Traditional uses of non-timber forest products in southwest Ethiopia: Opportunities and challenges for sustainable forest management

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Abstract: *Southwest (SW) Ethiopia, characterized by high biophysical and cultural diversity, contains Afromontane rainforests and most indigenous people are dependent on these natural forests for their livelihoods and socio-cultural demands, with non-timber forest products (NTFPs) forming the most important one. Besides economical roles, a variety of NTFPs including wild coffee in the region have different socio-cultural roles for local inhabitants. However, these roles are under the challenges of forest degradations and socioeconomic changes. This paper was, therefore, initiated to summarize available information on the traditional and cultural uses of NTFPs, and their implication for SFM in SW Ethiopia, and to forward recommendations on the option of using these roles of NTFPs as a tool for SFM, and to sustain these uses for the local people. Based on available information, NTFPs in SW Ethiopia contribute 24 to 30% of the total livelihoods of rural households and fulfill different socio-cultural needs of the local people including primary health care, traditional beliefs and other socio-cultural activities, such as success in marriage arrangement, dispute settling, child birth, etc. But, these uses are challenged by deforestations, cultural and lifestyle changes of local inhabitants associated with changes in religion, and expansion of settlements and large plantation crop investments, and problems related to policy and land-use right law implementation. As the available literature focused mainly on some NTFPs that have international market demands, e.g., coffee, spices and honey, information on all available NTFPs and their traditional uses and contribution to SFM in the region is generally scarce. Thus, in addition to the known NTFPs, exploring and popularizing of locally important NTFPs together with their traditional uses, and opportunities and challenges to use them as a tool for SFM in SW Ethiopia is needed.*

Keywords: Bio-cultural diversity, NTFPs, opportunities, threats, SW Ethiopia

1. Introduction

Non-timber forest products (NTFPs) are defined as 'all products of biological origin other than timber extracted from forests, woodlands and trees outside forests for human use' (Demel *et al*., 2010; CIFOR, 2011). Typical NTFPs include fruits, seeds, bulbs, barks, fibers, roots, leaves, fishes, games as well as small wooden poles and firewood, amongst others (Peters, 1994; Cunningham, 1996). They have been key to satisfying household's subsistence needs in terms of nutrition, medical care, energy demand, construction purposes, and cash income amongst others, as well as cultural self-conceptions and traditional belief-systems (Rojahn, 2006; Heubach, 2011). Under the Millennium Ecosystem Assessment, NTFPs are classified as provisioning ecosystem services (MEA, 2005).

Utilization of NTFPs has a long history and for millennia, NTFPs have been forming an inherent part of the livelihoods of rural communities living in different parts of the world including SW Ethiopia (Heubach, 2011; Mohammed Chilalo and Wiersum, 2011; Feyera Senbeta *et al*., 2013). For most of the evolutionary history of human, forests have been valued for their numerous NTFPs, but little or no for their timber production (Tefera, 2005). However, in the ages of 'civilization' and until the recent past (1970s), the production function of a forest was often estimated by its timber values, less by its NTFPs

values while they have a significant role for livelihood of local communities, especially for forest-dwelling ones (Reenen, 2005). Currently, the important roles of NTFPs for livelihood and sustainable forest management (SFM) are again recognized and became more and more clear (Tefera, 2005; Reenen, 2005). With increasing awareness on rapid forest resource degradation and NTFP's importance for SFM and livelihood, the need for identifying NTFPs and their appropriate management options gradually become the research and development agenda.

Similarly, NTFPs in Ethiopia are traditionally utilized by local communities for ages in various forms and different contexts: as subsistence needs, gap filling and cash income. Most of the households in southwest (SW) Ethiopia still derive higher proportions of their total income from NTFPs (Reenen, 2005; Mohammed and Wiersum, 2011). As subsistence, NTFPs are used as food, feed, construction materials, utensils, medicines, etc. However, utilization and management of NTFPs in this region have got attention for SFM very recently, and some information on major NTFPs has already been documented (Reenen, 2005; Tefera, 2005; Mohammed and Wiersum, 2011; Abebe and Koch, 2011; Feyera *et al*., 2013). In addition to their ordinary uses, some NTFPs are deeply linked to some cultures.

SW Ethiopia is a region in the country that contains the remnant fragments of the Afromontane rainforests of the country. Particularly, Sheka, Kafa and Bench-Maji Zones are known for their natural forests with 60, 20 and 15% of forest cover, respectively (Mohammed and Wiersum, 2011), which contain over 107 woody species and gene pools of some important food plants such as *Coffea arabica, Aframimum corrorima* (*korarima*) and *Piper capense* (long pepper- *timiz*) (Zewdie, 2010). These forests are also one of UNESCO's designated Biodiversity Hotspotf of global interest with *C. arabica* as a flagship species (Mohammed and Wiersum, 2011).

