

NATIONAL BEEKEEPING POLICY

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PREAMBLE

The Beekeeping sector in Tanzania has been managed without a policy since 1949 when it was officially formed as a department under Agriculture. The guidance for developing and managing the bee and beefodder resources since then has been in the form of technical and administrative orders and directives whose main objectives were to modernize beekeeping practices by introducing box hives; to maximize production of honey and beeswax, and to increase export earning from sales of honey and beeswax.

Many Socio-economic developments and environmental changes which are taking place together with macro economic policy reforms implemented in Tanzania and increased concern on environmental conservation for sustainable development of the beekeeping industry have necessitated formulation of a Beekeeping Policy which takes into account the role of inter-sectoral cooperation and coordination which will enhance the sustainable management of bee and beefodder resources in and around agricultural farms, forest and wildlife protected areas.

This beekeeping policy document was prepared in the initial stages as part of the Forest Policy involving relevant stakeholders at three different workshops, various meetings within FBD, consultative meetings of FBD's administration with Consultants and a Task Force. The final document was prepared by improving and consolidating issues, recommendations and or resolutions passed at the three workshops and other consultative meetings. Another important source of information for the final document was TFAP document which contains the NBP. Relevant issues concerning development of Beekeeping Sector contained in NBP which were prepared in 1989 with participation of the main stakeholders at village meetings and national

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ABBREVIATIONS AND ACRONYMS

EIA	Environmental Impact Assessment
FAO	Food and Agricultural Organisation of the United Nations.
FBD	Forestry and Beekeeping Division.
GDP	Gross Domestic Product
HMF	Hydroxy-Methyl-Furfuraldehyde.
MNRT	Ministry of Natural Resources and Tourism
NBP	National Beekeeping Programme
NBRC	Njiro Beekeeping Research Centre
NFP	National Forest Programme
NGO	Non-Governmental Organisation
PSRC	Public Sector Reform Commission
RPFB	Rolling Plan and Forward Budget
SWRI	Serengeti Wildlife Research Institute
TAFORI	Tanzania Forestry Research Institute
TFAP	Tanzania Forestry Action Plan.
UNCED	United Nations Conference on Environment and Development.

workshops, have been incorporated in the policy. It was decided to write a separate Beekeeping Policy document instead of combining with that of Forestry in order to have clear vision, mission and adequate coverage of beekeeping and beekeeping-based cross-sectoral issues and policy statements which are the basis for the formulation of new Beekeeping Legislation which will be the main legal instrument for implementing the policy.

The Beekeeping Policy, whose main goal is to enhance sustainable contribution of the sector for socio-economic development and environmental conservation, covers both stinging and non-stinging (stingless) honeybees regardless of ownership or administration; it includes feral (wild) and domesticated (kept in hives) colonies and all other bees which are nonparasitic and collect nectar and or pollen for their food.

"Bee Reserve" is a land area administered and managed for the purpose of sustainable development of bee and beefodder resources.

"Colony" is the society of honeybees composed of one queen, thousands of worker bees and a few tens or hundreds of drones capable of reproducing itself as a biological unit.

"Effective bloom period" is when the flower and the bee need each other most; is the period when nectar and or pollen are in the greatest obtainable amounts and when effective pollination by bees is possible due to the fact that foraging bees are in the greatest numbers.

"Executive agency" is an autonomous commercial agency owned by the government and created for a specific purpose of managing a bee reserve or demonstration apiaries for extension and commercial purposes. The staff are government employees but with specific terms and conditions defined for employment by the agency.

"Feral colonies" of bees are wild colonies which are not domesticated. They are found in natural nests, or hanging from branches of trees.

"Melliferous plants" refer to nectar-producing plants which are sometimes called **"beefodder"** or **"beeforage"** i.e. plants from which bees collect nectar and or pollen.

"Meliponiculture - Agro-Forestry" is a practice where beekeeping, using non-stinging honeybees (melipona) is carried out on the same land where

GLOSSARY

"Agro-forestry" is a practice where agricultural crops and trees are intercropped on one farm land.

"Api-Agro-Forestry" is a practice where beekeeping, using stinging honeybees (Apis - Apiculture, Api) is carried out on the same land with Agro-Forestry so that bees collect nectar and pollen from the cultivars and natural flora and in return render pollination to the flora.

"Apiary" is a bee farm which contains several honeybee colonies kept in hives.

"Beekeeping administration" comprises Government of Tanzania administration of beekeeping under FBD.

"Beekeeping-Agro-Forestry" refers to either api-agro-forestry or meliponiculture-agro-forestry or both.

"Beekeeping equipment" includes hives, hive tool, bee protectives, beesmoker, honey and beeswax strainers, honey extractors; honey and beeswax storage facilities; other honey and beeswax processing and grading equipment.

"Beekeeping Sector" comprises apiculture and meliponiculture.

"Bee Product" includes honey, beeswax, pollen, propolis, royal jelly, brood, live bees and pollination services.

1. NATIONAL FRAMEWORK FOR BEEKEEPING POLICY FORMULATION

The national Beekeeping Policy is based on a macro-economic, environmental and social framework as discussed below.

1.1 *Macro-Economic Framework*

Since 1986 Tanzania embarked on policy and institutional reforms whose overall objective has been to revamp the national economy and facilitate wholesome growth. These reforms have changed the macro-economic environment quite significantly. The focus on government socio-economic objectives and policies as stated in the Rolling Plan and Forward Budget (RPFB 1996/97-1998/99) are as follows.

- to combat poverty and deprivation in order to improve people's welfare;
- to ensure macro-economic stability;
- to maintain an environmentally sustainable development path;
- to create an enabling environment for a strong private sector;
- to reduce government involvement in directly productive activities;
- to improve efficiency in the use of public resources.

A comprehensive financial sector reform programme is underway and is expected to be a key element in the creation of an attractive

Agro-Forestry is practiced in order to improve pollination of flora and production of honey and other bee products.

"Nonparasitic Bees" include all bees which gather or collect nectar and or pollen which they use to feed their young ones rather than animal food.

"Parasitic Bees" include all bees which feed their young ones with animal food, i.e. they feed their nests with bees, ants, beetles, larvae of other insects, etc.

will be created. Human resource development and technical capabilities will be strengthened so as to ensure competent technical and management skills and smooth industrial operations.

1.2 Environmental Framework

The national environmental policy defines the environmental policy framework which is also relevant to other related sectors, including beekeeping. The overall objectives of the national environmental policy are the following:

- To ensure sustainable and equitable use of resources for meeting the basic needs of the present and future generations without degrading the environment or risking health or safety;
- To prevent and control degradation of land, water, vegetation and air which constitute our life support systems;
- To conserve and enhance our natural and man-made heritage, including the biological diversity of the unique ecosystems of Tanzania;
- To improve the condition and productivity of degraded areas including rural and urban settlements in order that all Tanzanians may live in safe, healthy, productive and aesthetically pleasing surroundings;
- To raise public awareness and understanding of the essential linkages between environment and development and to promote individual and community participation in environmental action;

setting for the development of private enterprises. This also involves restructuring of the state-owned banks. The PSRC adopted its Master Plan for parastatal sector restructuring in which 128 parastatals were earmarked for privatisation or liquidation. The main aim is to optimise the use of resources under new management and/or ownership resulting in a positive impact on public finances.

The main functions of the government will be reviewed and the productive ones reduced through commercialisation or privatisation with subsequent government concentration on defined priority sectors. A corresponding reduction in civil service employment will be implemented in order to allow a more realistic remuneration of remaining employees within the overall fiscal constraints which the government faces. The objective of the pay structure reform is also to reduce the importance of non-monetised allowances, leading to a more equitable and transparent pay structure.

An enabling environment for the private sector and business development will be facilitated. The policy measures include adoption of the National Investment Promotion Policy, liberalised marketing for food and cash crops, private participation in parastatal organisations and private banking. An aid strategy will be produced to guide utilisation of aid resources in the budget frame so that externally financed programmes are properly managed and effectively maintained during and after the end of foreign assistance.

Small and medium-scale industries for purposes of increasing industrial output, employment generation, sectoral linkages and rural industrial development will be promoted. Access to credit and foreign exchange will be improved through the development of new forms of credit institutions. An enabling environment for private sector participation both in investment and production

Science and technology have a central role in the exploitation, processing and utilisation of natural resources and in the resulting environmental impacts. The primary objective in the areas is the promotion of environmentally sound technologies, i.e. technologies that protect the environment; are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products and handle residues in a more acceptable manner than the technologies for which they are substitutes (best available technology principle). The use of environmentally sound technologies in beekeeping include the following:-

- use of bee smokers during honey harvesting in order to avoid bush fires;
- use of appropriate bee protectives in order to protect the beekeeper from being stung and protect bees from dying due to loss of bee stings;
- use of alternative hives instead of bark hives in order to protect trees from dying due to debarking.

