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Indigenous Knowledge on Plant Species of Material Culture (Construction, Traditional Arts & Handicrafts) used by the Afar & Oromo Nations in & Around the Awash National Park, Ethiopia

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Indigenous Knowledge on Plant Species of Material Culture (Construction, Traditional Arts & Handicrafts) used by the Afar & Oromo Nations in & Around the Awash National Park, Ethiopia

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I. Introduction

According to Cotton (1996), although synthetic plant products have an increasing influence on the existing material culture of traditional societies, both wild and cultivated plants remain vital to many aspects of traditional life. This author defined the term *Material culture* as the total range of objects produced by a particular society including functional items such as tools, shelters and clothing as well as more decorative arts and handicrafts.

Plant species serve humans with many ranges of useful materials for building and construction of timber, poles, fencing and other purposes (Hill, 1952; Abbiw, 1990; Cotton, 1996; Kochhar, 1998). Timber, which is a major forest product, has a considerable importance in the construction of temporary shelters and permanent homesteads, fences and other items within the traditional societies (Hill, 1952; Cotton, 1996). Besides, other plant parts are used in roof construction especially stems and sheets of bark or split wood in traditional dwellings (Abbiw, 1990). He stated that in Ghana at least 15 various plant species are useful to make roof shingles. Furthermore, roofing materials are produced by the leaves of large palm fronds and/or various species of grasses for traditional dwellings (Abbiw, 1990; Cotton, 1996; Cunningham, 1996). For example, a number of thatching grasses, particularly *Eragrosits pallens* and *Stipagrostis uniplumis,* are used as construction material for roofs, hut walls, yards and mats in Botswana (IUCN, 2007). The roofing plant materials can be chosen according to functional properties like availability, durability and water-proofing nature (Abbiw, 1990).

Plant and plant products also have additional uses in traditional arts and handicrafts including tool handles, cooking utensils, mortar and pestles, walking/herding sticks, combs, paddles, containers and many others. For example, fibrous stems and roots are used to make basket, cordage and textiles (Cotton, 1996; Cunningham, 1996). Likewise, plant extracts and exudates are sources of dyes, gums, tannins, latex, waxes, resins, adhesives and others. In turn, in many cultures, there are traditional plant based tools, which are used in hunting and defense such as harpoons, bows, arrows, spears, fishing reels and traps, hunting clubs and so forth (Abbiw, 1990; Cotton, 1996). Therefore, the present study aimed to assess IK on plant species of material culture (construction, traditional arts and handicrafts) used by the indigenous peoples of the

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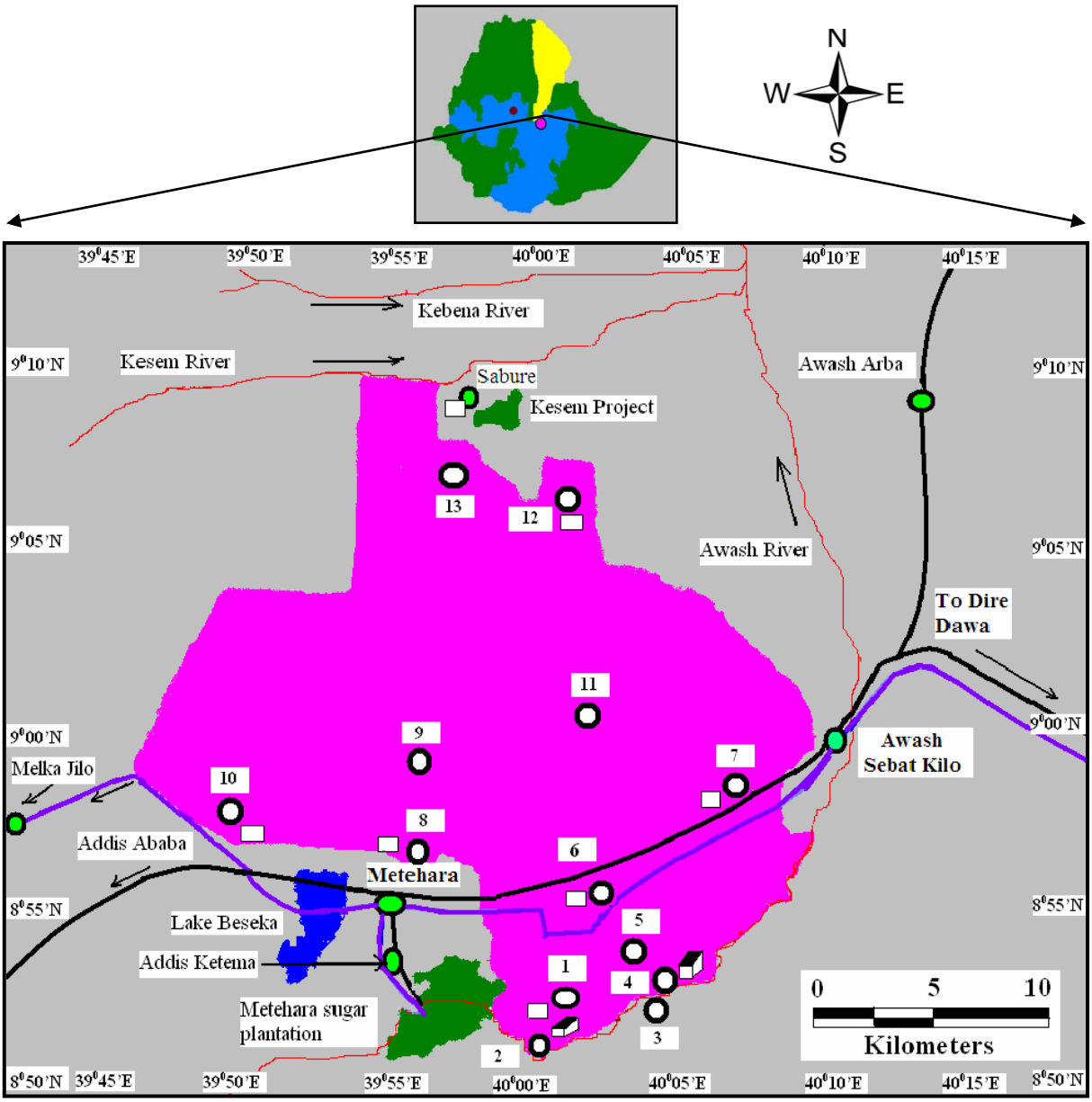
Afar and Oromo (Kereyu and Ittu) Nations in and around the ANP and thereby record, compile and document the associated IK to assist in the proper utilization, management and conservation of useful plants and the settings of the Park as a whole.

II. The Study Area

a) Geographical location

The study was conducted in ANP, Ethiopia, which is 225 km away from Addis Ababa and situated between latitudes 8°50' and 9°10' north and longitudes 39°45' and 40°10' east (EMA, 1992) (Figure 1). ANP is characterized by semi-arid climate or *Qolla* Zone and bimodal rainfall with the annual rainfall ranging between 400 and 700 mm (Jacobs and Schloeder, 1993). Out of the nine vegetation types of Ethiopia, the vegetation type of ANP is classified under *Acacia-Commiphora* woodland (Sebsebe Demissew and Friis, 2009) in the Somali-Masai Regional Center of endemism (White, 1983). Jacobs and Schloeder (1993) reported that ANP occurs in one of the most geologically active regions of the world. The phenomena of rifting and volcanism are continuous processes. Hence, it is estimated to have continued for 25-30 million years in Ethiopia, while about 5 million years in the ANP. According to Jacobs and Schloeder (1993), ancient alluvial and colluvial soils, soils of volcanic origin as well as recent alluvial soils are the three major soil types of the study area. The major water sources in the study area include Awash River with major tributaries around ANP including the Kesem and Kebena Rivers, Lake Beseka and the Hot Springs at the northern tip of the ANP. Thirteen data collection sites in ANP were: 1. Gotu, 2. Awash River, 3. Awash Gorge, 4. Karreyu Lodge, 5. Ilala Sala plain, 6. Hamareti, 7. Geda, 8. Sogido, 9. Mt. Fentale, 10. Sabober, 11. Dunkuku (Kudu Valley), 12. Filwuha, and 13. Sabure (Figure 1).