SW Ethiopia is also characterized by cultural diversity. More than ten indigenous ethnic groups in the abovementioned zones reside adjacent to each other and in mixed patterns of settlement, with specific and common socioeconomic history. Most of them are dependent on natural forests for their livelihoods, with NTFPs forming the most important one. For example, the Sheko, Kaficho, Shekecho and Bench people are chiefly employed in NTFP extraction and small-scale subsistence agriculture. Menjo, Mandjah, Meinit and Mejenger are traditional beekeepers and hunters/gatherers (Avril, 2008; Mohammed and Wiersum, 2011).

This bio-cultural diversity and high dependency on forests as sources of NTFPs reasonably imply the existence of a range of traditional and cultural uses of NTFPs as well as management of forests. The objectives of the paper, therefore, were (1) to summarize the available information on the traditional and cultural values of NTFPs, and their implication for SFM in SW Ethiopia, and (2) to forward recommendations on the option of using traditional and cultural functions of NTFPs as a tool for SFM, and on sustainable use of these functions of NTFPs for the future.

2. Types of NTFPs in SW Ethiopia

Ethiopia's forest and other vegetation resources offer diverse NTFPs that provide substantial inputs for the livelihoods of a very large number of people in the country and an estimated annual turnover more than $US 2.3 billion to the notational economy (Table 1). Some of the NTFPs such as wild coffee, gum-resins, honey and bees' wax and ecotourism occupy key position in the State's economy, particularly in foreign currency earnings through export (Demel *et al*., 2010). SW Ethiopia, still its large parts covered with natural vegetation, is rich in NTFPs, which contribute 24 to 30% of the livelihood of households in the region (Mohammed and Wiersum, 2011) and 52%, 41% and 23% of annual cash income of households in Bench Maji and Sheka zones and Gore districts, respectively (Demel Teketay *et al*., 2010).

Based on their contribution to total products and household income, coffee, honey, spices (*korarima*, long pepper and wild pepper), climbers, fruits and bamboo are cited as the major NTFPs in SW Ethiopia (Reenen, 2005; Mohammed and Wiersum, 2011; Abebe and Koch, 2011). Only few authors (e.g., Rojahn, 2006; Aseffa, 2007) have documented other

important NTFPs (such as bees wax, *gesho* [*Rhamnus prinioides*, a condiment used in making a local drink, *teji* and *tela*], *desha* [*used* to clean the oven], e*nsosela* [*Impatients tinctoria*, a plant *used* for *decorating* the *skin* with color and healing rheumatism], liana, palm, wild fruits, fuel wood and charcoal) in the region. In the coffee forests of Yayu, Sheko, Bonga and Harenna, Feyera *et al*. (2013) identified 143 locally useful wild plant species, which are used for material sources (69 species), medicine (50 species), food (38 species), honey forage (32 species), animal fodder (9 species), environmental uses (4 species) and social services (2 species). However, other locally important NTFPs (e.g., grasses, barks and leaves of trees and shrubs, wild animals, fishes, aromatic and ornamental plants used for food, feed, construction, medicine, condiments, beautification and other purposes in the region), nationally and internationally important NTFPs (e.g., civet musk), and forest grazing and browsing have not been well-considered and quantified by any of the studies. Conversely, the role of these types of NTFPs to rural livelihood was reported in other regions of Ethiopia, e.g., Dendi district (Demel *et al*., 2010) and countries, e.g., India, Nigeria and South Africa (Singh, 1999; Ogundele *et al*., 2012; Tewari, 2012). In general, the NTFPs extracted in SW Ethiopia can be categorized into different use groups: food, fodder, local construction materials, medicines, spices, income sources, fuel wood, farm implements and household furniture.

3. Traditional and cultural Uses of NTFPs

Most of NTFPs in SW Ethiopia except coffee, honey, spices and civet musk, which are also used for sale in both local and national markets, are used only for household consumption, and almost all of the NTFPs collected in this region have cultural values. Some of the traditional and cultural uses of some common NTFPs, such as coffee, honey, spices, bamboo and medicinal plants are discussed below.

Coffee

SW Ethiopia as the centre origin of *C. arabica* and still containing wild coffee, utilization of coffee as NTFP might have been started in this region. The forest-based (wild or semi-managed) coffee production system provides 70,000 to 90,000 metric tons of coffee, contributing about 30-35% of annual coffee production of the country and US$ 130 million per year to the national economy (Table 1, Demel *et al*., 2010).

The historical, cultural and economical relationship between coffee and Ethiopians including local communities in SW Ethiopia is deep-rooted and multifaceted (Stellmacher, 2006). It plays a significant role in the national economy, daily life of the local people, and it is much more than a beverage and has lots of cultural values. It contributes about 33% of the country's foreign currency earnings (ICO, 2013) and 10% of the gross domestic product, and supports the livelihoods of around 20 million people in one way or another (Demel *et al*., 2010). It is used for various religious, cultural and social purposes. For example, it is often made and drunk as sign of confirmation for marriage arrangements, settling of disputes, agreements on some issues, and after some events like birth, death, and the like. Morning coffee is often used to express good wish and fortunate day for the family, the villagers and the country. Some individuals use coffee beans or a coffee cup to spiritually express the fortunes or illness of individuals.

