

Beekeeping for poverty reduction and biodiversity conservation

Angela R Mwakatobe, Tanzania Wildlife Research Institute, PO Box 661, Arusha, Tanzania

Raphael M Machumu, Forestry Training Institute Olmotonyi, PO Box 943, Arusha, Tanzania

Keywords: beeswax, honey, income generation, Manyoni District, Tanzania

Introduction

Beekeeping in Tanzania plays a major role in socio-economic development. It is an important source of income especially for communities living close to forests and woodlands (*BfD Journal* 89, 2008). In Tanzania current honey and beeswax production stand at 3.5% of estimated potential figures (Mwakatobe & Mlingwa, 2005). This low production indicates an opportunity to increase beekeeping activities to raise income and reduce poverty. Despite its significance, there is little empirical evidence of the value of traditional beekeeping for income generation. Our research aims to assess the contribution of traditional beekeeping to poverty reduction in Manyoni District. The results will contribute to appropriate policy for beekeeping and its role in poverty reduction.

Beekeeping in Tanzania

We estimate that the beekeeping sector generates US\$ 1.7 (€1.3) million each year from sales of honey and beeswax, and employs about two million rural people. Mwakatobe and Mlingwa (2005) contend that besides its domestic role, beekeeping is a good source also of foreign exchange earnings for Tanzania (see Table 1). It is estimated that production potential for bee products in Tanzania are 138,000 tonnes of honey and 9,200 tonnes of beeswax *per annum* from 9.2 million honey bee colonies. Current national production figures are approximately 4,860 tonnes honey and 324 tonnes beeswax per year – only 3.5% of potential production.

Contribution of beekeeping

Most bee products are for home consumption, but any marketable surplus can provide a safeguard and security against crop failures or for use between crop harvests (Nair 1993). Income generated from beekeeping can be used to pay for education, health, transport and housing. Beekeeping provides further employment for urban and rural people

involved in the honey beer business and in producing equipment and protective clothing. For about 70% of beekeepers interviewed, income from selling bee products subsidised household economies by at least 30%.

Honey production

The major areas of honey production in Tanzania are Dodoma, Iringa, Singida and Tabora Regions (NWRC, 2007). Manyoni District has a high beekeeping production potential (Table 2), as it was reported by Village Beekeeping Development Groups that income accrued per individual beekeeper increased from an average US\$150 (€112) in June 2000, to US\$691 (€516) in June 2003. With an average of four beekeepers at household level, income per household increased from US\$450 (€336) to US\$2,764 (€2,064).

Manyoni District

Manyoni District has a total of 20,000 beekeepers and 42 beekeeping groups who manage 320,000 colonies with a production potential of 1,313,910 kg of honey and 314,875 kg of beeswax per year (Tables 3 and 4), harvested from 99.8% local style hives made of bark or logs (*personal communication Divisional Beekeeping Officer, 2009*).

Research

From 21 administrative wards of Manyoni District, seven wards were randomly selected based on their potential for beekeeping. From each ward, one village was randomly selected. From each village a list of beekeepers was obtained and these formed the sampling frame for each village. A sample of beekeepers' households to be interviewed was randomly selected using sampling intensity at 5% level (Msuya *et al*, 2006) (Table 5).

Primary data was obtained through structured questionnaires and checklists of probe questions used to interview household heads and key

continues on page 6

Table 1. Tanzania honey and beeswax exports trends July 1995 to January 2008

Year	Beeswax			Honey		
	Tonnes	Value in TZS	Value in US\$	Tonnes	Value in TZS	Value in US\$
1995/1996	226	477,424,113	782,662	56	45,420,532	74,459
1996/1997	326	836,303,796	1,359,843	310	227,607,933	370,094
1997/1998	449	996,153,837	1,532,544	190	154,163,826	237,175
1998/1999	403	1,014,211,975	1,440,678	39	24,184,518	35,533
1999/2000	643	1,897,251,766	2,405,550	156	132,581,766	167,698
2000/2001	370	845,432,000	1,056,790	12	11,800,000	14,760
2001/2002	235	555,856,200	617,618	-	-	-
2002/2003	592	1,776,000,000	1,776,000	823	905,443	905,443
2003/2004	332	1,165,490,000	1,165,490	1,821	1,091,861,639	1,087,657
2004/2005	288	1,166,384,698	1,241,100	465	544,513,855	779,718
2005/2006	302	1,645,246,568	1,403,794	147	187,616,236	159,809
2006/2007	261	1,355,013,643	1,132,063	282	428,420,976	340,345
2007/2008	57	350,655,711	295,911	264	496,136,539	419,034

