

A discussion of the importance of forest beekeeping and commercial honey and beeswax trade for the sustainable management of natural forests in SW Ethiopia

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Abstract

Making forest conservation pay through adding value to non-timber forest products (NTFPs) is a highly compelling concept, one that is based on the idea that a standing forest which delivers significant livelihood benefits is more likely to be retained. It is assumed that NTFP harvesting is more sustainable than timber harvesting. This paper discusses forest beekeeping in the biodiverse forests of South-West Ethiopia, and considers the role of commercial honey and beeswax trade in slowing forest conversion and degradation. The context is a research and development project (NTFP-PFM Project – SW Ethiopia) which established formal participatory forest management arrangements in demarcated community forests and supported community NTFP-based income generating activities, principally honey. Forest beekeeping and honey trade is tested against a set of criteria, which have emerged from over two decades of NTFP research, and show why some NTFPs fail to deliver conservation outcomes, whilst others succeed. Achievements of the project and an economic land-use analysis, with carbon payments included, are considered. The analysis shows that honey trade is significant and performs notably well against the test criteria. The economic land-use analysis and project results suggest that unaided by other factors forest beekeeping alone is unlikely to ‘win’ against other land uses. However, because forest conversion to agriculture is not permitted under the participatory forest management (PFM) agreements the land use / forest use options for local people are limited. The evidence is not strong that honey alone can make conservation pay, but there is a strong argument that honey can help make PFM pay.

Keywords

NTFPs, forests, landscape, ecosystem services, biodiversity, trade, markets, honey, Ethiopia, participatory forest management, livelihoods

JEL Codes

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Introduction

The strong link between forests and traditional beekeeping creates opportunities for promoting beekeeping as an incentive for sustainable forest management (CIFOR 2008).

This statement is linked to the highly compelling idea which originated in the 1980s in the Amazon (Peters 1989), spread throughout the tropics in the 1990s and can be summarised as follows: *“The practice of extracting economically valuable, non-timber forest products leaving the forests structurally and functionally intact, has emerged as a possible means of reconciling the conflicting roles of tropical forests”,* (Nepstad and Schwartzman 1992). Enthusiasm for this “win-win” solution to both poverty and deforestation resulted in significant research and action in the 1990s, with a dedicated strand of work designed to commercialise NTFPs to increase their value. By the turn of the century, however, some notable failures in practice gave rise to scepticism, followed by pessimism. As described by Ros-Tonen (2003), *“the picture at the start of the new century is one in which optimism regarding the potential of NTFP extraction as a combined strategy for conservation of natural forests and poverty alleviation has waned, to be replaced with a more cautious approach or even forthright pessimism”*. Since then the pendulum has swung back to a more nuanced understanding of the importance of NTFPs.

A set of stylised facts have emerged to help understand the limitations of NTFPs (Sills *et al* 2011 in Shackleton *et al* 2011):

1. By their very nature many NTFPs are perishable and seasonal, factors which work strongly against commercialisation.
2. Poor people buy NTFPs because they are cheap, not because they are preferred. Rich people prefer alternatives.
3. NTFPs are inherently substitutable by cultivated crops or synthetic products.
4. Natural systems are not as productive as farmed systems and natural forests cannot be managed to increase productivity. Lack of management means that the marginal costs of collecting rise rapidly, resulting in low returns to labour.
5. Commercialisation leads to over-exploitation.
6. Entry into high value, distant markets results in ‘elite capture’, the livelihoods of the collectors and harvesters does not change, with no subsequent change in their incentive to maintain and manage the forest.
7. NTFPs are poverty traps; “inferior goods with low prices that do not compensate for the high collection costs”.
8. A recognition that in cases where NTFPs are important and valuable, this is usually the result of forest manipulation, thereby compromising the idea that NTFPs help preserve wilderness.

The antithesis of what can go wrong is what makes it go right. Cunningham (2011) sets out a list of **Characteristics of winning products: Lessons from Successful**

Enterprises in the chapter on Non-timber products and markets: Lessons for Export-Oriented Enterprise Development from Africa (Shackleton *et al* 2011). Cunningham sets out 18 characteristics (Annex 1) which range from rights of access to the forest, to correct pricing, to positioning options with the value chain. Interestingly most of the characteristics are concerned with what makes the product a success in the marketplace rather than what makes the trade, once established, able to secure a conservation outcome.

The NTFP-PFM Project, South-West Ethiopia

The NTFP-PFM Project (full title: Forest landscape sustainability and improved livelihoods through non-timber forest product development and payment for environmental services) ran from 2003-2013, and is now continuing with new funding and a new name. Combining approaches to Participatory Forest Management (PFM) and community-based marketing of Non-Timber Forest Products (NTFPs) the project was built around the tenet that, with the right support and institutional arrangements, the standing forest could deliver significant livelihood benefits – adequate to forestall forest conversion and degradation and thus maintain important environmental services.

The NTFP-PFM Project focused on the moist montane forests located in the Bench-Maji, Sheka and Kefa Zones of the Southern Nations, Nationalities and Peoples Regional State (SNNPRS) in the Southwest of Ethiopia. These montane forests are valued for their high species endemism (Tadesse and Arassa 2004) and have essential hydrological functions, being sometimes referred to as a ‘Water Tower’ for the Baro and Akobo river system (NTFP-PFM 2013). In addition they are highly valued by communities living in the area for domestic and economic purposes, are the natural habitat of the wild *Arabica* coffee (Hein and Gatzweiler 2006) and are remarkable for other economically important plant species including spices and honey bee flora. The relative importance of NTFPs varies with altitude, which ranges from 900m to 2,800m in the project area.

These forests are influenced by a high rate of agricultural expansion and are exposed to considerable livestock and population pressure (Place *et al* 2006). In some areas the forest is highly modified to favour coffee management. The potential of these forests in relation to the production of NTFPs such as wild coffee and honey was a major factor for the initiation of the NTFP-PFM Research and Development Project in the above three zones.

The overall purpose of the project was to ‘Maintain a forested landscape to support improved livelihoods of local forest-dependent communities and ensure the delivery of environmental services in a wider context’. To achieve this purpose the project worked to deliver formal PFM arrangements between local communities and

government, increase involvement in and returns from NTFP-based income generating activity and to test a pilot model for payment of environmental services.