Coffee prepared from dried berries and young leaves is also used for various social and cultural purposes. For example, *bunakela,* prepared from dry roasted coffee berries mixed with butter and/or roasted barley, wheat or chickpea, is usually used by long distance travelers or hunters in Gedio and Borena, and in special cultural and family occasions of Oromo people in Wollega, e.g., first dish to celebrate a child birth and circumcision, an expression of success in marriage arrangement or fortune telling events. *Chamo* (a tea of coffee leaves), prepared from dried coffee leaves and spiced with pepper and ginger, is a favorite drink and used as medicine for sick and weak individuals in Kefa, Benchi-Maji and Sheka Zones and Godre district. Both the normal drinking coffee and *chemo* are used by Sheko communities to dilute some traditional plant medicines (Mirutse *et al*., 2010). Similar uses are also there in some other areas of the country. In Hararghe, for example, *Kuti*, infusions of roasted and grinded coffee leaves, and *Hoja*, powder of coffee husk mixed with milk and salt, is commonly used.

Honey

Ethiopia has also a long tradition of beekeeping. It is one of the major bees wax and honey producing countries in the world and the fourth largest wax exporter to the world market after China, Mexico and Turkey (Girma Deffar, 1998; Demel *et al*., 2010). About 30,000 - 50,000 metric tons of honey and 4,000 metric tons of bees wax with estimated gross financial values of $US 86.5 and 19.8 million, respectively are annually produced in Ethiopia most or all of which is forest/vegetation based in terms of nectar provision, bee colony hosting and construction material supply (Table 1, Demel *et al*., 2010).

In the forest areas of SW Ethiopia, honey is primarily produced by hanging up beehives made of wood, bark or bamboo on the branches of trees (Fig. 1). Honey can also be collected from feral source in the hollow wood, soil or rock, or from managed bee colonies foraging in forests or cultivated plants. The forest honey in SW Ethiopia constitutes the important NTFPs which are used as a source of food, tonic, cash and medicine for local communities (Tefera, 2005). For example, the annual honey production in Sheko and Yayu districts is worth US$ 14.6 and US$ 11.6 per ha, respectively (Rojahn, 2006).

Figure 1 Traditional beekeeping and uses of honeybee products in SW Ethiopia (Tadesse 2007)

Until very recently that forest honey producers have started supplying honey to national and international markets, the honey collected from forests was almost exclusively used for local consumption, to a very large extent for the local brewing of mead, known as *tej* (honey-wine) (Fig. 1, Rojahn, 2006), and to some extent for food sweetening and traditional medicine. SW Ethiopia is, thus, not only known for its natural forests, coffee and spices, but also for its quality honey *tej,* a very common traditional drink and business in this region. Apart from business, honey *tej* is also brewed for many social events like holidays, weddings, and other similar events.

The owners of local *tej*-houses and small honey retailers separate the honey from wax and retail it themselves (Rojahn, 2006). The wax is usually sold as a by-product to wax collectors who, in turn, trade with processing companies. According to Rojahn (2006), however, bees wax in Sheko and Yayu districts is regarded as a by-product of *tej*-making and is not used. Wax is also used to make local candle, called *tuaf*, which is used to light home and in church or in religious events of the Orthodox Christian.

Spices

In Ethiopia, five species of spices grow in the wild (Goettsch, 1997), and SW Ethiopia supplies a significant amount of two of these spices (*Korarima* and long pepper) annually to national and international markets. For example, Kefa Zone supplied an average of 402.94 metric tons between 1991 and 1995, and Kefa and Sheka Zones together about 1,208 metric tons in 1999 with estimated value of $US 2.7 million (Table 1). However, the supply greatly fluctuated and the total annual *korarima* export between 1994 and 1998, for instance, was less than 60 metric tons (Demel *et al*., 2010).

Of the five wild spices in Ethiopia (Goettsch, 1997), *Korarima* and long pepper, both are native to Ethiopia, constitute the two important wild spices harvested and traded in many areas of southern and southwestern Ethiopia (Fig. 2). *Korarima* grows naturally in the forest, almost the same habitat as natural coffee, whereas long pepper grows in forest margins and disturbed areas or forest gaps (Tadesse, 2007; Avril, 2008). Both spices are totally harvested from wildly grown plants in the forest although farmers have recently started domesticating them in the gardens, fields or forest borders (Avril, 2008).

Figure 2 Traditional extraction and marketing of spices in SW Ethiopia (Avril, 2008)

Korarima is renowned food flavoring spice and medicinal plant. Its dried fruits are used in the daily dishes (e.g. *wot* [stews or sauces traditionally eaten with *injera* - a sourdough-risen flatbread with a unique, slightly spongy texture and a national dish of Ethiopia and Eritrea], coffee and sometimes local bread) of most Ethiopians. It is also used as a carminative, purgative and tonic in traditional medicine (Jansen, 1981). An ethnobotanical survey conducted in Gamo Gofa, Debub Omo and Kafa showed that all plant parts (seeds, leaves, rhizomes, roots, pods and flowers) of *korarima* are used as a medicine for different aliments (Eyob *et al.*, 2008). Long pepper is also used to spice *wot*, and preferred by local consumers because of its lower price and greater availability in a local market than exotic spices (Goettsch, 1997). However, the indigenous communities in rural areas of the study area use these spices very often for cash income and less for own consumption as they do not use *wot* with *injera* traditionally (Reenen, 2005; Avril, 2008). As a result, the consumption of the spices collected in this region is delocalized in towns and other areas where *wot* with *injera* or *wot* with spaghetti are very common.

