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Challenges and opportunities of beekeeping in Mvomero district, Morogoro region, Tanzania

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Abstract

Beekeeping is one of the economic activities which play a valuable part in rural livelihoods in many developing countries. In Tanzania, beekeeping contributes to about 33% of household income of the communities living in the Miombo woodlands. This study aimed at exploring the challenges and opportunities of beekeeping industry in Mvomero District. We used focus group discussion, household questionnaire survey and key informant interviews to collect information on beekeeping potentials, challenges hindering local communities to participate in beekeeping and opportunities for rural communities' engagement in beekeeping industry. Income generation is the major reasons for practising beekeeping activities, which ranked number two after agriculture regarding major sources of income. Inadequate and poor quality of equipment and lack of appropriate skills are the main factors hindering local communities in beekeeping activities. Results also indicated that there are opportunities for local communities to participate in the activity due to presence of beekeeping groups, community banks and forest reserves. For increased participation of local communities, the study recommend for promotion, strengthening and empowerment of beekeeping groups and associations in production and marketing of bee product. Rural communities can be assisted to access credit facilities, development partners' support and training. Also, in order to increase income accrued from beekeeping industry, promotion and support on training on production of other bee products and processing of secondary bee products to local communities vital. Also, for improvement of quality control and markets of bee products establishing of honey collection points or centers are highly recommended. The centers will provide important post-harvest activities including proper honey processing, packaging and selling of bee products. Local communities can learn and acquire knowledge and skills for proper beekeeping from these centers. In addition, all stakeholders in beekeeping should promote and support beekeeping awareness campaigns for improvement due to contributions of beekeeping to livelihood and environmental conservation.

Keywords: beekeeping, communities, challenges, opportunities, Mvomero district

1. Introduction

In Tanzania majority of people live in rural areas endowed with plenty of resources such as land, forests, plants and animals. Despite having all these resources, large numbers of people in the rural communities are still poor or cannot afford to cater for their basic needs and those of their families. Beekeeping is one of the important economic activities which play a valuable part in livelihoods of rural and forest dependents in many developing countries^[1, 2, 3, 4, 5, 6]. It is an important income-generating activity which has a great potential for development^[7, 2, 8]. Beekeeping is one of the sustainable forms of agricultural practices which require low capital investment, low labour intensity and is an environmental friendly activity^[1]. It is the practice and management of honeybees in hives which leads to the production of valuable products such as honey, beeswax, propolis and bee pollen^[9, 6]. The main beekeeping products harvested in Tanzania are honey and beeswax that are mainly used for food, medicines and source of income^[10]. It is estimated that the beekeeping sector in Tanzania generates about US\$ 1.7 million each year from sales of honey and beeswax and employs about 2 million rural people in the country^[11, 12].

Beekeeping contributes up to 33% of household income in the Miombo woodlands of Tanzania^[13]. Also, it has been reported to be the second income earning activity after agriculture in Manyoni District^[10] and is ranked as a major source of income same as agriculture in Kigoma and Katavi Regions^[4, 5]. Honeybees are also considered responsible for 80% of all insect pollination^[14, 15, 16]. Crops pollinated by honeybees produce comparatively higher yields with better quality seeds and fruits^[17, 18].

Despite government interventions in standardizing and developing beekeeping, the sector is still not sufficiently exploited although the country is of high production potential [5]. The current actual production of honey and beeswax in Tanzania is low compared to its potential production of 138,000 Metric tons of honey and 9,200 tons of beeswax per annum [19]. A declining trend for exports of Tanzania honey has been revealed in the recent years. For example in 2010 about 291.4 metric tons were exported compared to 152.6 tons in 2015 [20]. The current average bee products production in the country is 7% of the existing production potential [12]. On the other hand, the current demand for pure honey and beeswax by external market persistently exceeded the supply [21]. Pure honey and beeswax are increasingly becoming valuable and expensive commodity in the market. Production of bee products can increase if the existing beekeeping potential will optimally be exploited by all stakeholders in the country. This paper, therefore, explores the challenges and opportunities of beekeeping industry in Mvomero District in

the eastern Tanzania. We hypothesize that beekeepers in Mvomero experienced various challenges in beekeeping activities. Also, we hypothesize that there are opportunities for local communities to participate in beekeeping industry for improvement of their livelihoods.

