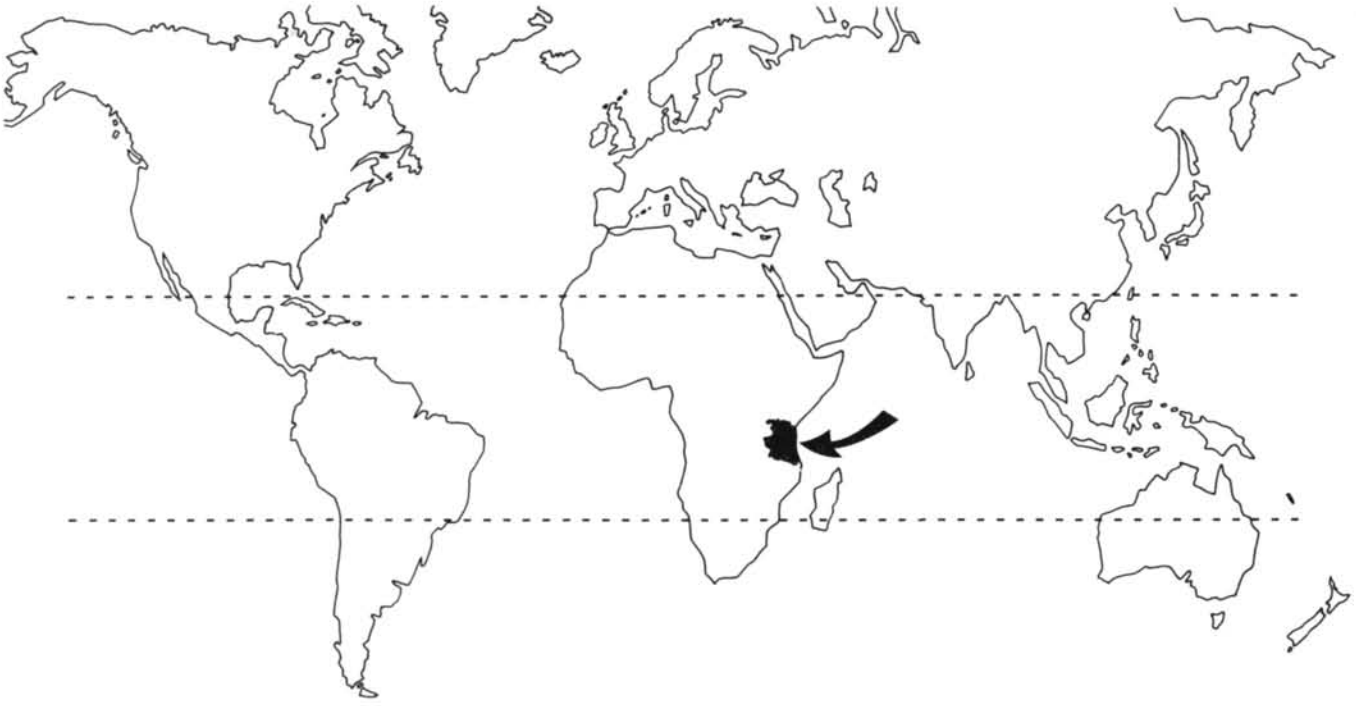

BEEKEEPING DEVELOPMENT PROGRAMMES IN TANZANIA

by G. NTENGA
(Ministry of Natural Resources and Tourism, Game Division, P O Box 426, Dar-es-Salaam, Tanzania)

(From "Apiculture in Tropical Climates", IBRA, London 1976, Pages 147-154)

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Beekeeping Before Independence

There is little evidence regarding the importance of beeswax as an article of commerce in pre-German times (before 1885), although it is clear that the Portuguese traded in beeswax with people along the East African coast. The trade was improved by the Germans, who found that Tanganyika was an important source of beeswax. In order to upgrade its quality for use in their refining industry, they put much effort into teaching honey hunters and beekeepers how to render beeswax into clean cakes, and this led to the achievement of a high quality product.