Bamboo

Two indigenous species of bamboo namely the African alpine bamboo (*Arundinaria alpine*) and the lowland bamboo (*Oxytenanthera abyssinica*) are

recognized in Ethiopia (Fig. 3). Ethiopia has one of the largest bamboo resources in the world with estimated land area cover of over 1.1 million ha (150,000 ha of highland and 959,000 ha of lowland) (Ensermu *et al*., 2000). This is 67% of all African bamboo resource and 7% of that of the world total (Kassahun, 2003). Bamboo in Ethiopia provides an estimated annual turnover of over $US 10.5 million (Table 1).

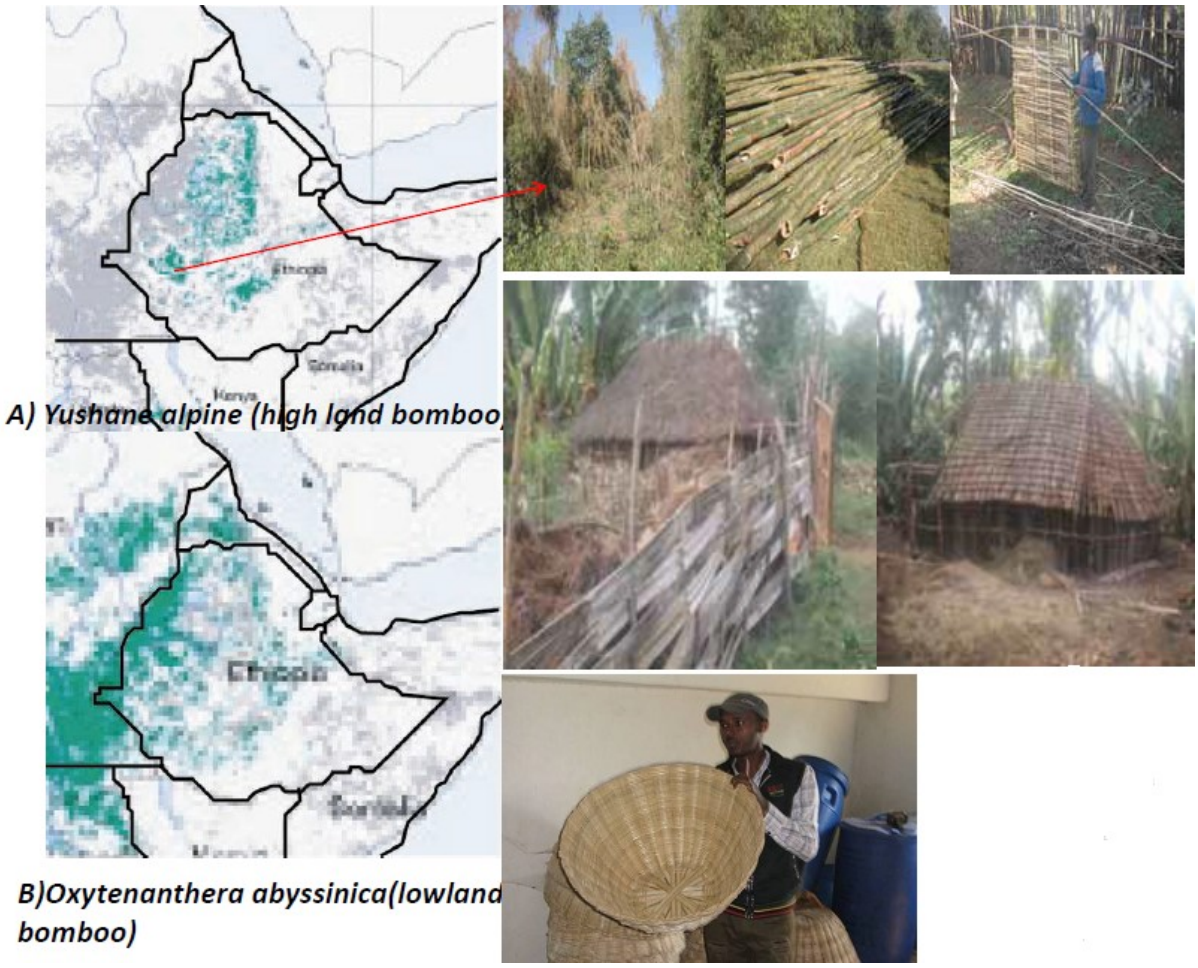

Figure 3 Distribution, traditional extraction and use of bamboo. The baskets are used for transportation of honey combs in SW Ethiopia (Aseffa, 2007)