2. Materials and Methods

The study was conducted in Mvomero District, Morogoro Region, Tanzania from 2016 to 2017 (Fig 1). Primary data was obtained through questionnaire survey, Focus Group Discussions (FGD) and Key Informant Interviews (KIIs). The aspects covered in these tools focused on beekeeping potentials, challenges hindering local communities to participate and succeed in beekeeping and opportunities for rural communities' engagement in beekeeping industry. A total of 130 beekeepers were interviewed during questionnaire survey. Data were analyzed by using SPSS version 21.0. We generated frequency tests and Pearson test (χ^2) for comparison of the significance of variations in testing our hypotheses.

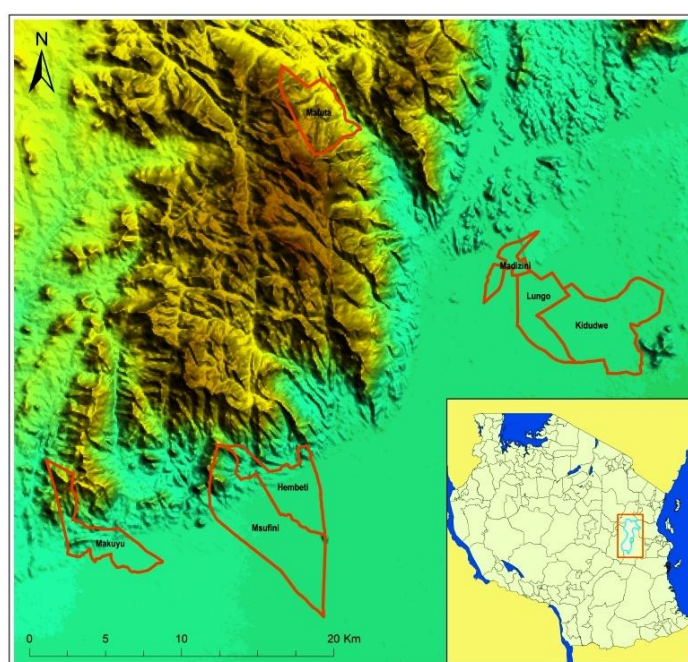


Fig 1: Map of the study area.

3. Results and Discussion

3.1 Educational qualifications and tribes of respondents

Majority of the respondents attained primary school (79.2%, n = 130); 6.1% secondary; 4.6% college; 0.7% university and

9.2% informal (never attended formal school) education (Table 1). This observation indicates that beekeeping has been adopted as one of the main income generating activities by people who could not make it to high education levels.

Table 1: Educational qualifications of respondents

	Education qualifications				
	Never gone to School	Primary School	Secondary School	College Education	University Education
Number of respondents	12	103	8	6	1
Percentages (%)	9.2	79.2	6.1	4.6	0.7

Source: Field Survey, 2016 and 2017

3.2 Reasons for doing beekeeping activities

Reasons for doing beekeeping activities did not differ significantly among the respondents in surveyed villages (Pearson $\chi^2=33.4$, $df=24$, $p=0.09$, $n=130$, Table 2). Source of income was reported to be the main reason for practising beekeeping in the study area, while motivation by other beekeepers and leaders of beekeeping groups was second. Other reasons were source of medicines, foods, acquired

beekeeping training, and inherited activity from parents. Also, results indicated that majority of respondents (92.3%, $n=130$) started to engage in beekeeping activities in recent years from 2000 after being motivated by different conservation stakeholders.

