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PROMOTING MODERN BEEKEEPING IN THE EAST USAMBARA MOUNTAINS: WHAT ARE THE CHALLENGES AND OPPORTUNITIES?

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ABSTRACT

Beekeeping in Tanzania plays a major role in socio-economic development and environmental conservation. It is a source of food (e.g. honey, pollen and brood), raw materials for various industries, medicine and source of income for beekeepers. It is estimated that the sector generates about US$ 1.7 each year from sales of honey and beeswax and employ about 2 million rural people. It is an important income generating activity with high potential for improving incomes, especially for communities living close to forests and woodlands. Despite whole range of benefits emanating from this sector; its potentials are yet to be adequately tapped to respond to the goals and objectives of the existing policy, legislations and National Beekeeping Programme and indeed contribute significantly to the rural community livelihoods improvement in Tanzania. Studies indicate that there is a huge mismatch between honey production potential and actual production in Tanzania. This paper draws from the project: "Promoting beekeeping as an innovative mechanism for biodiversity conservation and community livelihoods improvement in the East Usambara Mountains". This is an on-going project being implemented in two villages adjacent to the Amani Nature (ANR) involving 12 beekeeping groups comprised of 120 members, both males and females. Data for this paper were obtained through project monitoring exercises, consultative meetings with village leaders and community participating members from the project villages, field observation, desk review and discussion with key informants. Findings show a range of challenges and opportunities. A number of challenges have been recorded notably community inadequate knowledge on modern beekeeping and the real value of honey and other bee-related products, lack of knowledge on the existing supportive policies, plans and on beekeeping in Tanzania and lack of well-organized community groups/associations for beekeeping just to mention a few. Despite all these challenges there exist a lot of opportunities for a vibrant beekeeping initiative in the East Usambaras and Tanzania in general. These includes presence of a favorable beekeeping policy, land policy, forest policy and others, eagerness and readiness of the community members to participate in modern beekeeping and available markets for the honey and bee-related products. Conclusively; the paper indicates that

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

the existing potential for modern beekeeping in the East Usambaras cannot be overemphasized and that if judiciously taped it can play significant role in terms of improved biodiversity and community livelihoods in the East Usambaras. Both internal and external support is therefore called for to capacitate the community in the East Usambaras for their productive participation in the beekeeping sector.

Keywords: Modern beekeeping, Challenges, Opportunities

1. INTRODUCTION

In underscoring the important role of the honeybees Crop Life International (2013) asserts that over a third of global food production is dependent on animal pollination for reproduction and managed honey bees are the most important commercial pollinators of those crops.

Tanzania is among countries in the world with a high production of bee products especially honey and beeswax. The high production of bee products in Tanzania is mainly due to presence of a high population of bee colonies that are estimated at 9.2 million, and also due to presence of high number of vegetation that are preferred by bees in many areas of the country (Kihwele *et al*., 2001; Latham, 2001; Mbuya *et al*., 1994) cited in SCF & Traidcraft (2007).

Beekeeping in Tanzania plays a major role in socio-economic development and environmental conservation. It is a source of food (e.g. honey, pollen and brood), raw materials for various industries, medicine and source of income for beekeepers. It is estimated that the sector generates about US$ 1.7 each year from sales of honey and beeswax and employ about 2 million rural people. It is an important income generating activity with high potential for improving incomes, especially for communities living close to forests and woodlands (Mwakatobe & Mlingwa, 2015). It is an important income generating activity with high potential for improving incomes, especially for communities leaving close to forests and woodlands. Beekeeping also plays a major role in improving biodiversity and increasing crop production through pollination (ibid). Despite whole range of benefits emanating from this sector; its potentials are yet to be adequately tapped to respond to the goals and objectives of the existing policy, legislations and National Beekeeping Programme and indeed contribute significantly to the rural community livelihoods improvement in Tanzania. To this end, studies (FAO, 2016; Mwakatobe & Mlingwa (unpublished); Namwata et al; 2013) have indicated that there is a huge mismatch between honey production potential and actual production in Tanzania. Worse still NBP (1998) in SCF & Traidcraft (2007) asserts that although the agricultural sector accounted for nearly half of the total GDP (48.1 per cent), followed by the service sector (36.5 per cent), with the industrial sector contributing 15.4 per cent to GDP (UNDP, 2001); beekeeping contribution to GDP is still

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

insignificant. Nevertheless, Tanzanian honey is known all over the world due to its natural state compared to honey from other countries.