Table 1 An estimated annual production of NTFPs and their gross financial values in Ethiopia and South West Ethiopia

Product Type	Ethiopia		SW Ethiopia
	Annual production (tons)	Estimated annual turnover in $US (x1000)[a]	Annual production/Average annual yield supplied to Addis Ababa market (tons)[b]
Wild coffee	70,000-90,000	210,000	230.22
Honey	30,000-50,000	86,500	3.24[c]
Bees wax	4,000	19,840	14.64
Spices	1,208	2,700	402.94
Herbal medicine	56,000	2,055,484.3	ND
Bamboo	ND	10,555.6	ND
Civet musk	400	183	ND
Gum/Incense	5000	6,800	ND
Essential oils	ND	ND	ND
Forest Grazing(Fodder)	ND	ND	ND
Forest food(wild food)	ND	ND	ND
Total		2,305,122.9	

[a] includes sales on export and domestic markets; ND denotes no data available

[b] Average (1991-1995) annual coffee, honey/bees wax and spice yields supplied to Addis Ababa market from Bonga

[c] Annual production of honey in Sheko and Yayu districts calculated from Reichhuber and Requate (2007)

Sources: Demel *et al*., (2010); PFMP (2004); Reichhuber and Requate (2007)

In Sheka, Kefa and Benchi-Maji Zones of SW Ethiopia, bamboo stands cover a total of land area of 29,619 ha (Ensermu *et al*., 2000), and bamboo is one of the most important NTFPs with several uses in the region (Fig. 3). The local people extract bamboo for house construction, especially the roof structures; fencing homesteads and farmlands to protect the crops from free grazing animals; and making beehives, floor mat, flutes, and household equipment and utensils like chairs, drinking cups, baskets, shelf, d*ollo* (water container), cups, g*amo* (traditional tray), pipe used for smoking tobacco, bed, and food for their households or for sale (Fig. 3). It is also sharpened like a knife and used to separate edible parts of an *enset* plant (*Ensete ventricosum*) from the fiber (Ensermu *et al*., 2000; Reenen, 2005; Tadesse, 2007). In some parts of Ethiopia, ingredients from black bamboo help to treat kidney disease, roots and leaves to treat venereal disease and cancer, sap to reduce fever and ash will cure prickly heat.

Medicinal Plants

Healthcare in rural areas of Ethiopia largely depend on traditional medicines drawn mostly from plants used both by women in the home and traditional health practitioners (THPs) (Girma, 1998). THPs are normal farmers who know how to prepare medicine from medicinal plants and usually keep this knowledge as a secret within a family. In Ethiopia, about 56,000 metric tons of medicinal plants are harvested and used per annum, and an estimated number of 80,000 traditional healers (about 9,000 of them officially registered ones) use traditional medicines (Table 1, Demel *et al*., 2010). Six hundred species of medicinal plants are distributed all over Ethiopia, with greater concentration in south and SW of the country (Girma, 1998). As per Demel *et al*. (2010), however, the figure of indigenous plant species that have herbal medicinal applications is a bit higher (about 1,000 species), most of which are wild plants. They have been used in traditional health care system to treat nearly 300 physical disorders, from childhood leukaemia to toothaches and mental disorders.

In some ethnic groups of SW Ethiopia, 196 medicinal plants (20 in Kafficho, 71 in Sheko, 35 in Bench, 65 in Meinit and 5 in Mejenger) are documented (Endeshaw, 2007). Ethnobotanical studies in three ethnic groups (Meinit, Sheko and Bench) showed 157 medicinal plants (Mirutse *et al*., 2009a, Mirutse et *al*., 2009b; Mirutse *et al*., 2010). Of which 33.8% were trees, shrubs, vines and climbers that can be considered as NTFPs and the remaining 66.2% were herbs (Table 2). The majority of the latter were uncultivated weed species growing in disturbed

habitats and found in abundance near to homes. Medicinal tree species, e.g., *Bersama abyssinica*, *Ritchiea albersii* and *Vernonia auriculifera, w*ere found as remnant trees scattered in farms or forests faraway from homes. Some woody medicinal plants, particularly trees, unlike herbaceous ones are rapidly declining due to selective cutting for construction, fuel wood, etc (Mirutse *et al*., 2009a; Mirutse *et al*., 2009b; Mirutse *et al*., 2010).