The PFM arrangements involve working up from a small local unit – the *gott* – and demarcating forest areas falling under their jurisdiction. Participatory forest management plans were developed and formally agreed through a signed document with government for each *gott* forest. At a higher level several *gotts* form a Forest Management Association which provides a higher level of local monitoring and supervision. By the end of the 2013 there were 63 signed and 33 nearly-signed PFM agreements in the project area covering an area of 40,000 hectares of forest.

Whilst recognising the complexity of the project’s overall purpose and the inter-relatedness of landscape and livelihoods, this discussion focusses on one NTFP – honey³ – with view to understanding its role, and limitations, in contributing to the project objective.

What is known about the role of honey and forest beekeeping in relation to forest management?

The early enthusiasm for the “win-win” concept of commercialising NTFPs to achieve forest conservation gave rise to a significant number of development projects which aimed to add value to natural forest through adding value to NTFPs and enabling access to new markets. This work provided the material for some important research covering NTFPs as diverse as *rooibos* tea in South Africa to ant larvae in Indonesia to Brazil nuts. Given that honey is known in every society and bees⁴ live almost everywhere where there are flowering plants, honey as a non-timber forest product is not mentioned as often as one might expect.

Table 1. List of notable NTFP research studies

Research	Reference to honey?
CIFOR’s 61 case study comparative study of commercial production and trade of non-timber forest products (Ruiz-Pérez <i>et al</i> 2004).	None of the 61 cases concerned honey. The word honey appears once in the entire document in a list of categories of different types of NTFPs.
2006 study of 10 products from 18 marginalised communities in Bolivia and Mexico (Marshall <i>et al</i> 2006)	Honey not mentioned once

³ Note on terminology. In its raw state honey is actually honey comb and therefore comprises both the beeswax (the comb) and the honey contained within the comb. When processed, honey comb yields two products – the liquid honey (food, medicine and ingredient for alcoholic drinks) and beeswax (used for cosmetics, candles and a wide range of industrial purposes). The term honey is often used to refer to raw unprocessed honey comb (i.e. honey and beeswax as a complete product) or may refer to the processed liquid honey. The context should make the meaning clear.

⁴ Honey bees (*Apis* species) are not indigenous to the Americas although bees of the family *Meliponini* are, and they do make honey

NTFPs in the global context (Shackleton <i>et al</i> 2011)	In this 286 page book honey is mentioned six times, including a record of Zambian and Tanzanian honey export statistics and a mention of the Zambian honey company Forest Fruits Pty Ltd.
The literature resource of the Poverty and Conservation Learning Group http://povertyandconservation.info/en/bibliographies	Out of 1800 articles only three mention honey

Beekeeping and honey is barely mentioned. Why not? And if it had been studied against the question “Does commercialisation of forest honey production lead to sustainable forest management?”, how would it perform?

Why so little mention of honey in the literature? Firstly there is no shortage of beekeeping and conservation development projects, for example conservation projects in Kilum-Ijim, Cameroon, Inyonga Forest, Tanzania and Mount Elgon, Uganda have all included beekeeping (Abbott *et al*, 1999, Hausser and Savary 2002, IUCN 2012). What is lacking is academic research seeking to test the role of beekeepers as forest conservers? Why?

One theory is that bees simply fall between stools. Defining non-timber forest products is a fraught undertaking (Shackleton *et al* 2011) with conflicting views arising about whether products derived outside forests count? Why non-timber and not non-wood? And what about services? Some NTFP researchers focus primarily on flora, for example, the NTFP-focussed trade body Phytotrade Africa is concerned with plants only. Those who embrace animals tend to focus on charismatic wildlife, perhaps. Others might assume that beekeeping is not wild enough to count, given that beekeeping involves beehives and therefore significant human agency. Another theory is that beekeeping and honey trade is very widespread – every society knows honey – and researchers are perhaps drawn to the little known and more obscure products. Whatever the reason honey and bees remain surprisingly absent from the NTFP literature.

In this paper we test both the negatives and positives against the case of forest beekeeping in areas of SW Ethiopia where the NTFP-PFM project has been underway since 2003. We draw on the work done since 2003 and discuss some of the outcomes.

Forest beekeeping in Sheka, Kaffa and Bench-Maji zones of SW Ethiopia

Firstly – to what are we referring? African forest beekeeping systems are ancient practices and differ from community to community. There is no agreed definition

and what is presented below is a general description. As with many natural resource production systems there is a continuum from wild harvest to intensive management, with the odd detour along the way. The following characteristics of forest beekeeping define the system discussed in this paper. It is a specific system that is different from honey hunting and other forms of beekeeping.

- African forest beekeeping is defined by species and involves the African honey bee⁵ *Apis mellifera*, of different races, but always indigenous.
- The honey which they produce is harvested from the nectar of indigenous forest tree flowers, encompassing a very wide range of floral species
- Forest beekeeping is not honey hunting, which involves the taking of honey comb from wild honey bee nests, located in natural (i.e. no human agency involved their creation) cavities within the forest, usually hollow trees but also cavities in rocks, the ground and cliffs. In fact the separation between honey hunting and forest beekeeping is probably less clear than presented here. Some natural cavities might be 'owned' by individuals for example.
- Forest beekeeping is defined by place i.e. the bee colonies are living within the forest and foraging on the nectar and pollen of forest trees.
- Forest beekeeping is defined by method. Man-made bee hives are made from locally available materials, usually sourced from the same forest, and fashioned into a simple cylinder shape and placed in forest trees. The beehives are occupied by wild swarms. The honey bees which establish their colonies in the man-made and man-placed hives are part and parcel of and undistinguishable from the wider, wild, honey bee population. Either once or twice a year, depending on local seasonal cycles, beekeepers harvest honey comb. Bee hive styles vary in materials and design (e.g. where the entrance is, whether openings at both ends or not) but the basic structure is a hollow cylinder. Harvesting methods vary.
- Forest beekeeping is not frame hive beekeeping or top-bar beekeeping which happens to be located within a forest. These beekeeping systems are both movable comb systems which allow colony manipulation and are not embraced within the overall definition of African forest beekeeping which does not involve colony manipulation. This is important as without colony manipulation the honey bees live 'as in the wild'. This latter distinction and its importance, as with some of the other points, might be open to discussion.

