

## Full Length Research Paper

# Ethnobotanical study of indigenous knowledge of plant-material culture in Masha and Yeki Districts, Southwest Ethiopia

Seada Yassin<sup>1</sup>, Balcha Abera<sup>1\*</sup> and Ensermu Kelbessa<sup>2</sup>

<sup>1</sup>Department of Biology, College of Natural Sciences, Jimma University, Ethiopia.

<sup>2</sup>The Ethiopian National Herbarium (ETH), Department of Plant Biology and Biodiversity Management, College of Natural Sciences, Addis Ababa University, Ethiopia.

Received 3 November, 2014; Accepted 28 January, 2015

Plants have been used throughout human history as a source of food, medicine and material culture. Several studies on plant material culture from Ethiopia, were limited to a certain geographical areas and ethnic groups. The purpose of this study was, therefore, to investigate the plants and associated indigenous knowledge of three ethnic groups (Shekacho, Sheko and Mejengir), residing in the Masha and Yeki Districts of Sheka Zone, southwest Ethiopia. A total of 80 informants between the ages of 20 and 80 were selected by the help of local administrators and knowledgeable elders. Ethnobotanical data were collected through semi-structured interview, guided-field-walk and field observation. Simple statistical methods such as percentage, ranking and comparison were applied for data analysis. A total of 113 plant species distributed in 91 genera from 48 botanical families were reported by informants of three ethnic groups used in making plant-based material culture. Of the 19 use categories recorded, the highest (69; 49.3%) were reported by Shekacho followed by Mejengir (38; 27.1%), and Sheko (33; 23.6%) ethnic groups. Preference ranking and direct matrix exercises on selected plants used for construction and as multipurpose indicated the highest preference of people for *Arundinaria alpina* and *Cordia africana* followed by *Ficus ovata*, *Baphia abyssinica* and *Cyathia manniana*. According to priority ranking, agricultural expansion was identified as the most destructive factor of forest plants, followed by illegal wood harvest and construction. The current study recommends the establishment of plant material culture centre. *Ex situ* and *in situ* conservation measures should be taken in the study area for sustainable use of plant resources and preservation of indigenous knowledge.

**Key words:** Ethnobotany, preference ranking, direct matrix ranking, paired comparison, Ethiopia.

## INTRODUCTION

Plants have been used throughout human history as a source of food, medicine and material culture (Schlereth,

1982; Balick and Cox, 1996; Sophia, 2005). Plant material culture varies enormously and depends on the

\*Corresponding author: Email. [balcha\\_abera@yahoo.com](mailto:balcha_abera@yahoo.com).

availability of plant species, specific environmental condition, and indigenous knowledge of a particular ethnic group (Cunningham, 2001; Terashima, 2001; Tika and Borthakur, 2008). In developing countries, the diversity of plant species remain vital in material culture for making homesteads, agricultural tools, fences, household furniture and/or utensils amongst the others (Parezo, 1996; Wiersum, 1997; Turner, 2000; Choudhary et al., 2008; Hattori, 2006). According to Cotton (1996), plant-based material culture of a given society refers to the total range of objects produced from the plants by that society including functional items such as tools, shelter and clothing, as well as more decorative arts and crafts. A range of plant extracts and exudates have provided pigments, dyes, resins and adhesives which have fulfilled a variety of functional and aesthetic requirements (Dunkelberg, 1992; Johnson, 1992; Miller and Tilley, 1996; Aumeeruddy and Shengji, 2003). For instance, Cotton (1996) mentioned that fibrous stem, roots and leaves have also provided materials for basketry, cordage and textiles; specific types of wood have been used for both construction and manufacturing of a wide range of tools, toys and small utensils; seed and flowers have been used in making necklaces and ceremonial garments.

Ethiopia is a land of topographical and climatic diversity suitable for the distribution of diverse plant taxa (Gebra-Egzabher, 1991). There are about 6,000 species of vascular plants in the country, out of which 10% are endemic (Gebra-Egzabher, 1991). Ethiopia has also diverse ethnic groups and varnishing cultures that possess a wealth of knowledge in the utilization of plants in material culture (Bahru et al., 2012). Although, there is a high utilization of in-county produce and imported synthetic industrial products in Ethiopia, much of the rural human population still depends on plant-based material culture due to a number of factors including the accessibility, economic affordability, and cultural acceptability (Hadera, 2000; Tamene et al., 2000; Jotte, 2007; Institute of biodiversity conservation (IBC), 2008; Abera, 2013).

The dependence of plant-based material culture by three ethnic groups (Shekacho, Sheko and Mejengir) could partly be attributed to underdeveloped infrastructures and expensive industrial products (Gemedo-Dalle, 2004; Anonymous, 2008). Unless the indigenous knowledge on plant-based material culture is documented and the potential plant species conserved both plant and knowledge sources, the knowledge could be lost forever especially in the current fast-growing and expansion of agriculture, urbanization and modern life style that leads to more acculturation. It is surprising that only two studies (Bahru et al., 2012; Abera, 2013) have been reported on plant-based material culture limited to a specific geographical location and ethnic groups in Ethiopia. Furthermore, due to the remoteness of the Masha and Yeki Districts and lack of well-established infrastructure, the indigenous knowledge of Shekacho, Sheko, Majengir

ethnic groups remained unexplored.

Therefore, this study aimed to assess and document the plant species, and associated indigenous knowledge and practices related to plant material cultures among ethnic groups in the Sheka Zone, Southern Nations, Nationalities and Peoples Regional State (SNNPRS), southwest Ethiopia. The study was expected to play a role in prioritizing plants used in the manufacture of material culture in the districts for further evaluation and conservation.

### Description of the study area and people

Sheka Zone is located in the Southern Nations, Nationalities and Peoples Regional State (SNNPRS), southwest Ethiopia. Sheka Zone covers about 2387.54 km<sup>2</sup> [(Sheka Zone Finance and Economy Development Department (SZFEDD, 2012)]. The administration center of Sheka Zone is located 676 km southwest of Addis Ababa. Geographically, the Zone lies between 7°24'-7°52' N latitude and 35°13'-35°35' E longitude and consists of three districts, namely the Masha, Andracha and Yeki (Figure 1). The Zone is bordered by Oromia Regional State to the North, Gambella Regional State to the West, Kaffa Zone to the East and Bench Maji Zone to the South. In total, there are 45 rural and 2 urban Kebeles (Kebele-The least administrative hierarchy in Ethiopia) in the two districts; Masha (town name, Masha) and Yeki (town name, Teppi) consist of 21 and 26 Kebeles, respectively.

According to Central Statistical Agency, CSA (2009), the total population of Sheka Zone was 226,090 residing in urban and rural areas with 114,661 males and 111,429 females. Of the total population of Sheka Zone (226,090), 27,406 (12.12%) live in Andracha District (14,000 males, 13,406 females), 122,469 (54.16%) in Yeki [(62,333 (50.89%)] were males and 60,136 (49.10%) were females and 37,983(16.79%) live in Masha District [(18,660 (49.12%)] were males and 19,323 (50.82%) were females. The rest 29,540 (13.06%) and 8,692 (3.84%) live in Tepi and Masha town administrations, respectively (CSA, 2009). Of these, the study was conducted in Mesha and yeki Districts.

There are different ethnic groups in the Sheka Zone including Shekacho, Sheko, Mejengir, Kafficho, Amhara, Oromo and Guraghe. The first three are indigenous peoples. According to Central Statistical Agency (CSA) (2009), the ethnic composition of Sheka Zone is 34.7% Shekacho, 20.5% Kafficho, 20.5% Amhara, 9.6% Oromo, 5.0% Sheko, 4.8% Bench and 2% Mejengir. These people do have their own culture, language, and life styles.

The Shekacho and Sheko were from Omotic and Mejengir from Nilotic language origins. This study focused on two selected districts (Masha and Yeki) of Sheka Zone, inhabited by three major ethnic groups

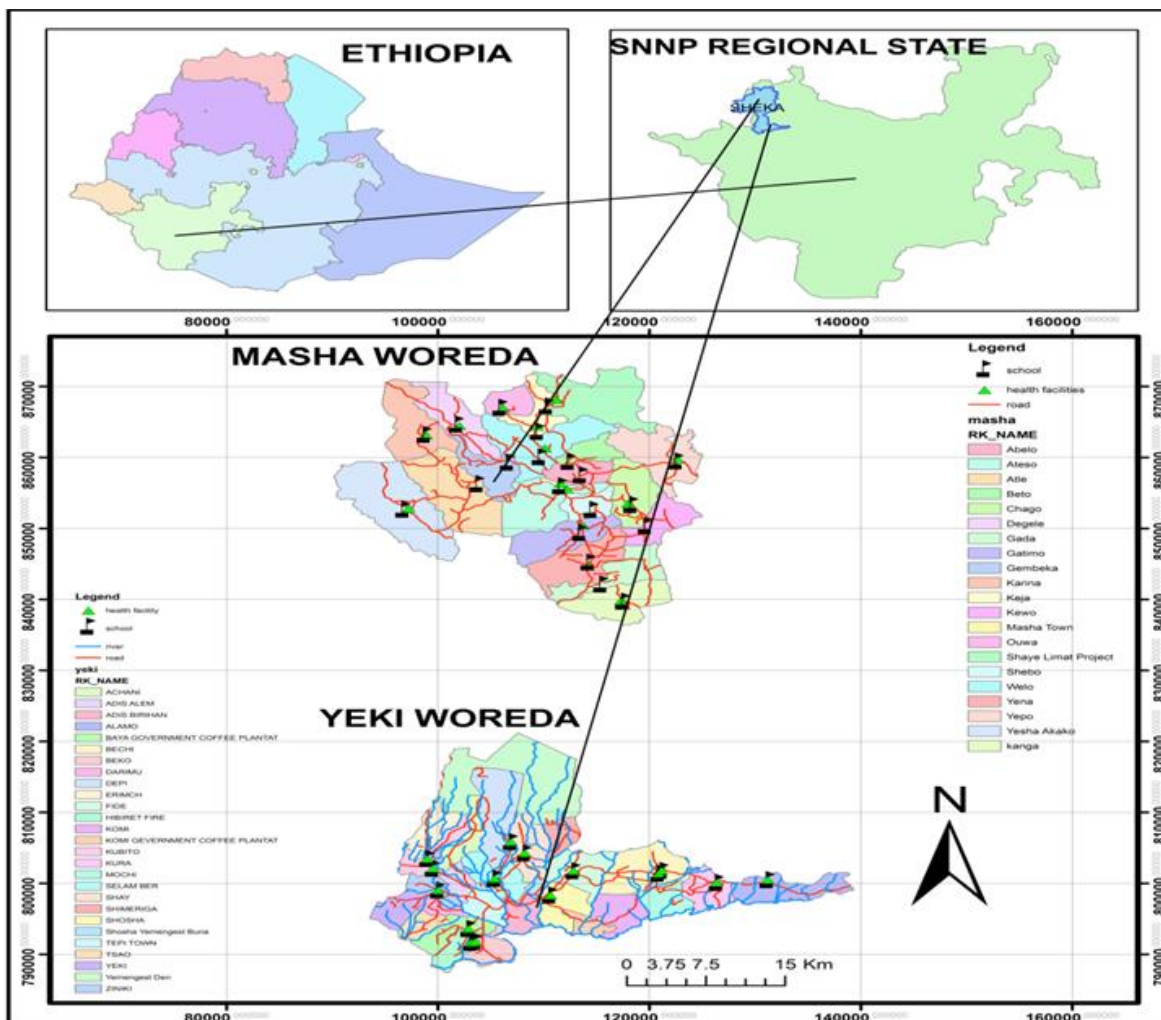


Figure 1. Map of the study districts.

namely Shekacho, Sheko, Mejengir [(Central Statistical Agency, (CSA, 2009)].