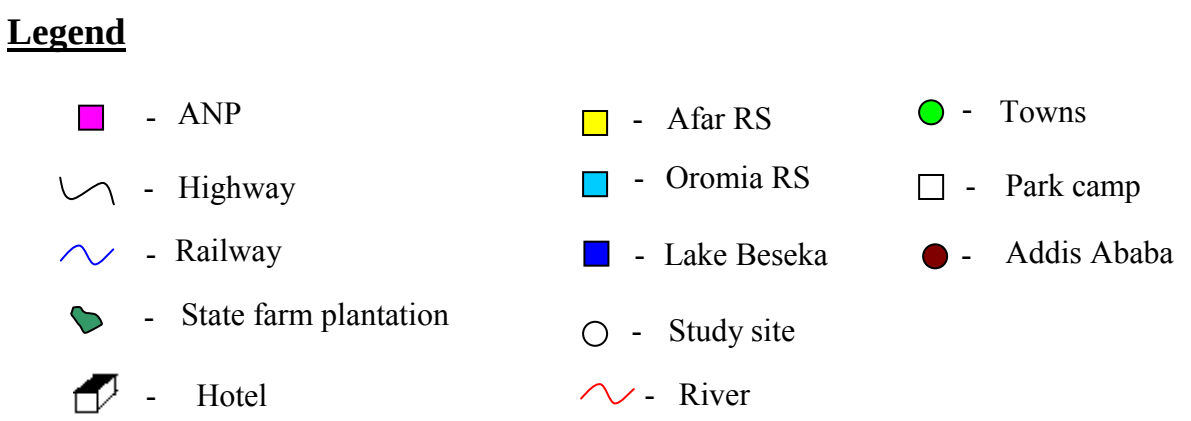
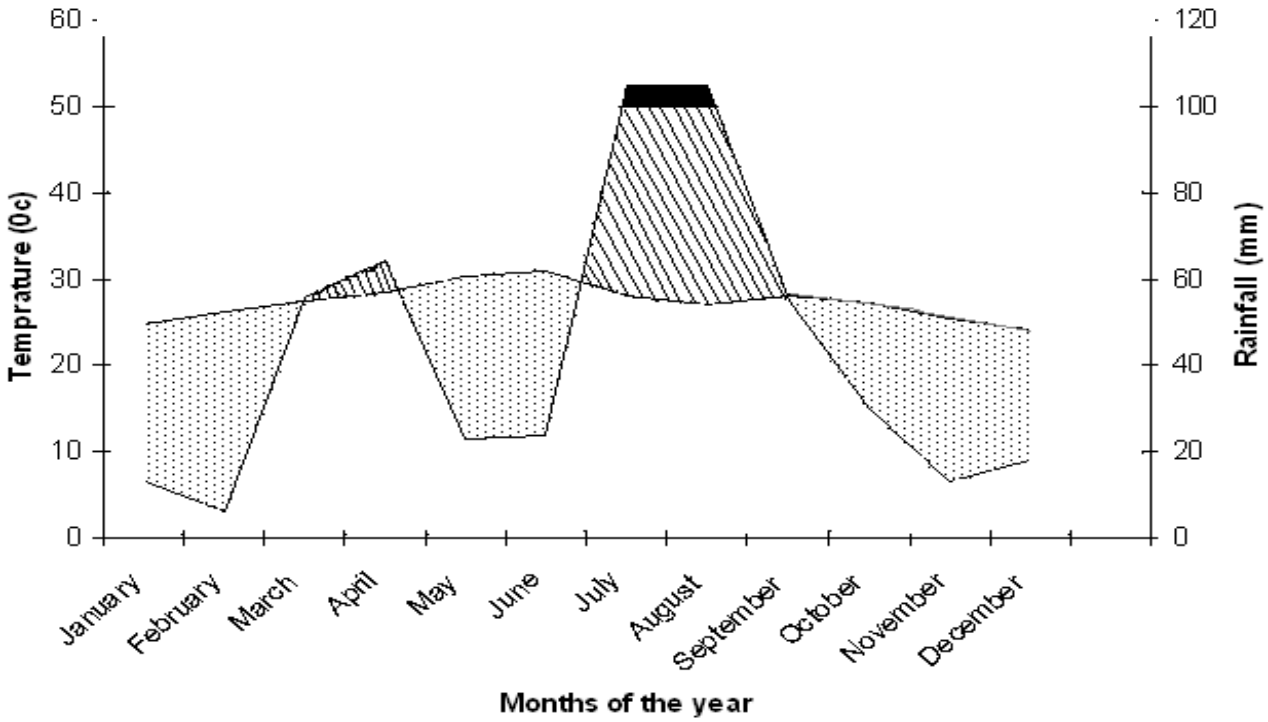


Figure 1 : Map of ANP modified from EMA (1992), Jacobs and Schloeder (1993) and Berihun Gebremedhin and Solomon Yirga (2005)

Awash Sebat Kilo

Altitude: 960 m a.s.l. Latitude $8^0 59'$ N Longitude $40^0 09'$ E



Source : Raw data obtained from NMSA (2009)

Figure 2 : Climadiagram at Awash Sebat Kilo meteorological station, east of ANP (from 1999-2008)

III. Materials and Methods

a) Sampling techniques and data collection

A reconnaissance survey of the study area was conducted from August 15-30, 2008 in order to obtain an impression about site conditions, to collect information on accessibility of plant species that serve as material culture and to identify sampling sites. Accordingly, 13 study sites (see Figure 1) were selected and established as data collection sites. Following this, ethnobotanical data were collected between September, 2008 and March, 2009, on three field trips that were carried out in each study site, following the methods by Martin (1995), Cotton (1996) and Cunningham (2001). Semi-structured interview, guided field walk, discussions and observation, with informants and key informants were applied based on a checklist of questions using the Afar and Oromo languages with the help of

translators to obtain IK of the local people on plant species of material culture. Voucher specimens were collected, identified and kept at National Herbarium, Addis Ababa University.

During the study, information regarding the IK on plant species of material culture in and around the ANP was gathered and the selection of informants and key informants was carried out based on prior information obtained from clan and religious leaders, knowledgeable elders, Park's scouts (*i.e.,* who have served in the ANP for more than 12 years and members of either the Afar or the Oromo Nations), pastoralists and agropastoralists. Others included individuals from different age groups, gender and Nations as well as field observation. Despite the effort made to involve as many women informants, only few women could take part in the study as they are not encouraged culturally within the society. Others are lack of permission from their husbands or other socio-cultural reasons, which they refrain from describing. Consequently, informants were selected from the Afar and/or the Oromo Nations based on the vicinity of their Kebeles to the Park. Four Kebeles from the Afar Nation (Awash, Doho, Dudub and Sabure Kebeles), whereas five Kebeles from the Oromo Nation (Benti, Fate Leidy, Gelcha, Ilala and Kobo Kebeles) were taken. Of these, 96 informants 7 or 8 individuals for each study site (76 men and 20 women) between the ages of 20 and 80 were selected using prior information. Out of these, 36 key informants (32 men and 4 women) were selected. Basic information on plant species of material culture including their vernacular names, habit, part (s) used, uses and their major use categories was/were collected from informants.

b) Ethnobotanical data analysis

The data were analyzed and summarized using simple statistical tools such as percentages, graphs and tables. The Jaccard's Coefficient of Similarity (JCS) was also calculated and the similarity in plant species composition between the Afar and the Oromo Nations were compared as it was described in Kent and Coker (1992). Accordingly, JCS was calculated between paired habitat types (A and B) as follows:

$$JCS = \frac{c}{c + b + a}, \text{ where}$$

a - is the number of species found only in habitat A,
b - is the number of species found only in habitat B and
c - is the number of common species found in habitat A and B.