Table 2: Reasons for practicing beekeeping in surveyed areas

Reasons for doing beekeeping	N	%
Source of income	76	58.5
Motivated by beekeepers	22	16.9
Medicines	11	8.5
Beekeeping training	11	8.5
Foods	7	5.4
Inherited activity	2	1.5
Environmental conservation	1	0.8
Total	130	100.1

Source: Field Survey, 2016 and 2017

3.3 Challenges facing beekeepers

Research findings indicated that there was no significant variation regarding to challenges facing beekeepers at Mvomero District (Pearson $\chi^2=40$, $df=30$, $p=0.1$, $n=130$). Inadequate and poor quality of beekeeping equipment and lack of appropriate beekeeping skills were the major factors that hinder local communities to participate in beekeeping activities (Table 3). Other limiting factors include environmental destruction which may lead to low production of bee products, viciousness of bees, vandalism of bee colonies, unreliable market of bee products, lack of capital for

investing to beekeeping activities, family commitments, and long distance to the apiaries. These findings correlate with observation made elsewhere in Tanzania ^[19, 21, 7, 4].

Poor quality and inaccessibility of beekeeping equipment is a major challenge for the development of beekeeping activities to majority of beekeepers who want to investment in the industry. Most of them lack capital to purchase modern hives, protective gears, processing and packaging materials as most of these equipment are expensive. On the other hand, lack of appropriate beekeeping knowledge may lead to low production and poor quality of bee products hence low ability to compete in the market. Also, forest encroachment for settlement, agriculture and livestock keeping have remarkably increased to meet demands of the increased population in the area. These activities lead to destruction of forest area which is suitable for beekeeping. Family commitment such as taking care of the children and other family members is another hindrance factor that prevent people, especially women, to engage in beekeeping. About 12.3% of respondents could not mention any challenges facing beekeepers; this indicates lack of awareness on beekeeping activities and their contribution to livelihoods.

Table 3: Challenges facing local communities in beekeeping activities

Challenges	Wards					Total Respondents	Percentage (%)
	Mvomero	Kweuma	Mtibwa	Hemeti			
Inadequate and poor quality of beekeeping equipment	7	8	10	7		32	24.6
Lack of appropriate beekeeping knowledge	4	4	6	7		21	16.2
Environmental destruction	4	7	2	5		18	13.8
Not known	0	9	3	4		16	12.3
Low production of bee products	6	0	2	6		14	10.8
Bee threats (viciousness of bees)	2	1	2	5		10	7.7
Vandalism and theft	3	2	0	3		8	6.2
Unreliable markets of bee products	0	3	0	1		4	3.1
Lack of capital for beekeeping investment	0	2	0	1		3	2.3
Family commitments	1	0	1	1		3	2.3
Long distance from apiary	0	0	1	0		1	0.8
Total						130	100

Source: Field Survey, 2016 and 2017

3.3.1 Coping strategies

Results from FGDs indicated that beekeepers in the study area experienced various challenges in beekeeping activities and

suggested various coping strategies for sustainability as shown in table 4.

Table 4: Challenges facing beekeepers and their coping strategies

SN	Challenges	Coping Strategies
1.	Inadequate and poor quality of beekeeping equipment	<ul style="list-style-type: none"> Seek for development partner's support. Search for supply of quality equipment.
2.	Lack of appropriate beekeeping knowledge	<ul style="list-style-type: none"> Organize beekeeping seminars and training. Learn beekeeping technology from relatives and skilled group members.
3.	Environment destruction	<ul style="list-style-type: none"> Conservation awareness. Tree planting campaign.
4.	Low production of bee products	<ul style="list-style-type: none"> Learning from other beekeepers on appropriate beekeeping practices.
5.	Vandalism and theft	<ul style="list-style-type: none"> Regular patrols.
6.	Lack of reliable market and prices of bee products	<ul style="list-style-type: none"> Sale bee products to the local market or free market where the price is higher.
7.	Lack of capital for beekeeping investment	<ul style="list-style-type: none"> Solicit funds from donors or development partners. Borrow money from friends or relative and loans from financial institutions. Formation of beekeeping groups.
8.	Family commitments	<ul style="list-style-type: none"> Use relatives or experienced beekeepers.
9.	Long distances to the apiaries from the villages leading to poor accessibility.	<ul style="list-style-type: none"> Hire transport. Use bicycles. Seeking help to relatives to assist beekeeping activities in the forest during hive sitting, harvesting, transportation of equipment and bee products to and from the forest to the processing and storage places or markets.

