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Uses, preference, cultural importance and informant consensus factor of tree species in Uttarakhand: A case study from Bhilangana Watershed in Western Himalaya, India

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Abstract. Residents in the hilly area of Indian Himalaya are largely dependent on tree resources for their livelihoods. The local knowledge and traditional practices are vanishing in rural areas due to drastic change in lifestyle and land use pattern. Diversity and tree species used by residents of Bhilangana watershed for their everyday needs have not yet been adequately recorded. Available information is mainly on ecology and geology of the region. Therefore, the aim of the study was to document tree diversity and extant local knowledge on tree species. Extensive surveys were conducted during 2018–19 to assess tree diversity, local knowledge on tree utilization through personal interview of 158 local residents. A total of 187 tree species belonging to 131 genera and 58 families were recorded and of these, 174 species were of ethno-botanical importance with at least one or multiples uses. Around 56.68% of tree species belonged to 15 dominant families. Ethno-botanical important species were classified into different use categories by local according to their use. Among use categories, 19.78% trees were used for medicine, 28.34% edible, 45.98% fodder, 59.89% fuel and 6.95% with no direct use in the area. The value of relative frequency of citation (RFC) for 28 tree species was calculated 1 which shows the relative high popularity/preference of these species and cultural importance (CI) value was found between 1 to 3.09 for 38 trees which signify the importance of tree species in the area. The highest informant consensus factor (0.99) was found for edible and religious followed by fibre (0.98), timber (0.98), fodder (0.974) and fuel (0.97). These findings highlight the importance of tree resources in mountainous regions.

Keywords: rural people, cultural importance, tree diversity, utilization.

1. Introduction

Indian Himalayan Region (IHR) is recognized as a distinct floristic region with different cultures and traditions in India (Hooker, 1904; Singh & Singh, 1987). It harbours around half of the vascular plants of India and has historically contributed substantially to the security of its people and economic development of the country (Rao, 1997). Mankind has been relying on biodiversity since ancient times for various resources needed for survival and ethnobotanical studies have been proved as an important tool in understanding how different indigenous communities relate

to natural resources, notably for day-to-day life sustenance (Farooquee & Maikhuri, 2007; de Albuquerque & Hanazaki, 2009; Bussmann et al., 2021). Local diversity and the historic isolation of Himalayan settlements led to unique traditional knowledge of the residents about plants that support basic sustenance needs like food, fodder, fuel, shelter, health care, etc. (Semwal et al., 2007; Rana et al., 2013; Romanelli et al., 2015).

Uttarakhand is a rural centered state of India where about 69.77% population lives in rural areas. Besides common inhabitants the state is comprised of five major tribes (Jaunsaris, Tharus, Rajis, Buksas and Bhotiyas) with diverse cultural backgrounds (Tolia, 2010). Nature and natural resources especially the forests and plant species hold a very special status in their ideologies and beliefs. Plants offer a variety of family provisions and domestic food security in the rural areas of Uttarakhand. A large number of people in the region are involved in agriculture, animal husbandry, forestry and other biodiversity dependent vocations for their livelihoods (Pandey, 2009; Sharma et al., 2009; Negi & Maikhuri, 2013; Singh et al., 2017). Biomass is the principal component of domestic energy which fulfils more than 90% energy demand of Himalayan communities as commercial fuel particularly LPG (Liquefied Petroleum Gas) is beyond reach to rural communities (Sharma et al., 2009; Shaheen et al., 2016; Singh et al., 2017). Fodder plant species and grazing in forests and meadows are main sources of livestock feed across the Himalayan regions (Singh & Sundriyal, 2009). Consequently, a drastic change in loss of plant wealth due to the various natural and anthropogenic pressures has been reported in the Himalayan regions (Samal et al., 2003; Sharma et al., 2009).