Tanzania is one of the fourteen biodiversity hotspots in the world. Programmes for the conservation and utilisation of biodiversity shall be pursued to prevent and control the causes of significant loss of biological diversity. Policies, strategies and programmes for the conservation of biological diversity and sustainable use of biological and genetic resources shall be integrated into relevant sectoral/cross-sectoral policies, strategies and programmes.

EIA is a planning tool used to integrate environmental considerations in the decision making process to ensure that unnecessary damage to the environment can be avoided. As part of the implementation of the environmental policy, guidelines and specific criteria for EIA will be formulated.

- To promote international cooperation on the environment agenda, and expand our participation and contribution to relevant bilateral, sub-regional, regional, and global organisations and programs, including implementation of conventions.

There is a clear cause-and-effect relationship between poverty and environmental degradation: environmental degradation leads to widespread poverty and poverty is a habitual cause of environmental degradation. Satisfaction of basic needs is therefore an environmental concern relevant to environmental policy. Investment in development such as beekeeping which is a reliable income generating activity and friendly to the environment, is vital for environmental protection because the environment is the first victim of acute poverty, urban overcrowding, overgrazing, shrinkage of arable land and desiccation. Destruction of environment will have adverse effects on the existence of honeybees and beefodder which are the main resources for sustainable beekeeping development.

The ownership of land and natural resources (including Bee Reserves and Apiaries), access to and the right to use them are of fundamental importance, not only for more balanced and equitable development, but also to the level of care accorded to the environment. It is only when people can satisfy their needs, have control of the resource base as well as have secure land tenure that long-term objectives of environment protection can be satisfied. The communal tenure of village lands which are administered by village councils provides a good legal environment for the development of community-based forest, woodland, management of bee reserves, apiaries and development of Beekeeping-Agro-Forestry Systems.

objective in the education sector is to ensure access to basic education by the year 2000 through decentralisation and liberalisation of education services. Broader involvement of the private sector and communities is encouraged in the development and management of higher education. The objective of the health sector is to provide health services to all Tanzanians with emphasis on primary and preventive health care. Community, NGO and private sector participation in the health sector is sought through a number of ways.

The main objective in the housing sector is to ensure that all Tanzanians have a decent shelter. The private sector activities in the housing development and provision are encouraged. In the field of information and broadcasting, the aim is to increase efficiency and effectiveness in information collection, analysis and dissemination through a multitude of media: newspapers, radio and television. In order to improve social welfare, an enabling environment for private sector and NGO participation will be created. Women's workload will be reduced through introduction and popularisation of modern and appropriate technology and by imparting technological skills to communities. Public awareness on national culture will be promoted through a variety of ways in the field of cultural development.

Contribution of beekeeping in the social framework can be realised in areas of producing honey which is food and medicine, improving conservation of environment through pollination and generating income for the people through sale of honey, beeswax and pollination services (colony rental fees). The income generated from beekeeping activities can be used to pay for social services such as education, health, transport, etc. and housing (to build own house).

Regarding public participation and education, environmental management must be everybody's responsibility. The major responsibilities of government institutions and non-governmental organisations are to assist local communities by making them aware of their own situation and supporting them to become responsible for their own destiny. The fundamental prerequisites for the achievement of sustainable development is broad public participation in decision-making, including the participation of individuals, groups and organisations in environmental impact assessments and decisions, particularly in those which potentially affect the communities in which they live and work.

The private sector, particularly within business and industry, can play a major role in reducing the stress on resource use and the environment. Improvement of production systems through technologies and processes that utilise resources more efficiently and generate less waste, that reclaim, recycle and reuse by-products is an obligation of business and industry. The private sector and the community of non-governmental organisations therefore offer a national network that should be tapped, enabled and strengthened in support of efforts to achieve environmental objectives. The role of women in environmentally related activities will be promoted with a view of achieving increased women's involvement in such areas as forestry, beekeeping, agriculture and water management programmes.

1.3 Social Framework

The withdrawal of the government from involvement in direct production activities will enable the provision of more resources to the social services sector. Greater emphasis will be placed on decentralisation of authority to the local level and promotion of community involvement in the provision and management of social services through increased cost-sharing. The overall

2.1.3 Beekeeping Improves Bio-Diversity Conservation

Beekeeping, being the art and science of keeping honeybees (sometimes referred to as Apiculture and or Meliponiculture) plays a major role in improving biodiversity. Honeybees include stinging and non-stinging: *Apis mellifera* spp. and *Trigona* or *Melipona* spp, respectively. Decrease and disappearance of honeybees, may be used as indicators of a degrading environment.

2.2 ***Constraints which hinder Development of Beekeeping Sector***

The major constraints facing the Beekeeping Sector are:

2.2.1 Lack of Formal Beekeeping Policy and Law

Since 1949 when it was officially formed as a Department under Agriculture, the Beekeeping Sector in Tanzania has been developed under technical and administrative orders and directives whose main objectives were to:

- (i) *"Modernize"* beekeeping practices by introducing box hives.
- (ii) Maximize production of honey and beeswax.
- (iii) Increase export earnings from the sale of honey and beeswax.

The following are some of the reasons explaining why formal beekeeping policy and law are important:

- (iv) International markets for honey and beeswax are highly competitive in terms of quality. In 1991 Tanzanian honey won by 100% the Quality Test for "Organic Honey" in the UK. However, quality control in terms of other

2. MAIN BEEKEEPING SECTORAL CONSTRAINTS AND OPPORTUNITIES

The beekeeping sector is vested with the responsibility of managing the bee and beefodder resources sustainably. The overall priorities and current constraints evolve around the following issues:

2.1 *Management of Bee and Beefodder Resources for Sustainable Socio-Economic Development and Enhanced Environmental Conservation*

2.1.1 The Production Potential of Bee Products

It is estimated that the production potential of bee products in the country is about 138,000 tons of honey and 9,200 tons of beeswax per annum from an estimated potential number of 9.2 million honeybee colonies. The national honey and beeswax productions are estimated to be 4,860 tons and 324 tons per year, respectively, which is about 3.5% only of the production potential.

2.1.2 Beekeeping Contribution to Socio-Economic Development and Environmental Conservation

The Beekeeping sector plays a major role in socio-economic development and environmental conservation. Beekeeping is a source of food (honey, pollen and brood); raw material for various industries (beeswax candles, cosmetics, textiles, lubricants etc.), medicine and income for beekeepers. It is estimated that beekeeping generates about 1.2 million USD annually for the economy from sales of honey and beeswax. Bees also provide pollination to both cultivated and natural plants.

Programmes which allow beekeepers to carry out beekeeping in Forest and Game Reserves; Development of appropriate indigenous beekeeping technology which is popular to beekeepers and friendly to the environment. Notwithstanding the lack of formal Beekeeping Policy, beeswax exports have been legally handled under section 10 of "Produce Export (Beeswax) Rules, 1957 Cap. 137".

2.2.2 Lack of Formal Cross-Sectoral Coordination for Cross-Sectoral Issues of Beekeeping with other related Sectors of Forestry, Agriculture and Wildlife.

The following socio-economic and environmental developments have necessitated formulation of a policy for the Beekeeping Sector with the main objective of improving conservation of the honeybees and their environment so that the Nation can sustainably harness the symbiosis that exists between honeybees and the plants:-

- (i) The demand from people living in the vicinity of the Forest and Game Reserves for carrying out beekeeping activities in the reserves has increased significantly in the recent years. For example, during the Budget Session in June - August 1996 period more than four questions were asked by the beekeepers through their parliamentary representatives, asking the government to issue permits to beekeepers so that they can carry out beekeeping in the reserves. This kind of demand requires an integrated policy consideration by the three Sectors:- Forestry, Wildlife and Beekeeping.
- (ii) Beekeepers are demanding for the establishment and development of Bee Reserves after experiencing problems of scarcity of beefodder plants (especially of miombo type) due to land clearing for agriculture,

factors such as "HMF", colour, taste, viscosity, aroma etc., needs legal directives which 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.