The principal product which is harvested and sold is honey comb. Honey comb comprises two products in one, i.e. honey and beeswax, and so sometimes reference is made to both products. The relative domestic and market values of honey versus beeswax vary amongst communities.

Project achievements

⁵ Beekeeping systems which rely on stingless bees also occur but not discussed here.

Three project outputs which inform on the role of honey in relation to the project objectives are referred to, the Project Impact Assessment (Bekele and Tesfaye 2013), End of Project Evaluation Report (NTFP-PFM 2013) and the Final Report of the Forest Enterprise Work (Abebe 2013).

Indications of positive achievements

The Final Report of the Forest Enterprise Work, (Abebe 2013), reported that the project linked honey producer groups with buyers, with a recorded achievement of an annual export of 250 tonnes of honey from the project area, (Abebe 2013). Overall the report concluded that there had been a *“big leap in supply of honey by producer groups and traders from the area to national and international markets through project facilitated market linkages”*, and the prevailing market price for honey rose from ETB 5 to ETB 50 per kilo, an increase well exceeding the rate of inflation, (Abebe 2013). The End of Project Evaluation recorded, *“The project has had a positive impact on the local honey trade. This NTFP trade is now well established and likelihood of long term benefits are high”* (NTFP-PFM 2013:35). The Project Impact Assessment Report indicated that, with the exception of firewood, honey is the highest earning NTFP, (Bekele and Tesfaye 2013). On forest conservation achievements the same study also reported that in interviews community members reported a notable fall in forest encroachment and illegal harvesting and a notable increase in forest regeneration and the health of young seedlings.

More cautious and nuanced interpretations of project achievements

The *“big leap”* in supply of honey traded as a result of project work refers to honey traded in new ways, by new actors. There is no reliable data of **total** honey trade before and after the project, although the price data in the previous paragraph supports a positive change. There is no direct evidence that the signs of reducing deforestation reported by Bekele and Tesfaye are linked to honey trade. Other reported results are cautious.

On whether the project achieved its overall objective to *“Maintain a forested landscape to support improved livelihoods of local forest-dependent communities and ensure the delivery of environmental services in a wider context”*, the End of Project Evaluation concluded *“it is still too early to make any conclusions”*.

Despite reporting positive trends in honey trade and income Abebe concludes, *“Income from the honey is found to provide not enough incentives to keep on conserving forests through the eyes of PFM communities”*.

Other important results

In the earlier phases of the NTFP-PFM project effort was invested in supporting farm-based livelihoods to relieve pressure from the forest and backyard beekeeping was one intervention. During the MTR of Phase II this approach was completely reversed as it became clear that non-forest activities weakened the link between communities and forests and had an adverse effect on the way people valued forests, *“moving out the production and business of NTFPs from the forest to farmland is seen as something that gradually deteriorates the connection and coexistence of people and forests by turning forests into less competitive land uses”* (Abebe 2013:5). After the MTR farm-based interventions were scaled back.

Households who rank forest produce as their main source of income declined slightly during the project period, but about 82% of forest-based households and 44% of non-forest based households gave forest-based income sources the highest or second highest ranking in terms of potential to improve their livelihoods in the future (Bekele and Tesfaye 2013). Income from honey increased during the project period, but so has income from agriculture (Bekele and Tesfaye 2013).

The value of the forest – can it pay its way?

Project reports indicate an interest in allowing limited, sustainable, commercial timber exploitation⁶. Abebe (2013: 21) concluded, *“... there is a need to work with government on piloting of sustainably sourced community timber production...”*, with Bekele and Tesfaye (2013: 36) making a similar conclusion, *“What we think as the “right incentive” in the context of PFM arrangements here is the inclusion of wood among forest products extractable for marketing”*. The project view is that timber is needed – in addition to NTFPs – to make the forest pay (Sutcliffe *et al* 2012).

An economic analysis of alternative land use options in the project area provided empirical evidence to help elucidate this question. Work done by Sutcliffe *et al* (2012:474) showed that lower altitude forests which could be modified for coffee production yielded the greatest returns per hectare (US547). In forests less-suited to coffee, agriculture was the most rewarding land use option (US303 per ha), with sustainable forest management without timber harvesting being the least rewarding option (US68 per ha). Even with sustainable timber and commercial firewood harvesting the higher figure of (US82 per ha) is still lower than agriculture option. The researchers concluded, *“The limited revenues achieved from most NTFPs and other forest products leave the ... forest uncompetitive and encourage communities to engage in forest clearance. Hence ... doubt can be cast on the ‘conservation by commercialisation’ hypothesis ...”* (Sutcliffe *et al* 2012: 479).

⁶ Currently not allowed under Government and PFM rules

Another forest service – carbon-offsetting was considered in an earlier study by Sutcliffe (2011). He showed that payments for carbon-offsets could tip the balance in favour of maintaining forest, for the non-coffee forests only. The tipping point was shown to depend partly on the CO₂ price and partly on the discount rate. At a discount rate of 14 percent communities would need carbon offset payments at US\$5 per ton CO₂ to persuade them to reduce deforestation.

Analysis of forest beekeeping and commercial honey and beeswax trade against criteria which hinder and favour forest conservation outcomes

This section contains two tables. The first considers beekeeping and honey trade against criteria which have been shown to hinder ‘*conservation through commercialisation*’ whilst the second table takes a look at the winning characteristics which have shown as important for positive outcomes. Both sets of criteria from Non-Timber Forest Products in the Global Context (Shackleton *et al*, 2011).