The Germans attempted beekeeping to a limited extent, and it is thought that they tried to introduce European bees; Smith (1961) noted that German bee houses are remembered by people in the Kilimanjaro area. Certain improvements in the design of traditional hives were made, and around 1906 Dr. Morstatt of Amani advocated the use of box hives and the preservation of bee colonies when their honey was taken, instead of killing them.

In the days of British administration (1918-1961), interest in improving beeswax production was taken by an Agricultural Entomologist based at Morogoro. According to Harris (1931) extension work was carried out: through encouraging beekeeping in areas where no beeswax was exported, by demonstrating that it had a market value; through improving methods of wax preparation where beeswax was already produced; and through improving hive design in areas of intensive wax production. After wrestling with the problems, it was realized that the scope of the beekeeping industry in Tanganyika was so vast that a full-time appointment was needed. A Beeswax Officer was therefore appointed, "to make a thorough study of African bees and to determine how native beekeeping, wax and honey production can be improved and stimulated" (Smith, 1958). These were the original terms of reference,issued by the British Colonial Office in London, which gave birth to a specialist branch of the Agricultural Department. They were followed by certain other directives, to the effect that all efforts should be made to increase production by using larger hives, and by increasing their number. This was the basis of all beekeeping activities in Tanganyika during the British administration.

Beekeeping Organization After Independence

After independence in 1961 there was a fresh look at the beekeeping industry as a whole, and fresh directives were issued by the Forest Department:

1. To endeavour to change from primitive beekeeping methods to modern methods, by gradually introducing the movable-frame long hive specially designed for African forest conditions.

2. To finalize trials with all types of bee houses, and to publish a report on their usefulness or otherwise to beekeeping in Tanganyika.

3. To organize beekeepers' associations for receiving technical knowledge and for marketing bee produce.

4. To set up apiaries using platform stands, and to find solutions to various problems encountered in this form of beekeeping, with a view to eliminating the hazards of tree beekeeping methods.

5. To finalize queen introduction methods applicable to beekeeping in Tanganyika (Beekeeping Section, 1964).

Further directives redefined the whole beekeeping policy under short-term and long-term projects. Short-term projects were:

1. Modernization of the existing bush and forest beekeeping to the maximum possible, through the use of modern hives.

2. Improvement of methods of collecting and cleaning honey and beeswax.

3. Organization of marketing of honey and beeswax.

Long-term projects were:

1. Research in beekeeping, especially in the field of bee ecology, bee forage and bee breeding.

2. Study of the economics of intensive bee farming (Beekeeping Section, 1967).

Since the decentralization of the nation's administrative structure in 1972, the functions of the Beekeeping Section have been grouped into three major subsections, with the general objective of ensuring effective development and utilization of products of the beekeeping sector, as follows.

1. Planning and Development

This subsection has the following major functions:

(a) Developing long-term and 5-year plans for the sector;

(b) Assisting regions to prepare their annual beekeeping plans, and reviewing them for economic viability, technical feasibility and consistency with the overall sectoral plans;

(c) Providing extension services for the local population involved in beekeeping activities;

(d) Promoting beekeeping in selected regions;

(e) Maintaining up-to-date statistical information on the beekeeping sector.

2. Research and Training

(a) Preparing and ensuring effective implementation of research plans;

(b) Preparing formal and in-service training courses;

(c) Selecting candidates, preparing curricula and providing staff for the training courses;

(d) Liaison with the training section which provides administrative services for the formal training courses.

3. Commercial co-ordination

(a) Assisting co-operative societies (Ujamaa villages) in the collection, storage, distribution and marketing of honey and beeswax;

(b) Carrying out market research on existing and potential markets for honey and beeswax;

(c) Co-ordinating and, initially, actually managing all export activities.

All present beekeeping development activities in Tanzania are now based on the above organization.

