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## Importance of beekeeping on forest conservation, preservation of ecosystems and poverty reduction value for nature, Ethiopia

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### Abstract

The role of bees in agriculture, maintaining biodiversity, sustainable livelihoods and food security has been widely demonstrated. Nevertheless, the potential of beekeeping is very often not exploited in forestry activities and development programs, since the benefits of bees and beekeeping are obscure to stakeholders. This paper sets out to provide farmers and other stakeholders in the forestry sector with information and arguments to convince them to accept beekeeping as a viable commercial and protective measure that should always be considered and integrated into national forest program and other development strategies. Deforestation and forest fragmentation are two of the most widely recognized, vital factors responsible for the degradation of the environment. The paper highlights the role of bees in nature preservation and agriculture, the values of bees to man (economic, health and nutritional) at the national level and how these can be utilized in beekeeping and forestry program to contribute to poverty mitigation.

**Keywords:** Bees, beekeeping, forest, deforestation, biodiversity

### 1. Introduction

Bees are important pollinators and many ecosystems depend on the pollination of bees for their existence and for increasing their genetic diversity (cross-pollination). A decline in bee colonies and bee species could therefore threaten the survival of plant species that depend on the pollination by bees. Some types of plants depend uniquely on their pollination by bees (FAO, 2007) [3]. Research by ecologists indicates that over 100,000 species of plants would become extinct in the absence of the pollinating functions of bees. Bees also play an important role in pollinating crops. About one third of all plants and plant products eaten by humans depend directly or indirectly on bees for their pollination (FAO, 2009) [1].

Crops pollinated by bees have been proven to produce higher yields and better quality, often at no extra cost for the farmer. Yet, many farmers consider bees and other pollinators as harmful insects. Harm bees directly and indirectly. Pesticide use may cause extinction of population of bees in a colony or drastically reduce the active population of bees.

Reduced population of bee colonies could cause the colonies to collapse (CCD), a phenomenon that recently hit many beekeepers throughout the world (COST, 2008) [2]. Colony collapse disorder may cause the abandonment or extinctions of some bee colonies. "Beekeeping is very useful and important for forest resource management. This is because where beekeepers have put their hives they protect and avoid bush fires, and discourage people from cutting timber, poles and other forest resources. After some time these areas become green because the vegetation is allowed to grow. Therefore where there is an apiary, forest resources are conserved (Lilika, 2008) [7].

### 2. Role of beekeeping in conservation of forests and Economic development

The development of beekeeping activities for income generation and forest management is handicapped by poor transport, infrastructure and marketing systems for bee products (Kihwele *et al.*, 2001; Ngaga *et al.*, 2005) [5, 13]. Improved marketing of bee products will enhance increased income and food security at household and national levels thereby achieving the national and UN development millennium goals of poverty alleviation and natural resource management (URT, 2005) [14]. Further, the importance of beekeeping as an income-generating activity pivots on the fact that many people use honey as food, medicine and for sale. Beekeeping offers a great potential for development and is comparatively less demanding in terms of investment, labor and time.

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In addition, beekeeping is advocated to improve human welfare by alleviating poverty through increased household income: it is a source of food and nutritional security, raw materials for various industries, medicine, increased government revenue through levies and taxes, improved biodiversity conservation and enhancing environmental resilience (Kihwele *et al.*, 1999; MNRT, 2004)<sup>[6]</sup>.

Some tree species that are conserved through beekeeping include *Brachystegia spiciformis*, *Dalbergia melanoxylon*, *Dalbergia nitidula*, *Julbernardia globiflora* and *Pterocarpus angolensis* (Lilika, 2008)<sup>[7]</sup>. In addition to their role in forest resource management, bees are important pollinators of wild and agricultural plants. Increased income of small scale beekeepers in the study areas has increased awareness of the value of forest resource management and livelihoods. This argument is in line with the study by Kihwele *et al.* (2001)<sup>[5]</sup>, who opined that individuals, communities and organized groups can safely and effectively respond to the shocks and stresses caused by impoverishing forces, by practicing beekeeping activities. The only way to constantly mix genes for plants is by cross pollination, where pollen from one plant is translocated by bees to another plant so that the offspring become genetically different. In that way, there is a greater chance of the offspring surviving.

Beekeeping gives local people and the Government economic incentive for the retention of natural habitats, and is an ideal activity in any forest conservation program (Mwakatobe, 2001; Okoso- Amaa *et al.*, 2004)<sup>[12, 14]</sup>. In spite of the significance of beekeeping, there is little or no empirical evidence on the potential of beekeeping for income generation and forest management in most regions of the world. Most of the available research material is in the form of scientific documents with little information in the direction of rural development or forest conservation. Thus, there is need for information on the relevance of beekeeping to forest conservation; this information can be used by stakeholders in both beekeeping and forestry.

### 3. Health and nutritional value of Bees

Specific mention of key people in different cultures throughout history who used bee products in their medical treatments have been documented (Mau-Mandela, 2010)<sup>[10]</sup>. Bee products are nutrient-rich foods and also have medicinal properties. Honey, beebread and pollen are naturally rich in micronutrients and are a good source of energy. When properly processed and stored, honey can be kept for up to two years without losing its nutritional value. It can therefore be a valuable source of energy during food-insecure periods and constitute a good source of (additional) essential micronutrients for people with poor diets or for pregnant women and young children, whose adequate micronutrients intake is vital.

The complex carbohydrates found in honey are made of complex sugars such as glucose, oxidase, invertase, diastase, amylase and acid phosphate. They are considered pre-biotic i.e these carbohydrates are non-digestible, but by consuming them, you encourage the growth of friendly intestinal bacteria in the body, which helps you digest food more easily, thus lessening the work of the digestive system and relieving stress on the digestive process particularly important for convalescing people. Honey, pollen and propolis are also efficient, safe and natural medicines that can be used to treat a variety of diseases and ailments.

Honey has been used in traditional medicine for centuries, and apitherapists have been studying the medicinal properties of beehive products for years and have documented empirical findings with scientific research. Few examples of these medicinal properties are as follows: propolis is a potential natural antibiotic and anti mycotic and can be used to boost the immune system (Farn, *et al.*, 2004)<sup>[4]</sup>. Honey can be used for sore throats, it can be used on wounds and burns (Layflurrie, 2008)<sup>[9]</sup>, as it cleans wounds and stimulates cell regeneration. Pollen can be used to delay the effects of aging; it is rich in nutrients (Villanueva *et al.*, 2002)<sup>[15]</sup> and, together with honey, it is a beneficial food for sick people (Lietaer, 2007)<sup>[9]</sup>.

### 4. Conclusion

The role of bees in agriculture, maintaining biodiversity, sustainable livelihoods and food security has been widely demonstrated. Nevertheless, the potential of beekeeping is very often not exploited in forestry activities and development programs, since the benefits of bees and beekeeping are obscure to stakeholders. The role of bees in nature preservation and agriculture, the values of bees to man (economic, health and nutritional) at the national level and how these can be utilized in beekeeping and forestry program to contribute to poverty mitigation. In other cases, deforestation and forest fragmentation are two of the most widely recognized, vital factors responsible for the degradation of the environment. It is therefore important to increase awareness among farmers, forest communities and communities living around forests, about the important role that bees play in agriculture and in maintaining biodiversity and ecosystems.

### 5. Recommendation

Bee keeping communities, non-governmental organizations (NGOs), Government ministries and other stakeholders should combine efforts in the conservation of woodlands, thus reducing global warming to some extent.

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