Table 2. Analysis of forest beekeeping against the stylised facts which constrain NTFPs from delivering conservation as an outcome of their commercialisation

<i>Constraints which work against the ‘win-win’ concept</i>	<i>Forest beekeeping in SW Ethiopia – an analysis</i>
By their very nature many NTFPs are perishable and seasonal, factors which work strongly against commercialisation	Neither honey nor beeswax are highly perishable. Honey harvest is seasonal, occurring either once or twice a year. However, the implication that seasonality works against commercialisation is rejected. Most high-value commercially produced agriculture-based products are seasonal, such as grains, coffee, cocoa, pineapples etc. Seasonality can work in favour of economic development as a lump sum income can be invested in significant purchases such as livestock, other businesses or can be saved. Year round products which are collected daily and earn a daily income can (e.g. firewood), by contrast, can develop into poverty traps.
Poor people buy NTFPs because they are cheap, not because they are preferred. Rich people prefer alternatives.	Honey is highly valued by almost all societies, rich and poor alike. Until modern industrial bee-farming practices as practiced in parts of Europe, US, China, for example, honey was never perceived as plentiful and cheap. In Ethiopia honey is used to make an alcoholic drink called <i>tej</i> and as a medicine – whilst the former uses are changing, new uses (i.e. table honey) are emerging – both export and local. Honey is not

	characterised as a poor person's food.
NTFPs are inherently substitutable by cultivated crops or synthetic products.	As a sweetener honey can be substituted by sugar. In poor, rural African communities however, sugar is expensive. In richer markets honey is sought after as being a totally natural sweetener. Honey has many uses, in many different markets, and is a supremely resilient product. African forest honey's main competitor is not sugar but other honeys, such as mass-produced cheap honey from China. This competition is experienced in the global marketplace not in Ethiopia (yet!).
Natural systems are not as productive as farmed systems and natural forests cannot be managed to increase productivity. Lack of management means that the marginal costs of collecting rise rapidly, resulting in low returns to labour.	With the evolution of forest beekeeping local people have developed steps to increase the productivity of honey bees over and above the purely natural system i.e. hunting honey from wild nests. Forest beekeeping is not a totally wild collection system. Forest beekeeping retains many elements of a natural system, but is a managed natural system to increase productivity. Returns on labour are relatively high. The same point above is relevant – forest honey's main competitor is mass produced honey – but from outside Ethiopia. It is interesting to note that despite very significant donor-funded projects to so-called 'modernise' beekeeping in Ethiopia forest beekeepers produce larger quantities of honey at lower costs than movable comb (so-called modern) beekeeping on farms. Where honey is found in abundance in Africa, it originates from a forest beekeeping system (e.g. NW Zambia, Tabora in Tanzania, eastern parts of DRC, miombo forests in Mozambique)
Commercialisation leads to over-exploitation.	Honey is usually classed as an animal product and yet the primary resource is nectar. Honey bees are merely agents, transforming nectar (a plant product) into honey. The honey is harvested and not the animal. Over-exploitation is therefore very hard to achieve. Nectar is a readily replenishable resource – and nectar cannot be over-exploited. Over-exploitation can happen if the honey bee colonies are damaged during the

	<p>harvesting process, leading to a fall in the overall population of honey bee colonies per hectare. This could happen – especially (but by no means necessarily) with honey hunting. Many Ethiopian beekeepers only harvest the honey and leave the colony untouched. Taking a macro-view <i>Apis mellifera</i> is doing well in Africa where the habitat and resource is adequate. It is a highly resilient species, producing a relatively larger number of offspring (i.e. swarms (not bees)) each year. Because forest beekeepers deliberately place nest sites (i.e. beehives) for the bees the beekeepers’ actions probably increase the overall population density of honey bee colonies rather than cause a decrease. Although this has not been measured. The biggest threat to forest bees is deforestation not exploitation.</p>
<p>Entry into high value, distant markets results in ‘elite capture’.</p>	<p>What is there to ‘capture’? The resource base i.e. trees in which to hang hives <u>or</u> a stage in the value chain. In SW Ethiopia there is evidence that access to the forest does vary between ethnic groups (Dessalegn 2013) but this is not a result of honey commercialisation. Traders can earn more than beekeepers and yet ‘not everyone can be a honey trader’. A highly entrepreneurial trader with some capital can do well trading in honey – but are they the elite? Primary producers usually sell crude honey (i.e. honey and wax unseparated). Even in cases where a honey buying company invests in a honey processing factory and has access to high value distant markets this does not necessarily give them the strength to monopolise the supply chain. There are too many other local markets for honey which producers and traders can sell to. This does not necessarily mean that benefits are equally spread but this does not present a clear case of ‘elite capture’.</p>
<p>NTFPs are poverty traps; “inferior goods with low prices that do not compensate for their high collection costs but cannot</p>	<p>There is no evidence that beekeeping is a poverty trap. Why?</p> <ul style="list-style-type: none"> • Returns on investment are relatively high • It is hard to over-exploit the resource so returns do not diminish overtime (unless

<p>be managed to reduce those costs” or where increased levels of harvesting make it harder for a collector to find enough product to meet a minimum income level ... thus drawing in more and more of their time for diminishing returns.</p>	<p>the forest is degraded)</p> <ul style="list-style-type: none"> • It requires some months of forward planning and investment (i.e. making and placing a hive) – this is not a typical feature of a poverty trap • Much effort (labour) is in the harvesting – and yet if the forest is degraded and the bee population is falling – this means more hives will be empty – if hives are empty a beekeeper cannot/will not spend any effort harvesting because there will be nothing. This suggests an automatically positive relationship between effort and harvest which works against the development of a poverty trap.
<p>Where NTFPs are important and valuable, this is usually the result of forest manipulation, thereby compromising the idea that NTFPs help preserve wilderness.</p>	<p>SW Ethiopia affords an excellent example of this. Wild coffee. Forests in parts of Bench-Maji zone where wild coffee grows have been intensely manipulated to favour the coffee. This includes slashing the undergrowth, preventing the regeneration of canopy trees and transplanting self-seeded coffee plants to manipulate the spacing (no gaps, no crowding). Some beekeepers reported that they manipulated the forest by not cutting preferred bee trees (even when converting forest to farm), allowing forest bee trees to grow to maturity and selecting less-preferred bee trees when seeking timber for other uses e.g. house building and freeing saplings from lianas. This level of modification is moderate and benign, and contrasts to the intensification of coffee growing. The other way beekeepers manipulate the natural forest is through the placing of beehives. This may create more nesting sites for <i>Apis mellifera</i> than would be found in nature and may therefore increase the survival rate of new swarms and thus maintain an ‘artificially’ high population of <i>Apis mellifera</i>. This in turn may create competition for nectar and pollen from other insects.</p>

Many NTFPs have failed to deliver either because they cannot be commercialised or cannot be sustainably harvested at scale. Honey and beeswax perform notably well against the criteria.

