



UNITED REPUBLIC OF TANZANIA  
MINISTRY OF NATURAL RESOURCES AND TOURISM  
FORESTRY AND BEEKEEPING DIVISION

## GUIDELINES FOR ESTABLISHMENT AND MANAGEMENT OF BEE RESERVES AND APIARIES IN TANZANIA



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## FOREWORD

Beekeeping is an important economic sector with contribution to the livelihood of significant number of people in both rural and urban areas of Tanzania. It is estimated to employ over two million Tanzanians along its value chain. Bee products such as honey, beeswax, pollen, propolis, royal jelly and venom are used in different forms but are also raw materials for various industries including food, cosmetics, pharmaceutical, textiles, leather, electronics and candle. Beekeeping has also proved to contribute much to crop productivity by improving seed quality and it also enhances biodiversity conservation through pollination services rendered by bees. Due to the importance of pollination, beekeeping has been recognized as a conservation tool. Despite all these potentials, the contribution of beekeeping sector is neither well reflected in the national economy nor in the production of bee products in Tanzania.

There has been uneven progress in the sector since the year 1998 when The National Beekeeping Policy was formulated. For example, although the Policy encourages establishment and ownership of Apiaries and Bee Reserves to maximize production of bee products, no appreciable progress in establishment of Bee Reserves and Apiaries is evident,. There are more than 100 forests owned by the Government and Private Sector declared as Bee Reserves but not yet gazetted as per requirements of Beekeeping Act No. 15 of 2002. Consequently, some of these Bee Reserves have lost their potential and credibility for gazettelement.

Over the years, several stakeholders including Government, Non - Government Organizations (NGOs), Community Based Organizations (CBOs), Private sector and villages have initiated processes to establish Bee Reserves but have failed to finalize the process of gazettelement. The failure might be because of absence of guidelines that clearly stipulate procedures for establishment and management of Bee Reserves and Apiaries.

Therefore, the Ministry of Natural Resources and Tourism (MNRT) has prepared guidelines for establishment and management of Bee Reserves and Apiaries. Preparation of these guidelines seeks to enlighten all beekeeping stakeholders on the standard procedures for establishing of Bee Reserves and Apiaries together with their management. The government expects these guidelines to be an efficient and effective tool for improving establishment and management of Bee Reserves and Apiaries to enhance bee products production and bee resources conservation.



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## ABBREVIATIONS AND ACRONYMS

BTI	Beekeeping Training Institute
CBOs	Community Based Organizations
FAO	Food and Agriculture Organization of the United Nations
FBD	Forestry and Beekeeping Division
FORVAC	Forestry and Value Chains Development Programme
IPM	Integrated Pest Management
M&E	Monitoring and Evaluation
MNRT	Ministry of Natural Resources and Tourism
NGOs	Non-Government Organizations
PO-RALG	President's Office, Regional Administration and Local Government
SOP	Standard Operating Procedures
TAFORI	Tanzania Forestry Research Institute
TFS	Tanzania Forest Services Agency
URT	United Republic of Tanzania

## DEFINITIONS AND GLOSSARY

- Apiary** - an area with beehive or a collection of beehives, whether stocked (with bee colonies) or unstocked (without bee colonies).
- Api-tourism** - is a form of tourism connected with beekeeping as a traditional profession and with bee products in ecological, food and medicinal aspects.
- Bee** - an insect of the genus *Apis* or *Meliponula* or *Trigona* or any other genus of bee which produce honey.
- Bee colony** - group of bees composed of one queen, hundreds of drones and thousands of worker bees.
- Bee reserve** - an area of land administered and managed for the purpose of sustainable development of bees and bee fodder resources.
- Bee resources** - includes bees, fodder plants, water and any other resource that is used by the bees.
- Beekeeping (or Apiculture)** - the art and science of managing honeybees for production of honey, beeswax and other bee products for domestic consumption and commercial purposes.
- Beekeeping zone** - an area of land within a national or local authority forest reserve in which the keeping of bees and management of apiaries in accordance with an approved management scheme is permitted.
- Build-up period** - a period when the bees reproduce and a number of bees in the colony increases from the low numbers that were there during the death period.

- Dearth period*** - the period when there are few flowers, and no honey flow.
- Director*** - the person for the time being responsible for Beekeeping.
- Forest reserve*** - a forest area, either for production of timber, and other forest produce or for protection of forests and important water catchments, under the terms of the Forest Act Cap 323.
- Gazzettment*** - public notification through announcement by the minister in the Government gazette that an area has been reserved as a bee reserve.
- General land*** - means public land which not reserved land or village land.
- Honey flow period*** - is when the main plants in the area are yielding nectar.
- Local authority*** - District Council that manage bee reserve.
- Meliponiculture*** - the art and science of keeping stingless bees for honey or ecological services.
- Minister*** - the minister for the time being responsible for beekeeping.
- Ministry*** - the ministry for the time being responsible for beekeeping.
- Swarming*** - a natural means of reproduction whereby some honey bees leave the old colony with the old queen.
- Stocking rate*** - the maximum number of kept bee colonies that can be supported in an area.