Finally, JCS was multiplied by 100 in order to obtain the percentage similarity in species composition between the Afar and the Oromo Nations as applied by Kent and Coker (1992).

IV. Results and Discussion

a) Diversity and distribution of species of material culture

In this field study, a total of 156 plant species of material culture were recorded, being distributed in 115 genera and 70 families (Appendix 1). Of these, 79 species serve as sources of raw materials for various construction purposes and 77 are used for traditional art and handicrafts (Figure 3). Out of 156 plant species of material culture, 8 species were reported by the Afar Nation, 14 by the Oromo Nation and the rest by both of them. About 93% of the species were reported with their vernacular names, where 73% were reported by the Afar Nation and 87% by the Oromo Nation. Shrubs 61 species (39.6%) contributed the highest proportion of growth forms, which was followed by trees 58 (37.4%). Stems 119 (76.8%), followed by cut branches 24 (15.5%) were the most frequently utilized parts of the plant species in the study area by the local peoples. Some species are used in more than one material culture.

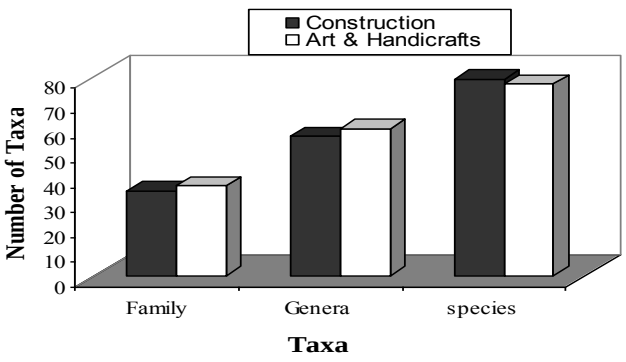


Figure 3 : Taxa of plant species for material culture.

Local communities in and around the ANP are highly dependent on plant species for various construction purposes such as house construction, species are used as a raw material for various household furniture and/or utensils, tool handles, dry fencing, roofs and/or walls thatching and so many other uses. Findings showed that more than 87% of the plant construction purposes (house construction, furniture,

fence posts and dry fencing) by the local communities in the study area. Some of the species used in house construction (load-bearing house posts, beams, roof supports, house walls and others), furniture as well as fence posts include *Acacia tortilis*, *Acacia nilotica*, *Acacia brevispica*, *Acacia mellifera*, *Acacia senegal*, *Balanites aegyptiaca*, *Olea europaea* subsp. *cuspidata, Dichrostachys cinerea*, *Cordia monoica*, *Tamarindus indica*, *Terminalia brownii*, *Ehretia cymosa* and *Ziziphus* species. Similarly, a study conducted in North Shoa Zone revealed that *Acacia brevispica* and *Acacia nilotica* for construction uses; *Ehretia cymosa* and *Terminalia brownii* for farm tools, whereas *Ehretia cymosa* for making furniture are more preferred by key informants (Hussien Adal, 2004). However, from field observation and informants report, it is clear that many homes around the study area are built from exotic tree species such as *Eucalyptus globulus* and *Prosopis juliflora* due to scarcity of indigenous tree species. Again, the fiber from the bark of *Acacia oerfota*, *Acacia tortilis* and *Grewia* species provide as ropes for tying the walls and roofs during house construction. On the other hand, plant species having thorns as well as faster growing rate were preferred more by the local peoples for dry fencing around homesteads, animal enclosures and farmlands. For instance, local people use various types of dry fencing by piling up branches of thorny plant species particularly *Acacia*, *Ziziphus* and *Cadaba species*, *Balanites aegyptiaca*, *Commiphora habessinica* and *Prosopis juliflora*.

Roofs, in turn, were thatched with a variety of grass species, the most commonly used being *Cymbopogon pospischilii*, which is commonly used by pastoralists for house construction around the study area. A similar result was also reported by Jacobs and Schloeder (1993). Likewise, Afar pastoralists also used the leaves of *Hyphaene thebaica* and *Typha* spp., which are the most preferred species for roof thatching. Other commonly used roof thatching materials include *Chrysopogon, Aristida adscensionis*, *Hyparrhenia* species, *Pennisetum setaceum*, *Sporobolus cosimilis* and many others. The people in Cheffa further revealed that roofs are thatched with *Hyparrhenia hirta* and *Hyparrhenia rufa* during the construction of houses. Fröman and Persson (1974) described that the tall and stemmy *Hyparrhenia* species are widely used for roof thatching. As informants stated that, in a rare case, if other resources are not available, the leaves of *Calotropis procera* are also used as roof thatching. This result is reported conversely in Ghana by Abbiw (1990) and Cotton (1996), where the stems of *Calotropis procera* was used as roof thatching. However, the corrugated iron sheets are replacing the use of roof thatching grasses through time due to modernization. Another reason might be due to shortage of tall grasses in the area. In turn, materials for house construction and traditional household utensils were replaced gradually by plastics and industrial products as a result of urbanization and loss of traditional way of life.

On the other hand, out of 77 plants of traditional art and handicrafts, 57 species (36.8%) are sources of farm implements, tool handles, household utensils and fencing tool (Felka (Af); Koko (Or)). The rest species serve for ritual values, soften leather, toothbrush, bed making, walking/herding sticks, bows and arrows, coloring/soften hair and many others (Appendix 1). Most of the species such as *Acacia tortilis*, *Balanites aegyptiaca, Berchemia discolor, Ceiba pentandra, Celtis toka, Cordia monoica, Dobera glabra, Tamarindus indica, Terminalia brownii, Ximenia americana, Ziziphus* species and many others are widely used for farm implements, tool handles, household utensils and fencing tool (Felka (Af); Koko (Or)). In turn, *Grewia* species are used for walking and/or herding sticks by children or elder persons; *Terminalia brownii* for coloring the body; the resin of *Ficus vasta* as adhesive and sealant and so forth. Again, the most widely used species for toothbrush reported by the informants were *Salvadora persica*, *Cadaba farinosa*, *Olea europaea* subsp. *cuspidata* and *Sida rhombifolia*. Likewise, Gemedo-Dalle *et al*. (2005) documented *Salvadora persica* as the most important plant species for toothbrushes in Borana lowlands, whereas Munishi *et al*. (2006) documented *Salvadora persica* and *Cadaba farinosa* in Tanzania for the same purpose. Of these, *Salvadora persica* is the best toothbrush from all and it is even sold in local and national market areas including Awash Sebat Kilo, Metehara, Addis Ketema, Sabure, Melka Jilo and Addis Ababa towns as well as along the main highway.