Given this state of affairs, it is obvious that more efforts are required to ensure that the potential of the beekeeping sector is adequately tapped. Working closely with the community in the areas where beekeeping is potential including building their capacity on sustainable beekeeping could be one of the best ways to achieve this.

This paper draws from an on-going beekeeping project being implemented in two villages adjacent to the Amani Nature (ANR), in the East Usambara Mountains involving 8 beekeeping groups comprised of a total of 80 members, both males and females.

1.1 Methodological approaches

1.2 Project location

The project is being implemented in the East Usambara Mountains in the villages adjacent to the Amani Nature Reserve (ANR). The ANR is situated in northeast Tanzania, 35 km from Muheza town and 45 km from Tanga City, in the southern section of the East Usambara Mountains. It was legally gazetted by the Tanzanian government in May 1997, with the aim of conserving the rich biodiversity of the East Usambara Mountains (UNDP, 2012). Assembled from six different forests reserves, Amani Nature Reserve is the biggest protected area in the East Usambara Mountains, covering approximately 8,360ha that includes low and highlands. The project is being implemented in the lowland villages of the area namely Kimbo and Shembekeza. As the biggest forest reserve, the ANR has a high value in terms of the regional nature conservation. Due to multiple factors, the ANR not only has a variety of different endemic flora and fauna species but also a wide variety of different landscapes. Other literature underscores that the East Usambara Mountains and Amani Nature Reserve in particular as an area of conservation importance. It is home to a number of human settlements as well as unique and endemic biodiversity (UNDP Equator Initiative, 2012).

The data for this paper was obtained from the on-going project being implemented in two villages of Kimbo and Shembekeza situated adjacent to the Amani Nature (ANR) involving 8 beekeeping groups comprised of with about 80 members altogether (males and females). Data collection was conducted using a range of methods as detailed in the subsequent sections:

1.3 Consultative meetings and Monitoring exercises

These were the regular meetings which brought together a range of actors including village leaders, participating beekeeping members, forest officer, beekeeping officer and the project

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

leader. Visits to the project sites/apiaries (where beehives are installed) for the team to observe the real situation on the ground. Through these meetings and field visits information on successes, opportunities and challenges being experienced by beekeeping members were reported. The method was also used to know about the number of colonized/un-colonized beehives and establishing reasons for the un-colonized beehives and other pertinent issues.

1.4 Field observation

Regular Field observation was used to capture information for this paper. This was done while taking into consideration factors that should be taken into account while choosing an apiary: How and where beehives are installed. This was critical in understanding whether the way beehives are stalled and the location where they are placed is conducive for easy colonization. For instance; whether beehives are installed close to the water source, whether the location has adequate light and whether beehives are not located close to human settlements and so on.

1.5 Literature review

Reports, documents, published and unpublished papers were reviewed as part of gathering information for this paper. Information on beekeeping from within and outside Tanzania related to the opportunities, challenges, benefits of beekeeping and markets for bee honey and other bee related products were reviewed.

2. RESULTS AND DISCUSSION

2.1 Socio-economic characteristics in the project villages

2.2 Population in the project villages

The two villages of Kimbo and Shembekeza where the project is implemented are among 21 villages situated adjacent to the Amani Nature Reserve (ANR) and almost all the villages have direct interaction with this reserve. The latest statistics as obtained from the Village Government authorities show that the population of Shembekeza village is 1110 people while that of Kimbo village was 961.

2.3 Main economic activities in the project villages

Just like in many other Tanzania rural areas, farming is the main economic activity in the East Usambara Mountains and Kimbo and Shembekeza villages in particular. Stallholder farmers cultivate a range of crops (both cash and food crops) including cardamom, cinnamon, black pepper, cocoa, oranges, maize, beans, sugarcane and vegetables. Farmers are also involved in harvesting and utilizing Timber and Non-Timber Forest Products (NTFPs) for domestic use and

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

for earning cash. Besides biodiversity conservation role that beekeeping can play, it is also true that if appropriately implemented it can play a significant role in improving community livelihoods (Mwakatobe et al; 2016, Namwata et al 2013; Linesman 2011, Mwakatobe & Machumu, 2005). Clearly this is cannot an exception in Shembekeza and Kimbo village and the East Usambara region in general. Thus beeping add to a list of important economic activities in that area.