Table 3. Analysis of forest beekeeping against the ‘Characteristics of winning products: Lessons from Successful Enterprises’

Characteristic of winning product	Does forest beekeeping and honey and beeswax trade in SW Ethiopia have this characteristic?
Abundant natural resource base	<p><i>Apis mellifera</i> is not a rare species. On the contrary it is indigenous across the whole of Africa and Europe in many different habitats. It feeds on many, many flowering plants and honey – in general terms – is not a niche product. Honeys differ greatly from place to place, depending on the flora. Provided the forest is abundant, <i>Apis mellifera</i> is abundant. In SW Ethiopia <i>Apis mellifera</i> populations are healthy. Provided there are flowers and cavities (whether natural or man-made) <i>Apis mellifera</i> will live in an extremely wide range of habitats. It is not a specialist.</p>
Clear rights to land and tree tenure and use	<p>In the NTFFP-PFM project area there are two forms of land and tree tenure pertaining to forest beekeeping. The customary <i>kobo</i> system (Bekele and Tesfaye 2013, Dessalegn 2013) and the recently introduced PFM arrangement.</p> <p>It is known that there are two forms of the <i>kobo</i> system – tree and land. Families have claimed rights to use delineated forest patches for their families, to the exclusion of others. Forest beekeeping is one of the major uses of these forest patches. The tree <i>kobo</i> system is similar. A family places a bee hive in a tree and claims ownership. In recent years, with increasing honey trade, families are re-asserting their claims over their customary <i>kobos</i> and taking the trouble to exclude users who cut trees. The government does not recognise the <i>kobo</i> system and all forests were taken by the state in the late 19th century and they have remained in government ownership since that time. PFM gives local communities stronger tenurial security (although not ownership) based on a PFM agreement with government. A principal cause of forest loss is forest land being taken over by investors e.g. tea plantations, and unlike <i>kobo</i> (which had local within-community significance and none without) PFM challenges this trend. The</p>

	<p>NTFP-PFM Project Impact Assessment strongly noted the importance of strengthening the PFM community institutions.</p> <p>The beehive, which is made and owned by individuals, creates security of tenure over the honey bee colony. The beehive ensures a clear distinction between open access NTFP collection and a tenure-based system. The honey bee colonies are essentially owned by the person who made the beehive. Therefore the person who puts in the effort is the person who reaps the reward. This incredibly simple evolution of a system perhaps gives it a supremely important advantage over pure wild collected resources.</p>
<p>Local self-sufficiency is not undermined (i.e. supplies for local household consumption are still available)</p>	<p>Compared to the total volumes of honey harvested only relatively small amounts are needed / used at home. There is no evidence that home use is undermined by commercialisation. Furthermore because beehives are owned (even if the forest is not) a home user of honey is not deprived of their honey by a commercial honey producer – because each owns their own unit of production – the bee colony.</p>
<p>Build on and out from existing markets, information access and strategic choices</p>	<p>The NTFP-PFM project worked to strengthen honey trade and this was achieved by building producer organisations and helping them form links with honey buying companies in Addis Ababa. Project reports document the success of this approach (Abebe 2013). The existence of pre-existing markets however is notable. Honey has been traded from these forests for decades. Indeed had it not been for the market demand for honey the forest beekeeping system would have scarcely developed to such an extent. These existing markets are important because:</p> <ul style="list-style-type: none"> - The change brought about by ‘new commercialisation’ is a modification, not a sea-change - There is a knowledge base from which to build in terms of production, handling and storage. For example, the new buyers don’t

	<p>want honey with high moisture content. Honey producers understand honey and know what they need to do to meet the new market expectations.</p> <ul style="list-style-type: none"> - Where the new producer organisations hit inevitable teething problems – there is the old system to fall back on – people stay within the value chain rather than exit it altogether. So, for example, when one producer organisation, built under the project, ran into difficulties with their onward buyer, their suppliers were not left with a worthless surplus. There are other market routes to absorb the temporary over-supply. - Honey that does not meet the quality standard required by the new buyers can be sold into other end-markets.
<p>Visionary champions make a difference: insight, innovation and staying power</p>	<p>European honey buyers have been quoted as doubting the marketability of ‘strong tasting’ African honeys in Europe (Traidcraft 2007). In light of the reported importance of visionary champions it is worth noting that the first European buyer of the first export of Ethiopian honey was a company (Tropical Forest Products, TFP) founded by a development worker determined to create a market for African honey. Before buying Ethiopian honey the TFP had worked hard to convince UK customers to buy Zambian honey, with success. TFP’s determination to sell African honey in Europe stemmed from their vision of helping Zambian beekeepers find a market for their honey. Having ‘paved the way’, others now export and import Ethiopian honey.</p>
<p>Sustaining a market requires quality in sufficient quantity, on time</p>	<p>There is no shortage of honey. On the contrary access to distant and new markets has been important in introducing heightened competition for honey, as without competition prices can fall in ‘good years’, discouraging producers. Considerable development work has been invested in addressing issues to do with timing of harvest and post-harvest handling, as these issues can compromise quality.</p>