3.4 Opportunities for local community's engagement in beekeeping industry

Presence of beekeeping groups and source of financial support were the major opportunities identified and assessed. A total of Seven (7) beekeeping groups, Community Banks (SACCOS) and Village Community Banks (VICOBA) were recorded in the three villages where FGDs were conducted (see Table 5). This observation indicates that efforts to mobilize beekeepers to join in functional beekeeping groups had previously started and that financial resources for investment in beekeeping can be available. Majority of beekeepers interviewed (95%, n = 116) were members of beekeeping groups recorded in surveyed area, although none of them had taken effort to acquire loan from the available micro-financial facilities for investing in the activity. More emphasis on appropriate investment in beekeeping is currently needed.

Table 5: Beekeeping groups and associations in surveyed area

SN	Villages	Number of beekeeping groups
1.	Mzufini	2
2.	Mafuta	2
3.	Lungo	3

Source: Field Survey, 2016 & 2017

A total of 72 (55.4%) respondents were self-financed in beekeeping activity (Table 12). Among these, Mtibwa ward had highest number of respondents i.e. 23 individuals. Only 7.7% of respondents got loans from VICOBA for beekeeping activities (Table 6), this was only noted in Hemeti ward. However, 18.5% of the respondents did not know of the sources of financial support while 9.2% received Government support. Concerning with the existence of beekeeping associations in Mvomero District, a total of 124 respondents (95.3%) had knowledge of only one.

Table 6: Percentage on source of financial support in Mvomero District

Financial support	Respondents	Percentage
Own income	72	55.4
Not known	24	18.5
Government official	12	9.2
VICOBA	10	7.7
From NGO	7	5.4
From member of parliament	2	1.5
From individual donor	2	1.5
Mkingu Nature Reserve	1	0.8
Total	130	100

Source: Field Survey, 2016 & 2017

4. Conclusion

Based on the results and discussions of this study, we conclude that income generation was the major reasons for practicing beekeeping activities among the rural community members of low education levels in all surveyed areas. Inadequate and poor quality beekeeping equipment and lack of appropriate beekeeping skills were the main hindrance factors for beekeepers. There are opportunities for local communities to participate in beekeeping due to presence of beekeeping groups, community banks and forest reserves. Insufficient awareness on loan facilities and thinking that financing of beekeeping activity is by donors could be major reasons for low use of loan facilities by the beekeepers.

5. Recommendation

We do recommend for establishment of strong beekeeping groups and association that will also help to address various beekeeping production and marketing challenges including inadequate beekeeping equipment. The government and development agencies can enable beekeeping associations financially to generate revolving funds to finance beekeeping sector and enable sustainable operations of beekeepers. In order to increase income accrued from beekeeping industry, promoting and support of training on other bee products than honey and processing of secondary bee products (value addition of bee products) e.g. soap, candles, body creams, ointments, wine etc. to beekeepers is vital. Sales of other bee products and secondary products will provide wider market, improve beekeepers income and invariably make beekeeping a better poverty alleviation strategy. Also, establishment of honey collection points or centers for marketing purposes is highly recommended. Centers will provide post harvesting services including proper honey processing, packaging and selling of bee products which can be one of the strategies to cope with challenges of poor quality and unreliable market of bee products. Lastly, stakeholders in beekeeping should promote and support beekeeping awareness campaigns for improvement due to contributions of beekeeping to the livelihood and environmental conservation.

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