Source: Kiondo (2010)

TZS = Tanzania shillings

Table 2. Actual and potential honey production in selected districts of Tanzania

High producing area			Medium producing area			Un-exploited areas		
District	Actual (tonnes)	Potential (tonnes)	District	Actual (tonnes)	Potential (tonnes)	District	Actual (tonnes)	Potential (tonnes)
Kahama	500	4,000	Kondoa	300	3,000	Lindi	50	8,000
Mpanda	1,500	8,000	Kiteto	250	2,000	Songea	50	6,000
Sikonge	2,000	6,000	Babati	150	1,200	Iringa	40	5,000
Urambo	1,400	6,000	Kibondo	250	4,000	Biharamulo	15	4,000
Nzega	400	4,000	Handeni	150	3,000	Kasulu	5	4,000
Tabora	1,200	5,000	Kigoma	100	3,000	Newala	15	4,000
Chunya	400	6,000	Arumeru	100	1,500	Tunduru	15	4,000
Manyoni	600	8,000	Rufiji	50	2,500	Singida	5	3,000
Bukombe	800	5,000	Nkasi	50	1,500	Hai	5	2,500
Total	7,800	52,000		1,400	21,700		180	40,000

Production ratio of honey to beeswax per colony per year is estimated to be 15 : 1 Source: MNRT (2001)

Table 3. Traditional beekeeping and production trends 2000-2008

Year	Beekeepers	Beekeeping groups	Local style hives	Frame hives	Honey (kg)	Wax (kg)
2000	8,900	9	144,000	120	139,000	11,500
2001	9,000	15	161,000	180	93,000	25,700
2002	9,500	17	220,000	204	275,760	9,500
2003	9,500	17	260,838	356	197,100	13,000
2004	11,000	27	271,000	655	270,075	1,649
2005	12,500	33	288,000	917	520,155	9,500
2006	14,000	35	298,000	947	205,160	11,716
2007	17,000	40	300,000	1,050	156,000	7,800
2008	22,000	42	320,000	1,250	1,313,910	314,875

Table 4. Value of bee products for Manyoni District 2000-2008

Year	Honey	Beeswax	Stingless bee honey	Total	Total (US\$)
2000	69,500	17,250		712,250	428,467
2001	46,500	51,400		97,900	58,853
2002	137,880	19,000		156,880	94,270
2003	131,400	32,500		163,900	98,530
2004	180,000	4,947		184,947	111,186
2005	346,770	285,000		631,770	379,785
2006	205,200	35,148		240,348	144,483
2007	208,000	273,000	12,000	493,000	296,363
2008	1,751,880	1,259,500		3,011,380	1,810,271

TZS 10,000 = US\$6.1

Table 5. Administrative area surveyed and number of beekeepers

N	Division	Ward	Village	Interviewees	Number of beekeepers
1	Itigi	Sanjaranda	Sanjaranda	6	120
2	Kilimatinde	Makuru	Msemembo	14	276
3	Manyoni	Aghondi	Aghondi	4	82
4	Kilimatinde	Solya	Kilimatinde	4	76
5	Itigi	Mgandu	Kayui	16	312
6	Itigi	Rungwa	Mwamagembe	25	503
7	Manyoni	Manyoni	Manyoni	3	50
Total				72	1,419

Table 6. Local-style hives used in Manyoni District 2009

Type of hive	Response (%)
Log	48.4
Bark	28.5
Tanzania transitional	20
Tanzania commercial	0.8
Cement	0.8
Hives for stingless bees	1.6

Other hives in use are made from gourds, grass, straw and tins (Key informant).