## MATERIALS AND METHODS

### Ethnobotanical inventory and informant selection

This study was conducted in eight Kebeles (Achani, Addis Alem, Bechi, Kubeto, Depi, Kura, Kubero and Yeki) of Yeki and seven kebeles (Abelo, Beto, Chago, Gatimo, Masha, Yena and Yego) of Masha districts inhabited by three indigenous ethnic groups (Shekicho, Shako and Mejengir) between December 2011 and March, 2012. Prior to data collection, an official letter was received from Jimma University Ethical Review Committee (ERC) while verbal informed consent was obtained from each informant who was participating during the study period. In addition, proposal write-up was guided under the supervision of advisor and co-advisors, evaluated and endorsed by two examiners and graduate committee of the College of Natural Science after public defense. The informants who participated in the current study were identified and selected with the help of Kebele leaders, Developmental

Agents (DAs) and knowledgeable elders. A total of 80 informants (50 males and 30 females) between the ages of 20 and 80 were identified, of whom 50 were randomly selected from the community by asking every individual in the house and working fields (30 from Shekicho and 10 each from the rest). The rest 30 informants were key informants (20 from Shekacho ethnic group and 10 from the rest two ethnic groups based on the number of population). An interview was conducted in the presence of principal investigator (translating the questionnaire from English to Amharic) and then by three local knowledge translators. Data were collected based on a checklist of questions translated to the local languages of the three ethnic groups (Shakinono, Shekogna and Mejengiregna). Essential information about the plants such as local name, growth forms, and plant parts used were recorded during field survey whereas degree of management (wild/cultivated), and other related ethnobotanical data (plants which were employed in the manufacture of particular items for construction, as a source of handicrafts and arts) were documented by asking informants.

### Specimens collection and identification

Voucher specimens were collected, preserved, pressed and dried

for identification. Preliminary identification was done in the field by using manuals and unidentified specimens were identified using herbarium materials, experts, and taxonomic keys in the various volumes of the flora of Ethiopia and Eritrea (Edwards et al., 1995, 1997, 2000; Hedberg and Edwards, 1995; Hedberg et al., 2006). The collected specimens with voucher numbers, family, species, vernacular names, dates and sites of collection were recorded and deposited at the Jimma Herbarium (Jimma University) and National Herbarium (Addis Ababa University).

### Preference ranking

Martin (1995) noted preference ranking (PR) techniques as useful for gathering information on the different needs, feelings and priorities of different categories of individuals within a community and a numerical value was assigned to each item. Preference ranking was conducted for nine plant species out of the total plants selected based on their cultural value, strength, durability and their ability to protect themselves from termites. Of 30, 15 representative key informants were randomly selected to identify the best-preferred plant species for house construction and house hold articles. Each informant was provided with nine plants reported to be used for these purposes and asked to assign the highest value (9) for plant species best preferred, against these materials and the lowest value (1) for the least preferred plant and in accordance of their order for the remaining ones. These values were summed up and ranks were given to each plant species. In addition, PR was also applied to determine and rank the threat factors for the plant species in the study area following the same procedure stated above for nine plant species.

### Direct matrix ranking

Direct matrix ranking technique was conducted for eight chosen multipurpose species out of 113 (Appendix 1) based on their cultural value, strength, durability and their ability to protect themselves from termites and seven use-categories from each ethnic group in order to evaluate their relative importance to the local people and the degree of the existing threats related to their use values (Martin, 1995). Thereafter, the plant species were listed for 15 randomly selected key informants to assign use values to each species. Each chosen key informants were asked to assign use values (5 = best, 4 = very good, 3 = good, 2 = less used, 1 = least used and 0 = not used). Using numerical scale in which the highest number is equal to the most preferred item whereas, the lowest to the least one. Then the informants were asked to rate their preferences. Finally, the values of each species were summed up and ranked. For the Mejengir and Shako ethnic groups, the ranking was done together because the most useful plants used in both of them were similar.

### Paired comparison

Pair comparison was used for evaluating the degree of preference of 8, 5, 5 selected plants by Mejengir Shekacho and shako ethnic groups, respectively. Based on the information given by each ethnic group, availability of the plant species in the area, cultural value, strength, durability and their ability to protect themselves from termites for house construction. In this study, 15 selected informants of each ethnic group were asked to choose the best item from every pair according to personal perception. A list of pairs of selected items with all possible combinations was made and sequence of the pairs and the order within each pair was randomized and presented to selected informants following Martin (1995) and their responses were recorded and total scores were

summed using the following formula:

$$\frac{n(n-1)}{2}$$

n = the number of medicinal plants being compared.

### Data analysis

Ethnobotanical data were analyzed using both quantitative and qualitative methods as recommended by Martin (1995) and Cotton (1996). Direct matrix ranking, preference ranking, and paired comparison were used to analyze the data. All the data was compiled, organized and entered into SPSS version 16 for Windows and a descriptive statistics (percentage and frequency) were computed to describe the ethnobotanical information on the plants used for material cultures, associated knowledge and conservation. The qualitative data obtained from the focus-group discussion was subjected for thematic analysis. Finally, all the results were presented in tables and figures.

## RESULTS

### Plants diversity in material culture

In this study, a total of 113 plant species were recorded, being distributed in 91 genera and 48 botanical families. The family reported with the highest number of plant species was Rubiaceae (11 species, 9.7%), followed by Euphorbiaceae (8 species, 7.1%) and Astraceae (7 species (Appendix 1). Of 113 plants species used for material culture, 47(41.6%) were tree species, 28(24.8%) Trees/shrubs, 15 (13.3%) herbs, 13 (11.5%) climbers, 9 (7.9%) shrubs and 1 (0.9%) was a fern (Figure 2).

### Source of plants used in material culture

Of the 113 useful plant species reported, 93 (82.3%) species were obtained from wild, 9 (7.9%) species were found in cultivated fields and home-gardens, and 11 (9.7%) species were obtained from both wild and cultivated fields (Figure 3).

### Plant part(s) and mode of preparation

A total of 13 plant parts were reported to be used to produce various kinds of plant-based material objects in Masha and Yeki districts. The most widely used plant part for the preparations of materials was the stem, which accounts for (86; 62.8%) followed by leaves (20; 14.6%) and branch (6; 4.4%) (Table 1). However, the same plant parts (stem, leave and branch) were also reported to be used for a number of materials while various parts of a plant may be used for a single material. As a result, the total number of plant species increased from 113 to 137 (Table 1). Out of the preparation methods, a large

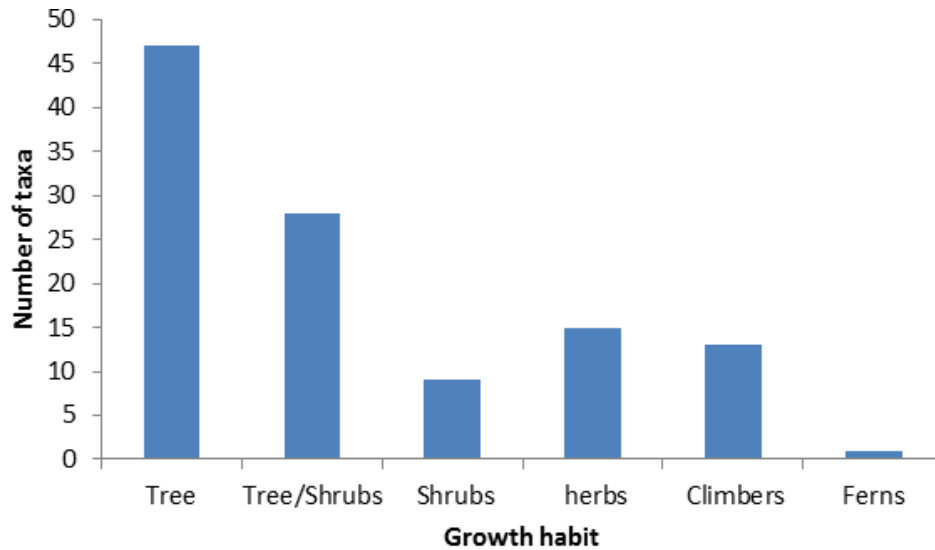


Figure 2. Growth habits of the plant species.

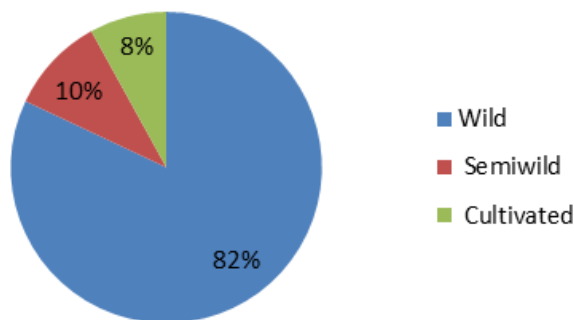


Figure 3. Source of plants used in plant-based material culture in the study area

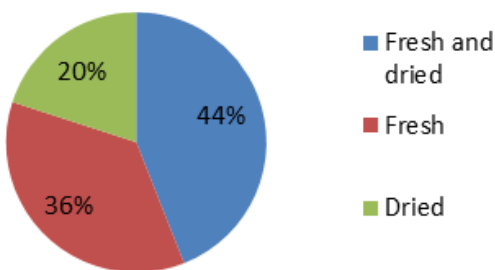


Figure 4. Plants condition used in the preparations of plant-based material culture.

number (59; 49.6%) of plants were reported to be prepared by carving followed by wrapping (15; 12.6%) and splitting (9; 7.6%) (Table 2). The use of similar preparation methods for a single plant increased the total number of plant species from 113 to 119 (Table 2).

### Plants condition

A large number (44; 4%) of plants were identified to be used in dried and fresh forms in material preparations. Relatively few plants (41; 36.3%) were used in fresh form and the rest plants 23 (23; 20.4%) were reported to be used as dried forms (Figure 4). As informants indicated a substance like cold water, ash, clay and animal dung was reported to be used for wetting, washing and decoration during the preparation of materials.

### Comparison of plant material culture among ethnic groups

The result of this study indicates that the three investigated ethnic groups (Shekacho, Sheko and Mejengir) are entirely dependent on plant-based material cultures for local kitchen utensils and/or household furniture, agricultural tools, fences, and musical instruments and others. Although there are some common plant species and plant material cultures reported by three ethnic groups (due to the similarity of the topography and cultural knowledge), this study also revealed that there is a significant difference ( $P < 0.05$ ) in the type of plant used and plant-based material culture between Shekacho and the rest but with no significant difference ( $P > 0.05$ ) between Sheko and Mejengir ethnic groups (Table 3). Of 19 uses recorded in this study, Shekacho ethnic group contributed a significantly higher (49.3%) as compared to 27 and 23.5% reported by Mejengir and Sheko ethnic groups, respectively. The difference is highly observed not only on the numbers but also on the kind of plant-based material cultures produced by these ethnic groups. For example, different

**Table 1.** Plant part used in preparation of plant material culture.

Plant part (s) used	Number of plant species	Percentage (%)
Stem	86	62.77
Leaf	20	14.6
Branch	6	4.4
Twig	5	3.6
Fruit	4	2.9
Root	4	2.9
Bark	4	2.9
Inflorescence	2	1.5
Culm	2	1.5
Latex	1	0.7
Pseudostem	1	0.7
Leaf stalk	1	0.7
Seed	1	0.7
Total	137	100

**Table 2.** Modes of preparation of plant material cultures.

Mode of preparation	Number of plants	Percentage (%)
Beating	1	0.8
Boiling	1	0.8
Burrowing	2	1.7
Carving	61	51.3
Latex collection	1	0.8
Mowing	4	3.4
Peeling	6	5.0
Pounding	2	1.7
Rubbing	7	5.9
Scooping and smoothing	1	0.8
Soaking	4	3.4
Splitting	9	7.6
Trampling	1	0.8
Weaving	4	3.4
Wrapping	15	12.6
Total	119	100

kinds of house construction (oval vs. round, one pole vs. two poles), musical instruments and household furniture (Appendix 1). In addition, in this study, there are several material cultures (such as ornaments, handcraft, Coffin) that were not reported by Sheko and Mejengir ethnic informants but only by Shekacho informants (Table 3).