Various studies have been carried out in Uttarakhand on plant diversity and ecological aspect but investigations on diversity and ethnobotanical aspect of trees species in and outside the forests in the region, particularly in Bhilangana watershed are lacking which restricts overall development and implementation of appropriate program for management and sustainable use of biodiversity. As the reports on ethnobotanical uses of tree species from Uttarakhand Himalaya are scanty. The present investigation was undertaken to document the diverse use of trees by local people and their dependence on the trees. Therefore, the present study attempts to access the diversity and ethnobotany of tree species by analyzing resource use pattern behavior among residents in the Bhilangana watershed. The aim of study was to document the available tree resources, promotion of afforestation and identification and selection of suitable tree species for tangible and intangible benefits of the residents. The results of the study will be useful in designing and implementing appropriate conservation strategies for resource use pattern.

2. Materials and Methods

2.1 Study area

The Bhilangana watershed is located in Uttarakhand, one of the western Himalayan states of India. Geographically it is situated at 30°19′53" N to 30°51′38" N latitude and 78°29′11" E to 79°01′53" E longitude (Fig. 1). The Bhilangana river originates from the Khatling glacier (3750 m asl) and confluenced with river Bhagirathi at erstwhile Tehri town, but after the construction of Tehri dam, drains its water in the reservoir near Ghansali after travelling a distance of ca. 65 km. The major tributaries of Bhilangana are Bal Ganga and Dharm Ganga. This area is surrounded by (high altitude lakes) Vasuki Taal, Sahastra Taal from the east and Masar Taal from the west of Tehri district, Uttarakhand. It has highly undulating topography ranging from 600 m asl to 6000 m above sea level. The northern and the north-eastern part of the watershed have steep slopes in upper reaches (over 70°). Whereas the lower portions and valley floors have gentle slopes (less than 15°).

The area has a seasonal climate with four distinct seasons i.e., monsoon (July to September), post-monsoon (October to November), winter (December to March) and summer (April to mid-June). The overall climate follows monsoon pattern of rainfall and average annual rainfall 1800 mm was recorded during 2018–2019. The months of mid-June to mid-September receive heavy rains through monsoonal winds, while some precipitation occurs during December to February due to western disturbances (Dimri et al., 2015). The maximum monthly temperature during 2018–2021 ranged between 28 °C and 42.2 °C and, the minimum ranged between -3 °C and -14.4 °C (at higher ridges).

Uniyal & Gupta (2013) carried out morphometric analysis of watershed and classified the area into different classes on basis of land use and land cover. Around 73 per cent (1091 km^2) of the watershed is covered with forests (Banerjee et al., 2018). The forests in the area are sub-tropical to temperate types with *Abies pindrow*, *Acer* spp., *Aesculus indica*, *Alnus nepalensis*, *Betula* spp., *Cedrus deodara*, *Ficus* spp., *Lyonia ovalifolia, Machilus* sp., *Mallotus philippensis*, *Neolitsa umbrosa*, *Pinus roxburghii*, *Quercus* spp., *Rhododendron arboreum,* etc. as dominant tree species. Soil of the region varies from gravelly to loamy.

2.2 Data collection

Stratified random sampling technique with cross-sectional research design was used for this study. A total of 158 knowledgeable key informants were interviewed on the recommendations of local people after reconnaissance