	<p>Quality has been improved when buyers give feedback to the producer organisations in a supportive way. Some producer organisations are developing reputations as supplying good quality honey. See later on Traceability.</p>
<p>Pricing: incentives to collect, incentive to buy: high price/volume</p>	<p>Over the lifetime of the NTFP-PFM project honey prices have increased beyond the rate of inflation. Higher prices are encouraging beekeepers to place more hives.</p>
<p>Diverse niche markets to reduce competition</p>	<p><i>"... with mainstream crops, massive subsidies to OECD producers reduces the chances of success for African farmers"</i> (Cunningham 2011). Globally honey prices are highly competitive. To compete Ethiopian honey needs to sell its ethical, natural and environmental credentials. There is some evidence that this approach is working and organic Ethiopian honey is used in a number of products produced by The Body Shop. A winning product is one that is quite special, to reduce competition, but not so special that it cannot be produced in sufficient quantities or so novel as to be un-marketable at scale. Forest honey from SW Ethiopia works because it meets this <i>quite special/not too special</i> characteristic and can be different things to different markets.</p>
<p>The power of strategic partnerships: business, producer associations and universities backed through policy support</p>	<p>Assistance to the sector has come from different areas: Beza Mar, the lead firm exporting honey from SW Ethiopia, attended the World Beekeeping Congress in 2005 (3 years before Ethiopia had EU 'third country' status and so permitted to export honey to EU) and participated in an African honey trade workshop, organised by the NGO <i>Bees for Development</i> as part of a DFID Business Link Challenge Fund project on African honey trade. In 2006 a trade workshop, organised in Ethiopia by SNV was attended by the owner of Tropical Forest Products, giving a chance for a visit the premises of Beza Mar. In 2008 Ethiopia achieved EU 'third country' listing with support from SNV. The work of the NTFP-PFM project supported honey trade by building producer organisations, forging trade</p>

	links, training on post-harvest handling, facilitating communication and strengthening the bargaining capacity of producers.
Conflict resolution mechanisms	<p>This characteristic refers to the robustness of community enterprises to solve conflicts and distribute profits, and also to whether power relations divide communities. In the project area there are divides which may impact on the success of PFM and/or the success of honey marketing. Coffee plot owners tend not to allow others to place hives in their plots and there is a divide between <i>kobo</i>-owners and <i>non-kobo</i> owners. Some minority groups have been excluded from the leadership of PFM institutions. However, the Project Impact Assessment reported that the PFM process was purposively creating more equitable arrangements, and whilst the <i>kobo</i>-system is seen as unfair by some, was generally respected. Women have been purposively included in a number of project activities and within the PFM structures but they do not practice forest beekeeping. Honey trading actors report some problems and dissatisfaction. However trade is not bound up in one trading structure or one trading channel. Problems are resolved not through conflict resolution as such (although this does happen) but rather survival of the most capable, adaptive trading groups and traders. The authors of the Final Impact Assessment strongly acknowledge that the future of PFM lies in robust institutions but also report that, "<i>The institutional resilience of the PFM approach has not yet been tested with any serious challenges</i>" (Bekele and Tesfaye 2013: 33). Given that honey trade pre-dated PFM the two are not totally inter-dependent.</p>
Regional co-operation in order to compete	<p>Across Africa other NTFPs have benefitted from regional trade bodies, for example PhytoTrade Africa and the West African Trade Hub. They provide services such as multi-country lobbying for policy change affecting a particular NTFPs and R&D. There is a regional trade body specifically dedicated to honey – ApiTrade Africa Ltd. Its role is somewhat limited but it does organise a major</p>

	<p>trade fair and conference for apiculture once every two years. ApiExpo Africa 2012 took place in Addis Ababa and a number of honey trade stakeholders from the project area attended. This provided exposure to honey trade actors from other African countries.</p>
<p>Upgrading within value chains</p>	<p>Upgrading implies “escalating on the value ladder” (Guiliani <i>et al</i> 2003). Perhaps even more important than escalating, is having a ladder with different rungs, thus allowing different actors to find a position in the value chain that suits them. A number of value chain researchers report that trading down might be more profitable and sustainable than trading up, particularly in buyer-driven value chains (Risgaard <i>et al</i> 2008). For example, to focus on quality or reduce risk. Commercial honey and beeswax trade is an industry with many rungs on the value ladder. Crude honey is the preferred ingredient in traditional Ethiopian mead – <i>tej</i>, this market is widely accessed with low barriers to entry – and honey with high moisture content is accepted. Traders who sell to Middle East countries prefer honey without the wax but otherwise this market is easy to access compared to the highly regulated markets of EU and US, where organic honey sells well. Markets for both organic and non-organic beeswax are significant. Organic honey and beeswax are sought by cosmetic companies. These different market routes create a dynamic trading landscape in the production areas, but the majority of producers sell the crude product only. The choices made by honey producers about whom to sell to have not been studied.</p>
<p>Traceability</p>	<p>The ability to trace where a product came from is a necessary requirement in most export markets. This feature is not well-established in the case of the SW Ethiopian forest honey although some producers are organic certified and organic certification requires a level of traceability. Traceability systems know-how is available within the coffee sector and needs to be transferred to the honey sector as this</p>

	<p>issue is likely to become more important. Despite the number and spread of honey producers simple traceability systems can be applied to forest honey.</p>
<p>Strategic use of labelling, branding, trademarks and certification</p>	<p>Organic and Fair trade are two certification schemes open to SW Ethiopian honey and beeswax. Fair trade has proved too expensive to maintain, whilst some honey suppliers are organic certified. Interestingly organic certification is 'used' for market access reasons rather than to achieve a premium to offset an opportunity costs for changed practices. It would be beneficial for forest beekeepers if they were 'rewarded' for forest conservation and/or wild produce but there are certification schemes of this kind for honey. The exporters and packers have invested in brands with good effect.</p>
<p>Effective trade fair participation</p>	<p>Producers and exporters have attended trade fairs, often with financial assistance from development partners.</p>
<p>Donor support to help level the playing field</p>	<p>Until 2008 Ethiopian honey could not be imported into the EU. The EU can only import animal products from 'third countries' if they have Residue Monitoring Plans in place. These RMPs concern safety issues in relation to chemical contamination of food, principally in relation to residues of veterinary medicines. SNV supported Ethiopia to put its RMP in place and Ethiopia achieved 'third country' status for honey in 2008. Beekeepers in Ethiopia invariably do not use veterinary medicines and achieving a satisfactory RMP was an expensive process but did not require change in production practices. This can be the case in countries which practise intensive bee-farming.</p>
<p>Limited policy bottlenecks</p>	<p>The need for an RMP could be seen as a bottleneck but this has now been overcome. Some policy issues favour Ethiopian honey. The EU has recently issued a new ruling banning honey which contains pollen derived from genetically modified plants. This policy has severely curtailed honey imports from several South American countries, notably Argentina. This gives Ethiopian forest honey, free from GM pollen, a distinct advantage in the EU</p>

Discussion

By analysing forest beekeeping and honey trade against criteria which have been shown as important in securing a successful outcome for incomes and forest maintenance we see that forest beekeeping performs well. By a number of measures the value of honey for communities in the area is very important and increasing. Yet according to analyses of the achievement of the NTFP-PFM project it is by no means clear that forest beekeeping, and honey and beeswax marketing will forestall the indomitable march of agriculture.