#### **Plant material culture categories versus number of plants reported by three ethnic groups**

Of the 19 major use categories of material culture items reported by all ethnic groups about 38% of the plant

species were used for house construction and to make utensils and house hold objects. However, the majority of the plant species (69%) were reported by Shekacho ethnic informants followed by 43 (48%) and 39 (43%) from Mejenger and Shako ethnic groups (Table 4). Moreover, this result showed the use of several plant species for the production of one or more plant-based material cultures mainly reported by Shekacho ethnic informants.

In addition, the difference was observed between Shekacho and the rest ethnic groups that there are plants that were reported by Shekacho informants but not by the rest for the construction of fence, ornaments, making of

**Table 3.** Number of plant material cultures used by Shekacho, Sheko, and Mejengir ethnic groups.

Ethnic groups	Number of material cultures used	Percentage (%)
Sheko	33	23.6 <sup>a*</sup>
Mejengir	38	27.1 <sup>a*</sup>
Shekacho	69	49.3 <sup>b*</sup>
Total	140	100

\*Means with standard deviations within the same column followed by same letters (a-e) are not significantly different ( $P < 0.05$ ).

**Table 4.** Comparison of plants reported by Shekacho, Sheko and mejengir Ethnic groups used for the preparation of plant-based material objects.

Plant-based material culture Items	Number of plant species used by Ethnic groups			Total	Percentage (%)
	Shekacho	Shako	Mejengir		
House construction	34	10	6	50	19.2 <sup>a</sup>
Fence	14	1	2	16	6.1 <sup>c</sup>
Musical instruments	18	2	4	24	9.2 <sup>b</sup>
Basketries or containers	9	1	4	14	5.4 <sup>c</sup>
Ornaments	9	-	-	9	3.5 <sup>d</sup>
Tooth brush	6	1	2	9	3.5 <sup>d</sup>
Bathing brush	3	1	3	7	2.7 <sup>d</sup>
Agricultural implements	14	5	3	22	8.4 <sup>b</sup>
Utensils and house hold objects	32	10	8	50	19.2 <sup>a</sup>
Weapon and Tool handles	7	1	1	9	3.5 <sup>d</sup>
Decorations	2	-	3	5	1.9 <sup>e</sup>
Traps and Nets	8	1	1	10	3.8 <sup>d</sup>
Torches	3	2	1	6	2.3 <sup>d</sup>
Traditional marks and tattoos	1	-	1	2	0.8 <sup>e</sup>
Clothes	4	3	2	9	3.5 <sup>d</sup>
Coffin	2	-	-	2	0.8 <sup>e</sup>
Hand cart	1	-	-	1	0.4 <sup>e</sup>
Beehives	11	1	1	13	4.9 <sup>c</sup>
Foot bridge	1	1	1	3	1.2 <sup>e</sup>
Total	179	39	43		
Percentage	69	43	48	261	100

\*Means with standard deviations within the same column followed by same letters (a-e) are not significantly different ( $P < 0.05$ )

handcart and coffin. On the other hand, even though the number of plant species reported to make a specific item varies enormously, about 84% of 19 material cultures were reported by all ethnic groups.

Out of these, higher significance differences ( $P < 0.05$ ) was observed on the number of plant species used for house construction, and household furniture and/or utensils between Shekacho and the rest (Shako and Mejenger) ethnic groups (Table 5). For example, 34 and 32 plant species were reported to be used by Shekacho for house construction and household furniture and/or utensils making, respectively compared to 8 to 10 plant species reported by Shako and Mejenger ethnic groups

for the same purposes.

#### Comparison of plant species for construction purposes

*Arundinaria alpina* (bamboo), *Cyathea manniana* and *Syzygium guineense* were ranked, first, second and third, respectively by key informants of Shekacho ethnic group for construction (Table 5). However, *Cordia africana*, *Baphia abyssinica* and *Malotus oppositifolius* were ranked first, second and third, respectively for construction purposes as reported by key informants

**Table 5.** Preference ranking of nine plants used for construction in Shekacho ethnic group.

Species name	*R <sup>1</sup>	R <sup>2</sup>	R <sup>3</sup>	R <sup>4</sup>	R <sup>5</sup>	R <sup>6</sup>	R <sup>7</sup>	R <sup>8</sup>	R <sup>9</sup>	R <sup>10</sup>	R <sup>11</sup>	R <sup>12</sup>	R <sup>13</sup>	R <sup>14</sup>	R <sup>15</sup>	Total	Rank
<i>Arundinaria alpina</i> K. Schum. Poaceae	9	9	8	9	8	9	9	8	9	8	9	7	8	8	8	126	1 <sup>st</sup>
<i>Cordia africana</i> Lam., Boraginaceae	4	6	4	9	9	8	9	8	9	8	6	7	4	5	5	101	4 <sup>th</sup>
<i>Cyathea manniana</i> Lam. Cyatheaceae	8	9	9	9	9	8	9	8	9	8	6	7	8	7	8	122	2 <sup>nd</sup>
<i>Ekebergia capensis</i> Sparrm. Meliaceae	6	6	6	5	3	5	3	2	3	4	3	2	1	1	2	52	8 <sup>th</sup>
<i>Galiniera saxifraga</i> Hochst.) Bridson Rubiaceae	4	5	5	5	3	3	3	3	5	5	5	5	4	4	6	65	6 <sup>th</sup>
<i>Hippocratea africana</i> Willd.) Loes., Celacteraceae	4	5	5	5	3	3	3	3	5	5	5	5	4	4	5	64	7 <sup>th</sup>
<i>Pouteria adolfi-friederici</i> Engl.) Baehni, Sapotaceae	7	5	5	5	6	6	6	6	6	5	6	6	7	6	6	88	5 <sup>th</sup>
<i>Schefflera abyssinica</i> (Engl.) Harms, Araliaceae	6	4	4	5	3	5	3	2	3	4	3	2	1	1	2	48	9 <sup>th</sup>
<i>Syzygium guineense</i> subsp. <i>afromontanum</i> (Willd.) DC, Myrtaceae	9	8	8	8	9	8	9	8	9	8	7	6	7	8	6	118	3 <sup>rd</sup>

\*Rs-Respondents

of Sheko and Mejengir (Tables 6 and 7) differing from Shekacho ethnic group.

In house construction, *Cyperus dichrostachyus*, *Cyprus* spp., *Eagrotis teff*, *Psychotria orophilia*, *Rhamnus prinodes*, *Ricimnus communis*, and *Pennisetum* sp., are used in roof thatching. The fibers obtained from the bark of *Clematis longicauda*, *Combretum paniculatum*, *Dombia torrida*, *Jasminum abyssinicum*, *Justica schempriana*, *Oncinotis tenuiloba*, *Landolphia buchmanani* provide as ropes for tying the roofs, walls and fences during construction.

#### Comparison of multipurpose plant species (Direct matrix ranking)

The highest values was assigned by key informants of Sheko and Mejengir ethnic groups

to *Cordia africana* as the most multipurpose plant species followed by *Ficus ovate* and *Pouteria adolfi-friederici* in the study area.

*Diospyros abyssinica*, *Baphia abyssinica* and *Manilkara butuji* were the other multipurpose species ranked, respectively. The least ranked species in multipurpose aspect varied between ethnic groups (Table 8, 9). This does not mean that the least ranked species are the less in multipurpose but either threatened and/or less preferred compared to other species. Thus, according to this rank, the survival of the most multipurpose species is under question due to the daily demand of the ethnic groups, which is not supplemented with follow-up and regular planting.

The highest value with the sum of 51 was given to *Arundinaria alpina* as one of the most multipurpose plant species in the area by key informants of shekacho ethnic group followed by

*Cordia africana* and *Galiniera saxifraga* (49 and 40 in the 2nd and 3rd places respectively) *Ficus sur*, *Hallea rubrostipulosa* and *Hippocratea africana* are the other multipurpose species ranking 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> respectively (Table 10).

The least ranked species in multipurpose aspect from the selected species were *Croton macrostachyus* and *Maesa lanceolata*. According to the informants, the least ranked species are the less threatened and the dominantly distributed species in the area however, the survival of the species with the highest rank is under question, especially *Arundinaria alpina*, which is locally threatened as it is dying because of aging (Table 11).

Some studies made in Ethiopia (Tamene, 2000; Hadera, 2000; Hundei, 2001; Berhanu, 2002; Amenu, 2007) have used the method of pair wise ranking where informants made their choices on



**Table 6.** Preference ranking of nine plants used for construction in Mejengir ethnic groups.

Species name	R <sup>1*</sup>	R <sup>2</sup>	R <sup>3</sup>	R <sup>4</sup>	R <sup>5</sup>	R <sup>6</sup>	R <sup>7</sup>	R <sup>8</sup>	R <sup>9</sup>	R <sup>10</sup>	R <sup>11</sup>	R <sup>12</sup>	R <sup>13</sup>	R <sup>14</sup>	R <sup>15</sup>	Total	Rank
<i>Albizia gummifera</i> (J. F. Gmel.) C.A.Sm. Fabaceae	4	2	5	6	6	7	3	6	6	5	6	4	5	6	2	73	4 <sup>th</sup>
<i>Diospyros abyssinica</i> (Hiern) F. White, Ebenaceae	7	6	6	7	7	8	8	7	5	7	8	5	7	7	6	101	3 <sup>rd</sup>
<i>Baphia abyssinica</i> Brummitt, Fabaceae	7	7	8	9	8	9	8	7	7	7	8	8	7	8	7	115	2 <sup>nd</sup>
<i>Mollotus oppositifolius</i> (Geisel) Muell.Arg., Euphorbiaceae	3	4	6	7	6	3	4	4	5	6	7	7	4	5	5	76	7 <sup>th</sup>
<i>Trilepsium madagascariense</i> DC., Moraceae	4	6	4	5	3	5	3	1	3	4	3	2	1	1	2	47	9 <sup>th</sup>
<i>Erythrococa trichogyne</i> (Muell. Arg) Prain., Euphorbiaceae	5	5	5	4	5	6	7	6	6	5	5	5	5	6	7	82	6 <sup>th</sup>
<i>Anthiaria toxicaria</i> Lesch., Moraceae	8	8	7	8	7	8	8	7	6	7	8	5	7	7	6	107	5 <sup>th</sup>
<i>Celitis africana</i> N.L.Burm.f., Ulmaceae	5	5	5	4	5	6	7	6	6	5	5	6	6	6	7	84	8 <sup>th</sup>
<i>Cordia africana</i> Lam., Boraginaceae	8	8	8	9	8	9	8	7	9	7	9	9	7	8	7	121	1 <sup>st</sup>

\*Rs- Respondents.