Angela Mwakatobe

Table 7. Beekeeping in Manyoni District 2000-2009

Year	Number of beekeepers	Traditional hives	Frame hives	Honey produced (tonnes)	Wax produced (tonnes)
2000	8,900	144,000	120	139.0	11.5
2001	9,000	161,000	180	93.0	25.7
2002	9,500	220,000	204	275.8	9.5
2003	9,500	260,838	356	197.1	13.0
2004	11,000	271,000	655	270.1	1.6
2005	12,500	288,000	917	520.1	9.5
2006	14,000	298,000	947	205.2	11.7
2007	17,000	300,000	1,050	156.0	7.8
2008	22,000	320,000	1,250	1,313.9	314.9
2009	20,000	320,000	1,250		

Source: District Beekeeping Office, Manyoni (2009)

informants (individuals who were willing to talk and with great knowledge about the issues raised). Also, direct observations and field visits to bee reserves and other forest areas were made to comprehend the information obtained during discussions. Checklists of probe questions were designed to collect information from key informants, other members of the households, and beekeeping and extension officers from village to district levels. Information secured included: materials used for hive construction, instruments used in making hives, local management techniques, harvesting techniques, gender roles in beekeeping, tools for processing, storage of honey and beeswax, and conservation issues. The data collected were summarised and analysed with Statistical Package for Social Science (SPSS). Secondary data was obtained through literature review from various documents.

Results

Information on indigenous beekeeping knowledge and practices, how the practices influence the relationship between indigenous knowledge and biodiversity conservation, and how it contributes to the livelihoods of the people living in Manyoni District.

Results reveal an estimated 19,258 beekeepers (27.8% women and 72.2% men). Over 55% of beekeepers are aged 36-50 years.

The type of beekeeping practised is mostly local, traditional style with a small infusion of frame hive beekeeping (Table 6).

Survey outcomes

- 91.7% of local-style hives are sited on trees and 5.6% on stands. Siting hives in trees is preferred over stands for safety from pests and predators, vandalism, theft, attack from wild animals and for catching swarms.
- 48.6% of beekeepers practised only traditional beekeeping, 38.9% practised both traditional and frame hive beekeeping and 11.1% only frame hive beekeeping.
- 59.7% of the beekeeping population kept only honey bees while 33.3% kept both honey bees and stingless bees in bee reserves (76.4%), general lands (13.9%), and reserved land (1.4%).

According to the data, income for individual beekeepers in the District reached an average of US\$856 (€639) in 2009. This was an increase of 22.4% from the 2003 figure of US\$691 (€516). FBD (2004) reported that the average income per individual beekeeper rose from the year 2000 figure of US\$150 (€112) to US\$691 (€516) in 2003. There was an increase in the number of beekeepers and activities during 2000-2009 (Table 7). The contribution of beekeeping to poverty reduction and sustaining livelihoods in the sampled villages is significant (Chart 1).