## 1.0 INTRODUCTION

### 1.1 Background

Beekeeping plays an important role in socio-economic development in Tanzania. It is a source of nutritious food and raw materials for industries such as cosmetics, pharmaceutical and textiles. It also contributes to environmental conservation. Currently beekeeping industry is estimated to employ more than two million people.

Tanzania has 48.1 million hectares of forests and woodlands that are ideal for developing the beekeeping industry. The country has a potential of producing 138 000 tons of honey and 9 200 tons of beeswax per year. Despite the existing potentials, it produces only 30 400 and 1830 tons of honey and bees wax per year respectively. Further, in terms of foreign currency, the sector generates 7.96 and 1.59 million Euro from sales of honey and beeswax annually respectively.

In order to ensure maximum bee products production and support development of the beekeeping industry, the government has put in place several frameworks: The National Beekeeping Policy of 1998, the Beekeeping Act No. 15 of 2002, the Beekeeping (General) Regulations of 2005, the Guidelines for Quality Assurance of Beekeeping Products in Tanzania of 2007, Quality Assurance Standards for Honey and Beeswax of 2006 (TZS: 2006) and the National Beekeeping Research Master Plan (2020-2030). Other legislations supporting the beekeeping industry include: The Forest Act No 14 of 2002, the Wildlife Conservation Act of 2009, the Environment Act No 20 of 2004, the Land Act No.4 of 1999 and its amendments of 2004 and the Village Land Act No. 5 of 1999.

The National Beekeeping Policy encourages establishment, management and ownership of Bee Reserves and Apiaries. The Beekeeping Act No. 15 of 2002 provides a framework for the establishment of bee reserves. It emphasizes on setting aside sufficient forest areas for the purpose of developing and managing honeybees as well as maximizing production and utilization of bee products. In line with the Beekeeping Act, the Village Land Act provides also for community based natural resources management. The Act empowers the local community at village level through the village council to demarcate land for common use and/or natural resource management.

Establishment, management and ownership of Bee Reserves is a strategy for conservation. This strategy ensures sustainable existence of honeybees and other bee resources. Bee reserves are a source of gene pool for both stinging and stingless bees, production of bee products, Api-tourism and enhance conservation of biodiversity.

Since the adoption of the National Beekeeping Policy in 1998, there are more than 100 forests owned by the government and private sector that have been declared to be Bee Reserves. However, there are only nine (9) Bee Reserves that have been gazetted of which eight (8) are owned and managed by central government and one (1) by private company. Most of the declared Bee Reserves are not surveyed, lack management plans and therefore their sustainability is at risk. The associated risks include decrease of bee fodder plants, bee colonies and their habitats caused by activities such as uncontrolled pesticide application, land clearing for agriculture, industrial expansion and bush fires. Bee fodder plants are decreasing mainly due to irrational use of resource base such as debarking, clearing of vegetation and absence of Integrated Pest Management (IPM).

Further, joint management systems for the Bee Reserves are practiced on small scale and are not effectively functioning.

For the established bee reserves, beekeepers need to manage bee colonies by establishing apiaries. Proper apiary management starts with choosing a good site to place beehives. The establishment of apiaries may be undertaken in the bee reserves, forest reserves, general land and wildlife protected areas. To date there are more than 1,533 established Apiaries managed by government institutions, NGOs, CBOs and private sector. However, there is no unified practice on apiary management.

It is in this context, the Forestry and Beekeeping Division (FBD) prepared these guidelines to provide guidance to communities, government institutions, private sector and other stakeholders on establishment and management of Bee Reserves and Apiaries.

## **1.2 Objective of the Guidelines**

The objective of the guidelines is to provide Standard Operating Procedures (SOP) on establishment and management of Bee Reserves and Apiaries for the effective production of bee products, provisioning of ecosystem services, safety and health of bee colonies.

## **1.3 Scope of the Guidelines**

The guidelines focuses on steps for establishment and management of bee reserves and establishment and management of apiaries including selection of suitable areas for apiary establishment, preparation of management plans, type of apiaries and colony carrying capacity, apiary inspection, prevention and control of bee pests, prevention of bee diseases, stocking of beehives, protection of apiaries against fire and records keeping.