**Table 7.** Preference ranking of nine plants used for construction in Sheko groups.

Species name	*R <sup>1</sup>	R <sup>2</sup>	R <sup>3</sup>	R <sup>4</sup>	R <sup>5</sup>	R <sup>6</sup>	R <sup>7</sup>	R <sup>8</sup>	R <sup>9</sup>	R <sup>10</sup>	R <sup>11</sup>	R <sup>12</sup>	R <sup>13</sup>	R <sup>14</sup>	R <sup>15</sup>	Total	Rank
<i>Ficus ovate</i> Vahl. Moraceae	4	2	5	6	6	7	3	6	6	5	6	4	5	6	2	73	8 <sup>th</sup>
<i>Diospyros abyssinica</i> F. White, Ebenaceae	7	6	6	7	7	8	8	7	5	7	8	5	7	7	6	101	4 <sup>th</sup>
<i>Baphia abyssinica</i> Brummitt, Fabaceae	7	7	8	9	8	9	8	7	7	7	8	8	7	8	7	115	2 <sup>nd</sup>
<i>Hippocratea pallens</i> (Willd.) Loes., Celactrsae	3	4	6	7	6	3	4	4	5	6	7	7	4	5	5	76	7 <sup>th</sup>
<i>Lagenaria siceraria</i> (Molina) Standl., Curcubitaceae	4	6	4	5	3	5	3	1	3	4	3	2	1	1	2	47	9 <sup>th</sup>
<i>Antiaris toxicaria</i> Lesch., Moraceae	5	5	5	4	5	6	7	6	6	5	5	5	5	6	7	82	6 <sup>th</sup>
<i>Malotus oppositifolius</i> Geisel) Muell.Arg., Euphorbiaceae	8	8	7	8	7	8	8	7	6	7	8	5	7	7	6	107	3 <sup>rd</sup>
<i>Hippocratea africana</i> Willd.) Loes., Celacteraceae	5	5	5	4	5	6	7	6	6	5	5	6	6	6	7	84	5 <sup>th</sup>
<i>Cordia africana</i> Lam., Boraginaceae	8	8	8	9	8	9	8	7	9	7	9	9	7	8	7	121	1 <sup>st</sup>

\*Rs-Respondents

**Table 8.** Comparison of multipurpose plants in Mejengir ethnic group.

List of species	Use categories							Total	Rank
	Construction	Musical instruments	Farming implements	House hold articles	Weapon	Tool handles	Beehives		
<i>Diospyros abyssinica</i> F. White, Ebenaceae	7	8	8	8	6	5	8	50	2 <sup>nd</sup>
<i>Albizia gummifera</i> (J. F. Gmel.) C.A.Sm. Fabaceae	8	6	8	4	4	8	3	41	4 <sup>th</sup>
<i>Baphia abyssinica</i> Brummitt, Fabaceae	8	2	8	8	3	8	1	38	5 <sup>th</sup>
<i>Mollotus oppositifolius</i> Geisel) Muell.Arg., Euphorbiaceae	8	2	0	8	1	3	5	27	7 <sup>th</sup>
<i>Trilepsium madagascariense</i> DC., Moraceae	8	5	3	7	6	5	8	42	3 <sup>rd</sup>
<i>Erythrococa trichogyne</i> (Muell. Arg) Prain., Euphorbiaceae	7	6	4	4	6	5	2	34	6 <sup>th</sup>
<i>Anthiaris toxicaria</i> Lesch., Moraceae	8	1	5	5	8	5	0	32	8 <sup>th</sup>
<i>Cordia africana</i> Lam., Boraginaceae	8	8	7	7	7	7	8	52	1 <sup>st</sup>

**Table 9.** Comparison of multipurpose plants in Sheko ethnic groups.

List of species	Use categories							Total	Rank
	Construction	Musical instruments	Farming implements	Household articles	Weapon	Tool handles	Beehives		
<i>Ficus ovate</i> Vahl. Moraceae	7	8	8	8	6	5	8	50	5 <sup>th</sup>
<i>Diospyros abyssinica</i> F. White, Ebenaceae	8	6	8	4	4	8	3	41	2 <sup>nd</sup>
<i>Baphia abyssinica</i> Brummitt, Fabaceae	8	2	8	8	3	8	1	38	3 <sup>rd</sup>
<i>Hippocratea africana</i> Willd.) Loes., Celacteraceae	8	2	0	8	1	3	5	27	7 <sup>th</sup>
<i>Pouteria adolfi-friederici</i> (Engl.) Baehni, Sapotaceae	8	5	3	7	6	5	8	42	4 <sup>th</sup>
<i>Manilkara butuji</i> Chiov. Sapotaceae	7	6	4	4	6	5	2	34	6 <sup>th</sup>
<i>Mallotus oppositifolius</i> (Geisel) Muell.Arg., Euphorbiaceae	8	1	5	5	8	5	0	32	8 <sup>th</sup>
<i>Cordia africana</i> Lam., Boraginaceae	8	8	7	7	7	7	8	52	1 <sup>st</sup>

**Table 10.** Comparison of multipurpose plants in Shekacho ethnic groups through direct matrix.

List of species	Use categories							Total	Rank
	Construction	Musical instruments	Farming implements	Household articles	Weapon	Tool handles	Beehives		
<i>Cordia africana</i> Lam., Boraginaceae	8	7	6	7	6	7	8	49	2 <sup>nd</sup>
<i>Maesa lanceolata</i> Forssk. Myrcinaceae	6	1	4	3	3	4	1	22	8 <sup>th</sup>
<i>Hallea rubrostipulosa</i> (K. Schum.) J. F. Leroy, Rubiaceae	7	5	3	7	5	3	8	38	5 <sup>th</sup>
<i>Galiniera saxifraga</i> (Hochst.) Bridson, Rubiaceae	7	7	8	4	6	6	2	40	3 <sup>rd</sup>
<i>Ficus sur</i> Forssk., Moraceae	7	2	5	7	8	2	8	39	4 <sup>th</sup>
<i>Croton macrostachyus</i> Del., Euphorbiaceae	7	4	5	5	2	5	6	34	7 <sup>th</sup>
<i>Arundinaria alpina</i> K. Schum., Poaceae	8	8	6	8	7	6	8	51	1 <sup>st</sup>
<i>Hippocratea africana</i> (Willd.) Loes., Celastraceae	8	4	4	8	1	4	6	35	6 <sup>th</sup>

**Table 11.** Paired comparison of eight plants used for construction and house hold equipments in Shekacho ethnic group in reference to cultural value.

Species	R1-R15								Frequencies	Rank
	<i>Arundinaria alpina</i>	<i>Cordia africana</i>	<i>Cyathea manniana</i>	<i>Syzygium guineense</i>	<i>Galiniera saxifraga</i>	<i>Hallea rubrostipulosa</i>	<i>Macaranga capensis</i>	<i>Ficus sur</i>		
<i>Arundinaria alpine</i> K. Schum., Poaceae	-	Aa	Cm	Aa	Aa	Aa	Aa	Aa	6x	1 <sup>st</sup>
<i>Cordia africana</i> Lam., Boraginaceae	-	-	Ca	Ca	Ca	Ca	Ca	Ca	6x	1 <sup>st</sup>
<i>Cyathea manniana</i> Hook. Cyatheaceae	-	-	-	Sg	Cm	Cm	Cm	Cm	5x	2 <sup>nd</sup>
<i>Syzygium guineense</i> subsp. <i>afromontanum</i> (Willd.) DC. Myrtaceae	-	-	-	-	Sg	Hr	Sg	Sg	4x	3 <sup>rd</sup>
<i>Galiniera saxifraga</i> (Hochst.) Bridson Rubiaceae	-	-	-	-	-	Hr	Mc	Fs	0x	6 <sup>th</sup>
<i>Hallea rubrostipulosa</i> (K. Schum.) J. F. Leroy. Rubiaceae	-	-	-	-	-	-	Hr	Fs	3x	4 <sup>th</sup>
<i>Macaranga capensis</i> Baill.) Benth. Eupphorbiaceae	-	-	-	-	-	-	-	Fs	1x	5 <sup>th</sup>
<i>Ficus sur</i> Forssk. Moraceae	-	-	-	-	-	-	-	-	3x	4 <sup>th</sup>

$$N(n-1)/2, 8(8-1)/2 = 8 \times 7 / 2 = 56 / 2 = 28$$

**Table 12.** Paired comparison of five plants used for construction and house hold equipments in Mejengir ethnic groups in reference to strength and cultural value.

Species	R1-R15					Frequencies	Rank
	<i>Baphia abyssinica</i>	<i>Cordia africana</i>	<i>Diospyros abyssinica</i>	<i>Ficus ovata</i>	<i>Hippocratea africana</i>		
<i>Baphia abyssinica</i> Brummitt, Fabaceae	-	Ca	Ba	Ba	Ha	2x	3 <sup>rd</sup>
<i>Cordia africana</i> Lam., Boraginaceae	-	-	Ca	Ca	Ca	4x	1 <sup>st</sup>
<i>Diospyros abyssinica</i> F. White, Ebenaceae	-	-	-	Da	Ha	1x	4 <sup>th</sup>
<i>Ficus ovata</i> Vahl. Moraceae	-	-	-	-	Ha	0x	5 <sup>th</sup>
<i>Hippocratea africana</i> Willd.) Loes., Celacteraceae	-	-	-	-	-	3x	2 <sup>nd</sup>

**Table 13.** Paired comparison of five plants used for construction and house hold equipments in Sheko ethnic group in reference to strength and cultural value.

Species	R1-R15					Frequencies	Rank
	<i>Baphia abyssinica</i>	<i>Cordia africana</i>	<i>Diospyros abyssinica</i>	<i>Trichilia prieuriana</i>	<i>Hippocratea africana</i>		
<i>Baphia abyssinica</i> Brummitt, Fabaceae	-	Ca	Ba	Ba	Ha	2x	3 <sup>rd</sup>
<i>Cordia africana</i> Lam., Boraginaceae	-	-	Ca	Ca	Ca	4x	1 <sup>st</sup>
<i>Diospyros abyssinica</i> F. White, Ebenaceae	-	-	-	Da	Ha	1x	4 <sup>th</sup>
<i>Trichilia prieuriana</i> Sond. Meliaceae	-	-	-	-	Ha	0x	5 <sup>th</sup>
<i>Hippocratea africana</i> Willd.) Loes., Celacteraceae	-	-	-	-	-	3x	2 <sup>nd</sup>

individual basis.

#### Paired comparison on plants used in material culture by the Mejengir ethnic group

In this study, 10 informants from Mejengir ethnic group were asked to indicate the efficacy and popularity of species used for construction and house hold equipments and they did paired comparison of five plants by using  $(N(n-1)/2, 5(5-1)/2 = 5 \times 4/2 = 20/2 = 10)$  formula (Table 12). *Cordia africana*, *Hippocratea africana*, *Baphia abyssinica*, *Diospyros abyssinica* and *Ficus ovata* were ranked 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> respectively.

#### Paired comparison on plants used for material culture by the Shako ethnic group

The same to the above ethnic groups, 10 informants from Mejengir ethnic group were asked to indicate the efficacy

and popularity of species used for construction and house hold equipments and they did paired comparison of five plants (Table 13). *C. africana*, *Hippocratea africana*, *Baphia abyssinica*, *Diospyros abyssinica* and *Trichilia prieuriana* were ranked 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> respectively. Most of the results among the Sheko and Mejengir ethnic groups are similar.

#### Local threats of plants used for material culture and indigenous knowledge in the Study Areas

It was observed that plants species in the study area were being threatened. The major threat factor with the highest rank assigned by informants was agricultural expansion followed by illegal wood harvest and construction (Table 14).