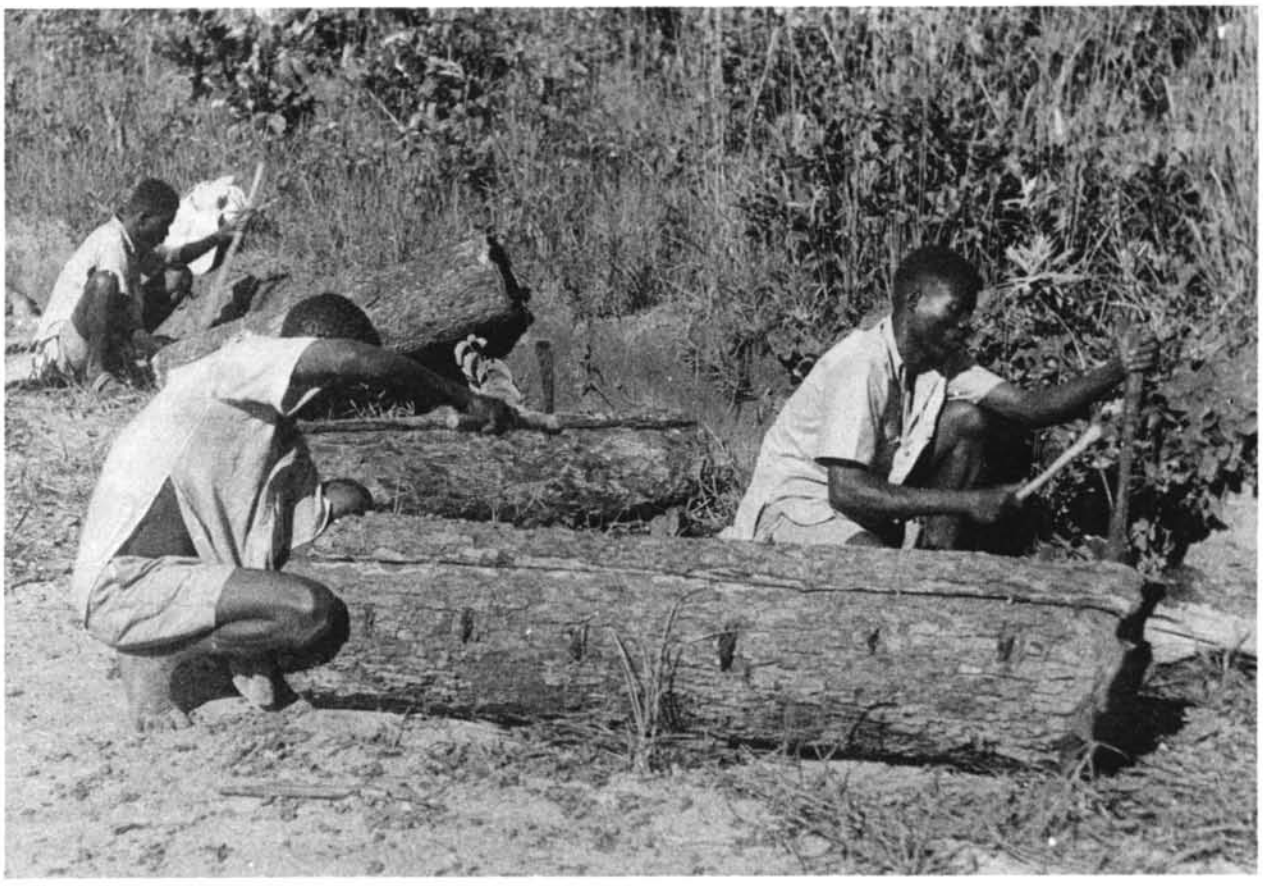
Beekeeping Development Potential

Much lies ahead for the scientist and technician for developing the beekeeping industry in Tanzania. Approximately 320,000 km^2 of mainland Tanzania is under forest cover, the greater part being open woodland. This forms the principal habitat of a very prolific and productive race of honeybees, Apis mellifera adansonii. In areas where industrious men have taken up beekeeping, much honey and beeswax is collected annually. The forests and woodlands abound in indigenous species of trees, shrubs and herbs, most of which produce nectar that the honeybees collect and use in producing honey and beeswax. In Tanzania most of the nectar comes from leguminous trees, particularly of the family Caesalpiniaceae; in the miombo woodland areas the most common genera are the Brachystegia and Julbernardia.