- (v) In recent years, some foreigners, especially from Middle-East Countries, have shown interest in buying honeybee colonies from Tanzania. It should be noted that honeybees from other countries have many diseases such as European Foul Brood (EFB), American Foul Brood (AFB), Nosema, etc, and parasites such as *Acarapis woodii* and Varroa mites. Thus legal regulation for controlling importation and exportation of honeybees is inevitable. Such legal regulations must be based on a sound Beekeeping Policy which encourages research and development of indigenous honeybee species.
- (vi) Recently foreign and local investors have shown interest in investing in the beekeeping industry. Therefore a Policy is needed which should be clear in guiding both foreign and local investors in which areas to invest and give incentives which will encourage sustainable investment and development.

These and other recent socio-economic developments and increased concern on environmental conservation for sustainable development of the Beekeeping Industry, necessitated formulation of a **Beekeeping Policy** (Draft 1993) which took into account the role of inter-sectoral cooperation and coordination which would enhance environmental conservation by carrying out projects such as Development of Beekeeping-Agro-Forestry Systems, Development of Beekeeping Extension Support

smaller bodies compared to the stinging honeybees. Also, stingless honeybees are suitable for pollinating crops which are grown in residential areas e.g. backyard gardens because humans and domestic animals are safe from stinging. A policy which encourages the conservation and development of stinging and stingless honeybees for production of bee products and pollination services is urgently required.

- (v) Field studies have shown that many dead honeybees have been found in agricultural farms due to pesticide poisoning. Some progressive farmers have started hiring honeybee colonies from beekeepers to pollinate agricultural crops. Legal regulations are needed to safeguard not only the interests of the farmer and the beekeeper, but also the life of the honeybee colonies which render pollination services. A Policy which encourages and guides how to sustainably use honeybees for pollination services is required.

2.2.3 Lack of Effective Beekeeping Extension Services

Beekeeping extension services are not effectively reaching the beekeepers, processors of bee products, manufacturers of beekeeping equipment and business people involved in buying and selling bee products. As a result, the goods and services of the beekeeping sector are still low in quality and quantity; the number of beekeepers is still small, thus the national production of bee products is less than 5% of the production potential; about 90% of beekeeping activities are carried out by old men while participation by women and the youth is low or non-existent in some areas of the country due to beliefs that beekeeping is carried out by old men and associated with witchcraft. Another reason why women and the youth are not actively participating in beekeeping is the stinging behaviour of the honeybees and lack of

logging and charcoal production. A typical example for such demand was recorded in Chunya District. A policy that encourages the coordination with forestry sector and agriculture in establishment and development of Bee Reserves is therefore required.

- (iii) In recent years efforts to promote the development of Beekeeping-Agro-Forestry Systems (sometimes called Api-Agro-Forestry) have significantly increased. One of the main objectives of these integrated land use systems is to sustainably maximize the production of goods and services from the three sectors while at the same time enhancing environmental conservation. A policy that encourages the development of Beekeeping-Agro-Forestry Systems and makes formal arrangement for cross-sectoral cooperation and coordination for sustained management of the same is inevitable.
- (iv) Studies in recent years have shown that the continued existence of the stinging and non-stinging (stingless) honeybees which are famous for producing high quality honey which is popular for its medicinal value, and other economic importance is threatened by chemical poisoning (especially pesticides), land clearing for agricultural and industrial development and bush fires which kill the honeybees, beefodder and destroy the natural habitat of the honeybee. The threat to the existence of the honeybees is made more serious by the lack of legal protection of the same. Some beekeepers of Iringa and Njombe Districts who were interviewed in 1992 claimed that about twenty to thirty years ago, stingless honeybees were abundant in and around their villages, but these days there is not a single colony found. Apart from producing high quality honey, the stingless honeybees are excellent pollinators of a wide range of sizes of flowers due to their

2.2.5 Lack of adequate and appropriate Processing and Storage Facilities for Bee Products

This constraint has a negative impact on the quality and quantity of honey reaching the consumer.

2.2.6 Lack of Transport Facilities for Beekeeping Extension and Production

This problem has a negative impact on attracting women and the youth to join beekeeping, distribution of goods and services.

2.2.7 Lack of efficient and effective Marketing of Bee Products

Existing reports show that there are great amounts of honey and beeswax which are not marketed in the districts due to lack of efficient and effective marketing system. This frustrates beekeepers and puts off potential ones.

knowledge about the use of bee protectives; also management techniques for the stingless honeybees are not known to them. Another serious problem connected with lack of effective beekeeping extension services is inadequate public awareness on bee products-based industries which could employ many people and improve their socio-economic development.

2.2.4 Lack of adequate Statistical Information to guide Plans and Operations for the Development of the Beekeeping Sector.

The importance of statistical information for sustainable development of the sector is in the areas of attracting and giving confidence to potential investors and guiding the preparation of bankable beekeeping programmes and projects which can attract provision of credit facilities for beekeepers, processor of bee products, manufacturers of beekeeping equipment and traders of the products. Information on bee and bee fodder resources which exist in the various ecological zones in the country is not readily available. Other important data for guiding plans and operations include:-

- Colony productivity in terms of bee products per season per given type of a hive;
- Prices of bee products in local and world markets;
- Prices of beekeeping equipment in the various beekeeping areas;
- Annual National production and export figures of bee products, and
- Contribution of the beekeeping sector to the GDP.

Based on the above objectives **six policy areas** were identified, namely:

- Establishment and sustainable management of bee reserves;
- Apiary management;
- Beekeeping - based industries and products;
- Beekeeping in cross-sectoral areas;
- Beekeeping for ecosystem conservation and management;
and
- Institutions and human resources.

In each of the above policy areas, relevant **policy issues** are discussed and brief **policy statements, instruments and directives** to be applied are stated.

3. BEEKEEPING SECTORAL GOAL & OBJECTIVES

The overall **goal** of the national beekeeping policy is to enhance the contribution of the beekeeping sector to the sustainable development of Tanzania and the conservation and management of her natural resources for the benefit of present and future generations.

The **sectoral objectives** are derived from the macro-policies of the country as well as from the beekeeping sectoral problems and opportunities. Objectives for the beekeeping sector are as follows:-

- Ensured sustainable existence of honeybees by maintaining and effectively managing adequate area of bee reserves.
- Improved quality and quantity of honey, beeswax and other bee products and ensured sustainable supply of the same;
- Enhanced beekeeping - based national development and poverty alleviation through sustainable supply of bee products (honey, beeswax, royal jelly, propolis, brood, pollen) and services;
- Improved biodiversity, increased employment and foreign exchange earnings through sustainable bee products-based industrial development and trade;
- Ensured ecosystem stability by practising Integrated Pest Management (IPM) and carrying out EIA for investments inside or around Bee Reserves and Apiaries; and
- Enhanced national capacity to manage and develop the beekeeping sector in collaboration with other stakeholders.

4.1.2. Private Bee Reserves

Conservation of fauna and flora by government under formal systems such as Game and Forest Reserves has made some people believe that conservation of natural resources is the responsibility of government only, that natural resources belong to government only, that private people have no right to conserve and manage them to meet their daily socio-economic needs and that if they want to utilize the resources they must go through long and bureaucratic procedures to obtain licence or permit for the purpose.

However, some tribes set aside trees and forest lands for traditional functions such as beekeeping, worshipping, collecting water, collection of medicines, etc. Experience has shown that such community based conservation (CBC) is effective and sustainable. Existing reports show that beekeepers from important beekeeping areas are demanding for the establishment and development of Bee Reserves after experiencing problems of scarcity of beefodder plants and honeybee colonies due to land clearing for agriculture, logging and charcoal production. Participation of stakeholders in conserving and managing honeybees and other beekeeping resources will be encouraged through promotion of community based natural resources management (CBNRM).

Policy Statement (2): To enable participation of all stakeholders in conserving and managing honeybees, individual beekeepers and organized communities will be encouraged under government guidelines, to establish, manage and own Bee Reserves for carrying out sustainable beekeeping activities.

4. POLICY STATEMENTS

4.1. Establishment and Sustainable Management of Bee Reserves

OBJECTIVE: Ensured sustainable existence of honeybees by maintaining and effectively managing adequate area of bee reserves.

4.1.1. Central and Local Government Bee Reserves

Available reports show that some rare stinging and stingless bee species are disappearing from many areas in the country due to environmental degradation caused by such activities as uncontrolled pesticide application, land clearing for agriculture, industrial expansion and bush fires. Establishment and management of bee reserves by central and local governments or specialized executive agencies will ensure sustainable existence of honeybees and other beekeeping resources. Joint management systems for the bee reserves will be promoted. Such bee reserves will serve the following purposes: (a) be the main source of bee breeding materials; (b) be source of package colonies for both stinging and stingless honeybees; (c) enhance conservation of biodiversity of honeybees; (d) be for production of bee products.