### 2.0 BEE RESERVES ESTABLISHMENT AND MANAGEMENT

#### 2.1 Establishment of a Bee Reserve

Bee Reserve is an area of land administered and managed for the purpose of sustainable development of bees and bee fodder resources. It is, established according to the Beekeeping Act No. 15 of 2002. In this regard, the Act must be read together with other Acts such as the Land Act No. 4 of 1999 and the Village Land Act No. 5 of 1999. The powers of establishment are vested to the Minister responsible for beekeeping [section 11(1)]. According to section 11(2) of the Beekeeping Act, bee reserves are categorized into Private Bee Reserve, National Bee Reserve, Local Authority Bee Reserve and Village Bee Reserve. The following section outlines the key steps to be followed when establishing a bee reserve:

##### 2.1.1 Private bee reserve

Private bee reserve is a reserve which is owned and managed by individuals or a group of persons or community or private sector. According to the Act, private bee reserves are established in a privately owned land. In the course of its establishment, the following procedures shall be followed:

- i. Meet with Village Council to introduce intention to establish a bee reserve;
- ii. Meet with Village Assembly to introduce intention to establish a bee reserve;
- iii. After endorsement of the Village Assembly, survey and demarcate an area proposed to establish a bee reserve;
- iv. Prepare a map of the area by involving officials from land, forestry and beekeeping office in the respective district;

- v. Submit endorsed minutes of Village Assembly to the District Council, attached with a map of an area showing clear boundaries of the reserve and a special form (Annex 1) dully filled and signed by the village leaders;
- vi. Submit endorsed minutes of the District Council to the Regional Administration attached with a map of an area showing clear boundaries of the reserve and a special form (Annex 1) dully filled and signed by Village and District leaders;
- vii. Apply to the Ministry for approval of the proposed bee reserve by submitting endorsed minutes of the Regional Administration, attached with map of an area showing clear boundaries of the reserve and a special form dully filled and signed by the village to Regional leaders;
- viii. The minister shall cause a ninety days' notice of intention about establishment of bee reserve to be published in one or more news papers circulating in the area in an application for the proposed bee reserve has been accepted; and
- ix. After the elapse of ninety days, within which if no person or group of persons or representative object the intention or claim any right based on customary law, the Minister may publish in the gazette and that area shall be known as a gazzetted Private bee reserve.

### **2.1.2 National bee reserve**

National bee reserve is a reserve, which is owned and managed by Central Government. In the course of its establishment the following procedures shall be followed:

- i. Identification of an area;
- ii. Conduct meeting with Village Council to introduce intention to establish a bee reserve;
- iii. After consensus with village council, conduct a meeting with Village Assembly to introduce the intention to establish a bee reserve;

- iv. After endorsement of the village assembly, survey and demarcate an area proposed to establish a bee reserve;
- v. Prepare map of the area;
- vi. Submit endorsed minutes of Village Assembly to the District full Council, attached with a map of an area showing clear boundaries of the reserve and a special form (Annex 1) dully filled and signed by the village leaders;
- vii. Submit endorsed minutes of the District Full Council to the Regional Administration, attached with a map of an area showing clear boundaries of the reserve and a special form (Annex 1) dully filled and signed by Village and District leaders;
- viii. Apply to the Ministry for approval of the proposed bee reserve by submitting an endorsed minutes of the Regional Administration, attached with a map of an area showing clear boundaries of the reserve and a special form (Annex 1) dully filled and signed by the village to Regional leaders;
- ix. The Minister shall cause a ninety days' notice of intention about establishment of a bee reserve to be published in one or more news papers circulating in the area if the application for the proposed bee reserve has been accepted; and
- x. After the elapse of ninety days, within which if no person or group of persons or representative object the intention or claim any right based on customary law, the Minister may publish in the gazette and that area shall be known as a gazetted National bee reserve.

### **2.1.3 Local authority bee reserve**

Local Authority bee reserve is a reserve, which is owned and managed by Local Government. In the course of its establishment, the following procedures shall be followed:

- i. Identification of an area;
- ii. Conduct a meeting with Village Council to introduce the intention to establish a bee reserve;
- iii. After consensus with Village Council, conduct a meeting with Village Assembly to introduce the intention to establish a bee reserve;
- iv. After endorsement by the village assembly, survey and demarcate an area proposed to establish a bee reserve;
- v. Prepare a map of the area;
- vi. Submit endorsed minutes of Village Assembly to the District Council, attached with a map of an area showing clear boundaries of the reserve and a special form (Annex 1) dully filled and signed by the village leaders;
- vii. Declare an area as a local authority bee reserve;
- viii. Submit endorsed minutes of the District Full Council to the Regional Administration, attached with a map of an area showing clear boundaries of the reserve and a special form (Annex 1) dully filled and signed by Village and District leaders;
- ix. Apply to the Ministry for approval by submitting the endorsed minutes of the Regional Administration, attached with a map of an area showing clear boundaries of the reserve and a special form (Annex 1) dully filled and signed by the Village, District and Regional leaders;
- x. The minister shall cause a ninety days' notice of intention about establishment of a bee reserve to be published in one or more news papers circulating in the area if the application for the proposed bee reserve has been accepted; and
- xi. After the elapse of ninety days, within which if no person or group of persons or representative object the intention or claim

any right based on customary law, the Minister may publish in the gazette and that area shall be known as a gazetted Local Authority Bee Reserve.