In the drier parts the genus Acacia (Mimosaceae) is important, and where numerous herbs and shrubs occur they are good sources of nectar and pollen (Smith 1962). There are still large expanses of forest and woodland which have not yet been exploited for honey and beeswax production.

From recorded statistics, Tanzania at present exports an average of 368 tons of beeswax worth 5.5 million Tanzania shillings (£688,000) and 467 tons of honey worth 2.3 million Tanzania shillings (£288,000). The bulk of the honey is consumed locally, and nearly as much beeswax as the amount exported is thrown away through ignorance and ineffective marketing. It is estimated that production and exports could be increased tenfold if all the forests and woodlands were sufficiently and properly exploited.

TANZANIA: Map showing named localities.



Making a pegged-bark hive in Tanzania.

A report entitled "Tanzania beeswax" (Ntenga, 1976) identifies the major honey and beeswax producing districts.

The Present Programme

1. Market Development

This is considered to be of the highest priority, in order to provide channels for the existing bee produce. At present two centres offer adequate marketing facilities accessible to producers. One, belonging to the Tabora Beekeepers Co-operative Society, has been operating for over fifteen years, and at present caters for 3150 beekeepers. The second, at Handeni, has recently been developed with the aid of the West German Government, and has a similar capacity for producers in Tanga, Kilimanjaro, Arusha, Morogoro and Dodoma Regions.

The establishment of such centres, fully equipped with collecting and processing machinery, and a discriminatory system whereby high quality products receive attractive prices, and low quality ones fetch low prices or are rejected, helps to stimulate production of crops of the desired quality. Prompt payment for the products is a vital aspect, which serves to encourage greater production.

During the next five years one other centre is planned, to be established in the south to cater for the honey and beeswax producers in Lindi, Mtwara and Ruvuma Regions, including parts of Rufiji district of Coast Region. It is envisaged that the need will arise for the establishment of smaller units, particularly for producers in Kigoma and West Lake Regions. It is important, however, that before such centres are established feasibility studies should be carried out, with simple straining equipment located in selected areas. Heather honey presses loaned to or purchased by producers have proved to be of tremendous value. Ujamaa villages or corporations could initiate these efforts.

It is of paramount importance in this respect to win the beekeepers' co-operation. Without this, the products could be either adulterated or not properly rendered, and the whole venture might even collapse. This happened to the Nyamwezi Development Corporation in the early days of market development for honey and beeswax in Kahama District (Ntenga, 1976). Efforts should be made to teach the beekeepers how to prepare their produce for the market, and properly applied legal steps could help to attain the desired quality standard.

2. Improvement of Bee-Keeping Methods

Improved beekeeping stems from the use of beehives from which the crop can be collected without destroying the colony. In the early days of beekeeping development, the pattern of the "Sudan" hive was adopted, and modified for use in Tanganyika. The most important appliance was a queen excluder: there is no record of the successful use of a queen excluder in traditional hives.

With the founding of a Beekeeping Division of the Agricultural Department in 1949, modern frame hives made their appearance, first the Langstroth and then the Modified Dadant. A number of difficulties were experienced in the use of these hives, more especially due to the characteristics of the adansonii

bees. Anomalies associated with their natural comb spacing (compared with that of European races) led Smith (1961) to make certain modifications to the Dadant frame, eventually developing the African Dadant hive.

Subsequently Hubbert (1964) introduced a two-chamber African long hive, and the author developed the African Dadant hive (Ntenga, 1968), and also the transitional hive and the Tanzania Commercial hive (Ntenga, 1972). These latest versions have been modified into the more workable patterns that are currently in use in all experimental and production apiaries.

The use of simple hives will continue for many years. Suitable materials for making them have to be found without continuing the practice of debarking live trees. The advantages of simple hive - in terms of time, labour and money - make it difficult to change the ways of the traditional beekeepers. Efforts ought therefore to be made to teach them how to collect crops from simple hives without destroying the bees.