The informants reported that there are beliefs, which have played great role for the preservation of plants. To cut a plant part is not allowed, even a climber. Hence,

**Table 14.** Ranking of threat factors to plant species in Masha and Yeki districts responded by 15 informants.

Threat factors	R <sup>1</sup>	R <sup>2</sup>	R <sup>3</sup>	R <sup>4</sup>	R <sup>5</sup>	R <sup>6</sup>	R <sup>7</sup>	R <sup>8</sup>	R <sup>9</sup>	R <sup>10</sup>	R <sup>11</sup>	R <sup>12</sup>	R <sup>13</sup>	R <sup>14</sup>	R <sup>15</sup>	Total	Rank
Agricultural expansion	9	8	7	8	9	9	9	8	9	6	8	9	8	9	8	124	1 <sup>st</sup>
Illegal wood harvest	8	8	8	7	7	8	8	7	5	7	8	5	7	7	6	106	2 <sup>nd</sup>
Construction	7	7	8	6	8	6	7	6	6	6	8	6	7	6	7	102	3 <sup>rd</sup>
Fuel wood	3	4	6	7	6	3	4	4	5	6	7	7	4	5	5	76	6 <sup>th</sup>
Deforestation	4	6	4	5	3	5	3	1	3	4	3	2	1	1	2	47	7 <sup>th</sup>
Settlement	5	5	5	4	5	6	7	6	6	5	5	5	5	6	7	82	5 <sup>th</sup>
Forest fire	5	8	7	5	7	5	8	7	6	7	8	5	7	7	6	98	4 <sup>th</sup>

spiritual and religious beliefs of the three ethnic groups in Sheka, especially the Shekacho ethnic group have developed strong effect on its use and conservation. As reported by informants there are powerful beliefs, rituals and spirits and taboos for each ethnic group in Sheka zone. They believe that people who violate these taboos will die but there is high violation of these traditional rules by dwellers from other parts of Ethiopia, mainly in Yeki district.

## DISCUSSION

Although the deterioration of forest species is increasing in the study area due to agricultural expansion and other threat factors, there is still rich indigenous knowledge of making plant material culture by Shekacho, Sheko and Mejengir ethnic groups in Masha and Yeki districts of Sheka Zone, Southwest Ethiopia. A total of 113 plant species that are in use in these districts serve as raw materials for various construction purposes, traditional arts and handcrafts. A study conducted in and around the Awash National Park in central Ethiopia reported 156 plant species (Bahru, 2012).

Another study conducted in Kersa district,

Jimma Zone, Oromia Regional State, southwest Ethiopia revealed 46 plant species (Abera, 2013). Most of the plant species reported were also mentioned by authors in studies conducted elsewhere in Ethiopia; 26 plant species in Gemedo-Dalle (2004), 15 in Bahru et al. (2012), 19 in Rainer (2011). The most possible reasons for variations in number of plant species between the current and previous studies are due to difference in topography and traditional knowledge of the study sites.

The majority of plants used in material culture in the studied districts were obtained from the wild. The results concur with that of other studies conducted in Ethiopia (Bahru et al., 2012; Abera, 2013) and in India (Choudhay et al., 2008). Most of the species collected from the wild are highly exposed to various threat factors and as a result many of them including *C. Africana*, *F. ovate*, *G. saxifraga* and *Pouteria adolfi-friederici* are rarely encountered. Special attention should be given to those more preferred and multipurpose plants that were indicated by preference ranking exercise as the most threatened ones.

Tree was the most common growth habit used in the manufacture of plant material culture in the Masha and Yeki districts. This finding is in agreement with the reported study by Abera

(2013) in the neighboring Ghimbi district of Oromia regional state, which may indicate their relatively better abundance in the forest area as compared to other growth forms. However, a study conducted in and around Awash National Park reported the dominance of shrubs used in making plant material culture (Bahru et al., 2012).

Stem was the most used plant part in the manufacture of plant material culture in the present study as compared to other plant parts. A study conducted in Kersa District, Jimma Zone of Oromia regional state in southwest Ethiopia also showed the dominance of woody stem in the manufacture of plant material culture (Abera, 2013). This implies the presence of hardwood plant species and the study area is largely covered by forest.

According to current study results, a large number of plants were identified to be used in dried and fresh forms in material preparations. There were also many plants from which, parts were claimed to either be used as dried or fresh materials. Of the preparation methods, a large number of plants were reported to be prepared by carving followed by wrapping and splitting. This might be due to the wide use of woody trees to make plant material culture in the study area. A substance like cold water, ash, and clay was

reported to be used for wetting, washing and decoration during the preparation of materials. Axes, blades, knives, sickle and other sharp materials are used for cutting, carving, peeling and mowing during the preparation of materials from the plants. Similarly, Abera (2013) reported the use of dried and fresh materials, and mainly curving method for preparation.

Of the plant material cultures reported by ethnic informants, Shekacho ethnic group contributed the highest proportion as compared to Mejengir and Sheko ethnic groups. This may be due to the availability of a diversity of plant species and large population of Shekacho ethnic group (CSA, 2009) with a wide knowledge in the study area. A study conducted in and around the Awash National Park of Central Ethiopia also showed that the highest number of plant species and plant material cultures were reported by Oromo informants as compared to Afar ones (Bahru et al., 2012). Local communities of the Shekacho, Sheko and Mejengir ethnic groups in Masha and Yeki districts of Sheka Zone are highly dependent on indigenous plant species for various construction, household furniture and/or utensils, dry fencing, roofs and/or walls thatching. Similarly, the study conducted in east Shoa Zone, Ethiopia (Bahru et al., 2012) indicated the similarity of the majority of the plant species for house construction reported by Oromo and Afar nationals but with the frequent use of *Acacia* species (as exotic species) due to the scarcity of indigenous plant species as a result of deforestation for the purpose of agriculture. In addition, the fiber obtained from the bark of several plant species provides ropes for tying the walls and roofs during house construction. Roofs, in turn, were thatched with a variety of grass species in the study area in agreement with the reported studies of Bahru (2012), Jacobs and Schloeder (1993). On the other hand, plants with thorns were reported to be used for fencing house, farmland and animal enclosures in the study area. However, almost all plant materials for house construction including corrugated iron sheets, stand metals and stone blockers are substituting the use of plant species for house construction through time mainly in urban kebeles due to acculturation.

On the other hand, the rest of the plants in the study area were reported to be sources of handicrafts and traditional arts while others are used for ritual values, tooth brush, tool handles, household utensils, fencing tool and musical instruments. Likewise, Gemedo-Dalle et al. (2004), Bahru (2012) and Munishi et al. (2006) reported many plant species in Borana and central Shoa of Ethiopia and Tanzania, respectively used as a source of handicrafts, traditional arts, and ritual.

The plant species of material culture in Masha and Yeki districts have also common cultural values for all ethnic groups of the study area due to cultural diffusion and sharing of resources. Similarly, a study reported in Bahru et al. (2012) confirmed such similar use of plant species between Oromo and Afar Nations in Ethiopia; it indicates

the existence of common knowledge and cultural diffusion across a range of diverse cultures and geographical areas. In contrast, plants used in material culture also have certain cultural and ritual values within particular ethnic groups, which indicate that IK distribution can be influenced by socio-cultural factors of different ethnic groups.

Of the plant species used as material culture in the study area, some were found to have multipurpose values (use diversity). In this regard, the highest values assigned for the respective plant species by key informants were found to be as the most multipurpose plant species as compared to the least ranked species. However, according to the informants, this does not mean that the least ranked species are the less in multipurpose but either threatened and/or less preferred compared to other species. Thus, according to this rank, the survival of the most multipurpose species is under question due to the daily demand by the local community. A study reported from in and around the Awash National Park, central Ethiopia indicated that out of the total recorded plant species, which serve as a source of material culture, 16% of the species were found to have 4 and 5 distinct uses each, while 34% with 6 uses to the local people (Bahru et al., 2012).

In this study, the major threat factor with the highest rank assigned by informants was agricultural expansion followed by illegal wood harvest and construction. These were probably due to the fertility of the land suitable for agriculture. Specifically, timber production by business people has severely accelerated the high rate of exploitation of plant species like *Cordia africana* as suggested from Yeki district informants. As a result, the number of material objects made from plants is decreasing at an alarming rate and is replaced by industrial products extending to the household of the rural communities. The habitat of most plants is increasingly becoming eroded due to over harvesting of trees for fuel, wood and urbanization throughout the region (Adal, 2004). The lack of ownership, diminished role of clan leaders in forest and expansion of private sector investment for temporary benefit have brought cultural changes that alter the importance of traditional resource management practices, exposing the community to various socio-economic problems (Woldemariam and Fetene, 2007). In addition, as reported in Woldemariam and Fetene (2007) during the last decades several new threat factors, such as investment projects for new coffee and tea plantation development and fast population growth due to immigration related to settlement schemes and the agricultural development projects, have resulted in increasing pressures on the forests.

The informants reported that there were beliefs, which have played great role for the preservation of plants by the three ethnic groups. To cut a plant part is not allowed, even a climber. Hence, spiritual and religious beliefs of the three ethnic groups in Sheka, especially the Shekacho

ethnic group have developed strong effect on its use and conservation. In agreement with the present study, Adal (2004) has made similar conclusions in the study conducted in North Shoa Zone Ethiopia, about the roles of magical and religious beliefs and environmental perception on the use and management of plant species. As reported by Woldemaïam and Fetene (2007) there are powerful beliefs, rituals and spirits and taboos for each ethnic group in Sheka zone. They believe that people who violate these taboos will die but there is high violation of these traditional rules by dwellers from other parts of Ethiopia, mainly in Yeki district. However, these indigenous beliefs were dismantled as a result of non-indigenous settlement, agricultural expansion and state-led programme investments in new and fertile areas of the country.

## Conclusion

A total of 113 plant species that have 19 major use categories in material culture were reported from three ethnic groups (Shekacho, Sheko, Mejengir) of Masha and Yeki Districts of Sheka Zone, SNNPRS, and southwest Ethiopia. Out of 19 major categories, 49.29, 23.57 and 27.14% were reported by Shekacho, Sheko and Mejengir ethnic groups, respectively. The most potential and multipurpose plant species exposed to a wide human devastation were also documented in this study for urgent conservation plan.

## Conflict of interests

The authors have not declared any conflict of interest.

## ACKNOWLEDGEMENTS

The authors would like to thank Jimma University for financial support, Sheka Zone Administration Office, Masha and Yeki District Offices, and local communities for their positive approach and provision of valuable information.