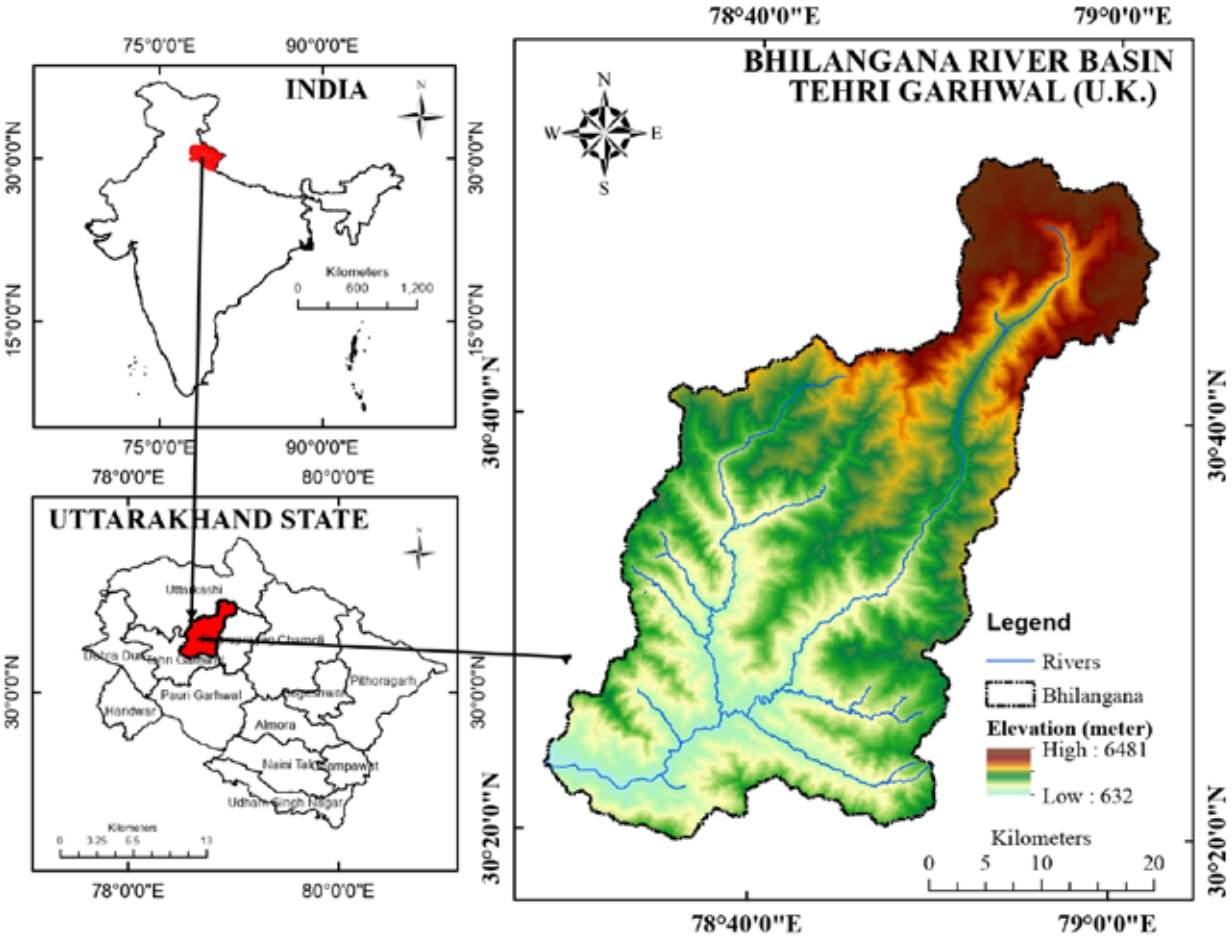

Figure 1. Location of Bhilangana watershed in Uttarakhand, India

surveys of the villages. The survey was conducted between December, 2018 and January, 2022 using semi structured questionnaires, personals interviews both in Hindi and local dialect (Garhwali). The ethnobotanical data like local names, uses, parts used, availability, distribution, etc. of each tree species were collected.

2.3 Plant identification

Tree species were identified with the help of regional floras (Gaur, 1999; Pusalkar & Singh, 2012; Rai et al., 2017, Pusalkar & Srivastava, 2018), Herbaria (GUH – Garhwal University Herbarium, BSD – Botanical Survey of India, Northern Regional Centre, Dehradun and DD – Forest Research Institute, Indian Council of Forestry Research and Education, Dehradun) and taxonomic experts. Nomenclature of recorded tree species was updated from the website https://powo.science.kew.org/ on 05–02–2022.