3. Centres of Various Types

Demonstration centres established in selected areas can greatly aid the extension efforts. Success is being achieved in the demonstration centres developed in Handeni District, Tanga Region. Beekeepers are brought to these centres for two months of practical training, and return to their home villages to look after village apiaries. Each demonstration centre has 300 hives. The development of modern beekeeping depends on effective beekeeping staff. So, in addition to maintaining demonstration centres, each beekeeping employee is required to build up and maintain a modern productive apiary.

Chandler (1975) has set a good example by studying in detail the traditional methods of beekeeping among the Wameru in Arusha Region. Such studies are needed in other areas, for they throw light on problems hitherto unnoticed, and make it easier to decide on the best line of approach in developing beekeeping in a given area.

As well as the above, it is vitally important to set up hive-manufacturing workshops, looked after by well trained beekeeping officers. This ensures that the equipment is accurately made, and up to the standards set. There are at present three workshops: at Tabora Training Centre, Forest Training Institute in Olmotonyi, and Handeni. Two others are under construction: one is at Arusha, Themi estate (beside the Research Laboratory), and one at Kondoa.

It is planned during the next five years to set up a wax foundation mill in one of the richest wax-producing districts. This mill is likely to be widely useful, in view of the beekeeping development programmes in several other African countries.

4. Development of State Bee Farms

The main purpose of setting up a state bee farm is to provide a working example of a modern farm where prospective bee farmers can obtain training and practical experience in commercial honey and beeswax production. The farm is also expected to provide package bees and nuclei, making available bees for

stocking new hives. Breeder stocks for the queen rearing unit can be selected from the bee farm: much can be learned about colony development from colony inspection records, and also about the phenology and intensity of nectar flows.

Although suitable locations for the apiaries for the farm should be carefully selected, they are not difficult to come by in Tanzania. There is adequate knowledge regarding plants that are important nectar yielders,and these are present in all vegetation belts. In areas where for some reasons static beekeeping cannot pay, migratory beekeeping can profitably be practised.

During the next five years it is planned to establish three bee farms,one every other year. Their proposed locations may be changed, since the Beekeeping Section is now transferred from the Forest Division to the Game Division, in which areas will become available for rational beekeeping that have hitherto been completely protected from human interference; the beekeeping will be done without disturbing the protected wildlife.

5. Bee breeding and Behaviour

For a bee-breeding project to be successful, it should be under the guidance of a competent geneticist. There is at present no provision for a bee geneticist in Tanzania, so initial efforts are directed towards establishing a queen-rearing unit which will guide all the small queen-rearing units attached to state and village bee farms.

To ensure success in this project, a number of "holding grounds" will be established in areas known to be inhabited by relatively docile strains of bees. Gentle behaviour is generally associated with cool regions. The northern zone and the southern highlands zone have this reputation, including West Lake Region and the Mwesi highlands of Mpanda District. The central queen-rearing unit at Arusha will obtain queens from these areas, and carry out the necessary selection and rearing.

6. Bee Botany and Pollination

Smith (1960) carried out an extensive study of plants of importance to bees, and factors which influence nectar secretion. The optimum stocking of apiaries in specific vegetation areas - in woodlands, upland grasslands, wooded grasslands, bushlands and thickets, and upland and lowland forests - urgently needs to be determined.

Pollination experiments of some significance were carried out in 1956 on pyrethrum. Recently Chandler and Mdemu (1975) have studied pollination of lucerne by adansonii bees. Pollination experiments on coffee have not been finalized. Most reports on pollination by bees in Tanzania have been based on observations and experience.

7. Stingless Bees

In Tanzania there is scope for developing apiculture with stingless bees for the production of honey and pollen. According to Chandler (1975) there are probably ten species of Meliponini in Tanzania, of which one Trigona species is particularly important, because it has been exploited for honey and wax by traditional methods for many years.

The development of a modern hive for Trigona togoenis could open a new field of enterprise in Tanzania. Further studies on the biology and management of this bee are needed.

8. Training

The need for recognised standards in the training of staff has been realized since 1958 when liaison was established with the British beekeeping examination institutions. Earlier, beekeeping extension staff were given basic training in simple beekeeping as outlined in a Beekeeping Division Pamphlet (Smith, 1955).