They have also certain cultural values within both Nations due to sharing of resources. For instance, both the Afar and the Oromo Nations use *Vernonia cinerascens* as cultural comb having only one stick, which is thinner or pointed at both ends. Again, *Acacia brevispica*, *Acacia tortilis* and *Balanites aegyptiaca* are used by both Nations for fencing tool (*Felka* (Af); *Koko* (Or)), which is a long stem ending with forked ends. Similarly, the smoke bath from *Terminalia brownii* wood with other ingredients (e.g. *Boswellia papyrifera* incense, sandals, etc.) is commonly used by women to scent (Eritole (Af); Bukbuka (Or)) their bodies and clothes as well as to flavouring milking utensils (Ayine (Af); Chocho (Or)). Such diverse uses of plant species over wider geographical areas between both Nations indicated that the existence of common knowledge (Kebu Balemie and Fassil Kebebew, 2006) as well as cultural diffusion (Teshome Soromessa and Sebsebe Demissew, 2002; Kebu Balemie and Fassil Kebebew, 2006) across a range of diverse cultures and geographical areas. Consequently, both Nations share most of the useful plant species around them within each other (Kebu Balemie and Fassil Kebebew, 2006).

On the contrary, useful plants also have certain cultural and ritual values within particular social groups. For instance, stem and leaves of Doum palm tree (*Hyphaene thebaica)* and *Typha* spp., which are restricted in the Northern tip of ANP, are a very important

resource for house and granary (major means of storing crops) construction, basketry, bed making and roof thatching around the Sabure, Doho and Dudub Kebeles by the Afar Nation. Women also make mats for sitting or sleeping on, as well as for drying crops. In line with this, *Ziziphus mucronata* and *Ziziphus spina-christi* are used by the Afar Nation to wash and soften dead person's body as well as coloring/soften hairs. Whereas, *Ficus sycomorus*, *Acacia tortilis* and *Balanites aegyptiaca* are highly respected and conserved by the Oromo Nation since they are the most important and widely used plants in the Oromo culture. Most traditional rituals and meetings are held in the shade of *Ficus vasta*, *Ficus sycomorus* and *Acacia tortilis* trees. However, in the case of the Afar Nation such traditional rituals and meetings are held in any type of tree shade without the selection of species. This indicated that IK distribution can be influenced by socio-cultural factors among different Nations (Cotton, 1996).

b) Plant species of material culture use diversity

Overall, plant species that serve as material culture in the study area were found to have multi-purpose values (use diversity) in various ways. These are forage/fodder, fuel wood (charcoal and firewood), medicine, food as well as miscellaneous uses. Out of the total recorded plant species which serve as 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 (Appendix 1)

c) Variation of indigenous knowledge between the Afar and the Oromo Nations

Research outputs during data collection revealed that both Nations equally reported 19 species for material culture independently, whereas 118 were common to both Nations (Table 1). The percentage similarity (about 76%) for the species, in turn, indicated that since the two groups situated almost in close geographical settings, there is a cultural diffusion and sharing of experiences and knowledge between them. Thus, they commonly utilize the same species.

Table 1 : The species similarity between the Afar and the Oromo Nations for plant species of material culture and the JCS in the study area

Total number of species	Total number of species reported by:			Jaccard's coefficient of similarity	Percentage similarity
	The Afar Nation	The Oromo Nation	Both Nations		
156	19	19	118	0.76	76

V. Conclusion and Recommendations

Indigenous people in and around the study area mainly depend on plant species of material culture for various construction purposes as well as traditional art and handicrafts. As a result, high diversity of species is recorded even if human-induced and natural factors influence the species. Planting of these important species around homesteads and farmlands for household use and sale; raising tree seedlings at nursery for large scale plantation of more exploited species (e.g. *Terminalia brownii, Acacia* spp., *Olea europaea* subsp. *cuspidata, Tamarindus indica*, etc.); better animal husbandry practices and improved shortage of grazing lands to minimize overgrazing of thatched grasses (e.g. *Cymbopogon pospischilii*, *Chrysopogon plumulosus*, *Hyparrhenia* spp., etc.); sustainable utilization and conservation of the species and awareness raising of the local people are recommended.

VI. Acknowledgements

The main author would like to acknowledge the Horn of Africa Regional Environment Center and Network (HoA-REC/N), members of the Afar and the Oromo Nations, Awash-Fentale Wereda and Fentale Wereda Offices, all the staff members of National Herbarium and ANP, the Department of Biology and others which directly or indirectly offered their various supports.

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Appendix 1 : List of plant species as a raw material for construction purposes (material culture) in the ANP

Key: Major use category *[F = Forage/fodder; Fu = Fuel wood; M = Medicine; Fo = Food; Mc = Material culture; Mi = Miscellaneous uses];* ***Habit*** *(Ha) [C-Climber; H-Herb; S-Shrub; T-Tree]; [* Species reported by the Afar Nation; ** Species reported by the Oromo Nation; Species without* ***asterisks*** *are reported by both Nations];* ***Note*** *[Components of house construction include load-bearing house posts, beams, roof supports, house walls, windows and doors]*

Scientific name	Family name	Ha	Vernacular name	Major use category	Part (s) used	Uses
Acacia brevispica Harms	Fabaceae	S	HAMARESA (Or)	F, Fu, Fo, Mc	Stem; cut branches	House construction, fence posts; dry fencing
Acacia dolichocephala Harms	Fabaceae	T		F, Fu, Mc, Mi	Stem; cut branches	Fence posts; dry fencing
Acacia mellifera (Vahl) Benth.	Fabaceae	S	MAKA'ARTO/ MA'EGHERTO (Af); SEPENE GURO (Or)	F, Fu, M, Fo, Mc, Mi	Stem; cut branches	House construction, furniture; dry fencing
Acacia negrii Pic. - Serm.	Fabaceae	S	KESEL-E (-TO) (Af); KESELE (Or)	F, Fu, Mc	Stem; cut branches	Fence posts; dry fencing
Acacia nilotica (L.) Willd. ex Del.	Fabaceae	T	KESEL-E (-TO)	F, Fu, M, Fo, (Af); BURKUKE (Or)	Stem; cut Mc, Mi	House branches construction, fence posts; dry fencing
Acacia oerfota (Forssk.) Schweinf.	Fabaceae	S	GOMERTO (Af); AJO (Or)	F, Fu, M, Fo, Mc, Mi	Stem; cut branches; bark	House construction; dry fencing; fiber used as rope & tying material
Acacia prasinata Hunde	Fabaceae	T	SEKEKTO (Af); DODOTI (Or)	F, Fu, Mc	Stem; cut branches	House construction, fence posts; dry fencing
Acacia r obusta Burch.	Fabaceae	T	GERE'INITO (Af); WANIGAYO (Or)	F, Fu, Mc	Stem; cut branches	House construction, fence posts; dry fencing
Acacia senegal (L.) Willd.	Fabaceae	S	ADADO (Af); SEPENSA DIMA/ SEPESA (Or)	F, Fu, M, Fo, Mc, Mi	Stem and branches; cut	House construction, furniture;
Acacia seyal Del.	Fabaceae	T	ADIGENTO/ MAKANI (Af); WACHU (Or)	F, Fu, Fo, Mc	branches Stem; cut branches; bark	dry fencing House construction, fence posts; dry fencing;