Policy statement (1): To ensure sustainable existence of honeybees, the government will establish and manage Bee Reserves with specific functions of sustainable management of indigenous honeybees including rare stinging and stingless bee species. The government or specialized executive agencies, will then enter into joint management agreements with organized local communities or other organizations of people living adjacent to the Bee Reserve, under appropriate user rights and benefits from such Bee Reserves in order to ensure their sustainable management.

4.2.2. Private Apiaries

It is estimated that Tanzania has potential to produce 138,000 tons of honey and 9,200 tons of beeswax per annum. Currently this potential is not fully exploited. Existing reports show that only 4,860 tons and 324 tons of honey and beeswax, respectively, are produced annually. This production, which is about 3.5% of the potential, is mainly from apiaries which are established and managed by individual beekeepers and organized beekeepers' economic groups. Available reports show that colony productivity is dependent on the following main factors: Size (Volume) of the hive; amount of beefodder (beeforage) available within the vicinity of the apiary; protection of colony against damage by fire, honey badger (*Mellivora capensis*) and other pests, and apiary management techniques. However, the average national colony productivity with cylindrical bark or log hives is 15 kg of honey and 1 kg of beeswax per year. In areas with more than one honey harvesting season, the annual production per colony will be higher.

Private apiaries are characterized by: being established and managed by old men; situated in remote forest areas which may sometimes be over 50 km away from villages; hives are hung from tall trees to protect colonies and hives against damages by bush fire, pest animals such as the honey badger and floods; harvesting honey during the night without wearing bee protectives - thus the beekeeper is exposed to the danger of being attacked by wild animals and badly stung by angry bees which try to defend their colony against the "beekeeper"; lack of means of transport to and from the remote apiaries for the beekeepers, their camping supplies and the bee products (honey and beeswax).

All these characteristics have made beekeeping appear an unattractive economic venture for both women and the youth. In

4.2. Apiary Management

OBJECTIVE: Improved quality and quantity of honey, beeswax and other bee products and ensured sustainable supply of the same.

4.2.1. Government Apiaries

Currently the Government owns four apiaries located in Handeni, Kondoa, Manyoni and Kibondo which are maintained as tools for policy development, regulation, monitoring and facilitation. They are mainly for demonstration purposes in order to enhance beekeeping extension, training and research and development of quality standards of bee products and improved methods of production which enhances productivity per colony and per given apiary site. The problems obtaining in government apiaries include: lack of adequate finance, working facilities and transport; trained personnel moving to other institutions where they get better salaries and working environment.

Policy statement (3): The management of central government apiaries (Handeni, Kondoa, Manyoni and Kibondo) will be transferred to executive agencies or to the private sector.

Policy statement (4): To enable effective and sustainable beekeeping extension services, both Central and Local governments will encourage executive agencies, NGOs and private sector to establish and manage apiaries for demonstration purposes. These apiaries will be managed in accordance with approved plans, on profit making basis and must be self-financing.

problems facing the beekeeping industry include: lack of public awareness on the existence of the various beekeeping based industries; lack of knowledge on how to make products from such industries; lack of capital and materials for the production of the goods and lack of sustainable management of resources for making hives.

The latter has led to big wastes of utilizable bark and wood. One of the solutions to this problem is the introduction of an integrated approach involving different users of tree species which produce bark for making hives so that a tree which is earmarked for saw-logs, charcoal, firewood or burned to clear land for agriculture should have all its utilizable bark made into several bark hives before it is converted for the said other uses. Formal cross-sectoral coordinating mechanism between Beekeeping and Forestry authorities will be established in order to improve production of appropriate beekeeping equipment.

Policy statement (8): The availability of appropriate beekeeping equipment will be ascertained through encouraging executive agencies, NGOs and private sector to carry out research and development and effectively disseminate information and equipment to beekeepers.

Policy statement (9): To attract investors in the production of beekeeping equipment, the provision of credit facilities will be encouraged.

effect, this discourages new investors in beekeeping industry, thus leading to the low management and utilization capacity.

Policy statement (5): To ensure sustainable supply of high quality bee products and pollination services, establishment and management of private apiaries will be encouraged.

Policy statement (6): To enable sustainable management of honeybee and floral resources for the sustained production of bee products, the private sector will be encouraged to establish and manage beekeeping - agroforestry systems.

Policy statement (7): To enable effective participation of women and the youth in carrying out beekeeping activities, extension packages whose aims and objectives are to make beekeeping a simple and attractive economic venture will be designed and rendered to the women and the youth.

4.3. Beekeeping-Based Industries and Products

OBJECTIVE: Enhanced beekeeping-based (national) development and poverty alleviation through sustainable supply of bee products (honey; beeswax, royal jelly, propolis, brood, pollen) and services.

4.3.1 Beekeeping Equipment

Beekeeping-based industries and products involve the manufacturing of beekeeping equipment (sometimes simply known as bee equipment) which include hives, bee protectives, bee smokers, hive tool, containers for honey and beeswax, honey extractors, strainers for honey and beeswax, etc. The core

polishes, chewing gum, textiles, pulp and paper, etc. The main problems facing the industries are:

- Lack of information about appropriate production techniques;
- Lack of adequate statistical information to guide plans and operations which would encourage investors; and
- Unreliable supply of beeswax.

Policy statement (12): The establishment and development of beeswax-based industries and production of beeswax products will be encouraged in order to ensure sustainable supply for both domestic consumption and for export. Research and development on other uses of beeswax and subsequent dissemination of results to users will be promoted.

4.3.4. Bee Pollination - Based Industries and Products

The use of bees as pollinators in order to increase crop yields is a popular practice in countries with developed agriculture systems. Tanzania has not adequately harnessed this mutual relationship between honeybees and agricultural crops due to the following constraints: lack of technical directives and assistance to beekeepers cum farmers on how to establish and manage colonies for pollination purposes; unreliable supply of strong bee colonies if and when needed; and lack of formal cross-sectoral arrangement for cooperation and coordination between the beekeeping and agricultural sectors in planning and implementing pollination programmes and projects. Availability of strong and efficient pollinators may be ascertained by carrying out bee breeding programmes which will ensure mass production of

Policy statement (10): To enable sustainable management of resources, an integrated approach involving different users of tree species which produce raw materials for making hives, will be designed and popularized. Along with this, alternative materials for making cheaper and effective hives will be ascertained through research and development. Formal cross-sectoral coordinating mechanism between Beekeeping and Forestry authorities will be established in order to improve coordination of activities.

4.3.2. Honey-Based Industries and Products

Honey-based industries and products involve the use of honey as an important ingredient in: the pharmaceutical industry; food preservation; honey-beer brewing and mead preparation (sometimes called "honey-wine") and confectioneries. The main problems connected with these honey-based industries include: unreliable supply of honey due to poor honey marketing system in the country; lack of capital and or credit facilities for potential investors; lack of public awareness on diversity of uses of honey and its various value added products: such as honey candies, honey - wine, etc.

Policy statement (11): The establishment and development of honey-based industries and production of honey products will be encouraged. Research and development on other uses of honey will be promoted.

4.3.3. Beeswax-Based Industries and Products

Beeswax-based industries and products include such enterprises as: production of beeswax candles; use of beeswax as an important ingredient in pharmaceuticals, cosmetics, lubricants,

Policy statement (14): To promote uses of other bee products, research institutions, the private sector and the community in general will be encouraged to invest in research and development of such products.

4.3.6. Eco-Tourism

Eco-tourism in and around bee reserves and apiaries is yet to be developed. Although there are no records of experience for such eco-tourism in other countries, initiatives towards development of the same are expected to give positive results due to great potential existing in the country. Beekeeping sector will cooperate with other stakeholders who are involved in the development of tourism to prepare brochures to guide tours to apiaries and bee reserves. Eco-tourism services and facilities such as observation hives, package comb-honey, package-bees, etc will be promoted.

Policy statement (15): The private sector and community in general will be encouraged to promote eco-tourism based on site seeing of bee reserves, apiaries, bee products and foraging bees. Legal framework for coordination with Tourism sector will be established.

honeybee colonies to meet demand of pollination - based industries such as commercial production of fruits, seeds and pollen (using pollen traps placed at hive entrances). Experiences in the USA, the Netherlands, Canada and the UK where rental fees per colony of honeybees for pollination services may go up to USD 100 per day, will be sought in order to attract investors.

Policy Statement (13): Crop producers will be encouraged to use bees as pollinators in order to improve crop yields.