#### **2.1.4 Village bee reserve**

Village bee reserve is a reserve, which is owned and managed by village government. It is established in a village land. In the course of its establishment, the following procedures shall be followed:

- i. Identification of an area;
- ii. Village Council make a resolution on intention to establish a bee reserve;
- iii. Conduct the Village Assembly meeting to introduce intention to establish a bee reserve;
- iv. Prepare village land use plan if not in place;
- v. Survey and demarcate an area proposed to establish a bee reserve;
- vi. Prepare a map of the area;
- vii. Declare an area as a village bee reserve;
- viii. Submit the endorsed minutes of the Village Assembly to the District Council, attached with a map of an area showing clear boundaries of the reserve and a special form (Annex 1) dully filled and signed by Village leaders;
- ix. Submit an endorsed minutes of the District Full Council to the Regional Administration, attached with a map of an area showing clear boundaries of the reserve and a special form (Annex 1) dully filled and signed by Village and District leaders;
- x. Apply to the ministry for approval of the proposed bee reserve by submitting endorsed minutes of the Regional Administration, attached with a map of an area showing clear boundaries of the reserve and a special form (Annex 1) dully filled and signed by the village, District and Regional leaders;

- x. The minister shall cause a ninety days' notice of intention about establishment of a bee reserve to be published in one or more news papers circulating in the area if the application for the proposed bee reserve has been accepted; and
- xi. After the elapse of ninety days, within which if no person or group of persons or representative object the intention or claim any right based on customary law, the Minister may publish in the gazette and that area shall be known as a gazetted Village Bee Reserve.

## **2.2 Management of a gazetted bee reserve**

Management of the gazetted bee reserve may be undertaken by either an Executive Agency; Local Authority; Village; a group; a person holding a concession of whole or part of gazetted bee reserve; a company, co-operative or other organisation in the private sector; or a non-governmental organisation. Section 18(1) of the Beekeeping Act provides opportunity for joint management of gazetted bee reserve through signing of a joint management agreement. Section 16(4) of the Beekeeping Act demand owners of National and Local Authority bee reserve to prepare and implement management plan. However, for proper management it is crucial for all types of bee reserves to have management plans.

### **2.2.1 Management plan**

In developing a bee reserve management plan one shall:

- a) Conduct resource assessment (Inventory) so as to collect necessary information which facilitates the development of management plan**

The information required includes vegetation (species of flowering plants), water availability, accessibility number of kept honeybee colonies and carrying capacity. The aforesaid information shall be collected in accordance with Annex 2.

- b) Develop a bee reserve management plan**

The output from resource assessment will be used for the development of management plan which is a strategic document intended to guide on how to achieve the stated objectives. The plan details all beekeeping operations, mechanisms for benefits accruing, rules and regulations. Therefore, bee reserve owners shall develop management plans as per prescribed format in Annex 3.

### **2.2.2 Management plan implementation strategies**

The implementation strategies may include the following:

- i. Raise awareness among the stakeholders on the management plan;
- ii. Keeping records for easy monitoring;
- iii. Abide to the management plan; and
- iv. Harvesting bee products and other forest resources sustainably.

### **2.2.3. Monitoring and evaluation of management plan implementation**

Continuous Monitoring and Evaluation (M&E) is necessary to ensure proper implementation of the management plan. In this regard, the owners of the bee reserves are required to prepare monitoring and evaluation framework.



The outcome of M&E is to inform the owner of the bee reserve on the progress and achievement of the implementation of the plan.

### **2.3 Establishment of a beekeeping zone**

In addition to the forest reserve, the government found it prudent to provide for a legal framework for the establishment of the beekeeping zone in order to advance the interest of beekeeping. The Beekeeping Act has laid down the procedures for the establishment of a Beekeeping zone. The Act vests mandate to the Director responsible for beekeeping and the Local Authorities to establish beekeeping zones as the case may be. Moreover, the beekeeping zone may be established by the operation of the Act.

For the purpose of clarity of the guidelines, section 23 (1) of the Beekeeping Act states that:

*"The Director may, on his own motion or as a result of representations made on him, establish a beekeeping zone within a national, or local authority, forest reserve and general land."* Once the Director has established such beekeeping zone, the law calls upon the public to apply to the Director in respect with the beekeeping in the zones.