2.4 Status of beekeeping in the project villages

Although in some parts of the East Usambara Mountains improved/modern beekeeping is practiced; it is clearly a relatively new initiative in Shembekeza and Kimbo villages. For years people in these villages have been undertaking traditional beekeeping using bark or log hives which is costly and less productive, laborious, time consuming and a risky undertaking (see figure 1a & b). Impressively, since the beginning of this project the community motivation and interest to undertake modern beekeeping has been on increase among community members such that beekeeping members are taking initiatives to construct additional beehives on their own using their own financial resources and local carpenters. Likewise some youth who are participating in the project are seeking for opportunities to join courses in beekeeping and there are a few cases where people who are not members of the project are imitating what the project participating members are doing. So far there are 12 beekeeping groups, four groups in Shembekeza and four in Kimbo village with a total of 80 members as shown in Table 1.

Table 1: Status of beekeeping in the project villages

	Shembekeza Village				
SN	Group name	Beehives by RSGF[1]	Own constructed beehives	Colonized beehives as of November, 2017	Rate of colonization (%)
1.	Umoja	5	5	4	40
2.	Mshikamano	5	10	7	47
3.	Chapakazi	5	-	4	60
4.	Upendo	5	-	5	100
5.	Mapatano*[2]	5	-	3	-

[1] Rufford Small Grant Foundation
[2] Newly established beekeeping groups

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

6.	Chipukizi*	5	-	-	-
	Sub total	***30***	***15***	***23***	***65.2***
	Kimbo Village				
1.	Bwiti	5	-	3	60
2.	Mapatano	5	-	5	100
3.	Tumaini Jipya	5	12	6	41.6
4.	Nyuki ni mali	5	-	5	-
5.	Kimbo family*	5	-	2	
6.	Aha n ndima du*	5	-	3	-
	Sub total	***30***	***12***	***24***	***57.1***
	Grand total	**60**	**27**	**47**	**54**

Table 1 explains real situation in so far as improved beekeeping is concerned. It shows the increase number of hives as constructed by the beekeeping members but also showing colonized hives and the rate of colonization.

2.5 Gender composition and distribution of beekeeping group members

Previously beekeepers used to hang beehives on trees hence limiting women to participate in beekeeping. Moreover, there has been a belief that beekeeping is carried out by old men and is associated with which craft (Beekeeping Policy, 1998). There is now a turn of things in that males and females, youth and elders are all involved in beekeeping through the project. Statistically of the 120 group members involved in the project, 67 are males and 53 are females - equivalent to 56% and 44% respectively as presented in table 2 and figure 1. Clearly this is an encouraging development and an initiative that needs to be enhanced.