4.3.5. Other Bee Products - Based Industries

Existing reports show that many traditional healers in Tanzania use bee-venom, propolis and other bee products for curing different human diseases. Although available information shows that bee-venom can cure ear problems, rheumatism and can regulate hypersensitivity of individuals if injected with prescribed doses, confirmed research findings with Tanzanian honeybees are lacking.

Other bee products which need research and development and marketing strategies are:

- queen pheromones whose extracts can be used as sex attractants in research and development for integrated pest management (IPM);
- bee brood (larvae) for making "bee soup" which is popular in some tribes in the country as a highly nutritious (with high protein content) food produced by honeybees.
- royal jelly for medicines and cosmetics.

Policy Statement (16): Individual beekeepers, beekeepers' associations and cooperatives will be encouraged to establish and manage apiaries in public land. To ascertain sustainable management and utilization of bee and beefodder resources, appropriate beekeeping equipment and management methods will be used.

4.4.2. Beekeeping in Agricultural Land

Apiary management in agricultural land is practised to a small extent. "Tree apiaries" is the common feature in coffee farms, for example, whereby hives are hung from tall shade trees so that passersby, domestic animals and the farmer may be safe from bee stings. Other safety measures include: erecting live fence of tall trees around the apiary; placing apiaries at safe distance from public places. Many farmers or beekeepers do not establish apiaries in or around their agricultural land because they are afraid of bee stings. However, some farmers have established apiaries of stingless honeybees within their homesteads which ensure sustainable supply of honey and pollination services to agricultural crops in farms around homesteads.

Other reasons for not establishing apiaries in or around agricultural land are:

- Beekeepers are afraid of losing their colonies due to poisoning by pesticides.
- The campaign for promoting "organic honey" as an important quality criterion urges beekeepers to keep apiaries far away from agricultural land to avoid contamination of honey with pesticides.

4.4. Beekeeping in Cross-Sectoral Areas

OBJECTIVE: Improved biodiversity, increased employment and foreign exchange earnings through sustainable bee products – based industrial development and trade.

4.4.1. Beekeeping in Public Land

The capacity of establishing and managing apiaries in unreserved land is still low in the country. Honey hunting which is said to be responsible for most annual bush fires is common in unreserved land. Beekeepers are discouraged from establishing apiaries in unreserved land by the following:

- Rampant theft of bee products and hives;
- Damage to colonies by bush fires and honey badger;
- Lack of seed money and bee protectives;
- Low carrying capacity of the land, i.e. low density of beefodder (beeforage) which causes absconding of colonies.

The latter could be rectified by activities such as "planting for bees" or enrichment planting with melliferous plant species which produce nectar and pollen for bees. Other strategies to make beekeeping in un-reserved land more attractive and sustainable will include the use of bee smokers and bee protectives during honey harvesting in order to prevent setting of bush fires; protection of colonies against theft; using appropriate means and methods to combat the honey badger and obtaining title deeds for apiaries.

Policy Statement (18): Apiary establishment and management in game reserves by organized local communities, individual beekeepers, NGOs and executive agencies will be encouraged. Joint management agreements including benefit-sharing mechanisms and incentives may be made between the government (Wildlife Division) and the local beekeepers (organized productive groups). Formal cross-actoral coordination mechanism between Beekeeping and Wildlife authorities will be established in order to improve coordination of activities under approved management plan of specific Game Reserve.

4.4.4. Beekeeping in National Parks

Beekeeping in National Parks (NPs) is not permitted. However, there is growing demand from organized communities (e.g. Beekeepers' Cooperatives) and individual beekeepers who would like to practice beekeeping by establishing and managing apiaries in National Parks where resources for beekeeping are in abundance. Such resources include:

- High density of feral honeybee colonies per unit area;
- Beefodder (beeforage) plants and water supply; and
- Presence of traditional beekeepers in the vicinity of the NPs.

With the introduction of the new concepts of conservation such CBC and Community-Based Natural Resources Management (CBNRM) in implementing programmes and projects basing on agreed and approved management plans whose formulation is based on information obtained from PRA studies, it is expected NP's administration will revise their legal regulations to incorporate bonafide beekeeping which is friendly to the environment, in the management plans for the NPs as a tool to

The problem of pesticide poisoning may be solved by establishing Integrated Pest Management (IPM) agreements between beekeepers and pesticide applicators as explained under policy statement (21).

Policy Statement (17): Apiary establishment and management in agricultural land will be encouraged for both stinging and stingless honeybees in order to improve the production of both bee products and pollination services which improve agricultural crop production.

4.4.3. Beekeeping in Game Reserves

Apiary management has recently been permitted in some game reserves under special agreements between Wildlife administration and beekeepers as a strategy for sustainable conservation of wildlife through people's participation in the management and utilization of the natural resources.

The special agreements include, among others:

- that beekeepers participate in conserving wildlife resource through giving information about existence and the location of poachers and themselves refraining from poaching;
- that beekeepers use beesmokers during honey harvesting; and
- that beekeeper's calendar which includes among other things: when to make and bait hives, erect apiary, harvest honey and process beeswax in the reserve must be known and monitored by the management of the reserve;

4.5. *Beekeeping for Ecosystem Conservation and Management*

OBJECTIVE: Ensured ecosystem stability by practising integrated pest management and carrying out environmental impact assessment for investments inside or around Bee Reserves and Apiaries.

4.5.1. Management of Pesticides

The management of pesticides in the environment is currently left at the mercy of the user (applicator); there is no cross-sectoral arrangement for encouraging IPM which involves different stakeholders who are positively and negatively affected by the pesticides. One of the problems resulting from lack of IPM in the use of pesticides is the killing of honeybees and other useful insects such as bumble bees, etc. Sometimes pesticide residues are found in the honey, thus rendering the product unqualified for "Organic honey" quality standards which are demanded highly for in the markets. In such situations, the beekeeper becomes a total loser of both honeybees and honey. In order to sustain not only the life of the bee colonies, but the beekeeping industry as well, the IPM agreement package will be promoted. The package may include, among others, (a) the application of pesticides at night when bees are not foraging; (b) the application of selected pesticides which are less toxic to bees; (c) avoiding application of pesticides on flowers at "effective bloom period"; (d) the beekeeper confining the bees when pesticides are being applied (beekeeper be notified of the intention, date, time and place of pesticide application).

sustainably manage the NP's resources through encouraging people's participation.

Policy Statement (19): Possibilities of carrying out beekeeping in National parks will be explored in collaboration with Wildlife authorities.

4.4.5. Beekeeping in Forest Reserves and Plantations

Apiary management in forest reserves and forest plantations is practised to a limited extent in special areas under the permission of the Director of Forestry and Beekeeping (DFoB) in accordance with the regulations covered in the Forests Ordinance Cap. 389. With the introduction of the new concept of forests management which encourages **joint forest management approach** whereby tangible benefits for people living in the vicinity of the forest land are considered and incorporated in the joint management agreement, it is expected that the forest administration will incorporate apiary management in their joint forest management plans so as to enhance people's participation in managing and utilizing the forest resource in the country sustainably.

Policy Statement (20): Apiary establishment and management in Forest Reserves and plantations by private sector and organized communities will be encouraged through joint forest management agreements. The agreement package for the joint forest management will include user rights and benefits. Formal cross-sectoral coordination mechanism between Beekeeping and Forestry authorities will be established in order to improve coordination of activities.

4.6. Institutions and Human Resources

OBJECTIVES: Enhanced national capacity to manage and develop the beekeeping sector in collaboration with other stakeholders.

4.6.1. Institutional Framework for Policy Planning, Implementation and Coordination

The policy planning, implementation and coordination capacity of the beekeeping sector is relatively weak due to:

- Lack of formal beekeeping policy and law;
- Lack of trained personnel in planning and policy issues;
- Lack of formal cross-sectoral coordination with other related sectors such as forestry, agriculture and wildlife;
- Lack of feedback mechanisms between beekeeping extension workers and beekeepers/traders/processors and other stakeholders involved in beekeeping development;
- Lack of adequate statistical information to guide plans and operations for the development of the beekeeping sector; and
- Lack of facilities and equipment for collection, storage and management of beekeeping data and information.

Policy Statement (23): The policy analysis and planning capacity for the beekeeping sector within Forestry and Beekeeping Administration will be strengthened with emphasis placed on strategic planning and coordination.

Policy Statement (21): To ensure safety of bees from pesticide poisoning, joint Integrated Pest Management (IPM) agreements between pesticide applicators and beekeepers will be established. Formal cross-sectoral coordination mechanism between Beekeeping authorities and other institutions which are concerned with pesticide application will be established in order to improve coordination of activities.