A much wider knowledge was needed for the beekeeping instructors. These were given training in frame-hive beekeeping on the lines of the British Beekeepers' Association system. An eight-week Beemaster course was thus established in 1958 to meet this requirement. Candidates who qualified for the Beemaster Certificate were required to work for two years in the field to gain practical experience, before they were given another training leading to a higher qualification, the Expert Beemaster Certificate, later known as the Senior Beemaster Certificate. This qualification was similar in standard to the Senior Certificate of the British Beekeepers' Association and the Expert Beemaster Certificate of the Scottish Beekeepers' Association, and was recognized by the Examination Board for the National Diploma in Beekeeping. The National Diploma in Beekeeping is generally the highest qualification and is similar in standard to the National Diploma in Agriculture and related diplomas; it is required for all senior appointments of beekeeping staff in Tanzania.

In Tanzania today two institutes provide training for beekeeping staff to the standard of the National Diploma in Beekeeping of the UK. The Tabora Beekeeping Training Institute provides basic training to Beemaster level, and also makes provision for short courses for beekeepers in various parts of the country. Higher training is given at the Forest Training Institute at Olmotonyi, Arusha, and provision is made there for candidates from other African countries.

Overseas training is also arranged, and Canada is particularly active in providing special training in apiculture. Nine officers have been trained there, and one in the German Federal Republic.

9. Statistics

Good planning for beekeeping development depends much on information already available, on the annual production of bee produce, numbers of hives, apiaries, beekeepers, and number and location of good beekeeping areas. One project within the beekeeping development programme is the establishment of a records system to make essential information available for planning and management.

10. Ujamaa Beekeeping

Since the development of Ujamaa (self-help) villages in the late 1960's, efforts have been continued to establish collective bee farms of a size that the villagers themselves will be able to manage. Under the special fund for regional development, more than 12,000 modern hives have been distributed to cover 450 villages, commonly 10 to 50 per village. Protective clothing, smokers and honey presses have been given to some villages. In areas where response is very good, the villagers are encou-

raged to contribute traditional hives. The excellent response in Kondoa District deserves special mention.

11. School Beekeeping

Special effort is directed towards developing school apiaries, to teach pupils how to keep bees, and to show them that beekeeping is a profitable undertaking as well as an interesting hobby. Beekeeping is one of the activities in the national campaign for agricultural development in secondary schools. Catholic Relief Services have carried out a survey on possibilities of promoting beekeeping in primary schools. Some schools already keep bees.

12. Publicity

Articles are regularly published in local papers. Material for the radio is usually broadcast in the general Maliasili (Natural Resources) programme. Film shows are given in special cinema vans in rural areas throughout the country.

Foreign Involvement

In July 1973 the Canadian International Development Agency launched a three-year assistance programme for developing the beekeeping industry in Tanzania. One of the major projects tackled was upgrading the training courses at Olmotonyi. Success is evident from the quality of the officers who have since graduated there. A national beekeeping research centre has been developed at Themi Estate,Arusha. Two cinema vans have been provided for extension work throughout the country. The CIDA assistance provided personnel and training at a stage of rapid beekeeping development in Tanzania.

The German Federal Republic is fully involved in the development of a honey processing and packing plant at Handeni, under the Tanga Integrated Rural Development Programme. The centre is now fully functional, and 18 tons of honey were handled in 1976 from Handeni and the neighbourhood. Three demonstration centres have been established, each with staff quarters, classroom and store, and 300 colonies. This project is fully financed by the Government of the German Federal Republic.

Conclusion

There is wide scope for developing the beekeeping industry in Tanzania. The beekeeping development programme itself is extensive, and inevitably encounters problems that must be overcome if the programme is to be successful; problems associated with man and his traditions, and problems associated with the honeybee (and its enemies) which require a scientific approach. When conditions are adverse beekeeping can become disappointing and unattractive. In order to accomplish what is needed, the whole beekeeping development programme in Tanzania requires substantial financial support, to provide access tracks, hives, buildings, machinery and manpower.

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