Acacia r obusta Burch.	Fabaceae	T	Gere'inito (Af); Wanigayo (Or)	F, Fu, Mc	Stem; cut branches	House construction, fence posts; dry fencing
Acacia senegal (L.) Willd.	Fabaceae	S	Adado (Af); Sepensa dima/ Sepesa(Or)	F, Fu, M, Fo, Mc, Mi	Stem and branches; cut branches	House construction, furniture; dry fencing
Acacia seyal Del.	Fabaceae	T	Adigento/ Makani (Af); Wachu (Or)	F, Fu, Fo, Mc	Stem; cut branches; bark	House construction, fence posts; dry fencing; fiber from bark is used as rope
Acacia tortilis (Forssk.) Hayne	Fabaceae	T	E'ibito/Behbey (Af); Dedecha (Or)	F, Fu, M, Fo, Mc, Mi	Stem; cut branches; bark	House construction, furnit ure; dry fencing; bark used for ropes
Acalypha fruticosa Forssk.	Euphorbiaceae	S	Chiri (Or)	F, Fu, Mc, Mi	Stem & branches	Temporary house construction
Agave sisalana Perrine ex Engl.	Agavaceae	H	Ya'a (Af); Alge dheltu (Or)	Mc, Mi	Stem; leaves	House construction; fibers are used to make strong ropes
Aristida adscensionis L.	Poaceae	H	Durfi (Af)	F, Mc	Whole part	Roof thatching
Balanites aegyptiaca (L.) Del.	Balanitaceae	T	Udayito/Ala'ito (Af); Bedeno (Or)	F, Fu, M, Fo, Mc, Mi	Stem; cut branches	House construction, fence posts, furniture; dry fencing
Berchemia Discolor (Klotzsch) Hemsl.	Rhamnaceae	T	Yeyebito (Af); Jejeba (Or)	F, Fu, Fo, Mc	Stem	House construction, fence posts, furniture
Boscia salicifolia Oliv. *	Capparidaceae	S	-	F, Fu, Fo, Mc	Stem	House construction
Cadaba farinosa Forssk.	Capparidaceae	S	Fura (-yito)/ Numhele (Af); KelikNationha (Or)	F, Fu, M, Fo, Mc, Mi	Stem; cut branches	House construction; dry fencing
Calotropis procera (Ait.) Ait.f.	Asclepiadaceae	S	Gele'ato/ Ghula'ento (Af); Felfela adal (Or)	Fu, M, Mc, Mi	Stem; leaves	House construction; used for roof thatching if thatching grass is scarce

Capparis tomentosa Lam.	Capparidaceae	S	Harenigema (Or)	F, Fu, M, Fo, Mc, Mi	Cut branches	Dry fencing
Ceiba pentandra (L.) Gaertn.*	Bombacaceae	T	Ferenji tuti (Af)	F, Fu, Fo, Mc, Mi	Stem	House construction, fence posts, furniture
Celtis toka (Forssk.) Hepper & Wood	Ulmaceae	T	Gudibi'ato (Af); Metekoma (Or)	F, Fu, Fo, Mc	Stem	Furniture
Chrysopogon aucheri (Boiss.) Stapf	Poaceae	H	Durfi (Af); Alelo (Or)	F, Mc	Whole part	Roof thatching
Chrysopogon plumulosus Hochst.	Poaceae	H	Durfi (Af); Deremo (Or)	F, Mc	Whole part	Roof thatching
Cissampelos mucronata A. Rich. **	Menispermaceae	C	Hidi (Or)	Mc	Stem	Tying material
Cissus quadrangularis L.	Vitaceae	C	Ali'e (Af); Chophi (Or)	M, Fo, Mc	Cut branches	Dry fencing
Cissus rotundifolia (Forssk.) Vahl **	Vitaceae	C	Buri (Or)	F, Fo, Mc	Stem; bark	Furniture; fiber used as tying material
Combretum molle R. Br. ex G. Don	Combretaceae	T	We'iba'ito (Af); Rukesa (Or)	F, Fu, Mc, Mi	Stem	House construction, fence posts, furniture
Commiphora erythraea (Ehrenb.) Engl.	Burseraceae	T	Yeyebito (Af); Chelanka (Or)	F, Fu, Mc	Stem	Furniture, fence posts
Commiphora Habessinica (Berg) Engl.	Burseraceae	S	Hedayito (Af); Hamesa (Or)	F, Fu, Fo, Mc, Mi	Stem; cut branches	Furniture, fence posts; dry fencing
Cordia monoica Roxb.	Boraginaceae	S	Mine gure Subula (Af); Medero (Or)	F, Fu, Fo, Mc	Stem	House construction, fence posts, furniture

Crotalaria incana L.	Fabaceae	H	Ijisise (Or)	Fu, M, Mc, Mi	Stem; cut branches	House construction; dry fencing
Cryptostegia grandiflora Roxb. ex R. Br.	Asclepiadaceae	S	Hali mero (Af); Hakonkol (Or)	Fu, Mc, Mi	Stem & branches; bark	House construction, to construct granary (Gotera (Or)) for storing cereal crops **; fiber used as tying material
Cymbopogon pospischilii (K. Schum.) C.E. Hubb.	Poaceae	H	Isesu/Ayiso (-yita) (Af)	F	Whole part	Roof thatching
Dalbergia lactea Vatke **	Fabaceae	S	Dilo lelafa (Or)	F, Fu, Mc	Stem	House construction, fence posts
Dichrostachys cinerea (L.) Wight & Arn.	Fabaceae	S	Jirme (Or)	F, Fu, Mc, Mi	Stem; cut branches; bark	House construction, fence posts; dry fencing; fibers are used as tying materials
Dobera glabra (Forssk.) Poir.	Salvadoraceae	T	Ghersa (Af); Ade (Or)	F, Fu, Fo, Mc, Mi	Stem	House construction, fence posts, furniture
Ehretia cymosa Thonn.	Boraginaceae	S	Mine gure (Af); Ulaga (Or)	F, Fu, M, Fo, Mc	Stem; bark	House construction, fence posts, furniture; fiber used as tying material
Ficus sycomorus L.	Moraceae	T	Subula (Af); Od a (Or)	Fu, M, Fo, Mc, Mi	Stem	House construction, fence posts, furniture
Ficus vasta Forssk.	Moraceae	T	Mara'ito (Af); Kiltu (Or)	Fu, M, Fo, Mc, Mi	Stem	House construction, fence posts, furniture
Flacourtia indica (Burm.f.) Merr. **	Flacourtiaceae	S	-	F, Fu, Fo, Mc	Stem	Furniture, fence posts
Grewia bicolor Juss.	Tiliaceae	S	Adibi'ato (Af); Haroresa (Or)	F, Fu, Fo, Mc	Stem; bark	House construction; fiber used as tying material
Grewia ferruginea Hochst. ex A. Rich.	Tiliaceae	S	Adibi'ato/ Fo (Af); Haroresa (Or)	F, Fu, Fo, Mc	Stem; bark	House construction; fiber used as rope & tying material