## REFERENCES

- Abera B (2013). Plants used in material culture in Oromo community, Kersa district, Jimma Zone, Southwest Oromia, Ethiopia. *Afr. J. Plant Sci.* 7(7):285-299
- Adal H (2004). Traditional management and conservation of useful plants in dryland parts of North Shoa Zone, of Amhara National Region, An Ethnobotanical Approach. M.Sc. Thesis, AAU. 174pp.
- Anonymous (2008). Maritu. Sheka zone culture, tourism and state communication department. Annual Bulletin 1(2). (Amharic Version), Ethiopia.
- Aumeeruddy Y, Shengji P (2003). Applied ethnobotany: case-studies from the Himalayan region. People and plants working paper 12. WWF, Godalming, UK.
- Bahru T, Asfew Z, Demissew S (2012). Indigenous knowledge on plant species of material culture (construction, traditional arts and handicrafts) used by Afar and Oromo nations in and around Awash National Park, Ethiopia. *Global J. Hum. Soc. Sci.* 12:11.
- Balick MJ, Cox PX (1996). Plants, people and culture. The science of ethnobotany. Scientific American Library, New York, USA.
- Choudhary BL, Katewa SS, Galav PK (2008). Plants in material culture of tribal and rural communities of Rajsamand district of Rajasthan, Indian J. Trad. knowl. 7(1):11-22.
- Cotton CM (1996). Ethnobotany: Principles and Applications. John Wiley and Sons, New York. pp. 412.
- CSA (2009). Central Statistical Agency, Addis Ababa, Ethiopia.
- Cunningham AB (2001). *People, park and plant use: Recommendations for multiple-use zones and development alternatives around Bwindi Impenetrable National Park*, Uganda.
- Dunkelberg K (1992). Bamboo as a building material, In: Bambus, Karl, K. and Verlag S. Contributions from the seminar: Design with bamboo, 2001.
- Edwards S, Demissew S, Hedberg I (1997). Flora of Ethiopia and Eritrea. Volume 6. Hydrocharitaceae to Arecaceae. The National Herbarium, Addis Ababa, Ethiopia, and Department of Systematic Botany, Uppsala, Sweden.
- Edwards S, Tadesse M, Demissew S, Hedberg I (2000). Flora of Ethiopia and Eritrea. *Magnoliaceae to Flacourtiaceae*. The National Herbarium, Addis Ababa, Ethiopia, and Department of Systematic Botany, Uppsala, Sweden. 2:1.
- Edwards S, Tadesse M, Hedberg I (1995). Flora of Ethiopia and Eritrea. Volume 2, part 2. Canellaceae to Euphorbiaceae. The National Herbarium, Addis Ababa, Ethiopia, and Department of Systematic Botany, Uppsala, Sweden.
- Gebre-egziabher T (1991). Diversity of the Ethiopian flora. In: plant genetic resources of Ethiopia, Engles, J.M.M., Hawkes, J.G. and Worede, M., Cambridge University press, Cambridge pp. 75-81.
- Gemedo-Dalle T, Brittle ML, Johannes I (2004). Plant biodiversity and ethnobotany of Borana pastoralists in Southern Oromia, Ethiopia. *Econ. Bot.* 59(1):43-65.
- Hadera G (2000). A study on the ecology and management of Dess'a Forest in the Northeastern Escarpment of Ethiopia. MSc. Thesis. Addis Ababa University, Addis Ababa.
- Hattori S (2006). Utilization of Marantaceae Plants by the Baka Hunter-Gatherers in Southeastern Cameroon. *Afr. Study Monogr.* 33:29-48.
- Hedberg I, Edwards S (1995). Flora of Ethiopia and Eritrea. Volume 7. Poaceae. The National Herbarium, Addis Ababa, Ethiopia, and Department of Systematic Botany, Uppsala, Sweden.
- Hedberg I, Friis I, Edwards S (2004). Flora of Ethiopia and Eritrea. Volume 4, part 2. Asteraceae. The National Herbarium, Addis Ababa, Ethiopia, and Department of Systematic Botany, Uppsala, Sweden.
- Hedberg I, Kelbessa E, Edwards S, Demissew S, Persson E (2006). Flora of Ethiopia and Eritrea. Volume 5. Gentianaceae to Cyclocheilaceae. The National Herbarium, Addis Ababa, Ethiopia, and Department of Systematic Botany, Uppsala, Sweden.
- IBC (Institute of biodiversity conservation) (2008). Ethiopia: Second Country Report on the State of Plant Genetic Resources for Food and Agriculture (PGRFA) to FAO, Addis Ababa, Ethiopia. pp. 45.
- Jacobs M, Schloeder CA (1993). The Awash National Park management plan, 1993-1997. Nyzs-The wildlife conservation society International and the Ethiopian Wildlife Conservation Organization. Ministry of Natural Resources Development and Environmental Protection. Addis Ababa, Ethiopia. NYZS- The Wildlife Conservation Society, New York, USA and the Ethiopian Wildlife Conservation Organization. Addis Ababa, Ethiopia. 285pp.
- Johnson M (1992). Research on traditional environmental knowledge: its development and its role. In: M. Johnson (ed.), *Lore: Capturing Traditional Environmental Knowledge*, Ottawa. pp. 3-4.
- Jotte Z (2007). The impact of cultural changes on the people of Sheka and their traditional resource management practices: the case of four kebeles in Masha Woreda. pp. 89-136.
- Martin GJ (1995). Ethnobotany: a method manual. Chapman and Hall, London. p. 267.
- Miller D, Tilley CY (1996). "Editorial." *J. Mat. Cult.* 1:5-14.
- Munishi PKT, Temu RPC, Kessy JF, Sitoni D, Majenda M (2006). Ethnobotany and local use of Indigenous plant species in representative

- sites of the Somali-Masai phytochorion in Northern Tanzania. In: Drylands Ecosystems: Challenges and Opportunities for Sustainable Natural Resources Management. Proceedings of the Regional Workshop held at Hotel Impala, Arusha, Tanzania, June 7-9, 2006 (Nikundiwe, A. M. and Kabigumila, J. D. L., eds). pp.112-120.
- Parezo NJ (1996). Material Culture, In: Levinson, David; Melvin Ember Encyclopedia of Cultural Anthropology, 3:748.
- Rainer WB, Swartzinsky PA, Worede P, Evangelista P (2011). Plant use in Odo-Bulu and Demaro, Bale region, Ethiopia J. Ethnobiol. Ethnomed. 7:28.
- Schlereth T (1982). Material Culture Studies in America: American Association for State and Local History. Nashville.
- Sophia T (2005). Maale Material Objects in their social and ritual context. M. A. Thesis. Johannes Gutenberg University, Mainz, Germany.
- SZFEDD (Sheka Zone Finance and Economy Development Department, Data Collection and Dissemination Process). (2012). Basic data of Sheka Zone, Masha, Ethiopia.
- Tamene B, Bekele T, Kelbessa E (2000). An Ethnobotanical study of the Semi-wetland Vegetation of Cheffa. Ethiopia.
- Terashima H (2001). The relationships among plants, animals and man in the African tropical rain forest. Afr. Study Monogr. 27:43-60.
- Tika PS, Borthakur SK (2008). Ethnobotanical observations on Bamboos among *Adi* tribes in Arunachal Pradesh. Indian J. Trad. Knowl. 7:594-597.
- Turner NJ (2000). Ethnobotany: future directions for the new millennium. J. NASA, 16(1):15-18.
- Wiersum KF (1997). Indigenous exploitation and management of tropical forest resources: an evolutionary continuum in forest people interactions. Agric. Ecosyst. Environ. 63:1-16.
- Woldemariam T, Fetene M (2007). Forests of Sheka: Ecological, social, legal and economic dimensions of recent land use/land cover changes, overview and synthesis. In: Masresha Fetene (ed.), Multidisciplinary case studies on impact of landuse/ landcover changes, Southwest Ethiopia. MELCA Ethiopia, Addis Ababa. pp. 1-20.
- World Bank (1998). Indigenous knowledge for development; a framework for action knowledge and learning center Africa region.



**Appendix 1.** List of plant species used for material culture in Sheka Zone; Masha and Yeki district. (T = tree, Sh = shrub, T/Sh = tree/shrub, Sh/H= shrub/herb, H = herb, Cl = climber, F= fern: local names Sh1=Shakinono; Sh2= Shekogna and Mgr= Mejangiregna)

Collection number	Scientific name	Family	Local Name (Mejengir, Shako and Shakinono)	Habit	Parts used	Form used	Methods of preparation	Uses for material culture and Notes
2237 •SY	<i>Acanthus eminens</i> C.B.Clarke	Acanthaceae	Peecho (Sh1)	Sh	Stem	Fresh	Splitting	“WUTO” (hole sealing) for roof NB: - The fresh is chosen for bending easily unless it is broken if dried.
2247	<i>Alangium Chinense</i> (Lour) Harms	Alangiaceae	Shotto (Sh1)	T	Stem	Dried and fresh	Carving and Sharpening	Beehive, beehive hanging, Torch or Match (twig), Construction NB: have light stem
2202	<i>Albizia gummifera</i> (J. F. Gmel.) C.A.Sm.	Fabaceae	C'ato (Sh1); Kasoy(Mgr)	T	Stem	Fresh and dried	Carving , peeling the bark	Beehive hanging, beehive(YEGILO), fence, house construction, bathing (in Shako ethnic groups) NB: They refer the dried one to handle easily
2187	<i>Allophylus abyssinicus</i> (Hochst.) Radlkofer	Sapindaceae	She'o (Sh1)	T	Stem and branch	Dried	Carving	Construction, farming implements
2210	<i>Antiaris toxicaria</i> Lesch.	Moraceae	Tengi (Mgr & Sh2)	T	Stem, bark and stem	Fresh and dried	Beating up and Peeling the bark, Soaking in the water and squeezing	Cloth (bark), Sac (to store grain), vessel cleaning sponge, Blanket and mat
2235	<i>Apodytes dimidiata</i> E. Mey. ex Am.	Icacinaceae	Wundabo (Sh1)	T	Stem	Fresh and dried	Carving	beehive hanging (because of suitable branches) and construction In basketries, irrigation pipe, brooms(leaf), cooking utensil, water bottles, processing Ensete (MAARO), construction (fence and house), beehive (both culms and Culm sheath are used), floor mat, chairs, DOLLO (water container), cups, GAMO (traditional tray), pipe used for smoking tobacco, bed, etc.
2227	<i>Arundinaria alpina</i> K. Schum.	Poaceae	Ho'o(Sh1)	T/ Sh	Culm, culms sheath, branch and twigs,	Fresh	Splitting and Weaving	Small musical instruments (Whistle and flute)
2255	<i>Arundo donax</i> L.	Poaceae	Shombok'o (Sh1, Sh2 and Mgr)	T/ Sh	Culm	Dried	Burrowing (making a hole)	Small musical instruments (Whistle and flute)
2256	<i>Baphia abyssinica</i> Brummitt	Fabaceae	Shifu(Sh2); Duwe(Mgr.)	T	Branch, stem	Fresh and dried	Carving	Tooth brush (twig), the most important plant for construction and farm implements in Shako and Mejengir ethnic group.