Section 24 (1) of the Beekeeping Act states that *"Any person, group of persons, group, or organisation may apply in the prescribed form to the Director to keep bees within a beekeeping zones."*

Moreover, the Beekeeping Zone can be established by the Local Authority. Section 25 (1) of the Beekeeping Act states that *"Local authority may establish a beekeeping zone within a local authority forest reserve"*.

In the alternative, the beekeeping zone can be established automatically by the operation of the Act. This is being provided by section 24(4) of the Beekeeping Act which reads:

*" Any person who at the coming into force of this Act, was keeping bees within a national or local authority forest reserve, as the case may be, shall be deemed to have received permission from the Director to continue to keep bees within that national or local authority forest reserve as if the place where he was keeping the bees was a beekeeping zone".*

Hereunder is the narration of the said procedure:

- i. The public or any one may make a representation to the Director to the effect of persuading him to his satisfaction to establish a beekeeping zone,
- ii. The Director having been persuaded to establish a bee keeping zone, shall employ the following steps:
  - a) Publish a notice of his intention to establish a beekeeping zone and invite the public to respond to the notice;
  - b) Receive and analyse any comment, objection, reaction generated from the public;
  - c) Determine whether to establish a beekeeping zone or not;
- iii. Where the Director has determined to establish a bee keeping zone shall do so by a notice in the Government Gazette; and
- iv. Once the beekeeping zone is established the public may make application to the Director to keep bees in the established zone.

### 3.0 APIARY ESTABLISHMENT AND MANAGEMENT

#### 3.1 Establishment of an apiary

An apiary is a place where beehives are kept and managed by a beekeeper. There are five types of bee apiaries namely tree apiary, stand apiary, bee cage, bee house and house eaves apiary. Apiaries are established in different sizes and layout depending on management operation. They are established in home gardens, farmlands, forests, wildlife protected areas or in general land. A good apiary site ensures healthy colonies with maximum production of bee products. Poor site selection may result into bee swarming or absconding, death from starvation, cold, flooding or fire, pests destruction or vandalised by people.

Majority of the beekeepers have established apiaries without formal SOP or considering the existing legal frameworks. This scenario has resulted into poor management of the apiaries and bee colonies. In establishing an apiary a beekeeper shall:

- i. Identify an area;
- ii. Secure permission from the land owner where an apiary is intended to be established;
- iii. Communicate to the Village Government, District Council or TFS office the intention to establish an apiary;
- iv. Erect the sign post showing the name of the apiary and the owner's address for public awareness; and
- v. Establish an apiary in accordance with the management plan of the area.

### 3.1.1 Tree apiary

This is an apiary whereby hives are hung from branches or perched between branches of tall trees in the vicinity of homestead, woodland or forest areas. Tree apiaries are mainly for stinging honeybees and commonly used in miombo woodland areas. Also, tree apiaries can be used in beekeeping-agro-forestry systems. This type of apiary has the following advantages:

- i. Beehives are protected from ground fire, animals, floods, pests like ants, and are more difficult to steal;
- ii. Absconding/swarming colonies prefer beehives higher off the ground;
- iii. It is possible to continue to cultivate under the beehive, so multiple land use can be practiced;
- iv. They seem to disturb people less if they are up in a tree; and
- v. The apiary does not need to be fenced.



**PLATE 1: Tree apiary**

### 3.1.2 Stand apiary

This is an apiary whereby hives are placed on stands about 1.2 metres above the ground. Colonies are placed at a convenient working height, thus making beekeeping interesting and attractive. By this, inspection of colonies and prevention from absconding and swarming can safely and easily be carried out. This type of apiary has the following advantages:

- i. It is easier to place the hive on the stand and remove it;
- ii. The beehive does not swing about even if the beekeeper is working; and
- iii. Honey collection and brood-nest control can easily be carried out.



**PLATE 2: Galvanized pipe and wooden stand apiaries**

### 3.1.3 Bee house

This is an apiary whereby beehives are placed on 1.2 metres height platforms inside specially built houses with entrance slots in the wall to the outside. A bee house can be made with mud hut with holes in the walls for bees to pass through. The bees are well protected from the weather, pests, predators and thieves. Further, hive operation can be done at any time of the day.



**PLATE3: A bee house**

### **3.1.4 Bee cage**

This is an apiary whereby beehives are placed on platforms inside specially built cage whereby bees are allowed to freely enter through hive entrances since the sides of the bee cage are either free or protected by a wire mesh. The bees are well protected from the weather, pests and predators.



**PLATE 4: Bee cages**

### 3.1.5 House eaves apiary

This is an apiary whereby hives are placed under the eaves of living houses. Preferably stingless honeybees are kept in house eaves apiaries in order to protect them against thieves and bee pests such as safari ants and honey badger.