4.5.2. Environmental Impact Assessment

The potential damage to the bees, bee products and beefodder plants in bee reserves and apiaries may be caused by development activities such as mining, road construction, pesticide application, land clearing, bush fires and other industries. Environmental Impact Assessment (EIA) must, therefore, be incorporated in the planning and decision-making process in order to ensure beforehand that unnecessary damage to the environment is avoided and possible mitigation measures are identified. Formal arrangement with other institutions involved in setting indicators and criteria for EIA will be made so that definition of the scope and guidelines for the beekeeping sector is prepared and honeybees which are very sensitive to environmental degradation may be used in EIA as indicators of the status of a given environment.

Policy statement (22): Environmental impact assessment (EIA) will be required for investments which will take place inside or around bee reserves and apiaries, and which may cause potential damage to the bees, bee products and beefodder plants.

management guidelines and plans for the various apiary systems which include:

- public land;
- Bee reserves;
- Wildlife protected areas (Game reserve & National Park).
- Forest reserves and plantations; and
- Agricultural land.

The formulation and subsequent revision of beekeeping legislation will follow the approved policy and will be harmonised with the legislations of other related sectors. National criteria and indicators for sustainable beekeeping resource management will be established. Management guidelines for different apiary systems will be developed based on these national criteria and indicators. Management plans for Bee Reserves and apiary systems in unreserved and reserved lands and agricultural areas will be prepared. The capacity of the beekeeping administration within FBD to monitor the implementation of the plans will be strengthened. Royalties and other fees will be established and adjusted from time to time to reflect their economic values. Revenue will be effectively collected. Prices of bee products, pollination and other services sold from central and local government bee reserves and apiaries will be determined based on free market values.

Policy Statement (24): Beekeeping legislation will be formulated basing on the new beekeeping policy. The legislation will be harmonised with the legislations of other related sectors and revised as and when needed.

Policy Statement (25): Royalties and other fees for bee products and services will be established and managed, and will be periodically adjusted to reflect their economic values.

4.6.2. Legal and Regulatory Framework

The beekeeping sector has been managed without formal policy and law since 1949 when it was officially formed as a department under agriculture. The development of the sector was based on technical and administrative orders and directives. Notwithstanding the lack of formal beekeeping policy and law, beeswax exports have been legally handled under section 10 of "Produce Export (Beeswax) Rules, 1957 Cap. 137".

Lack of beekeeping legislation has led to the following constraints which hinder the development of active and sustainable management of the beekeeping sector:

- Lack of formal harmonisation with other related sectors on cross-sectoral policy issues and activities such as apiary management in agricultural land, forest areas, wildlife protected areas, integrated pest management (IPM) for the sustainable conservation and management of the honeybees and environment;
- Lack of legal guidelines on pricing has deprived the government of royalties and other fees for bee products and services rendered by the beekeeping sector;
- Lack of legal regulations on the importation and exportation of bees, bee products (except beeswax) and bee equipment has made it difficult for the FBD to issue appropriate directives and control measures to importers and exporters of the same;
- Lack of criteria and indicators for sustainable beekeeping resource management has made it difficult to develop

remuneration of civil servants and difficult working environment have resulted in low working morale.

Whereas at the regional level there is a Regional Beekeeping Officer (RBO) whose links, if any, with DBOs are weak. The central capacity at FBD to provide beekeeping administrative and technical guidance to the districts and regions is inadequate in terms of human resources, finance and materials. Technical and professional staff is inadequate at all levels. For example, some districts which have large beekeeping potential do not have even a single beekeeping extension personnel. Coordination with related sectors on cross-sectoral policy issues and related activities is poor at all levels: district, regional and central (FBD).

Policy Statement (30): The role of the beekeeping administration will focus on policy development, regulation, monitoring and facilitation, and decentralization of responsibilities will be promoted. Specialist technical and training backup services as well as information dissemination and sharing will be strengthened.

The development of the beekeeping administration within FBD will be in accordance with the civil service organisation and efficiency reform and local government reform recommendations. Links and coordination between the central and regional/district levels will be strengthened. Districts, especially those with large beekeeping potential will be urged to maintain adequate staff, finance and facilities for the development and management of beekeeping extension. In order to ensure professional and technical competence of the personnel, in - service and further training programmes will be implemented. The capacity of the beekeeping administration to provide legal, beekeeping resource assessment and market information to regions, districts and other stakeholders will be

Policy Statement (26): Pricing of bee products and services from private and government apiaries will be based on free market values.

Policy Statement (27): Importation of bees, bee products, & used bee equipment will be controlled in order to prevent possible importation of bee diseases and parasites which would harm and/or kill indigenous honeybees.

Policy Statement (28): Development and management of indigenous honeybees will be given first priority.

Policy Statement (29): National criteria and indicators for sustainable management of beekeeping resources will be developed. Management guidelines for the different apiary sites (farmland, reserved and unreserved areas) will be developed for both stinging and stingless honeybees on the basis of these criteria and indicators, and management plans for bee reserves and apiaries prepared accordingly.

4.6.3. Beekeeping Administration

The beekeeping administration under FBD, like the other natural resources sectors, is operating under three parallel structures, viz. the local governments, regional administration, and the ministry responsible for beekeeping. The District Beekeeping Officer (DBO) who is assisted by Divisional Beekeeping Officers (DivBOs) and Ward Beekeeping Officers (WBOs), is in charge of the development and management of the beekeeping sector in the district.

Current information systems and databases do not provide sufficient information for decision making. Inadequate

The recruitment of qualified and competent beekeeping staff for local governments will be intensified and in-service training promoted. Sustainable direct and indirect uses of beekeeping resources by local governments will be encouraged.

4.6.5. Beekeeping Research

Beekeeping research has been carried out without a comprehensive master plan and research priorities have not been defined. Inadequate human resource capacity and low priority in terms of funding and infrastructure development have hindered the implementation of research and development for the beekeeping sector. Beekeeping research has not been demand-driven because of poor links between the research institution (Njiro Beekeeping Research Centre) and users such as beekeepers, processors of bee products, manufacturers of bee equipment, traders of bee products and bee equipment, owners of bee products-based industries such as pharmaceutical, cosmetics, candle making, etc.

Policy Statement (32): Beekeeping research and development will be promoted and strengthened as the basis for sustainable development and management of the beekeeping sector, and financial resources for problem - oriented research and development programmes will be provided through cost-sharing mechanisms and establishment of research funds.

strengthened and information sharing with other stakeholders intensified.

4.6.4. Local Governments

The technical capacity of the local governments on beekeeping activities is weak. Some local governments are not aware that their districts are rich in beekeeping resources, and therefore, beekeeping is not in the priority list of their development plans. The beekeeping sector at the district level is facing the following constraints which hinder the active and sustainable management of the beekeeping resources:

- Technical and professional staff is inadequate;
- Lack of coordination between beekeeping and other related sectors of forestry, agriculture and wildlife for cross-sectoral issues and activities such as beekeeping extension, beekeeping in Game and Forest Reserves, bee pollination programmes for agricultural crops, and IPM.
- Lack of effective beekeeping extension due to inadequacy of personnel, finance, means of transport and transportation for extension staff, beekeepers, goods and services.
- Lack of adequate statistical information to guide plans and operations for the development of the beekeeping sector.

Policy Statement (31): The capacity of the local governments to administer and manage beekeeping resources (bees, beefodder, personnel and materials) will be strengthened and a coordination mechanism between the local and central governments established and enhanced.

seminars, and joint development of research plans. International and regional cooperation in beekeeping research will be promoted.

4.6.6. Beekeeping Training and Education

Information on labour market for beekeeping is lacking and the overall manpower and training plan has not been adequately prepared. Professional and specialist training is inadequate and training curricula have not been updated to meet the needs of multiple-use beekeeping. Practical aspects of training are weak and curricula do not provide sufficient possibilities for specialisation. The links between the beekeeping sector training institute and those of other sectors are weak. Due to inadequate funding, the only beekeeping training institute (BTI) Tabora, in the whole SADC and Africa South of Sahara regions, is under-utilised at present. Commercial activities and regional cooperation by training institutions will be encouraged for increased cost-sharing and self-financing. Commercial activities include: apiary establishment and management, consultancy services, buying and re-selling bee products; manufacturing bee equipment, etc.

Policy Statement (35): To ensure adequate professional, technical and specialist staff in the sector, the beekeeping training will be strengthened. Specialist training will be promoted.