Grewia schweinfurthii Burret	Tiliaceae	S	Adibi'ato (Af); Mudhe gure (Or)	F, Fu, Fo, Mc	Stem; bark	House construction; fiber used as tying material
Eucalyptus globulus Labill.	Myrtaceae	T	Bahir zafi (Af & Or)	Fu, M, Mc	Stem	House construction, fence posts, furniture
Euclea racemosa Murr. subsp. *schimperi*(A. DC.) White	Ebenaceae	S	Miessa (Or)	F, Fu, Fo, Mc	Stem	House construction, fence posts
Grewia tenax (Forssk.) Fiori	Tiliaceae	S	Hedayito/ Huda /Mine gure (Af); Deka tuntuna (Or)	F, Fu, Fo, Mc	Stem; bark	House construction; fiber used as rope & tying material
Grewia velutina (Forssk.) Vahl	Tiliaceae	S	Adibi'ato (Af); Haroresa (Or)	F, Fu, Fo, Mc	Stem; bark	House construction; fiber used as rope & tying material
Grewia villosa Willd.	Tiliaceae	S	Gariwa (Af); Ogomdi (Or)	F, Fu, M, Fo, Mc, Mi	Stem; bark	House construction; fiber used as rope & tying material
Hagenia abyssinica (Bruce) J.F. Gmel.	Rosaceae	T	Begala (Af); Heto (Or)	Fu, M, Mc	Stem	House construction, fence posts, furniture
Hippocratea africana (Willd.) Loes.	Celastraceae	C	Misi (Af); Tero (Or)	F, Fu, Mc	Stem & branches	House construction, to construct granary (Gotera (Or)) for storing cereal crops ** ; tying material
Hyparrhenia hirta (L.) Stapf	Poaceae	H	Ayisoyita/ Isesu (Af); Mene chita (Or)	F, Mc	Whole part	Roof thatching
Prosopis juliflora(Sw.) DC.	Fabaceae	S	Weyane (Af & Or)	F, Fu, M, Fo, Mc, Mi	Stem; cut branches	House construction, fence posts; dry fencing
Rhynchosia Malacophylla (Spreng.) Boj. **	Fabaceae	H	-	Mc, Mi	Stem	Tying material during house and fence construction
Pennisetum setaceum (Forssk.) Chiov.	Poaceae	H	Areb muri (Or)	F, Mc	Whole part	Roof thatching

Persicaria setosula (A. Rich.) K. L. Wilson	Polygonaceae	H	Alelitu (Or)	Mc	Above ground part	Used for roof thatching if thatching grass is scarce
Hyparrhenia rufa (Nees) Stapf	Poaceae	H	Isesu (Af); Mene chita (Or)	F, Mc	Whole part	Roof thatching
Hyphaene thebaica (L.) Mart.*	Arecaceae	T	Unga/ Gara'ito (Af); Meti (Or)	F, Fu, Fo, Mc	Stem and leaves; leaves; bark	House construction; roof thatching; fiber used as tying material
Hyphaene thebaica (L.) Mart.*	Arecaceae	T	Unga/ Gara'ito (Af); Meti (Or)	F, Fu, Fo, Mc	Stem and leaves; leaves; bark	House construction; roof thatching; fiber used as tying material
Lantana camara L.	Verbenaceae	S	Baduwa hara (Af); Midan dubra (Or)	F, Fu, Fo, Mc, Mi	Cut branches	Dry fencing
Maerua angolensis DC. *	Capparidaceae	S	Dunibiayito/ Sekileli'a (Af)	F, Fu, Fo, Mc	Stem	Household furniture, fence posts, furniture
Manilkara butugi Chiov.	Sapotaceae	T	Butuye (Af); Butuji (Or)	F, Fu, Fo, Mc, Mi	Stem	House construction, fence posts, furniture
Moringa stenopetala (Bak.f.) Cuf.	Moringaceae	T	-	Fu, Fo, Mc	Stem	Household utensils, furniture
Morus mesozygia Stapf	Moraceae	S	-	F, Fu, Mc	Stem	Furniture, fence posts
Olea europaea L. subsp. *Cuspidata* (Wall.ex G.Don) Cif.	Oleaceae	T	Weyibo (Af); Ejersa (Or)	F, Fu, M, Mc, Mi	Stem	House construction, fence posts, furniture
Parkinsonia aculeata L.	Fabaceae	S	-	F, Fu, Fo, Mc	Stem; cut branches	Fence posts; dry fencing
Pennisetum menzianum Leeke	Poaceae	H	-	F, Mc	Whole part	Roof thatching

Rhynchosia minima (L.) DC. **	Fabaceae	C	Kelela (Or)	Mc	Stem	Tying material during house and fence construction
Salvadora persica L.	Salvadoraceae	S	Hadayito/ Dadaho (Af); Ade (Or)	F, Fu, M, Fo, Mc	Stem	House construction, furniture
Schinus molle L.	Anacardiaceae	T	Kundo berbere (Or)	Fu, M, Mc, Mi	Stem	Fence posts, furniture
Sesbania sesban (L.) Merr.	Fabaceae	S	Enchini/ Harcha (Or)	F, Fu, Mc	Stem; young stems	House construction; fibers used as tying material
Sporobolus cosimilis Fresen.	Poaceae	H	Hamelito (Af)	F, Mc	Whole part	Roof thatching
Sterculia africana (Lour.) Fiori	Sterculiaceae	T	Kereri (Or)	F, Fu, Fo, Mc, Mi	Stem; cut branches	Fence posts, furniture; dry fencing
Tamarindus indica L.	Fabaceae	T	Segentu (Af); Roka (Or)	F, Fu, M, Fo, Mc , Mi	Stem	House construction, fence posts , furniture
Terminalia brownii Fresen.	Combretaceae	T	We'iba'ito (Af); Bir'ensa (Or)	F, Fu, M, Mc, Mi	Stem	House construction, fence posts, furniture
Trilepisium madagascariense DC. **	Moraceae	T	Selaweta (Or)	Fu, Mc	Stem	House construction, fence posts, furniture
Typha spp.*	Typhaceae	H	Gede (Af)	F, Mc	Whole part	Roof and walls thatching
Ximenia americana L.	Olacaceae	T	Hudha (Or)	F, Fu, Fo, Mc	Stem	Fence posts, furniture
Ziziphus mucronata Willd.	Rhamnaceae	T	Kusir-a (-to) (Af); Kurkura hado (Or)	F, Fu, M, Fo, Mc, Mi	Stem; cut branches	House construction, fence posts, furniture; dry fencing
Ziziphus spina-christi (L.) Desf.	Rhamnaceae	T	Kusir-a (-to) (Af); Kurkura (Or)	F, Fu, M, Fo, Mc, Mi	Stem; cut branches	House construction, fence posts, furniture; dry fencing

Appendix 2 : List of plant species as sources of traditional arts and handicrafts (material culture) in the ANP.

Key: Major use category *[F = Forage/fodder; Fu = Fuel wood; M = Medicine; Fo = Food; Mc = Material culture; Mi = Miscellaneous uses];* ***Habit*** *(Ha) [C-Climber; H-Herb; Semi-parasitic-SP; S-Shrub; T-Tree]; [***** Species reported by the Afar Nation;* ******** *Species reported by the Oromo Nation; Species without* ***asterisks*** *are reported by both Nations]*

Scientific name	Family name	Ha	Vernacular name	Major use category	Part (s) used	Uses
Abutilon ramosum Guill. & Perr.	Malvaceae	H	Hambukto (Af); Ataye (Or)	F, Mc	Stem	Toothbrush
Acacia brevispica Harms	Fabaceae	S	Hamaresa (Or)	F, Fu, Fo, Mc	Stem	Tool handles, farm implements, long stem ending with forked ends used as fencing tool (Felka (Af); Koko (Or))
Acacia mellifera (Vahl) Benth.	Fabaceae	S	Maka'arto/Ma' egherto (Af); Sepene guro (Or)	F, Fu, M, Fo, Mc, Mi	Stem (wood)	Farm tools
Acacia nilotica (L.) Willd. ex Del.	Fabaceae	T	Kesel-e (-to) (Af); Burkuke (Or)	F, Fu, M, Fo, Mc, Mi	Stem; bark	Tool handles, household utensils (mortars and pestles), arrows & bows *; ink making, to soften leather
Acacia oerfota (Forssk.) Schweinf.	Fabaceae	S	Gomerto (Af); Ajo (Or)	F, Fu, M, Fo, Mc, Mi	Stem	Household utensils (milking utensils)
Acacia prasinata Hunde	Fabaceae	T	Sekekto (Af); Dodoti (Or)	F, Fu, Mc	Stem	Farm tools
Acacia robusta Burch.	Fabaceae	T	Gere'inito (Af); Wanigayo (Or)	F, Fu, Mc	Stem	Household utensils
Acacia senegal (L.) Willd.	Fabaceae	S	Adado (Af); Sepensa dima/ Sepesa (Or)	F, Fu, M, Fo, Mc, Mi	Stem; seed	Farm implements; dye is used for coloring
Acacia seyal Del.	Fabaceae	T	Adigento/ Makani (Af); Wachu (Or)	F, Fu, Fo, Mc	Stem; bark	Farm implements, tool handles, household utensils, fencing tool (Felka (Af); Koko (Or)); dye is extracted from bark