2.3 Data analysis

2.3.1 Use report (UR)

The use report (UR) per species, is a count of the number of informants who mention each use category for the species and the sum of all uses in each use-category (Prance et al., 1987). The number of uses (NU) per species is the sum of all categories for which a species is considered useful (Prance et al., 1987).

2.3.2 Frequency citation (FC) and Relative frequency citation (RFC)

The frequency of citation (FC) per species is the sum of informants that cites a use for the species in the dataset (Prance et al., 1987). The relative frequency citation index was calculated as per (Tardío & Pardo-de-Santayana, 2008), using the following formula: RFC = FC/N where N is total number of informants.

2.3.3 Cultural importance index (CI)

Cultural importance index (CI) assesses the importance of each species (CIs). The index is calculated dividing the number of use reports of the species by the number of informants, using the equation (Tardío & Pardo-de-Santayana, 2008):

$$CIs = \sum_{u=u1}^{uNC} \sum_{i=i1}^{iN} URui/N$$

where UR is the number of use reports of the species for different use categories (NC) and N is the total number of informants; u is the use reports of a particular species and i is number of informants reporting the number of use reports.

2.3.3 Informant consensus factor (FIC)

Informant consensus factor (Fic) was calculated to evaluate the variation in the information provided by informants about the use of tree species. FIC was calculated using the equation (Heinrich et al., 1998; Trotter & Logan, 1986):

FIC = (Nur – Nt) / (Nur – 1), where Nur is the number of use reports for a particular use category and Nt is the number of species used for a particular use category by all the informants.

3. Results and Discussion

3.1 Demography of informants

The informants represented a diverse array of people and were classified into different categories on the basis of occupation, gender, age and education. Among the 158 informants 129 (81.64%) were males and 29 (18.35%) females. The participation of males was higher in comparison to females which may be due to the culture in the area in which females generally not coming forward for public discourse or possibly due to some other reasons (Sharma et al., 2011). Among the participants (29) 18.35% were illiterate, 13.92% below primary and most of the other had primary, secondary or higher education. This study revealed that 82.27% informants were farmers and 17.72 % were in other occupations which shows that the low level of education make it difficult for people to find formal work. The largest proportion of the respondents were elderly between age of 41 to 60 years (73.42%) and these results reflect that indigenous knowledge is well established among elder people and seems to be decreasing in the younger generation of the region. Local people, especially elders possess more accurate and valuable knowledge of natural resources or plant diversity than young and have a wide variety of choices and uses of tree species.

3.2 Tree diversity

Our study demonstrates a great diversity of tree resources in Bhilangana watershed representing 187 tree species (7 Gymnosperms and 180 Angiosperms) belonging to 52 families and 83 genera which accounts 41.18% of tree species of Uttarakhand and 12.75% of Indian Himalayan Region (Bhatt et al., 2016, 2020). Out of the total species (187 species and 131 genera), 56.68% belonged to 15 dominant families. Fabaceae and Moraceae which were reported as the two most dominant families with 30 and 25 tree species in Uttarakhand, Western Himalaya and Indian Himalaya by Bhatt et al. (2016); were also dominant in the study area, it shows the affinity of valley with other parts of Himalaya regions.

3.3 Uses of tree species

In the study area fuel-wood is one of the most important natural resources that villagers extract from forest and agricultural land for their daily needs. Informants reported 174 (93.04%) tree species with at least one to several uses in the area and the tree species were classified into ten use categories (Table 2). Each household requires wood for fuel, timber and agriculture implements, etc. due to deprived socio-economic conditions and poor accessibility to modern facilities in the region (Sharma et al., 2011; Negi & Maikhuri, 2016). All parts of the tree species are used to varying degree but the most frequently used part was wood followed by leaf and fruit and least used part were root, twig and resin (Fig. 2). This corresponds to similar results reported in several ethno-botanical studies on tree species in Western Himalaya, India (Ahmed et al., 2018; Joshi et al., 2019).

