeping in the region/district
3. List of beekeepers in the district/region
4. List of distributors/ buyers of honey in the region/district
5. Main uses of honey in the region/district
6. Information on consumers of honey – small, large, NGOs and industries
7. Information on traders of honey both in domestic and export markets
8. Major activities undertaken to promote marketing of honey in the region/district
9. Constrains of marketing of honey in the region/district
10. Sources of contamination of honey

11. What is you role in marketing of honey
12. What is your perceptions regarding future interventions to improve marketing of honey
13. Any other comments

Appendix 6: Essential composition and quality factors requirements

1. Chemical requirements for Table/Industry honey

Honey shall comply with chemical requirement of honey for table use and for industry as prescribed in Table I:

Table I: Chemical requirements limits for honey market

S/N	CHARACTERISTIC	REQUIREMENT	
		Table Honey	Industrial Honey
1.	Reducing sugar, as invert sugar, min, %	60	65
2	Sucrose, max, %	5	10
3	Moisture, max%	20	22
4	Water insoluble solids;		
	a) Pressed honey, max %	0.5	0.5
	b) Others, max, %	0.1	0.1
5	Mineral content (ash), max, %	0.6	1.0
6	Acidity as: (a) milliequivalent acids/,max	40	50
7	Diastase activity, min	8	10
8	Fructose/Glucose ratio, min.	1	1
9	Fieche's test	Negative	Negative
10	HMF, max, mg/kg*	20	40

2. Maximum Metallic contaminants tolerated by markets

The levels of metallic contaminants in honey shall not exceed those specified in Table: II

Table II: Metal contaminants

Metal	Max (mg/kg)
Arsenic	1.0
Lead	0.5
Copper	2
Zinc	5.0
Tin	5.0

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3. Pesticides and antibiotics residues

The levels of pesticides and antibiotics residues shall not exceed those specified in Table III:

Table III: Pesticides and antibiotics residues tolerated by markets

Substance	Category	Levels
Coumaphos	Insecticide	Max. 1.0 mg/kg
Phenol	Disinfectant	Max.1.0 mg/kg
Streptomycin	Antibiotic	Max. 1.0 mg/kg
Tetracycline	Antibiotic	Max. 1.0 mg/kg
Sulfonamide	Antibiotic	Max. 1.0 mg/kg
Organophosphorus	Pesticides	Max. 50 ppb
Organochlorine	Pesticides	Max. 50 ppb

NOTE: HPCL means high Performance Liquid Chromatography

GLC means Gas Liquid chromatography

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