Acacia tortilis (Forssk.) Hayne	Fabaceae	T	E'IBITO/BEHBEY (Af); DEDECHA (Or)	F, Fu, M, Fo, Mc, Mi	Stem; leaves & bark	Household utensils (mortars and pestles), fencing tool (FELKA (Af); KOKO (Or)); ritual value **
Agave sisalana Perrine ex Engl.	Agavaceae	H	YA'A (Af); ALGE DHELTU (Or)	Mc, Mi	Leaves	Fibers are used to make sacks and mat
Artemisia absinthium L. **	Asteraceae	H	HARITI (Af); ARITI (Or)	Mc, Mi	Above ground part	Ritual value
Asparagus africanus Lam. **	Asparagaceae	C	HIDE SERE/SERITI (Or)	M, Fo, Mc, Mi	Whole plant	Ritual value
Balanites aegyptiaca (L.) Del.	Balanitaceae	T	UDAYITO/ALA'ITO (Af); BEDENO (Or)	F, Fu, M, Fo, Mc, Mi	Stem; whole plant	Household utensils, farm implements, tool handles, fencing tool (FELKA (Af); KOKO (Or)); cultural value**
Berchemia discolor (Klotzsch) Hemsl.	Rhamnaceae	T	YEYEBITO (Af); JEJEBA (Or)	F, Fu, Fo, Mc	Stem	Household utensils, tool handles, farm tools, toothbrush
Boswellia papyrifera (Del.) Hochst.	Burseraceae	T	LUBATEN (Af); MUKE ITANA (Or)	F, Fu, Fo, Mc	Resin (incense)	Resin (incense) is used as smoking for good scent (ERITOLE (Af))
Cadaba farinosa Forssk.	Capparidaceae	S	FURA (-YITO)/ NUMHELE (Af); KELIKNATIONHA (Or)	F, Fu, M, Fo, Mc, Mi	Stem	Toothbrush, walking sticks
Calotropis procera (Ait.) Ait.f. **	Asclepiadaceae	S	GELE'ATO/ GHULA'ENTO (Af); FELFELA ADAL (Or)	Fu, M, Mc, Mi	Whole plant; stem (wood)	To make cultural pillow
Ceiba pentandra (L.) Gaertn. *	Bombacaceae	T	FERENJI TUTI (Af);	F, Fu, Fo, Mc, Mi	Stem; mature fruit	Household utensils, tool handles, farm implements; fibers from mature fruit used as making pillow and mattresses
Celtis toka (Forssk.) Hepper & Wood	Ulmaceae	T	GUDIBI'ATO (Af); METEKOMA (Or)	F, Fu, Fo, Mc	Stem	Household utensils, tool handles, farm implements
Combretum molle R. Br. ex G. Don	Combretaceae	T	WE'IBA'ITO (Af); RUKESA (Or)	F, Fu, Mc, Mi	Stem (wood)	Tool handles, farm implements, household utensils

Commiphora erythraea (Ehrenb.) Engl.	Burseraceae	T	Yeyebito (Af); Chelanka (Or)	F, Fu, Mc	Gum & resin	Gum & resin is used for an incense and insecticide
Commiphora habessinica (Berg) Engl.	Burseraceae	S	Hedayito (Af); Hamesa (Or)	F, Fu, Fo, Mc, Mi	Stem	Tool handles, farm implements, household utensils, toothbrush
Cordia monoica Roxb.	Boraginaceae	S	Mine gure/Subula (Af); Medero (Or)	F, Fu, Fo, Mc	Stem	Tool handles, farm implements, household utensils (mortars and pestles)
Crotalaria incana L.	Fabaceae	H	Ijisise (Or)	Fu, M, Mc, Mi	Stem	Farm implements, herding sticks
Cucumis prophetarum L. **	Cucurbitaceae	H	Hare goge (Or)	F, M, Mc, Mi	Fruit	Boys play with fruit like a ball
Cymbopogon citratus (DC.) Stapf **	Poaceae	H	Teji sar (Af); Tij sara (Or)	Mc		Above ground Ritual value
Dichrostachys cinerea (L.) Wight & Arn.	Fabaceae	S	Jirme (Or)	F, Fu, Mc, Mi	Stem	Household utensils (mortars and pestles), tool handles
Dobera glabra (Forssk.) Poir.	Salvadoraceae	T	Ghersa (Af); Ade (Or)	F, Fu, Fo, Mc, Mi	Stem	Household utensils (mortars and pestles), tool handles, camel saddles, toothbrush
Ehretia cymosa Thonn.	Boraginaceae	S	Mine gure (Af); Ulaga (Or)	F, Fu, M, Fo, Mc	Stem	Household utensils, tool handles, farm implements, walking/herding sticks
Eucalyptus globulus Labil	l. Myrtaceae	T	Bahir zafi (Af & Or)	Fu, M, Mc	Stem	Tool handles, farm implements
Euclea racemosa Murr. subsp. *schimperi* (A. DC.) White	Ebenaceae	S	Miessa (Or)	F, Fu, Fo, Mc	Stem	Tool handles, farm implements, household utensils, toothbrush
Ficus sycomorus L.	Moraceae	T	Subula (Af); Oda (Or)	Fu, M, Fo, Mc, Mi	Stem; whole plant; bark	Household utensils; ritual value **; to make beehives
Ficus vasta Forssk.	Moraceae	T	Mara'ito (Af); Kiltu (Or)	Fu, M, Fo, Mc, Mi	Stem; resin; bark	Household utensils; adhesive and sealant; to make beehives

Flacourtia indica (Burm.f.) Merr.	Flacourtiaceae	S	-	F, Fu, Fo, Mc	Stem	Tool handles, household utensils, farm implements
Gossypium hirsutum L.	Malvaceae	S	Tut (Af)	Mc	Seed hairs	Fiber derived from seed hairs (cotton) is used for making clothes
Grewia bicolor Juss.	Tiliaceae	S	Adibi'ato (Af); Haroresa (Or)	F, Fu, Fo, Mc	Stem	Tool handles, bed making *, walking/cultural/ herding sticks, bows & arrows, toothbrush
Grewia ferruginea Hochst. ex A. Rich.	Tiliaceae	S	Adibi'ato/Fo (Af); Haroresa (Or)	F, Fu, Fo, Mc	Stem	Farm implements, bed making *; walking/herding sticks, bows & arrows
Grewia schweinfurthii Burret	Tiliaceae	S	Adibi'ato (Af); Mudhe gure (Or)	F, Fu, Fo, Mc	Stem	Farm implements, bed making *
Grewia tenax (Forssk.) Fiori	Tiliaceae	S	Hedayito/ Huda/Mine gure (Af); Deka tuntuna (Or)	F, Fu, Fo, Mc	Stem	Farm implements, bed making *, walking/ herding sticks, bows & arrows
Grewia velutina (Forssk.) Vahl	Tiliaceae	S	Adibi'ato (Af); Haroresa (Or)	F, Fu, Fo, Mc	Stem	Tool handles,bed making *, walking /herding sticks, bows & arrows, fencing tool (Felka (Af); Koko (Or))
Grewia villosa Willd.	Tiliaceae	S	Gariwa (Af); Ogomdi (Or)	F, Fu, M, Fo, Mc, Mi	Stem; Bark	Tool handles, farm implements,bed making *, walking /herding sticks, bows & arrows; fluid from inner bark is extracted & used as coiling hairs culturally *
Hagenia abyssinica (Bruce) J.F. Gmel.	Rosaceae	T	Begala (Af); Heto (Or)	Fu, M, Mc	Stem	Household utensils, tool handles, farm implements, bed making
Hibiscus micranthus L. f.	Malvaceae	H	Akilehena (Af)	F, Fu, Fo, Mc	Stem; root	Walking sticks; magical value *