Our findings suggest that the tree species were supporting a wide range of livelihood activities in the study area as the indigenous communities were using 174 trees (with 14,663 use reports) directly for timber, fuel, medicine, food, fodder, etc. This shows the importance and diverse use of tree species in Himalayan region. However, rest 13 species (*Alangium chinensis*, *Castanea sativa*, *Catunaregam spinosa*, *Hydrangea aspera*, *Itea nutans*, *Magnolia grandiflora*, *Meliosma dillenifolia, M. simplicifolia, Michelia champaca, Pterospermum diversifolium, Sapium sebiferum*, *Stercullia villosa* and *Wendlandia heynei*) were also exploited in other parts of the Himalayan region which indicates the variation in use of resources.

3.3.1 As wild edibles

A total of 53 edible tree species have been recorded in the valley which are used in the form of fruit, vegetable, spice, flower, squash, candy, pickle, jam, chutney, etc. (Table 1). Some edible tree species with high cultural importance value are *Punica granatum, Diospyros* spp., *Aegle marmelos*,

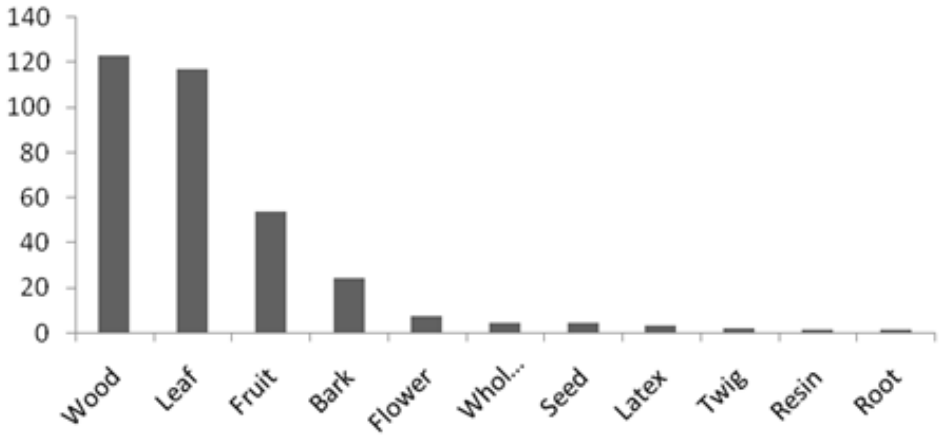

Figure 2. Relative proportion of plant parts used by the local people

Citrus jambhiri, *Elaeagnus umbellata*, *Artocarpus heterophyllus*, *Carica papaya*, *Morus alba*, *Cornus capitata*, *Hippophae salicifolia*, *Mangifera indica*, *Bauhinia variegata*, etc. The most commonly used among all the edibles are fruits such as *Myrica esculenta*, *Punica granatum*, *Prunus americana*, *Citrus* spp., etc. and are eaten fresh. Flowers of *Rhododendron arboreum* are consumed directly and are also widely used to prepare squash, chutney (a kind of sauce) and local brew. The floral buds, fruits, leaves and bark of *Bauhinia variegata*, *Carica papaya*, *Artocarpus heterophyllus*, *Cinnamomum tamala* are used in culinary. It was observed that floral buds of *Bauhinia variegata* and fruits and seeds of *Artocarpus heterophyllus* are used to make vegetable. Fruits of *Mangifera indica*, *Citrus* spp., are widely used to prepare pickle (Table 2). All the edible plants contribute to the rural economy of Bhilangana valley.

3.3.2 As medicine

During the survey, 37 (19.78%) medicinal tree species with 404 use reports were recorded having various therapeutic properties. *Dalbergia sissoo*, *Pinus rouxburghii*, *Abies pindrow*, *Mangifera indica*, *Punica granatum*, *Ficus auriculata*, *Aegle marmelos*, *Phyllanthus emblica*, *Betula utilis*, *Buxus wallichiana*, *Ficus benghalensis*, etc.are important trees used for therapeutic purposes by the local, these trees are also mentioned in Ayurvedic Pharmacopeia of India and Ayurvedic formulary of India and many other folklores of India. These plants are main ingredients of some Ayurvedic formulations (Triphala, Chayamanprash, Khadirarishta, Tansukh Bael Churna, etc.) which support the claims of the locals (Anonymous, 2008).