Table 2 Medicinal plants that can be considered as NTFPs and used by three different ethnic groups in Bench-Maji Zone, South West Ethiopia

Ethnic group	Scientific Name	Growth Form	Parts Used	Ailment Treated	Administrat-ion Route
Sheko	*Capparis erythrocarpos* Isert	Climber	Fruit,leaf	Boil	Topical
	Cayratia gracilis (Guill. & Perr.) Suess.	Climber	root	Wound	Topical
	Clausena anisata (Willd.) Hook. f. ex Benth.	Tree	Leaf	Evil eye	Nasal
	Clematis longicauda Steud. ex A.Rich.,	Climber	Itching skin	Leaf, stem	Topical
	Clematis simensis Fresen	Climber	Wound, eye infection	Leaf	Topical
	Coffea arabica L.	Tree	Headache	Leaf	Oral
	Cucurbita pepo L.	Climber	Taeniasis	Seed	Oral
	Embelia schimperi Vatke	Shrub	Taeniasis, Ascariasis	Fruit, root	Oral
	Euphorbia ampliphylla Pax	Tree	Wart	Sap	Topical
	Garcinia buchananii Baker	Tree	Ascariasis	Fruit	Oral
	Microglossa pyrifolia (Lam.) Kuntze	Shrub	Jaundice	Leaf	Oral
	Millettia ferruginea (Hochst.) Baker	Tree	Wound	Stem bark	Topical
	Momordica foetida Schumach.	Climber	Wound	Leaf	Topical
	*Phytolacca dodecandra*L'Hér.	Shrub	Rabies	Root	Oral
	Stellaria sennii Chiov	Climber	Eye infection	Leaf	Local (eye)
	Stephania abyssinica	Climber	Rabies	Leaf	Oral
	Vepris dainellii (Pic.-Serm.) Kokwaro	Tree	Boil	Root	Topical
	Vernonia amygdalina Delile	Tree	headache	Leaf	Topical(head)
	Carica papaya L.	Tree	Malaria	Leaf	Oral
	Microglossa pyrifolia (Lam.) O.Ktze.	Shrub	Meningitis(*tikus*)	Root/leaf	Oral, topical
			Cow mastitis	Leaf	Oral
	Phytolacca dodecandra L'Hérit.	Shrub	Dog rabies	Root	Oral
			Rabies	Leaf	Oral

Bench	*Prunus africana* (Hook.f.) Kalkm.	Tree	Ear infection Toothache	Stem bark	Local (ear) Local (tooth)
	Ritchiea albersii Gilg	Tree	Meningitis(*tikus*)	Leaf	Topical
	Smilax anceps Willd.	Climber	Ear infection	Root	Local (ear)
	Trichilia dregeana Sond.	Tree	Tinea capitis	Leaf	Topical
	Vernonia amygdalina Del.	Tree	*Michi*	Leaf	Topical(face), Local (nose)
	Acalypha volkensii Pax	Climber	Wound	Leaf	Topical
	Bersama abyssinica Fresen.	Tree	Tonsillitis	Stem bark	Oral
	Carissa spinarum L.	Shrub	Evil eye	Root	Nasal
	Cissampelos mucronata A.Rich.	Climber	Stomachache, retained placenta	Root	Oral
	lematis hirsuta Perr. & Guill.	Climber	Respiratory tract problem, Cataract	Root Leaf	Oral Local (eye)
	Clerodendrum myricoides (Hochst.) Vatke	Tree	Wound	Leaf	Topical
	Croton macrostachyus Del.	Tree	Snake bite	Root	Oral
	Embelia schimperi Vatke	Shrub	Taeniasis	Fruit	Oral
	Ficus vasta Forssk.	Tree	Itching skin	Topical	Topical
	Gardenia ternifolia	Tree	Malaria	Stem bark	Oral
	Hoslundia opposita Vahl	Shrub	Stomachache	Root	Oral
	Indigofera garckeana Vatke	Shrub	Diarrhoea (cattle), stomachache, headache	Root	Oral
Meinit	*Microglossa pyrifolia* (Lam.) O.Kuntze	Shrub	Stomachache Hard swell on skin	Leaf	Nasal, topical Oral topical
	Phytolacca dodecandra L'Hérit.	Shrub	Rabies	Root	Oral
	Rhus ruspolii Engl.	Shrub	Wound	Leaf	Topical
	Ricinus communis L.	Tree	Stomachache	Root bark, seeds	Topical
	Ritchiea albersii Gilg	Tree	Wound	Leaf	Topical
	Rubus steudneri Schweinf.	Shrub	Stomachache with diarrhoea	Root	Oral
	Stephania abyssinica (Dillon. & A.Rich.)Walp.	Climber	Stomachache, Retained placenta	Root	Oral
	Tephrosia elata Deflers	Shrub	Respiratory tract problem	Root	Oral
	Vernonia amygdalina Del.	Tree	Wound	Leaf	Topical

Vernonia auriculifera Hiern.	Tree	Toothache	Root	Local (tooth)

Sources: Mirutse *et al.* (2009a); Mirutse *et al.* (2009b); Mirutse *et al.* (2010)

In SW Ethiopia, most traditional plant remedies are used against human ailments, some against both human and livestock ailments, and a few against livestock ailments (Table 2, Endashaw, 2007). As they could be harvested freely from the immediate environment, most of these plant medicines, except those used as food, are not sold at local markets, and prepared and administrated at a household level (Mirutse Giday *et al*., 2009a; Mirutse *et al*., 2009b; Mirutse *et al*., 2010). As per Rojahn (2006), however, medical plants in Sheko and Yayu districts are mostly collected and prepared by THPs and they offer a gross annual income of US$ 1382.40 for each THP, and total net income of US$ 3.00 and US$ 1.80 per ha for Sheko and Yayu, respectively.