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

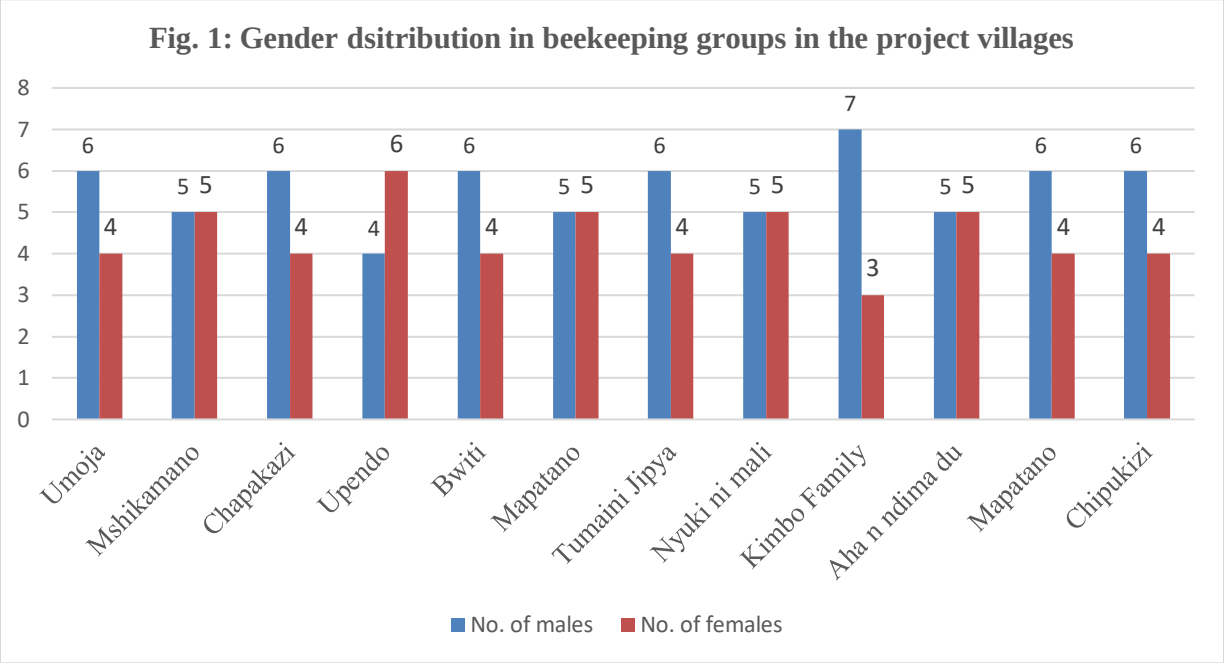
Table 2: Gender distribution in beekeeping in the project villages

SN	Group name	No. of Males	Number of females
1.	Umoja	6	4
2.	Mshikamano	5	5
3.	Chapakazi	6	4
4.	Upendo	4	6
5.	Bwiti	6	4
6.	Mapatano	5	5
7.	Tumaini Jipya	6	4
8.	Nyuki ni mali	5	5
9.	Kimbo Family	7	3
10.	Aha n ndima du	5	5
11.	Mapatano	6	4
12.	Chipukizi	6	4
	Total	**67 (56%)**	**53 (44%)**

One of the participants (woman) from the Mapatano beekeeping group in Kimbo village has offered part of her farmland (a potential apiary) to fellow interested villagers to use the land to install their beehives. This explains a kind of local social capital evolving among participants through this project and indeed the importance of women involvement in such initiatives.

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"



3. CHALLENGES

Although there is a potential for beekeeping in the East Usambara Mountains, a range of challenges were identified during implementation of this project. Some of the identified challenges are as detailed in the subsequent sub-sections.

3.1 Inadequate knowledge on modern/improved beekeeping

For many years in Shembekeza and Kimbo village and indeed across the East Usambara Mountains people had no knowledge and skills on improved beekeeping and as a result they have been practicing traditional beekeeping which as indicated in section 2.3.1 above is a risky, laborious, time consuming and less productive undertaking (see figure 1a & 1b). This is supported by UNDP (2014) noting that from ages ago in the past; farmers have been using rudimentary tools and approaches to produce just a handful quantity of organic products like honey and that, apart from reducing quality; there was no component for quality-addition along the entire system of honey production. Implementation of this project in Shembekeza and Kimbo villages therefore provides an opportunity for farmers in these villages to secure knowledge on improved beekeeping which is relatively productive and inclusive as it is much easier to implement and more beneficial as compared to traditional/conventional beekeeping.

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

Figure 1a: A traditional hive placed on the tree

Figure 1b: A traditional beehives being inspected as part of beekeeping training

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

Practicing traditional beekeeping entailed lack of protective gears and while using poor beekeeping techniques including fire to scare bees during honey harvesting. This in most cases has led to the destruction of habitats and depopulation of bee colonies. With improved beekeeping that the project is promoting the situation is more promising as it entails usage of better protective gears including bee smokers (figure 2)

Figure 2: Improved hives and bee smokers being promoted by the project in Shembekeza and Kimbo villages