Policy statement (36): To facilitate manpower development, regular demand-driven manpower needs assessment, curricula review and training planning will be conducted.

To ensure adequate and competent professional and technical staff to manage the beekeeping sector, sufficient resources will be

Policy Statement (33): Appropriate legal framework for cooperation and coordination of research activities between Njiro Beekeeping Research Centre (NBRC) and other related research institutions will be established. The current administrative linkage between SWRI and NBRC which was formed by Act No. 4 of 1980 which established SWRI will be revised so that NBRC is separated and given autonomy in order to strengthen beekeeping research in the country. Formal arrangement for cooperation, coordination and collaboration with other research institutions will be promoted.

Policy Statement (34): The beekeeping research priorities will be continuously revised based on demand - driven research principle with a closer cooperation between researchers and users.

Research and development on beekeeping will be promoted and sufficient financial resources provided through cost-sharing mechanisms and establishment of research funds. A beekeeping research and development master plan will be formulated in collaboration with stakeholders such as beekeepers, processors, manufacturers, traders, and representatives from related sectors which are involved in research and development of natural resources and agriculture. The master plan will set out priority areas for beekeeping research and development which will be reviewed from time to time based on the demand-driven research principle. Beekeeping research and development focusing on improved conservation of bees and beefodder plants; improved management of apiaries using indigenous honeybee species (stinging and non-stinging) will be promoted. Collaboration between the research institutions will be promoted. Close linkages between the research institutions and users will be developed through information exchange, symposia and

To ensure increased awareness and skills amongst the people on conservation, management and utilisation of beekeeping resources, the capability of the beekeeping extension service will be strengthened. The extension efforts will be directed towards private and community beekeeping as well as joint management in government bee reserves and apiaries. In order to have efficient and effective extension service, cross-sectoral coordination will be promoted. This will be achieved through integrated extension planning, increased input of beekeeping extension in other services through in-service-training of the extension staff, coordinated on-the - spot advice, farmer-to-farmer and beekeeper-to-beekeeper extension and other approaches as appropriate. The extension messages will be designed in a gender sensitive manner.

Beekeeping extension curriculum will be reviewed towards multiple-use of beekeeping resources in cross-sectoral areas. Extension packages for different geographical areas and ecological zones will be developed in close collaboration with the respective users. Involvement of NGOs and other institutions in beekeeping extension activities through coordination, training and preparation of extension materials will be further promoted. Introduction of environment and natural resources education in the primary and secondary schools will be supported.

4.6.8. Beekeepers' Cooperatives and Associations

Beekeepers cooperatives and associations are limited to a few regions in the country. These include Tabora Beekeepers Cooperative Society Ltd (TBKS); Kibondo Beekeepers Cooperative Society Ltd (UKI); Tanzania Beekeepers Association (TABEA); Arusha Beekeepers Association (ABA), etc. The capacity of the cooperatives and associations is weak; they lack extension packages, research and market information to support their activities; they lack infrastructure development

provided to strengthen the beekeeping training. A system for demand-driven continuous manpower needs assessment, curricula review and training planning for the sector will be developed. International and regional cooperation in beekeeping training will be promoted.

4.6.7. Beekeeping Extension Services

A well-functioning beekeeping extension service is a prerequisite for the promotion of community-based beekeeping-agro-forestry systems. The extension service is, however, poorly staffed and fragmented as different sectors of natural resources management and agriculture have their own services. All these organisations lack both human and financial resources, and extension messages delivered to farmers or beekeepers are sometimes conflicting as the coordination between different services is inadequate. Beekeeping-based cross-sectoral activities are not adequately addressed in the extension programmes. Inadequate extension materials and facilities are hampering extension work. Moreover, the current curricula of the primary and secondary schools do not include sufficient education on the natural resources management.

Policy statement (37): To ensure increased awareness and skills amongst the people on sustainable management of beekeeping resources, the capability of the beekeeping extension services will be strengthened.

Policy statement (38): Beekeeping related extension messages delivered by different natural resources management sectors and other related sectors will be harmonised through integrated planning, research and training.

Policy statement (40): To ensure effective marketing system, quality control and inspection mechanism will be strengthened, and traders of bee products will be encouraged by providing them with reliable services on quality control, inspection and market information.

4.6.10 Non-Governmental Organizations

NGOs related to beekeeping sector, involved in conservation and management of beekeeping resources, are those concerned with: **"planting for bees"**, buying and selling bee products, Wildlife conservation, **"conserve honeybees"**, and natural resources conservation.

The NGOs in the field of beekeeping provide a potentially effective channel to reach beekeepers, farmers and communities with extension advice and other incentives. However, the NGOs lack capacity both in terms of human resources and materials. Inadequate financing is also hampering their activities. Inadequate coordination amongst NGOs has resulted in overlapping activities in some areas.

Policy statement (41): Coordination and cooperation between the beekeeping sector and NGOs will be promoted.

Coordination between the beekeeping sector and NGOs will be promoted. Establishment of NGOs in the field of beekeeping will be encouraged. NGO participation in the preparation of beekeeping-related plans and programmes will also be encouraged. Moreover, NGOs will be encouraged to increase self-financing in order to ascertain their sustainability.

4.6.11 Financing

The development of the beekeeping sector has been dominated by a high dependence on private sector and public financing, and sectoral self-financing mechanisms have remained undeveloped. Poor economic situation with high interest rates has also hampered domestic financing. Private sector financing has been low due to lack of appropriate financing mechanisms. Support from development partners has 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. The same applies also to the country's limited capacity to fulfil all international obligations; conventions and other agreements. In addition, some foreign aid programmes have not had in-built sustainability to allow the government to take over the activities when donor financing ceases.

Policy statement (42): New and innovative sectoral financing mechanisms will be developed and directed to the key functions and stakeholders of the beekeeping sector.

The new policy is based on the establishment of self-financing structures, such as executive agencies and increased contribution by the private sector and local communities. National and local level financing mechanisms through, for example, establishing beekeeping development funds for private sector and local community investments in beekeeping activities will be developed. Public sector self-financing will also be intensified through full valuation of the resource use by product pricing based on their respective economic values and through efficient collection of royalties and other fees. The following income generating beekeeping activities will be promoted as a development strategy for self-financing mechanism: buying and

re-selling honey and beeswax; manufacturing and selling bee equipment; manufacturing and selling value added goods from honey and beeswax and charging pollination fees per colony per specified time in an orchard or farm; charging entrance fees to Bee Reserves and Apiaries; service charges for removing colonies of bees from buildings and other premises; Sales of Beekeeping Handbooks, pamphlets, Newsletters, etc.

Long-term financing arrangements for beekeeping research in collaboration with the international community will be developed. Commercialisation of some research activities will be promoted so as to increase self-financing. New mechanisms for cost-sharing of training expenses by different users, and development of commercial activities by training institutions for increased self-financing will be promoted. Provision of training and education services at the regional level on a commercial basis on selected field of speciality such as beekeeping and bee products-based industries will be promoted. Cost-sharing mechanisms will also be promoted to improve the sustainability of the beekeeping extension services. NGOs will also be encouraged to undertake commercial activities for increased self-financing so as to ensure their sustainability.

Efficient use will be made of existing international financing, including both public and private sources. The linking of donor funding to the national financing structures will be improved and donor assistance used to leverage private investment by creating an enabling environment. Systems for long-term external financing will be developed for projects with global dimension, such as conservation and research, e.g. in the form of conservation and research funds or other similar arrangements.

Policy statement (44): Foreign investors will be encouraged to invest in development programmes and projects which local beekeepers and traders cannot afford.

An effective donor coordination system in the context of overall sectoral coordination will be established. Integration of donor supported projects into the government institutional set-up and planning cycles will be promoted.

4.6.12. International Community

Tanzania is a member of international organizations which are involved in research and development of the beekeeping sector such as International Bee Research Association (IBRA) whose headquarters in the UK, and International Union for Beekeepers' Associations ("APIMONDIA"). Tanzania faces problems in paying annual membership fees and other contributions due to shortage of foreign currency. Formal arrangement will be made between Tanzania and the said institutions so that annual membership fees and other subscriptions can be paid in forms of bee products such as beeswax, honey and propolis whose prices will be based on their market values. Currently, the two institutions are accepting the bee products for membership contributions.

Despite the significant role of international financing of the Tanzanian beekeeping sector, donor coordination within the sector is still not effective. The priorities of some donor agencies sometimes seem to over-shadow those of Tanzania. Many qualified personnel have left the public sector due to attractive remuneration in donor supported projects resulting in brain drain from the public service. The situation leads to undermining of national priorities. Some donor-financed projects have also established parallel organisations within the government structure which have caused problems and confusion in their relations with the existing government administration.