Hyphaene thebaica (L.) Mart. *	Arecaceae	T	Unga/Gara'ito (Af); Meti (Or)	F, Fu, Fo, Mc	Stem and leaves; fibers from bark; seed	Bed making, making baskets & mats; to fix milking utensil;
Indigofera arrecta Hochst. ex A. Rich.	Fabaceae	H	Herchumen (Or)	Fu, M, Fo, Mc	Stem; leaves	Household utensils; coloring han , toothbrush,
Kleinia odora (Forssk.) DC. **	Asteraceae	S	Luko (Or)	F, Fu, Mc, Mi	Stem & leaves	To soften leather
Lagenaria	Cucurbitaceae Dunibiayito/	C	Dela (Af); Buki (Or)	Mc	Fruit	Mature fruit is used as milk/water container : is decorated to express their culture
Maerua angolensis DC. *	Capparidaceae	S	Sekileli'a (Af)	F, Fu, Fo, Mc	Stem	
Manilkara butugi Chiov.	Sapotaceae	T	Butuye (Af); Butuji (Or)	F, Fu, Fo, Mc, Mi	Stem (wood)	Tool handles, farm implements,
Morus mesozygia Stapf	Moraceae	S	-	F, Fu, Mc	Stem	Tool handles;
Ocimum forskolei Benth.	Lamiaceae	H	Suri mi'a (Af); Dama kese (Or)	F, Mc, Mi	Whole plant	Making broom (brush) for sweeping indoors or outdoors
Ocimum stirbeyi Schweinf. & Volk.	Lamiaceae	S	Biriteli (Af)	Fu, Mc	Stem	
Olea europaea L. subsp. *cuspidata* (Wall.ex G.Don) Cif.	Oleaceae	T	Weyibo (Af); Ejersa (Or)	F, Fu, M, Mc, Mi	Stem (wood); whole plant	Farm implements, household utensils, tool handles walking/herding sticks;
Oncocalyx schimperi (A. Rich.) M. Gilbert	Loranthaceae	SP	Hatote (Af); Dertu haroresa (Or)	Fu, M, Mc	Whole plant	To soften leather
Parkinsonia aculeata L.	Fabaceae	S	-	F, Fu, Fo, Mc	Stem	Tool handles, farm implements
Plicosepalus Sagittifolius (Engl.) Danser	Loranthaceae	SP	Hatote (Af); Dertu dedacha (Or)	Fu, M, Mc	Whole plant	To soften leather
Prosopis juliflora (Sw.) DC.	Fabaceae	S	Weyane (Af & Or)	F, Fu, M, Fo, Mc, Mi	Stem	Tool handles, farm implements
Pupalia lappacea (L.) A. Juss.	Amaranthaceae	H	Sorot kufu (Af); Metene (Or)	F, M, Mc	Fruits	Children collect many hooked fruits, fixed together like a ball & play with it
Rhus vulgaris Meikle	Anacardiaceae	S	Debobesa (Or)	F, Fu, M, Fo, Mc	Stem	Farm implements, household utensils, tool handles

Ricinus communis L.	Euphorbiaceae	S	Sherbeti (Af); Kobo (Or)	Fu, M, Fo, Mc	Seed	Crushed seeds used for greasing baking plates for *injera* & bread, to soften leather
Salvadora persica L.	Salvadoraceae	S	Hadayito/ Dadaho (Af); Ade (Or)	F, Fu, M, Fo, Mc	Stem	Household utensils, tool handles, farm implements, toothbrush
Sansevieria ehrenbergii Schweinf. ex Baker	Dracenaceae	H	Yi'e (Af); Alge (Or)	Mc	Leaves	Fibers used for basket, rope & whip making
Schinus molle L.	Anacardiaceae	T	Kando berbere (Or)	Fu, M, Mc, Mi	Stem	Household utensils, tool handles, farm implements
Sesbania sesban (L.) Merr.	Fabaceae	S	Enchini/ Harcha (Or)	F, Fu, Mc	Stem	Farm implements, tool handles
Sida rhombifolia L.	Malvaceae	H	Welayineba (Af); Hatawi (Or)	F, M, Mc, Mi	Stem	Toothbrush
Sida schimperiana Hochst. ex A. Rich.	Malvaceae	S	Welayineba (Af); Korcha ijole (Or)	F, Fu, M, Mc, Mi	Stem	Toothbrush
Solanum incanum L. **	Solanaceae	S	Amboko aso (Af); Hidi loni (Or)	F, Fu, Mc, Mi	Above ground part	It is hold with cultural sticks during marriage
Sterculia africana (Lour.) Fiori	Sterculiaceae	T	Kereri (Or)	F, Fu, Fo, Mc, Mi	Stem	Household utensils, farm implements
Tamarindus indica L.	Fabaceae	T	Segentu (Af); Roka (Or)	F, Fu, M, Fo, Mc, Mi	Stem; gum; bark	Household utensils, tool handles, farm farm implements;ink ink making; to soften leather
Terminalia brownii Fresen.	Combretaceae	T	W'iba'ito (Af); Bir'ensa (Or)	F, Fu, M, Mc, Mi	Stem (wood); bark	Tool handles, household utensils (mortars and pestles, spoons, tongs, etc.), farm implements, smoke bath of clothes and women's body body for good scent (Eritole (Af); Bukbuka (Or)) and bark smoking to flavor milking utensils (Ayine (Af); Chocho (Or)) ; dye used as coloring the body
Trilepisium madagascariense DC.	Selaweta (Or)	T	Moraceae	Fu, Mc	Stem	Farm tools, household utensils, tool handles
Vernonia cinerascens Sch. Bip.	Asteraceae	S	File neme'a (Af); Kertatume (Or)	F, Fu, Mc	Stem & branches	To make cultural comb from a single stick

Withania somnifera (L.) Dunal	Solanaceae	H	Gerba ado (Af); Bale uru (Or)	F, M, Mc, Mi	Leaves & branches	Herding sticks
Ximenia americana L.	Olacaceae	T	Hudha (Or)	F, Fu, Fo, Mc	Stem	Household utensils, farm implements, tool handles
Ziziphus mucronata Willd.	Rhamnaceae	T	Kusir-a (-to) (Af); Kurkura hado (Or)	F, Fu, M, Fo, Mc, Mi	Stem; leaf & stem; leaf	Household utensils, farm implements, hunting tools (spear shafts); to wash & soften dead person's body*; coloring/soften hair *
Ziziphus spina-christi (L.) Desf.	Rhamnaceae	T	Kusir-a (-to) (Af); Kurkura (Or)	F, Fu, M, Fo, Mc, Mi	Stem; leaf & stem; leaf	Household utensils, farm implements, hunting tools (spear shafts) ;to wash & soften dead person's body*; coloring/soften hair*

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