Chart 1. Some of the benefits accrued from beekeeping

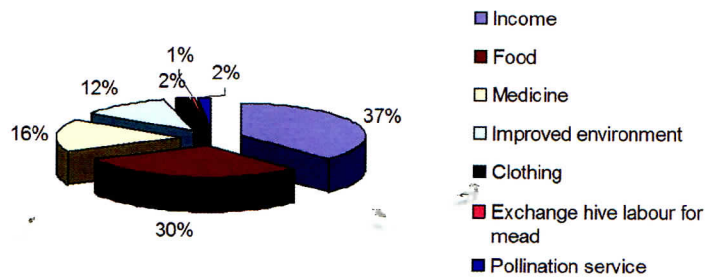


Chart 2. Livelihood improvement for beekeepers in Manyoni District

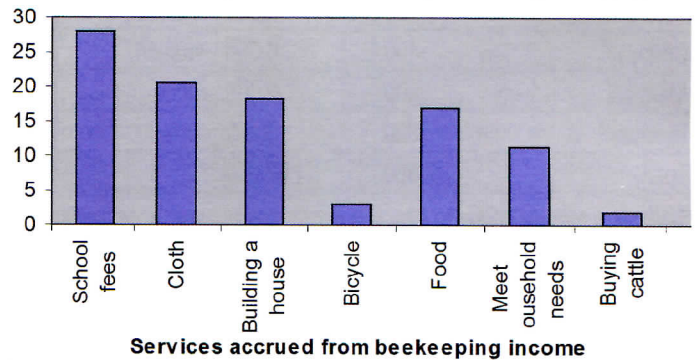
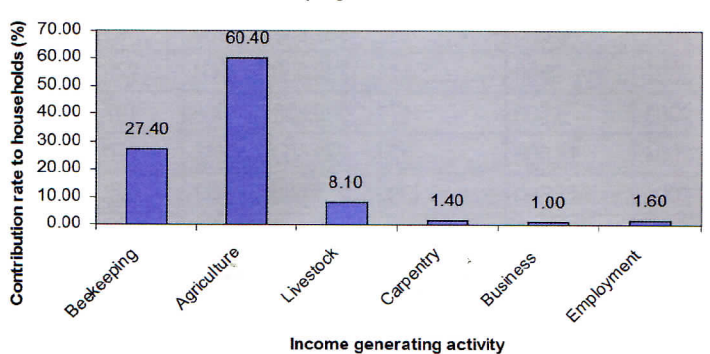


Chart 3. Contribution of beekeeping to household income



Income realised from beekeeping was the major benefit as testified by 37% of the respondents. The income is used to enable beekeepers to acquire social services, meet school fees, buy clothes, build houses, buy bicycles for transportation, supplement food (thus relieving hunger) and attend to other family issues (Chart 2).

Other uses of bee products mentioned by key informants included ceremonies, rituals, paying dowries and use during food shortages.

The study revealed that beekeeping contributes 27.4% of a beekeeper's total cash income per year, second only to agriculture (60.4% in 2009 - see Chart 3). From a study conducted by Ngaga *et al* (2005), Chunya, Songea and Nachingwea Districts had 30% of the households' economy subsidised by income derived from selling bee products.

Conclusions

- Manyoni people have a rich and useful indigenous knowledge of beekeeping, which makes significant contribution to the management and sustainability of the sector.
- The beekeeping sector makes a significant contribution to the socio-economic development of people in Manyoni District from the household to district levels in terms of income generation, food security, health, material well being, employment and agricultural development.

Recommendations

- To promote efforts in the production and marketing of bee products through strengthening and empowering beekeeping groups and associations.

- To provide training programmes in beekeeping with emphasis on gender awareness.
- To support beekeeping in Manyoni District, the Forestry and Beekeeping Division (FBD) should support villages in the process of participatory management of forests and bee reserves.

Acknowledgements

We thank the FBD through the Participatory Forest Management grant for funding this survey.

References

FBD (2004). *Beekeeping Development Project Report*. Ministry of Natural Resources & Tourism, Dar-es-Salaam, Tanzania.

KIONDO, M. R. (2010). Marketing and export of bee products. *Beekeeping and Environment* No 4. pp: 5-8.

MNRT (2001). *National Beekeeping Programme 2001- 2010*. 90pp

MWAKATOBÉ, A.; MLINGWA, C. (2005). Tanzania - The status of Tanzanian honey trade: domestic and international markets. *Bees for Development Honey Trade Workshop, Dublin, Ireland, August 2005*.

NAIR, P.K.R. (1993). *An introductory to agroforestry*. ICRAF. Kluwer Academic Publishers. pp 499: 95, 120

NGAGA Y.M.; OTSYINA R.; SENKONDO E.; MPUYA P. (2005). *Economic survey on the role of beekeeping in poverty reduction and environmental conservation in Chunya, Songea and Nachingwea Districts of Tanzania*.

MNRT, Dar es Salaam, Tanzania.

NWRC (2007). *Marketing of honey in Tanzania*. pp 42.

This report describes a field survey conducted in seven villages from seven wards of Manyoni District in Singida Region, Tanzania. The full report can be found on the BfD Website Information Portal www.beesfordevelopment.org/portal