**PLATE 5: House eaves apiary**

### **3.1.6 Site selection**

Selecting a good site for an apiary for maximum production of bee products is of paramount importance in beekeeping. Therefore, in selecting a site one must consider the following:

- i. Select a site with abundant flowering plants which are bee fodder;
- ii. Establish apiaries at most three kilometres from a reliable source of fresh water, alternatively provide water to bees;
- iii. Establish apiaries at least seven kilometres away from farm lands and industrial areas that use chemicals;
- iv. Establish apiaries at least one kilometre away from public areas (schools, market, church and hospital), except for sting less bees;
- v. Select a site which is easily accessible;
- vi. Avoid swampy areas; and
- vii. Avoid areas with strong wind.

### **3.1.7 Colony carrying capacity**

Carrying capacity of an area is another factor to consider when establishing an apiary. Beekeepers need to ensure that the carrying capacity is not exceeded for maximum production. In this context beekeepers shall:

- i. Select type of apiary depending on an area;
- ii. Stock beehives according to carrying capacity of an area as prescribed in Table 1;
- iii. Select layout of the apiary depending on type of apiary adopted;
- iv. Site beehives in accordance with type of apiary;
- v. For the case of bee houses and bee cages, the distance between hives and between lower; and upper shelf should be at least one metre for easy operations; and
- vi. Preferably stock beehives before siting them in the bee house or bee cage.

**Table 1: Colony carrying capacity per vegetation type**

No.	Types of Vegetation	Number of bee colonies per acre
1	Woodland with high density of trees	40 -50
2	Thicket	40 -50
3	Grassland	15 - 25
4	Forest Plantation	40
5	Sisal plantation	40
6	Mixed crops	20 or less

### **3.1.8 Stocking of beehives**

Hive stocking is a key component to beekeeping. It is the science and art of putting honeybee colonies in hives for the purpose of harnessing their products. It has however been observed that many beekeepers have larger number of hives that have no colonies. Therefore, a beekeeper may perform the following to stock beehives:

- i. Bait and site beehives to attract swarms;
- ii. Catch swarms by using swarm catcher (Catcher box);
- iii. Purchase bee colonies and transfer into beehives; and
- iv. Translocate nest into beehive for the case of stingless bees.

**Note:** Clean and rebait unoccupied beehives after every four weeks to attract swarms.

## **3.2 MANAGEMENT OF AN APIARY**

Apiary management is the set of routine activities in an apiary depending on weather or seasonal changes and the initial objectives. It plays an important role in improving quality, quantity and sustainable supply of honey, beeswax and other bee products. It is therefore important for a beekeeper to know and follow proper management skills in the apiary for maximum yield and quality of honeybee products. In order to have healthy bee colonies with maximum and quality honeybee products, beekeepers should consider the following: beekeeping calendar, apiary inspection, prevention and control of honeybee pests, honeybee diseases, fire prevention and records keeping.

### **3.2.1 Beekeeping calendar**

The beekeeping calendar is an annual action plan for the beekeeper. It helps beekeepers to know what they should do, and when, in their beekeeping operation (Annex 4). In preparing the calendar, the beekeeper shall arrange the beekeeping activities basing on the following periods:

- i. Dearth period;
- ii. Build up period;
- iii. Honey flow period; and
- iv. Harvesting period.

### **3.2.2 Apiary inspection**

Once the apiary is established and the beehive is occupied with bees, it is important to inspect the apiary and bee colonies to monitor their performance. In apiary inspection, the beekeeper shall consider the following:

- i. Visit apiary at least twice a month;
- ii. Inspect bee colonies where necessary:
  - Always wear protective gears/equipment before opening the hive;
  - Use bee smoker while inspecting bee colonies;
  - Do not block the hive entrance by standing at flight path of bees;

- Work gently without excessive talking or banging noises; Puff smoke gently around the entrance of the hive and remove the lid carefully; and
  - Open the hive with the use of hive tool and check the development of the bee colonies;
- iii. Avoid opening the hive in the sunny or rainy part of the day.

### **3.2.3 Prevention and control of honeybee pests and predators**

The methods used by the beekeepers to prevent and control pests vary from one area to another and they also range from mechanical to chemical methods.

To prevent and control honeybee pests, beekeepers:

- i. Shall maintain apiary hygiene through;
  - Cleaning and flaming of un-colonized hives at least once per month;
  - Clear all vegetation or weeds under the hive stands at least twice per month;
- ii. May apply either grease, oil or ashes to the hive stand/hanging wire at least once per two months to control crawling pests;
- iii. Shall hang the hives with appropriate materials to prevent honey badger;
- iv. Shall use metal plates on the stands to prevent lizard and honey badger;
- v. Shall apply plant extracts that are effective for control of pests such as termites;
- vi. Shall destroy breeding site of pests around apiaries; and
- vii. Shall ensure bee colonies are strong.