4. Opportunities and Challenges for Sustainable Use of NTFPs

SW of Ethiopia is physically diverse with high and reliable rainfall and high forest cover that contains gene pools of some important food plants of global interest, e.g., *Coffea Arabica* (Wood 1993; Zewdie, 2010). The region has a considerable agricultural potential for a wide range of crops, including plantation crops like coffee, tea, rubber and the like. This attracts large plantation crop farms, logging companies and settlers, which results in high forest resource degradation. The area, therefore, can be seen as one of the last resource frontiers in the country, which is being used with increasing intensity as the population grows and deforestation occurs (Wood, 1993). Conversely, forests in SW Ethiopia is a major source of livelihoods for local people, contributing up to 44% of their income in some areas of the region, e.g., Chewaka-Uto in Sheka Zone (Tadesse and Masresha, 2007). Due to this high level of dependency on forest resources, local communities have developed traditional management practices based on religious taboos and customary tenure rights, e.g., Kobo system. The Kobo system is a forest (tree) tenure institution that grants first claimers an exclusive use right of a block of forests, usually for collection of NTFPs such as forest coffee, honey and others. Once claimed, the forest block is *de facto* individual property, respected by fellow citizens of the area and the owner has the right to exclude others (Demel *et al*., 2010). Some ethnic groups in the region (e.g., Shekecho people) also have a culture of keeping some forest areas (e.g., upper stream and riverbank forests) intact for religious/spiritual purposes. Such traditional management practices have sustained the forests and uses of their NTFPs of the region for centuries in a better condition as compared to other parts of the country (Tadesse and Masresha, 2007; Mohammed and Wiersum, 2011). However, deforestation, pesticide application by large plantation crop farms, policy and land-use right law execution problem and cultural and lifestyle changes of local people due to influx of large number of settlers and large farms affect the sustainable uses and cultural values of NTFPs in SW Ethiopia. Deforestation is mainly due to expansion of agriculture, settlements, large plantation crop (coffee, tea and rubber) investments, road constructions, and tree cuttings for timber, beehive, construction, fuel wood and charcoal (Fig. 1, 3 and 4). Pesticide applications by large plantation farms affect honey production and pollinators (Rojahn, 2006; Tadesse, 2007). Policy problems such as leasing of forestlands to the plantation crop investment projects without free and informed consent of local people, denying of customary tenure systems and weak institutional set up to implement policies (Tadesse and Masresha 2007; Demel *et al*., 2010) also affect sustainable uses of NTFPs. For example, besides 16,075 ha of the former state owned coffee farms (CPDE, 2011), over 43 coffee and tea plantation investment projects with a land area of more than 20,451 ha have recently given license and are operating on forestlands of Sheka Zone (Table 3). Similar activities have also been observed in other zones and districts of the region (e.g., Kafa, Benchi Maji, Godre and Gore). The licensing and implementation processes of land leasing for these investments were not based on free and informed consent of local inhabitants. It has also violated the traditional tenure rights and taboos (e.g., spiritual areas). Moreover, customary forests, which were in the hands of clan leaders, have become protected state forests (Tadesse and Masresha, 2007). Another

important problem is institutional capacities and arrangements at different levels. The institutions are weak, inefficient and poorly organized to implement forest and investment policies (Tadesse and Masresha, 2007, Demel *et al*., 2010, Andualem, 2011), and to follow up the implementations of investment projects and harmonize the benefits of local inhabitants with that of the investors (Tadesse and Masresha, 2007).

Figure 4 Forest areas converted to agriculture in SW Ethiopia: coffee plantation with shade trees (top left), tea plantation with Gravillea planted on the edge (top right), crop and grazing lands with some remnant trees (bottom left), and large trees felled for making of traditional beehives (bottom right) (Tadesse, 2007, Zewdie , 2007)

Table 3 Some of the major allotted forest areas for plantation investments in Sheka Zone

Investment group name	Area (ha)	Districtct	*Kebele**
Azage Anbelo	80	Anderacha	Yokchichi
Abebe Anteneh and Belay Welashe	1,500	Anderacha	Yokchichi
Shishi Opi	120	Yeki	Depi
Worku Ado	170	Anderacha	Echi
Awel Muzein	160	Yeki	Alamu
Denbi Fuafuate	240	Yeki	Achane
Gahiberi	85	Yeki	Achane
Tesfaye Ibro	120	Yeki	Dayi
Yebora Agri Dev't	109	Yeki	Shimerga
East African Tea Plantation	3,435	Masha	Chewaka
Gemadro Coffee Plantation	2,295	Anderacha	Gemadro
Gemadro Coffee Plantation II	1,000–2,000	Anderacha	Duwina
Kodo coffee	70	Masha	Uwa
Shebena coffee	67	Anderacha	Shebena
	20,451		