Policy statement (43): Consultation with development partners in the context of overall sectoral coordination of projects or programmes will be strengthened in order to avoid parallel and overlapping programmes.

STAKEHOLDER/ ROLE IN	ESTABLISHMENT AND SUSTAINABLE MANAGEMENT OF BEE RESERVES AND APIARY MANAGEMENT	BEEKEEPING-BASED INDUSTRIES & PRODUCTS	BEEKEEPING IN CROSS-SECTORAL AREAS FOR ECOSYSTEM CONSERVATION AND MANAGEMENT
1. Cont... No. 1	2. • Formulation and enforcement of by-laws. • Establishment and management of apiaries in protected area. • Employment in apiary management and utilization of bee products.	3.	4.
2.Private sector and/or specialized executive agencies.	• Joint management of Bee Reserves. • Provision of employment. • Sustainable harvesting and utilization of bee and floral resources by using appropriate bee-protectives, beesmokers and hives. • Awareness raising and beekeeping extension services. • Financing of investments in beekeeping sector. • Promotion of bee products and marketing effectively.	• Provision of employment. • Production of value-added bee products such as candles, honey-beer, honey-wine, confectionery products, cosmetics, polishes, lubricants, etc. • Products development and marketing. • Investment in environmentally sound production technology. • Awareness raising & beekeeping extension services. • Financing of beekeeping industry investments. • Eco-tourism development in beekeeping.	• Joint management of Bee Reserves. • Provision of employment. • Sustainable harvesting and utilization of bee and floral resources by using appropriate bee-protectives, beesmokers and hives. • Awareness raising and beekeeping extension services.

5. ROLES AND RESPONSIBILITIES OF MAIN STAKEHOLDERS

The main actors (stakeholders) and their responsibilities in implementing the policy are outlined in the following table:-

STAKEHOLDER/ ROLE IN	ESTABLISHMENT AND SUSTAINABLE MANAGEMENT OF BEE RESERVES AND APIARY MANAGEMENT	BEEKEEPING-BASED INDUSTRIES & PRODUCTS	BEEKEEPING IN CROSS- SECTORAL AREAS FOR ECOSYSTEM CONSERVATION AND MANAGEMENT
1. 1. Beekeepers, farmers & local Communities	2. • Conservation and management of honey bees and beefodder plants in village and private bee reserves. • Establishment and management of village bee reserves. • Participation in joint management of bee reserves. • Selecting apiary sites. • Making beekeeping equipment. • Stocking hives with colonies. • Erecting apiaries. • Protecting colonies against fire, pests, and pesticides. • Production and processing of bee products for both local and export markets. • Establishment and management of apiaries within homestead using stingless honeybees.	3. • Production of subsistence and commercial bee products and value added products. • Employment in beekeeping-based industries. • Setting quality standards for bee products. • Maintaining high quality standards for the bee products in order to be competitive in international markets.	4. • Using bee-smokers, bee protectives and appropriate hives to enhance sustainable conservation of ecosystems. • Conservation and planting of beefodder plants ("Planting for bees"). • Establishment and management of Api-Agro-Forestry systems and Meliponiculture - Agro-Forestry systems.

STAKEHOLDER/ ROLE IN	ESTABLISHMENT AND SUSTAINABLE MANAGEMENT OF BEE RESERVES AND APIARY MANAGEMENT	BEEKEEPING-BASED INDUSTRIES & PRODUCTS	BEEKEEPING IN CROSS-SECTORAL AREAS FOR ECOSYSTEM CONSERVATION AND MANAGEMENT
1.	2.	3.	4.
4. Central Government	• Policy formulation. • Sectoral-planning & budgeting. • Legislation. • Law enforcement. • Revenue collection. • Management of strategic bee reserves. • Monitoring & evaluation. • Information systems. • Manpower planning and human resources development. • Extension services. • Research, and research coordination. • Training & curricula development. • Coordination of other stakeholders. • International cooperation.	• Policy formulation. • Sectoral-planning & budgeting. • Legislation. • Law enforcement. • Monitoring & evaluation. • Information systems. • Manpower planning and human resources development. • Extension services. • Research and research coordination. • Training & curricula development. • Coordination of other stakeholders. • International cooperation.	• Policy formulation. • Sectoral-planning & budgeting. • Legislation. • Law enforcement. • Monitoring & evaluation. • Information systems. • Manpower planning and human resources development. • Extension services. • Research, and research coordination. • Training & curricula development. • Coordination of other stakeholders. • International cooperation.

STAKEHOLDER/ ROLE IN	ESTABLISHMENT AND SUSTAINABLE MANAGEMENT OF BEE RESERVES AND APIARY MANAGEMENT	BEEKEEPING-BASED INDUSTRIES & PRODUCTS	BEEKEEPING IN CROSS-SECTORAL AREAS FOR ECOSYSTEM CONSERVATION AND MANAGEMENT
1. Cont. No. 2	2.	3.	4.
3. Local Government	• Coordination of beekeeping extension services with other related sectors. • Revenue collection. • Law enforcement. • Management of extension demonstration apiaries. • Establishment and Management of Bee Reserves. • Follow up for title deeds for apiary sites belonging to beekeepers. • Joint management of bee reserves and demonstration apiaries.	• Regulation. • Revenue collection.	• Financing of investments in beekeeping sector. • Promotion of bee products and marketing effectively. • Application of biodiversity guidelines in managing beekeeping activities. • Application of EIA in beekeeping investments. • Using population dynamic of stingless honeybees as indicators of environmental status; also in carrying out EIA. • Joint management of conservation areas. • Regulation. • Joint management of Bee Reserves. • Joint management of demonstration apiaries for extension. • Coordination of beekeeping extension services with other related sectors.

STAKEHOLDER/ ROLE IN	ESTABLISHMENT AND SUSTAINABLE MANAGEMENT OF BEE RESERVES AND APIARY MANAGEMENT	BEEKEEPING-BASED INDUSTRIES & PRODUCTS	BEEKEEPING IN CROSS- SECTORAL AREAS FOR ECOSYSTEM CONSERVATION AND MANAGEMENT.
1.	2.	3.	4.
7. NGOs	• Awareness raising and Beekeeping Extension Services. • Capacity building. • Training and technical assistance. • Financing of beekeeping and environment conservation. • Promoting gender roles, women empowerment. • Encouraging the youth to participate in beekeeping activities.	• Awareness raising and Beekeeping Extension Services. • Capacity building. • Training and technical assistance. • Financing of beekeeping and environment activities. • Promoting gender roles, women empowerment. • Encouraging the youth to participate in beekeeping activities.	• Awareness raising and Beekeeping Extension Services. • Capacity building. • Training and technical assistance. • Financing of beekeeping and environment activities. • Promoting gender roles, women empowerment. • Encouraging the youth to participate in beekeeping activities.

STAKEHOLDER/ ROLE IN	ESTABLISHMENT AND SUSTAINABLE MANAGEMENT OF BEE RESERVES AND APIARY MANAGEMENT	BEEKEEPING-BASED INDUSTRIES & PRODUCTS	BEEKEEPING IN CROSS- SECTORAL AREAS FOR ECOSYSTEM CONSERVATION AND MANAGEMENT
1.	2.	3.	4.
5. International Community	• Partners in sustainable development. • Financial assistance. • Capacity building through technical assistance, training and transfer of technology. • Facilitation of implementation of international obligations.	• Partners in sustainable development. • Financial assistance. • Capacity building through technical assistance, training and transfer of technology. • Facilitation of implementation of international obligations.	• Partners in sustainable development. • Financial assistance. • Capacity building through technical assistance, training and transfer of technology. • Facilitation of implementation of international obligations.
6. Other government institutions.	• Coordination and collaboration in extension, training & research. • Law enforcement. • Assist in monitoring and evaluation. • Support in conserving bees and beefodder plants. • Support in collection and dissemination of information. • Land use monitoring.	• Coordination and collaboration in extension, training & research. • Law enforcement. • Assist in monitoring and evaluation. • Support in conserving bees and beefodder plants. • Support in collection and dissemination of information. • Land use monitoring. • Assist in licensing of beekeeping-based industries and trade.	• Coordination and collaboration in extension, training & research. • Law enforcement. • Assist in monitoring & evaluation. • Support in conserving bees and beefodder plants. • Support in collection and dissemination of information. • Land use monitoring.