## Appendix 1. Contd.

Collection number	Scientific name	Family	Local Name (Mejengir, Shako and Shakinono)	Habit	Parts used	Form used	Methods of preparation	Uses for material culture and notes
2152	<i>Bersama abyssinica</i> Fresen.	Melanthaceae	Booko (Sh1)	T	Stem	Fresh and dried	Burrowing and carving	Beehive hanging, wood to make mortar, fence, Pestle, ploughs. Wood is referred for musical instruments and for house construction because it is not eaten by ants and beetle. For carving a pillow
2172	<i>Brucea antidysentrica</i> J. F. Mill.	Simaroubaceae	Nuqaasho (Sh1)	T	Stem	Fresh and dried	Carving	NB: The smoke and the plant smell are bad. Can be used as insect repellent
2192	<i>Canthium oligocarpum</i> Hiern	Rubiaceae	C'oeche-afo (Sh1)	Sh	Stem	Dried	Sharpening	Construction
2151	<i>Cassipourea malosana</i> (Baker) Alston.	Rhizophoraceae	Waraallo (Sh1)	T	Stem and branch	Dried	Sharpening	Beehive hanging, farm implements, pestle, Weapon, "MATO", trap, ornaments(branch)
2223	<i>Celtis africana</i> N.L.Burm.f.	Ulmaceae	Gonji (Mgr)	T	Stem	Dried	Carving	Tools; wood used to make ploughs
2228	<i>Chionanthus mildbraedii</i> (Gig & Schellenb.) Stearn	Oleaceae	Shigawo (Sh1)	T	Stem	Dried	Carving	Farm implement, tool handle
2195	<i>Clausena anisata</i> (Willd.) Benth.	Rutaceae	Ermicho(Sh1); Ermasoy (Mgr);Enshu (Sh 2)	T/ Sh	young stems and branch	Fresh and dried	Peeling or carving the tip	Tooth brush
2160	<i>Clematis longicauda</i> Steud. ex A. Rich.	Ranunculaceae	Shego(Sh1)	Cl	Stem	Fresh	Wrapping	Rope for construction of fence
2220	<i>Coffea arabica</i> L.	Rubiaceae	Moye (mgr)/buno (Sh1)	T/ Sh	Stem	Dried	Carving	Construction It is forbidden to cut it unless it fallen down or out of use for drinking b/c they believe it has so many uses rather than material culture.
2253	<i>Colocasia esculenta</i> (L.) Schott.	Araceae	Baaka or Goddarree (sh2 &Mgr)/Qiiddo (Sh1)	H	Leaf	Fresh	Wrapping	To wrap market foods, plate, use for drinking water as cup.
2232	<i>Combretum paniculatum</i> Vent.	Comberetaceae	Bergo (Sh1)	Cl	Stem	Fresh	Wrapping	Rope for construction
2199	<i>Cordia africana</i> Lam.	Boraginaceae	Di'o (Sh1); Danpe (Mgr); Danpa(Sh2)	T	Stem , bark, leaf	Dried and fresh	Carving	Construction (timber), house hold equipments, the bark peeled and use as a rope, the buttress roots use for musical instrument (drum), plate(leaf)
2168	<i>Croton macrostachyus</i> Del.	Euphorbiaceae	Shomo(Sh1)	T	Stem and root	Dried	Carving	Tool handle, beehive, house construction (roof), root for tool handle(knife handle)

## Appendix 1. Contd.

Collection number	Scientific name	Family	Local Name (Mejengir, Shako and Shakinono)	Habit	Parts used	Form used	Methods of preparation	Uses for material culture and notes
2159	<i>Cyathea manniana</i> Hook.	Cyatheaceae	Sesino(Sh1)	T	Stem	Dried	Carving and removing the spines and leaves	house wall construction and fencing
2254	<i>Cymbopogon citratus</i> (DC.) Stapf.	Poaceae	Toocho (Sh1)	H	Leaf	Fresh	Rubbing	Vessel cleaning specially for milk bottles
2240	<i>Cyperus dichroostachyus</i> Hochst.	Cyperaceae	Tono (Sh1)	H	Leaf	Fresh and dried	Mowing	Roof thatching in the wild, Weave floor mats.
2257	<i>Cyprus sp.</i>	Cyperaceae	Disho(Sh1)	H	Grass leaf	Dried	Mowing	Roof thatching ; the grass is sawn when it starts drying
2179	<i>Deinbollia kilimandscharica</i> Taub.	Sapindaceae	Qaaso(Sh1)	T/ Sh	Stem and leaf	Fresh and dried	Carving	Wedge, leaf bedding in forest (camp)
2213	<i>Diospyros abyssinica</i> (Hiern) F. White	Ebenaceae	Kuri (Mgr)	T	Stem	Dried	Sharpening	Strong wood for construction , farm implements, pestle, cloth (for males in Shako ethnic groups), tool handle NB: wood used for the pestle is always hard
2205	<i>Dombeya torrida</i> (J.F. Gmel.) P. Bamps	Sterculiaceae	Bo'aro(Sh1)	T	Bark or Peel	Fresh	Peeling and tearing	Fiber, bark peeled to make a rope and used in construction and for trapping.
2251	<i>Dracaena afromontana</i> Mildbr.	Dracaenaceae	Fishino (Sh1)	T	stem	Dried	Splitting	Fence
2198	<i>Dracaena fragans</i> (L.) Ker Gawl.	Dracaenaceae	Emo(Sh1)/ serte / Tesit(Mgr)	T	stem	Dried	Splitting	Cloth, fence
2252	<i>Dracaena steudneri</i> Engl.	Dracaenaceae	yudo(Sh1)	T	Stem, leaf	Dried	Splitting	Fence
2173	<i>Drynaria volkensii</i> Hieron.	Polypodiaceae	OkO(Sh1)	F	Leaf	Dried	Wrapping for sealing	Seal beehive
2214	<i>Ehretia cymosa</i> Thonn.	Boraginaceae	Jigemoy (Mgr) ; Yoogaamo (Sh1)	T/ Sh	stem	Dried	Carving	Farm implement
2167	<i>Ekebergia capensis</i> Sparrm.	Meliaceae	Ororo(Sh1)	T	Stem	Dried	Carving	Beehive hanging, door, window,
2244	<i>Ensete ventricosum</i> (Welw.) Cheesman	Musaceae	Qocho /qaawo(Sh1) Oudu(sh2)	H	Pseudo stem, leaf and leaf stalk	Dried and fresh	Chopping the pseudostem to extract the fiber and weaving	Fiber cloth, bedding, vessel and hand cleaning, bathing, shade, umbrella, pipe (leaf stalk or "oqqo"). Leaves used to wrap the dough or "Kocho" before putting it in the fire wood stove so that it does not burn.

## Appendix 1. Contd.

Collection number	Scientific name	Family	Local Name (Mejengir, Shako and Shakinono)	Habit	Parts used	Form used	Methods of preparation	Uses for material culture and Notes
2241	<i>Eragrostis tef</i> (Zucc.) Trotter	Poaceae	Gasho (Sh1)	H	Culm	Dried	Mowing with a sickle and trampling (walk over), then tying	Roof thatching , pillow and mattress (by trampling the straw/ጥህጋጋ (in Shakinono) inside the pillow case made from <i>Phoenix reclinata</i> leaf ), and broom
2200	<i>Erythrina abyssinica</i> Lam.	Fabaceae	Bero (Sh1)	T	Stem	fresh	Carving	Construction
2174	<i>Erythrina brucei</i> Schweinf.	Fabaceae	Kocho(Sh1)	T	Stem	Fresh and dried	Carving	Fence, hanging beehive, furniture, Tools; wood used to make the pestle for large mortars.
2194	<i>Erythrococca trichogyne</i> (Muell. Arg) Prain.	Euphorbiaceae	Bichirekucho (Sh1); Gidigr(Mgr)	T/ Sh	Stem	Fresh and dried	Sharpening and carving	Construction
2239	<i>Euphorbia ampliphylla</i> E.	Euphorbiaceae	Qakaro (Sh1)	T	Stem	Fresh	Carving	Beehive, fence, sliver for granaries
2218	<i>Ficus exasperata</i> Vahl	Moraceae	Balantay (Mgr)	T	Leaf	Fresh and dried	Rubbing	For cleaning kitchen utensils, sliver for granaries
2209	<i>Ficus ovata</i> Vahl	Moraceae	Acha(Sh2); dokey(Mgr)	T	Stem, latex	Fresh and dried	Carving , latex collection	Torch(milky latex)
2178	<i>Ficus sur.</i> Forssk.	Moraceae	Et'o(Sh1)	T	Stem	Fresh and dried	Carving	Timber for furniture, Beehives (wood), Coffin
2157	<i>Galiniera saxifraga</i> (Hochst.) Bridson	Rubiaceae	Diido(Sh1)	T/ Sh	Stem and fruit	Fresh and dried	Carving and burrowing	small mortar, tool handle Weapon, mortar, house roofing, "oko", farm implement, (Yoke and plough), children use the fruit as weapon , sliver for granaries
2204	<i>Girardinia bullosa</i> (Steudel) Wedd.	Urticaceae	Shekirato(Sh1)	H	Leaf	Fresh	Rubbing or pounding	Fiber for hunting net, sack, Cloth
2190	<i>Hallea rubrostipulosa</i> (K. Schum.) J. F. Leroy	Rubiaceae	Oppo(Sh1)	T	Stem and leaf	Dried and fresh	Carving	Beehive, mortar, beehive hanging, timber for door, plate (leaf)
2185	<i>Hibiscus macranthus</i> Hochst. ex A.Rich.	Malvaceae	Gaahijo(Sh1)	H	Stem	Dried and fresh	Peeling	Fiber /Rope; bark peeled for rope used in construction and stem for trap
2231	<i>Hippocratea africana</i> (Willd.) Loes.	Celastraceae	P'ijo (Sh1), Pizoy(Mgr)	Cl	Stem	Fresh	Wrapping , splitting and Soaking in water if dried	Used to make strong cordage for rope, containers and construction, house hold equipments
2184	<i>Hippocratea goetzei</i> Loes.	Celastraceae	T'ero(Sh1)	Cl	Stem	Fresh	Wrapping	Construction (fence) , sieve

## Appendix 1. Contd.

Collection number	Scientific name	Family	Local Name (Mejengir, Shako and Shakinono)	Habit	Parts used	Form used	Methods of preparation	Uses for material culture and notes
2258	<i>Hippocratea pallens</i> Planchon.ex Oliver	Celastraceae	Gelenchi (Mgr)	Cl	Stem	Fresh	Splitting	Basketries, construction
2163	<i>Ilex mitis</i> (L.) Radlk.	Aquifoliaceae	Qeto(Sh1)	T	Stem	Fresh and dried	Carving	beehive, fence,
2219	<i>Jatropha curcas</i> L.	Euphorbiaceae	Gebuy (Mgr)	T/ Sh	Stem	Dried and fresh	Sharpening	Fence
2182	<i>Jasminum abyssinicum</i> Hochst. ex DC.	Oleaceae	Hawuto(Sh1)	Cl	Bark	Fresh	Wrapping	Rope; used in house construction
2193	<i>Justicia schimperiana</i> (Hochst. ex Nees) T. Anders.	Acanthaceae	Shesharo(Sh1)	Sh	Stem	Fresh and dried	Peeling	rope and small stems for construction(roof) and (MAGER) because it is not eaten by termites easily,
2259	<i>Lagenaria siceraria</i> (Molina) Standl.	Cucurbitaceae	Boto (sh1); Gini (Mgr)	Cl	Fruit	Dried	Scooping, Scrubbing and smoothing the inside of the gourd	Kitchen utensils, and household objects (cups, containers, vessels, bowls and ladles.
2233	<i>Landolphia buchananii</i> (Hall. F.) Stapf	Apocynaceae	Yeebo (Sh1), Yakat (Mgr)	Cl	Stem	Fresh	Splitting and wrapping	Rope , basketries for chicken house and other household objects
2249	<i>Lepidium sativum</i> L.	Brassicaceae	Shiipo(Sh1)	H	Twig	Dried	Wrapping in a bunch	Broom, Shed for livestock
2183	<i>Lepidotrichilia volkensii</i> (Gurke) Leroy	Meliaceae	Shaayo (Sh1)	T	Stem	Fresh and dried	Carving	Tools; wood to make ploughs.
2236	<i>Leucas deflexa</i> Hook. f.	Lamiaceae	Tinbe –gube (Sh1)	H	inflorescence	Fresh	Rubbing	Vessel cleaning
2243	<i>Lippia adoensis</i> Hochst. ex Walp.	Verbenaceae	Shoobbo (Sh1)	T/ Sh	Leaf	Fresh	Rubbing	milk utensils cleaning (Fresh or dried
2188	<i>Lobelia giberroa</i> Hemsl.	Campanulaceae	Gedrano (Sh1)	T/ Sh	Inflorescence	Dried	sharpening the stalk of the infllorencense after removing the flower	Musical instruments for children
2158	<i>Macaranga capensis</i> (Baill.) Benth.	Euphorbiaceae	Werango (Sh1)	T	Stem	Fresh	Sharpening	Construction (mager)
2154	<i>Maesa lanceolata</i> Forssk.	Myrsinaceae	Chego (Sh1)	T/ Sh	Stem	Dried and fresh	Carving	Construction, house hold equipments , sliver for granaries