Not by honey alone

The focus of this discussion is on honey because for many communities it is the most important NTFP. And yet natural forests, communities' needs and markets are diverse. The 'make forests pay argument' never suggested success rests with one product. The competitive analysis undertaken by Sutcliffe *et al* (2012) compared the economic value of agriculture with the total of all forest uses. With the exception of modified coffee forests, agriculture was more economically rewarding than all forest uses combined. Sutcliffe concludes by suggesting forest values need to be increased by including timber harvesting (i.e. non-NTFP) and carbon credits in addition to NTFPs, if forest is to be a competitive land use.

Timber and carbon

In addition to NTFPs the two major use categories which remain undeveloped are carbon and timber. The inclusion of timber in PFM management plans (it is currently excluded) is advocated by the researchers who conducted the Project Impact Assessment, "*What we think as the "right incentive" in the context of PFM arrangements here is the inclusion of wood among forest products extractable for marketing, in addition to their availability for domestic use. It is a matter of developing (together with communities) a detailed exploitation arrangement based on sustainable management/utilization plan*" (Bekele and Tesfaye 2013: 37).

However, it is important to consider that honey is delivering an income stream from the forest **now** and carbon and timber remain as potential income streams. Timber harvesting is forbidden by the government which may seem draconian but the government has never banned forest beekeeping. Going back to one of the basic tenets of the NTFP '*commercialisation for conservation*' argument, forest beekeeping is **inherently** sustainable, timber cutting is **potentially** sustainable. It is not only a matter of trust but also complexity, scale and competence for timber harvesting. You just can't get it that wrong with forest beekeeping!

The reviewers who evaluated the project (NTFP-PFM 2013:40) wrote, "*The reviewers would suggest that helping communities to harvest merchantable timber has its pros and its*

cons. Felling trees, preparing and skidding logs to a point where they may be collected by buyers will need skills and investment, as well as a detailed and more technical management plan. The political economy of timber production may result in interests from other parties (e.g. timber processors, hauliers) keen to access the valuable timber resources competing with the community interests. The value of standing timber may represent a potentially important resource for the community, but that value could also represent a threat to PFM if not well managed". Timber harvesting requires a higher level of technical management and monitoring than forest beekeeping, with greater risks.

Landscape / land use planning

The NTFP-PFM project has put PFM structures and management plans in place. When negotiating with the Government of Ethiopia rural communities have weak bargaining power. Their willingness to enter into PFM (even with restrictions on the use of the forest) was based on a choice between a poor option and a better option. Consider the following scenarios;

1. No PFM, no locally devolved rights, *de facto* open access, risk of new investors 'taking' the land, forest degradation.
2. PFM, with restrictions on timber harvesting and forest clearing.
3. Full unfettered ownership with the freedom to manage forest, convert forest to farmland and/or harvest timber.

Scenario 3 has not been offered and local communities have no mechanism by which to negotiate to this scenario. Local communities have stated a clear preference for Scenario 2 above Scenario 1. In this case honey is not being called upon to compete 'un-aided' with agriculture, because PFM rules forbid it. In Scenario 2 honey and beeswax trade has a role to play in delivering the best livelihood outcomes for the communities engaged in PFM whilst offsetting some of the opportunity costs of PFM.

Conclusion

Given the complexity of landscape management and the rapidity of economic change in the SW highlands of Ethiopia, making a clear link between one NTFP and a landscape outcome is difficult. In an analysis of criteria which both hinder and boost the likelihood of NTFP commercialisation leading to conservation forest beekeeping and honey marketing performs remarkably well. The main factors in its favour are:

- The use and placing of local-style beehives sets forest beekeeping apart from wild harvest in a simple, effective and unobtrusive way. It is not an open access system.
- Beekeeping by its very nature is benign, largely non-exploitative and set against measures of forest sustainability – what can go wrong?
- Forest beekeeping in the SW forests of Ethiopia is well-established and local markets for honey and beeswax exist. Commercialising this activity requires

some support and intervention but the solid basis of the practice (which need not be changed to be commercialised) and local markets mean new developments are building on from a resilient basis.

- Honey and beeswax are high value, non-perishable products with diverse markets opportunities including the EU and US. As tradable products forest honey and beeswax have the advantages of being special enough to minimise competition and abundant and common enough to be readily accepted into many markets at scale.

The results of the NTFP-PFM project indicate some positive outcomes. However, these fall short of providing strong evidence that beekeeping can alone forestall the march of agriculture, prevent the conversion of forest lands to tea plantations or compete with logging (illegal or legal). In the context of PFM which is first and foremost driven by other factors – i.e. land security for rural communities – honey might offset some of the non-negotiable opportunity costs that local communities experience by participating in and delivering PFM. The evidence is not strong that honey alone can make conservation pay, but there is a strong argument that honey can help make PFM pay.

References

Abbott, J., Neba, S.E. and Khen, M.W. 1999. Turning Our Eyes from the Forest. The Role of Livelihoods Programme in Changing Attitudes and Behaviour Towards Forest Use and Conservation at Kilum-Ijim Mountain Forest, Cameroon. Unpublished report for Birdlife International.

Abebe, B. 2013. NTFP-PFM South-West Ethiopia, Forested landscapes and livelihood project. Forest based enterprise development work, Final Report.

Bekele, M. and Tesfaye, Y. 2013. NTFP-PFM South-West Ethiopia, Forested landscapes and livelihood project. Project Impact Assessment, Final Report. Submitted SLA and its partners by Conscientia training, consultancy and research PLC.