3.2 Inadequate knowledge on real value of honey and other bee-related products

In Tanzania it is more often acknowledged that the value of honey and associated products is relatively high and the local and international market for these products is available. Studies like SCF & Traidcraft (2007) show that due to its organic nature, Tanzanian honey has received a high demand in many countries in Europe (e.g. Germany, Holland, England, and Belgium) and

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

other countries in the world. However, local communities in Shembekeza and Kimbo villages and East Usambara Mountains in general are not informed about such opportunities and hence they lack motivation to embark in producing improved bee honey. Those who have been/are practicing traditional bee keeping have been selling honey at a throw away price and throwing away associated products such as the beeswax**;** thinking that beeswax is more of a bi-product than a valuable product. This is underscored by UNDP (2014) who argue that most beekeepers in Tanzania focus at honey only, they are not aware that other products like bee wax and propolis are equally profitable. UNDP note further that actually, the price of propolis is much higher than that of honey (ibid.). During beekeeping training one of one of the farmers at Shembekeza village had this to say:

> "*I have been practicing beekeeping for years now, but I was not aware that beeswax is such a valuable product. Indeed this training has been an eye opener to me and I believe the knowledge I have gained will help me to benefit more from beekeeping".*

3.3 Lack of knowledge on the beekeeping policies and plans (Policy and Regulatory Framework)

Potentially there is an enabling environment for beekeeping in Tanzania in the context of the existing policy and regulatory framework. However, this is not known to the beekeepers at the local/village level and therefore beekeepers are unable to make best use of this enabling environment. Of the policies and laws that support beekeeping in Tanzania are the National Beekeeping policy of 1998, the revised Forest Policy of 2010, National Wildlife policy, the National Beekeeping Act, 2002 and the Village Land Act of 1999 respectively. The Village Land Act for instance empowers the community at local level (village) recognizing it as the appropriate representative structure to implement natural resources management such that through village land use management system beekeepers can be allocated land for beekeeping development. Such is an enabling beekeeping environment which unfortunately is not well known to local communities who are the potential beekeepers at the local community level.

3.4 Lack of beekeeping associations in the project villages

Right now there are a few registered groups for beekeepers within the East Usambara Mountains region. However, there is none in the project villages of Shembekeza and Kimbo. This situation is attributed to the fact that improved beekeeping is a new initiative and therefore even registering beekeeping groups is a relatively new phenomenon. The conventional beekeeping has not been implemented in the form of registered associations. This has been one of the challenges/barriers for local beekeepers to make any significant progress associations or formally in terms of producing honey and other honey bee related products and securing support from

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

Government and non-state actors. FAO indicates that in many cases beekeeping groups across Tanzania are not properly organized, has poor networking and as a results communications among themselves is greatly affecting their markets.

4. OPPORTUNITIES

Despite a range of challenges that beekeepers are facing in the East Usambara Mountains and Shembekeza and Kimbo village in particular; there are also opportunities that if well utilized could benefit and enable beekeepers prosper from this conservation cum livelihoods improvement undertaking: Some of the opportunities are as detailed in the subsequent sub sections.

4.1 Presence of favorable policies and legislations

National beekeeping policy, National land policy, forest policy and National Land Act as well as the Village Land Act are among the key instruments which promote and support beekeeping in Tanzania. The national beekeeping for instance promotes conserving and managing honeybees and other beekeeping resources through Community Based Natural Resources Management (CBNRM). Policy statement (17) indicates that apiary establishment and management in agricultural land will be encouraged for both stinging and stingless honeybees in order to improve the production of both bee products and pollination services which improve agricultural crop production. This is what the current project is exactly, doing working with farmers to facilitate establishment of apiaries in their farmlands. More so, as indicated in the preceded sections the Village Land Act recognizes local community as appropriate representative structure to implement natural resources management and indeed bees and beekeeping management cannot be an exception. The downside, however, is that local people are not aware about these opportunities and therefore it is not easy for them to make best use of them and eventually benefit from them.

4.2 Eagerness and readiness of the community members to participate in modern beekeeping

Since the beginning of this project community members have shown keen interest to participate and ensure the project is sustained. The respective village leaders are quite positive and supportive to this project and this can provide a good basis for the project sustenance. During trainings in the first phase of this project participants stated categorically that over the years they have been longing to undertake modern beekeeping but the challenge was lack of knowledge and technicalities on how to start up such an initiative. So the establishment of the project was a kind of long waited opportunity and hence they seem to make best use of it.