## Appendix 1. Contd.

Collection number	Scientific name	Family	Local (Mejengir, and Shakinono)	Name Shako	Habit	Parts used	Form used	Methods preparation	of	Uses for material culture and Notes
2211	<i>Mallotus oppositifolius</i> (Geisel) Muell. Arg.	Euphorbiaceae	Birekechi (Mgr)	or Dasoy	T/ Sh	Stem	Dried fresh	and Sharpening		Construction (wall), farming implements
2206	<i>Malva verticillata</i> L.	Malvaceae	T'oso (Sh1)		T/ Sh	Leaf and bark	Fresh	peeling and soaking in the water		Bathing brush
2212	<i>Manihot esculenta</i> L.	Euphorbiaceae	Anchute (Mgr)		T/ Sh	Stem	Fresh dried	and Splitting the stem		Fence
2262	<i>Manilkara butugi</i> Chiov.	Sapotaceae	Gawo (Mgr)	(Sh 1) Goji	T	Stem	Fresh dried	and Carving		Musical instruments, construction
2176	<i>Maytenus gracilipes</i> (Welw. ex Oliv.) Exell subsp. <i>arguta</i> (Loes.) Sebsebe	Celastraceae	Atato(Sh1)		Sh	Stem and spine	Fresh dried	and Carving Sharpening	and	Spines use for making tattoos (traditional marks) and stems for making ornaments
2153	<i>Maytenus undata</i> (Thunb.) Blakelock.	Celastraceae	Getto p'ey(Mgr)	(Sh1),	Sh	Stem	Fresh dried	and Carving		Ornaments ,comb
2263	<i>Microglossa pyrifolia</i> (Lam.) O. Kuntze	Astraceae	Nibasho (Sh1)		Sh	Stem	Fresh	Splitting		House hold articles like sieve ("chimo")
2175	<i>Millettia ferruginea</i> subsp. <i>darassana</i> (Hochst.) Bak.	Fabaceae	Yaago(Sh1)		T	Stem	Fresh dried	and Carving		Construction (timber)
2217	<i>Momordica foetida</i> Schum. & Thonn.	Cucurbitaceae	Munji (Mgr)		Cl	Leaf	Fresh	Wrapping on the head		Cloth, ornamental uses for dancing on celebrations
2250	<i>Ocimum basilicum</i> L.	Lamiaceae	Kefo (Sh1)		H	Leaf	Fresh	Rubbing		Vessel cleaning
2201	<i>Olea welwitschii</i> (Knobl.) Gilg & Schellenb.	Oleaceae	Yeho(Sh1)		T	Stem	Fresh dried	and Carving		Bee hive, farm implements, tool handle
2161	<i>Oncinotis tenuiloba</i> Stapf	Apocynaceae	C'eno(Sh1)		Cl	Stem	Fresh	Wrapping		Rope for a fence ,
2234	<i>Oncoba spinosa</i> Forssk.	Flacourtiaceae	Shurato(Sh1)		T	Fruit and seed	Dried	Burrowing		House hold article (the dried fruit burrowed to put butter and salt), ornaments(seed)
2208	<i>Oxyanthus speciosus</i> DC.	Rubiaceae	A'emato(Sh1)		T/ Sh	Stem	Fresh	Carving sharpening	and	House construction, fence, weapon like spear

## Appendix 1. Contd.

Collection number	Scientific name	Family	Local Name (Mejengir, Shako and Shakinono)	Habit	Parts used	Form used	Methods of preparation	Uses for material culture and Notes
2196	<i>Pavetta abyssinica</i> Fresen.	Rubiaceae	Qorbandaro(Sh1)	T/ Sh	Stem	Fresh dried	and Carving	Construction
2216	<i>Pennisetum</i> sp.	Poaceae	Peta/elti solakak(Mgr)	or H	Leaf	Fresh dried	and Mowing	Roof thatching
2226	<i>Phoenix reclinata</i> Jacq.	Arecaceae	Zenbaba (yeebo) (Sh1)	T	Leaf, stem, petiole, midrib and sheath	Fresh dried	and Weaving and sewing	Leaves and midribs are woven and sewn as handcraft, containers, floor mat, broom, basketries and hat; sheathes are used for Sieve, leaves for ornamental and the thick midribs use for tooth brush.
2156	<i>Phytolacca dedocandra</i> L'Herit.	Phytolaceae	Yingo(sh1); Shorshu(Sh2)	Sh	Root and leaf	Fresh	Pounding & rubbing	Bathing brush (sponge ) during itching problem (leaf); root for cloth washing
2181	<i>Polyscias fulva</i> (Hiern) Harms	Araliaceae	Karasho(Sh1)	T	Stem	Fresh dried	and Carving	Beehive making, fence and construction
2238	<i>Pouteria adolfi-friederichi</i> (Engl.) Baehni	Sapotaceae	Sha'o (Sh1)	T	Stem	Fresh dried	and Carving	Beehive, house hold articles, timber, saucer
2222	<i>Pouteria alnifolia</i> (Bak.) Roberty	Sapotaceae	Fana (Sh2)	T	Stem and branch	Fresh dried	and Carving	Ornamental (comb)
2166	<i>Prunus africana</i> (Hook. F.) Kalkm	Rosaceae	Omo(Sh1)	T	Stem	Fresh dried	and Carving	Mortar (large one), beehive hanging, tool handle
2260	<i>Psychotria orophila</i> Petit	Rubiaceae	Neche Aimato(Sh1)	Sh	Stem	Fresh	Carving	Construction (roof)
2197	<i>Rhamnus prinoides</i> L'Herit.	Rhamnaceae	Geesho(Sh1)	T/ Sh	Stem	Fresh	Carving	Construction (roof)
2180	<i>Ricinus communis</i> L.	Euphorbiaceae	Eho(Sh1)	Sh	Stem	Fresh	Carving	Construction (roof), except for clan leaders home. In Shekacho ethnic group it is forbidden for traditional house of gepitatos.
2261	<i>Rothmannia urcelliformis</i> (Hiern) Robyns	Rubiaceae	Diibo (Sh1)	T/ Sh	Stem, fruit and leaf	Fresh	Carving and Boiling	Coloring handcrafts, construction (fence).
2189	<i>Rubus steudneri</i> Schweinf.	Rosaceae	Garoo(Sh1)	Cl	Stem	Fresh	Carving and bending	house construction, fence
2245	<i>Ruta chalepensis</i> L.	Rutaceae	Chediramo (Sh1)	H	Twigs	Fresh	Carving the tip of the twigs.	Tooth brush (twigs).
2246	<i>Rytigynia neglecta</i> (Hiern) Robyns	Rubiaceae	Nachato(Sh1)	T	Stem	Fresh	Carving	Side wall construction (mager)

## Appendix 1. Contd.

Collection number	Scientific name	Family	Local Name (Mejengir, Shako and Shakinono)	Habit	Parts used	Form used	Methods of preparation	Uses for material culture and Notes
2162	<i>Schefflera abyssinica</i> (Hochst. ex A. Rich.) Harms	Araliaceae	Manjo(Sh1)	T	Stem	Fresh & dried	Carving	Beehive hanging, beehive, timber, house hold equipments (furniture), farming implements (yoke)
2171	<i>Schefflera volkensi</i> (Engl.) Harms	Araliaceae	Qero(Sh1)	T	Stem	Fresh & dried	Carving	Construction (door support)
2242	<i>Sida rhombifolia</i> L.	Malvaceae	Sheto (Sh1)	H	Root, twig	Fresh & dried	Wrapping, tying in a bunch	Broom, vessel cleaning, tooth brush(root)
2203	<i>Solanecio gigas</i> (Vatke) C. Jeffrey	Asteraceae	Donbirako (Sh1)	T	Stem	Fresh	Carving	Construction
2177	<i>Solanecio mannii</i> (Hook. f.) C. Jeffrey	Asteraceae	Eqibelo(Sh1)	T/ Sh	Stem	Fresh	Weaving	chickens basket for laying and hatching egg
2264	<i>Sorghum bicolor</i> (L.) Moench.	Poaceae	Donqe(Mgr)	H	Twig	Dried	Wrapping in a bunch	Broom, granaries and Vessel cleaning
2169	<i>Syzygium guineense</i> subsp. <i>afromontanum</i> (Willd.) DC.	Myrtaceae	Yino(Sh1)	T	Stem	Fresh & dried	Carving	pole for house construction, wall
2229	<i>Teclea nobilis</i> Del.	Rutaceae	Molawo (Sh1)	T / Sh	Stem	Fresh & dried	Carving	Tools; wood to make ploughs.
2230	<i>Tiliachora troupinii</i> Cufod.	Menispermaceae	Acho (Sh1)	Cl	Stem (liana)	Fresh	Wrapping and soaking if dried	house construction, cordage
2224	<i>Trichilia dregeana</i> Sond.	Meliaceae	Luya /desha (Sh1)	T	Stem	Fresh & dried	Carving	Construction
2225	<i>Trichilia prieuriana</i> A. Juss.	Meliaceae	Deka (Sh2)	T	Stem	Fresh & dried	Carving and sharpening	Construction
2215	<i>Trilepsium madagascariense</i> DC.	Moraceae	Gebo /gemuy(Mgr)	T	Stem	Fresh & dried	Carving	Construction
2170	<i>Urera hypselodendron</i> (A. Rich.) Wedd.	Uritacaceae	Imano(Sh1)	Cl	Stem (liana)	Fresh	Wrapping	Cordage used for construction
2207	<i>Vangueria madagascariensis</i> Gmel.	Rubiaceae	Gujimato(Sh1)	T/ Sh	Stem	Fresh	Carving	Spear handle
2248	<i>Vangueria volkensis</i> K. Schum.	Rubiaceae	Ambilato (Sh1)	T/ Sh	Stem	Fresh & dried	Carving	Construction and simple farm implements
2155	<i>Vepris dainelli</i> (Pichi-Serm.) Kokwaro	Rutaceae	Mergeto(Sh1)	T/ Sh	Stem	Fresh & dried	Carving	Tool handles; wood to make ploughs handle ("Irf- in Amharic language")
2164	<i>Vernonia amygdalina</i> Del.	Asteraceae	Girawo(Sh1) ; Gesi (Mgr)	T/ Sh	Stem , branch and leaf	Fresh	Carving	Construction, Fence, Vessel cleaning , tooth brush and sliver for granaries



## Appendix 1. Contd.

Collection number	Scientific name	Family	Local Name (Mejengir, Shako and Shakinono)	Habit	Parts used	Form used	Methods of preparation	Uses for material culture and Notes
2165	<i>Vernonia auriculifera</i> Hiern	Asteraceae	Dengrato(Sh1)	T/ Sh	Stem	Fresh	Carving	Fence and granaries
2191	<i>Vernonia hochstetteri</i> Sch. Bip. ex Walp.	Asteraceae	Kusino(Sh1)	T/ Sh	Stem	Fresh	Carving	House construction
2221	<i>Vernonia lasiopus</i> Hoffm.	Asteraceae	Soyoma or Degorgnan (Mgr)	T/ Sh	Stem	Fresh	Carving	YEY (movable bed) in mgr ethnic groups, cloth (skirt in Shako ethnic groups), torch

Collected by •SY = Saeda Yassin