### **3.2.4 Honeybee diseases**

Bees can be infected with different diseases caused by various pathogens such as bacteria, virus and fungi. It is highly recommended to be proactive as it is a better way of protecting from diseases. Therefore, beekeepers are directed to take the following preventive measures:

- i. Maintain apiary hygiene;
- ii. Avoid unnecessary transfer of used hive parts and accessories from one hive to another;
- iii. Avoid importation of used beekeeping equipment and bee products; and
- iv. Report on the unusual behaviour or condition of the bee colony to the relevant authority.

### **3.2.5 Fire prevention**

Traditional honey harvesting and hunting practices involves setting of fire to produce smoke which is used to calm down bees. This practice is associated with negative impacts which are causing forest fires, killing bees and destroying of their natural habitats. Thus, in order to protect the apiaries from fires beekeepers need to:

- i. Construct and maintain fire line around apiaries at least once per year;
- ii. Use bee smoker during apiary operations instead of open fire;
- iii. Apply signs and warning notice boards around the apiary or bee reserve; and
- iv. Put off bee smoker immediately after apiary operations.

### **3.2.6 Records keeping**

Good records kept by the beekeeper will help to follow the progress of apiary operations and bee colony. In keeping apiary records, the beekeeper:

- i. Shall record type of hive;
- ii. Shall label beehive with a unique code;
- iii. Shall record number of colonies in the apiary;
- iv. Shall record date/time of last inspection;

- v. Shall record date of occupation/colonization;
- vi. Shall record date of last harvesting;
- vii. Shall record yield per hive;
- viii. May record colony strength and characteristics (i.e. defensive, calm, productive, poor);
- ix. Shall record pests and any sign of bee diseases; and
- x. May record cash flow – how much money spent or earned.

### 4.0 SAFETY AND FIRST AID

Apiary operators are exposed to many risk factors such as insects and snake bites, bee sting, wild animals, dehydration, falling, fire, road accidents and physical injuries. Beekeepers need to operate apiaries in accordance with procedures known and agreed in order to prevent and handle personal injuries. Safety and first aid tools and skills are prerequisite requirements in undertaking apiary operations.

To ensure safety during apiary management and operations the following are recommended:

- i. Apiary owner shall put in place safety precautions for apiary operators and attendants;
- ii. Apiary operators and attendants shall be trained on safety and first aid skills;
- iii. Beekeepers shall put in place first aid kits;
- iv. Medicine and medical equipment's should be checked regularly to make sure they are within their use by dates; and
- v. Carry first aid kit during all apiary operation.

### 5.0 MONITORING AND EVALUATION

Monitoring and Evaluation (M&E) as a management tool should be used to gauge whether developed guidelines are being implemented accordingly by stakeholders. M&E of the guidelines will be carried out by Forestry and Beekeeping Division. Findings from M&E will be used by the Ministry for the purpose of improving the beekeeping sector.

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**Annex 1: Special Endorsement Form**

**CONSERVATION OF NEW BEE RESERVE AND VARIATION OF BOUNDARIES FOR PRIVATE, VILLAGE, NATIONAL AND LOCAL AUTHORITY BEE RESERVES**

**UNITED REPUBLIC OF TANZANIA  
SPECIAL FORM**

WARD NAME .....  
P. O. BOX .....  
Date .....

Ref. No. ....

Conservation of Private, Village, Local Authority or National Bee Reserve

(Name of Reserve).....

Name of Village .....Name of Ward .....

Ward Executive approve conservation of area mentioned above to be Private/ Village/ Local Authority/ National Bee Reserve.

Name and Signature .....Name and Signature .....

Village Chairperson

Ward Executive Officer

Date .....

Date .....



## DISTRICT OFFICE

WARD NAME.....

P. O BOX.....

Date .....

REF. NO.....

District Council agrees with Ward Executive decision on conservation of Bee Reserve Mentioned above.

Name and Signature ..... Name and Signature .....

District Executive Director

District Commissioner

Date .....

Date .....

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## REGIONAL OFFICE

REGIONAL OFFICE .....

P. O. BOX .....

Date .....

Ref. No. ....

Regional Council agrees with District Council decision on conservation of Bee Reserve Mentioned above.

Name and Signature.....

Name and Signature .....

Regional Administrative Secretary

Regional Commissioner

Date .....

Date .....