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

"*For a long time now farmers had keen interest in modern beekeeping, but the challenge has been lack of resources and knowledge to undertake such an initiative, so it has come at the right time".* This was a remark made by the then Chairman of Kimbo village.

The keenness of the community members in the project is substantiated by the progress made by the beekeepers since the beginning of the project whereby the additional number of beehives constructed by the group members is vividly on the increase with some groups constructing beehives exceeding the number of beehives allocated by the project.

4.3 Available markets for the honey and bee-related products.

At the local (village) level the price of honey is reasonable whereby one litre of honey can catch between 6, 000 – 10,000 Tanzania Shillings equivalent to 2.7 and 4.5 US$ respectively. Internationally, according to the Ministry of Natural Resources and Tourism (2014) cited in FAO (2016) the current demand for pure honey and beeswax persistently exceed supply. Pure honey and beeswax is increasingly becoming valuable and expensive commodity. The major market destinations for Tanzanian honey and beeswax are in Europe (e.g. Germany, the Netherland, UK, Belgium and Norway), China, Japan, USA, Oman, and Dubai, and in the sub-Saharan countries to Botswana, Kenya, Burundi, DRC, Rwanda and Uganda. Such trend presents great opportunity for local bee-keepers to benefit from improved beekeeping

4.4 Support from the Government agencies and other organizations

Being the key executive agency in national forestry and beekeeping affairs to ensure efficient and effective management of forest and bee resources, the Tanzania Forest Service (TFS) provides a range of support to enhance beekeeping across the country. TFS supports beekeepers by providing hives, establishing market linkages and establishing functional demonstration apiaries for farmers to learn by doing. Statistics indicates that for the period of 2012/2015 alone, TFS supplied more than 14,076 top bar hives to local beekeepers and beekeepers are slowly adopting their use (FAO, 2016). Though not necessarily that the East Usambaras and Kimbo and Shembekeza villages in particular benefited from hives distributed by the TFS, clearly such initiative provide a good opportunity for these community to benefit through TFS. Likewise Tanzania Forest Fund (TaFF) which is a Conservation Trust Fund under the Ministry of Natural Resources and Tourism mandated to provides financial support in the form of research/development projects in forest conservation to support stakeholders who are committed to sustainable management of forest resources including improving livelihoods of communities adjacent to forests, protected areas and forest plantations. Again Shembekeza and Kimbo village could benefit from such opportunities should they be well informed about these opportunities.

ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

5. CONCLUSIONS AND RECOMMENDATIONS

This paper looked at the challenges and opportunities for modern bee keeping in the East Usambara Mountains with particular focus on Shembekeza and Kimbo villages where an improved beekeeping project is being implemented. What is apparent from the findings is that the existing potential for modern beekeeping in the East Usambaras cannot be overemphasized and that if this potential is sensibly taped it can play significant role in improving biodiversity and community livelihoods in the East Usambaras. The findings has revealed that improved/modern beekeeping is a relatively new initiative as previously people used to undertake conventional beekeeping which is less productive, time consuming and environmentally destructive. The on-going project provides room for participation of both genders (males and females) as opposed to the previous practices where women could not participate. In terms of challenges and opportunities; a range of these were recorded including but not limited to lack of knowledge on modern beekeeping, inadequate knowledge on the value of honey and other honey-bee related products. As for opportunities there also exist a range of them including supportive policies and legislations, available internal and external markets for honey and other products.

For more beneficial and sustainable beekeeping sector in Shembekeza and Kimbo villages and the East Usambara Mountains in general support to the community members in terms of capacity building on modern beekeeping, sharing networking and market opportunities and funding sources is very much called for. This need to go hand in hand with awareness raising to the community in relation to opportunities presented by the existing beekeeping sector institutional framework for beneficial and sustainable beekeeping. More so; at its current level the project has just reached a small proportion of the farmers within the East Usambara Mountains and hence up-scaling the project is important for more impact in terms of increased community livelihoods and biodiversity conservation.

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ISSN: 2455-6939

Volume:03, Issue:06 "November-December 2017"

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