CIFOR. 2008. Beekeeping in Zambia. Forest Livelihood Brief no. 7.

Cunningham, A. B. 2011. Non-timber Forest Products and Markets: Lessons for Export-Oriented Enterprise Development from Africa. Chapter 4 in Non-Timber Forest Products in the Global Context by Shackleton, S., Shackleton, C., and Shanley, P. (eds)

Dessalegn, M. 2013. Report (2) on Bio-Cultural Investigation for Wild coffee conservation by participatory forest management project [WCC-PFM].

Hausser, Y. & Savary, J. 2002. A cross sectoral approach to beekeeping support. Bees for Development Journal Issue No. 64.

Hein L, Gatzweiler, F. 2006. The economic value of coffee (*Coffea arabica*) genetic resources. Ecol. Econ. 60 (1): 176-185

Ingram, V. 2010. Taking stock & projecting apiculture value chains into the future in West and Central Africa: Win wins for livelihoods & conservation? Keynote Speech at SNV-WCA Forestry Knowledge Network Event. 1-3 June 2010, Foumban, Cameroon

IUCN. 2012. Livelihoods and landscape strategy: results and reflections. Available at https://cmsdata.iucn.org/downloads/lis_final_report_public_1.pdf

Mickels-Kokwe G. 2006 Small-scale woodland-based enterprises with outstanding potential. The case of honey in Zambia. Bogor, Indonesia: Center for International Forestry Research.

Nepstad, D.C. and Schwartzman, S. (eds). 1992. Non-timber products from tropical forests: Evaluation of a conservation and development strategy. Advances in Economic Botany, vol. 9. Bronx, New York: The New York Botanical Garden.

NTFP-PFM South-West Ethiopia, Forested landscapes and livelihood project. 2013. End of Project Evaluation Report. ENV 2006 114-229. Submitted to SLA and its partners by LTS International Ltd. 5th October 2013

Lalika, M.C.S. & Machangu, J.S. 2008. Beekeeping for income generation and coastal forest conservation in Tanzania. Bees for Development Journal Issue no. 88.

Marshall, E., Schreckenberg, K. and Newton, A.C. (eds) 2006. Commercialisation of non-timber forest products: Factor influencing success. Lessons learned from Mexico and Bolivia and policy implication for decision makers. UNEP-WCMC Biodiversity Series no. 32.

Peters, C.M, Gentry A, Mendelsohn R. 1989. Valuation of a tropical forest in Peruvian Amazonia. Nature 339:655–657

Place, F., Pender, J. and Ehui, S. 2006. Key issues for the sustainable development of smallholder agriculture in the East African Highlands. In Pender, J., Place, F. & Ehui, S. (Eds.) Strategies for sustainable land management in the East African Highlands. Washington, D.C., International Food Policy Institute

Riisgaard, L., Bolwig, S., Matose, F., Ponte, S., du Toit, A. and Halberg, N. 2008. A strategic framework and toolbox for action research with small producers in value chains. DIIS Working Paper no. 2008/17

Ruiz Peres, M., B. Belcher, R. Achdiawan, M. Alexiades, C. Aubertin, J. Caballero, B. Campbell, C. Clement, T. Cunningham, A. Fantini, H. de Foresta, C. García Fernández, K. H. Gautam, P. Hersch Martínez, W. de Jong, K. Kusters, M. G. Kutty, C. López, M. Fu, M. A. Martínez Alfaro, T. R. Nair, O. Ndoye, R. Ocampo, N. Rai, M. Ricker, K. Schreckenber, S. Shackleton, P. Shanley, T. Sunderland, and Y. Youn. 2004. Markets drive the specialization strategies of forest peoples. *Ecology and Society* 9(2): 4. [online] URL: <http://www.ecologyandsociety.org/vol9/iss2/art4/>

Ros-Tonen, M.A.F and Wiersum, K.F. 2003. The importance of non-timber forest products for forest-based rural livelihoods: an evolving research agenda. Paper presented at The International Conference on Rural Livelihoods, Forests and Biodiversity 19-23 May 2003, Bonn, Germany

Shackleton, S., Shackleton, C., and Shanley, P. (eds). 2011. *Non-Timber Forest Products in the Global Context*.

Sills, E., Shanley, P., Paumgarten, F., de Beer, J. and Pierce, A. 2011. Evolving Perspectives on Non-timber Forest Products. Chapter 2 in *Non-Timber Forest Products in the Global Context* by Shackleton, S., Shackleton, C., and Shanley, P. (eds)

Sutcliffe, P. 2011. Incentives for forest conservation. Costs and Benefits of Alternative Land Uses in the Montane Forests of Southwest Ethiopia. NTFP-PFM Research and Development Project.

Sutcliffe, P., Wood, A. and Meaton, J. 2012. *Competitive Forests - Making Forests Sustainable in South West Ethiopia*.

Tadesse, W.G. and Arassa, R. 2004. Forest biodiversity, management practices and NTFP production. Mizan Teferi (Ethiopia). Non-timber forest products research and development project.

Traidcraft. 2007. EU market opportunities for African honey and beeswax.

Annex 1. Characteristics of winning products: Lessons from Successful Enterprises, Cunningham (2011) in the chapter on Non-timber products and markets: Lessons for Export-Oriented Enterprise Development from Africa (Shackleton *et al* 2011).

1. Abundant natural resource base
2. Clear rights to land and tree tenure and use
3. Local self-sufficiency is not undermined (i.e. supplies for local household consumption are still available)
4. Build on and out from existing markets, information access and strategic choices
5. Visionary champions make a difference: insight, innovation and staying power
6. Sustaining a market requires quality in sufficient quantity, on time
7. Pricing: incentives to collect, incentive to buy: high price/volume
8. Diverse niche markets to reduce competition
9. The power of strategic partnerships: business, producer associations and universities backed through policy support
10. Conflict resolution mechanisms
11. Regional co-operation in order to compete
12. Upgrading within value chains
13. Strategies to reduce or avoid elite capture
14. Traceability
15. Strategic use of labelling, branding, trademarks and certification
16. Effective trade fair participation
17. Donor support to help level the playing field
18. Limited policy bottlenecks