## Annex 2: Resorces Assessment Form

<b>Bee Reserve Name</b>			
<b>Area (ha)</b>		<b>Date</b>	

Bee fodder plants					
Species	Common name		Habit (Tree, shrub, climber, herb)		
1.					
2.					
3.					
4					
Vegetation type	Woodland	Thicket	Savanna	Grassland	Other

## Water resources

Permanent stream and rivers		
Wetland		
Reservoirs		

Number of kept bee colonies	Stinging bees			Stingless bees	
Bee product harvesting potential	Honey	Beeswax	Propolis	Bee venom	Pollen

Suggested Management Activities eg Fire control, enriching flowering plants	
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## **Annex 3: Model format for Bee Reserve Management Plan**

### **PART ONE: INTRODUCTION**

#### **Section1 Background information**

- Social- economic profile of the district
- Ownership and administration of a bee reserve
- Process of establishing a bee reserve

#### **Section 2 Description of the area (an investigation stage)**

- Location, climate, boundaries, size, tenure and history of a bee reserve.
- Inventory: condition of a bee reserve and listing of bee keeping resources
- Maps: participatory resources maps and survey maps
- The community: (user groups and stakeholders), rights and privilege
- Existing management plan (if any)
- Legal aspect (if any)

#### **Section 3 Purpose and objectives**

Each bee reserve must define management objective that confers to the purpose of its establishment, such as;

- (a) Main source of gene pool
- (b) Source of package for both stinging and stingless honey bee colonies
- (c) Enhance conservation of biodiversity
- (d) Production of bee products
- (e) Sustainable management and utilization of bee resources

- (f) Livelihood improvement
- (g) Recreational function (Api-tourism)

#### **Section 4 Institutional establishment and management strategies**

- Prescribe the institutional framework for the management of bee reserve
- Provide information on;
  - Committee structure if any
  - Code of conduct where applicable
  - Benefits and loss
  - Responsibilities and stewardship
  - User groups and stakeholders
  - By-laws for Local Authority and Village Bee Reserve
  - Conflict resolution

### **PART TWO: IMPLEMENTATION STRATEGIES**

#### **Section 1 Zonation of the bee reserve (where applicable/needed)**

- Zones in the bee reserve (different zones depending on the resources available in the bee reserve and objectives eg. zone for beekeeping, Api- tourism sites, cultural sites)
- May include map showing how the bee reserve is divided into several zones.

#### **Section 2 Management operations and prescriptions**

In order to have good bee reserve and sustainable explain how you will implement the following;

- Bee reserves protection
  - Development of fire lines around bee reserves

- Law enforcement (Development of By –laws, Group patrols)
- Diseases and Pests control
- Planting for honey bees
  - Identifying of plant species (Melliferous species)
  - Carryout planting and replanting
- Access to bee reserves
  - Establish pathways, roads, bridges, camps and trails
- Apiculture and meliponiculture
  - Establishing of apiaries for stinging and stingless honey bee colonies
  - Provision for water sources,
  - Building of beekeepers camps
  - Bee management
- Utilization of bee reserves
  - Harvesting of bee products
  - Collection of mushroom
  - Selective logging
  - Medicin aluses
  - Ritual sites
  - Api-tourism
  - Training and Research
- Revenue collection
  - Establish fees/permit/bee reserves products and services
- Benefit sharing
  - Develop mechanism for cost and benefit sharing
- Funding
  - Identify sources of funds

### **PART THREE: MANAGEMENT PLAN REVIEW**

Agreed time to review the management plan should be stated.

## **PART FOUR: MONITORING AND EVALUATION**

- Monitoring timetable
- How the evaluation will be done
- Indicators to be used should be stated.

## **ANNEXES**

- Certificate of land of occupancy (if available)
- List of fodder plants in a bee reserve
- Matrix for monitoring and evaluation

## Annex 4: Template of a Beekeeping Calendar

Beekeeping Activities/Calendar	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>1.0 Dearth Period</b>												
1.1 Inspecting hives regularly												
1.2 Provide water to colonies												
1.3 Provide shade												
1.4 Remove abandoned combs in hives to avoid pests												
1.5 Feed the colonies if necessary												
<b>2.0 Build up Period</b>												
2.1 Inspecting hives regularly												
2.2 Remove combs in abandoned hives												
2.3 Prevent absconding												
2.4 If necessary feed the colonies												
<b>3.0 Honey Flow Period</b>												
3.1 For frame hives add suppers to enlarge hive volume												
3.2 Preparation of harvesting equipment												
<b>4.0 Harvest Period</b>												
4.1 Harvest honey												
4.2 Extract/strain honey												
4.2 Store honey												

Beekeeping Activities / Calendar	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4.2 Extract/strain honey												
4.2 Store honey												
4.3 Render beeswax												
4.4 Store beeswax												
4.5 Sell honey and beeswax												

**NB:** It should be noted that the Beekeeping Calendar may vary from one area to another. However, the activities for each period will remain the same.