* *Kebele* is the smallest administrative unit in Ethiopia

Source: Sheka Zone Investment Office (Tadesse and Masresha, 2007)

Moreover, it is reported that the investment projects have changed the culture and lifestyle of local people, from farming and NTFP collectors to daily laborers that make them to undervalue the native forest management practices (Zewdie, 2007). Cultural change of local people has also been brought by 'modernization' acculturation, change in religion from cultural and/orthodox to protestant Christianity; native culture adulteration with other cultures of the immigrants; and violations of taboos (destruction of forests used for spiritual purposes by plantation companies) (Zewdie, 2007; Mirutse *et al*., 2009a; Mirutse *et al*., 2009b; Mirutse *et al*., 2010). This results in an expansion of a new culture of resource use—selling of firewood and charcoal and a shift of attitudes in the traditional forest resource management practices, e.g., some community members unusually engaged in deforestation. Certification of forest coffee and honey as organic products, which receive a premium price in the world market, and registration of some forest fragments in Bonga, Sheka and Yayu areas as UNESCO Bioreserve where their buffer zones are accessible for local people to collect NTFPs, on the other hand, may promote sustainable use of NTFPs and management of forests in the region (Reenen, 2005; Mohammed and Wiersum, 2011).

5. Conclusions

Local people in SW Ethiopia have ever been using varieties of NTFPs in traditional ways for fulfilling their demand for long. In addition to their economical functions, most NTFPs are used for social, cultural and religious/spiritual functions. Coffee and Honey (*tej*), for example, are much more than a usual business and a daily beverage. They are used in many religious and cultural events, most often with spiritual and cultural meanings. Many tribal societies in the region have also strong belief on folk medicine and prefer to visit traditional healers for their health problem. Furthermore, the cultural communities in the region maintain certain forest areas and/ or plants as sacred places for ritual work in the traditional religions, e.g. *Deedo* in Sheka zone (Fig. 5). *Deedo* is a type of tree under which prayer or religious ceremony is conducted.

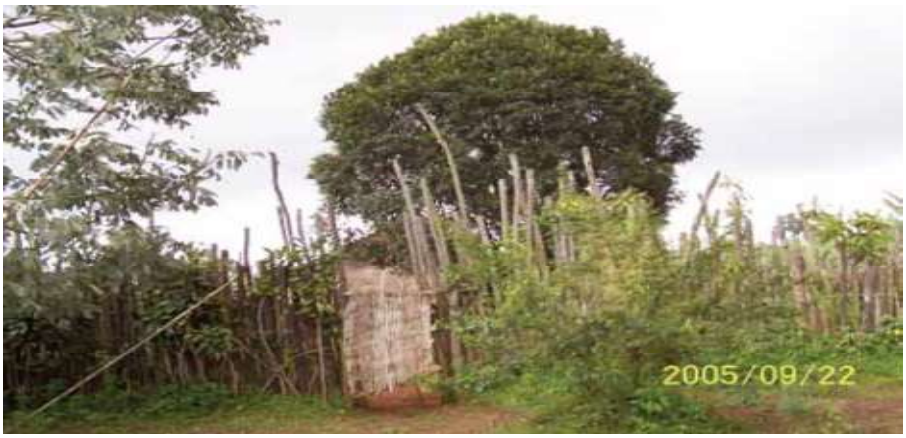

Figure 5 *Deedo* at the back of clan leader's home where prayer and ritual is conducted in Sheka Zone, SW Ethiopia (Zewdie, 2007)

However, studies on NTFPs from local use perspectives are very limited. Many studies have focused on those few NTFPs that have international market demand (Reenen, 2005; Mohammed and Wiersum, 2011; Abebe and Koch, 2011), and forgotten the traditional and cultural uses of many NTFPs, and their roles for local people's livelihood and SFM. The traditional and cultural uses of NTFPs in this region are also under extreme pressure due to rapid rate of deforestation and cultural changes as well as policy and land-use right law implementation problems. This possibly shows a need to popularize such uses and link some of them with the existing or potential markets, as tried in certification of coffee and honey as organic forest products (Reenen, 2005), which may, in turn, contribute to the reduction of deforestation. Exploring of different ethnobotanical information and NTFPs that have local importance for generations may also be needed to be conserved. The high dependency and long time traditional uses of NTFPs in SW Ethiopia possibly show the deep-rooted cultural linkage between the society and forests and its NTFPs. Thus, keeping this linkage may help to reduce deforestation.

In conclusion, in addition to the known NTFPs, exploring and popularizing of locally important NTFPs together with their traditional and cultural uses is forwarded to conserve these uses of NTFPs, may be as cultural heritage, and thereby for SFM in SW Ethiopia. Besides economical linkage, it also seems logical to conclude that keeping the cultural linkage between the society and forests and its non-timber products helps reduce deforestation. Domestication of some economically valuable NTFPs and improving their use and trade at the local level are also important. Building of institutional capacities at different levels to implement policies, and education and awareness creation on the importance of traditional and cultural uses of NTFPs for livelihood and SFM is also pertinent.

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