For healthcare 404 use reports for 37 tree species is reported. Many studies have also been carried out in the Western Himalaya that confirms similar utility of tree species (Maikhuri & Ramakrishnan, 1992; Semwal & Maikhuri, 1996, Maikhuri et al., 2000; Samant et al., 2007; Sharma et al., 2011; Negi & Maikhuri, 2013, Nagar et al., 2018; Nautiyal et al., 2018). In a recent study it is found that *Rhododendron arboreum* petals are rich in antiviral phytochemicals and inhibit SARS-CoV-2 infection (Lingwan et al., 2021).

3.3.3 As timber resource

Timbers play a great role in the economic development of any country. We recorded 34 (18.18%) tree species which are prominently exploited for timber purpose by the locals. Lifestyle and housing pattern consume a lot of timber wood in construction in hilly areas. These species are used in house construction (beams, floors, roofs, windows, doors, frames, pillars, etc.), furniture (beds, chairs tables, boxes, etc.), packing cases, utensils and many other house hold articles. *Taxus wallichiana*, *Abies pindrow*, *Cedar deodara*, *Pinus roxburghii*, *Juglans regia* are preferred because of durability of timber in the investigated area and other species (*Mangifera indica*, *Albizia lebbeck*, *Tectona grandis*, *Eucalyptus citriodora*, *Anogeissus latifolia*, *Mallotus philippensis*, etc.) are also used. Species distribution, availability and abundance greatly influence the utility of tree species.

3.3.4 As agricultural implements

In this study we recorded a total of 20 (10.69%) tree species which were used for making various agricultural and allied tools such as (Hal) Wooden plough and its parts, Leveler (Jol), Handle for Axe (Kulhadu), Rake (Dandalu), Sickle (Datti), Spade (Balcha), Hammer (Hathodu), Weeder (Kullu), etc.) in the area. Among these, plough and its parts, handles for Axes, Hammers, Hoes, and Picks were most common uses mentioned. In hilly areas, still traditional agricultural implements (made up of wooden and iron) are preferred over modern (tractors); it may be due to small and scattered holdings of agricultural lands (Kumar & Chander, 2017). Prominent tree species (*Quercus leucotrichophora*, *Q.*

semicarpifolia, *Q. floribunda*) were exploited for making plough and its parts (Handle, Beam, Shoe), Handles of Chopper, Big Sickle, Saw, etc. due to the durability and other qualities.

3.3.5 As fuel-wood resource

A total of 112 (59.89%) fuel-wood tree species were recorded in the area. Local inhabitants preferably use *Quercus* spp., *Taxus wallichiana*, *Aesculus indica*, *Juglans regia*, *Cedrus deodara*, *Buxus wallichiana* and *Pinus roxburghii* because of good burning properties but due to scarcity of selected species people are switching to other resources depending on the availability. Fuel wood is the only major form of energy for cooking, heating and occasionally for lighting in mountains. Its consumption varies significantly in different seasons and the average daily fuelwood requirement is more in high attitude than lower as people in lower elevation also use LPG for cooking (Sharma et al., 2009; Malik et al., 2014). Fuel wood use is prevalent in developing countries especially where it is commonly available (Fitzgerald et al., 1990, and Bhattacharya, 2015); Kumar et al. (2020) reported 49% of households use firewood as the primary fuel for cooking in India.

3.3.6 As fodder resource

We recorded a total of 86 (45.98%) tree species used as fodder by the locals with 11,000 use reports. Villagers usually lop branches of trees on their agricultural land and forest to meet fodder requirement and use branches as fuel wood after drying. Samant et al. (2007) listed 150 species of fodder representing trees, shrubs, and herbs used as fodder for livestock in the Indian Himalayan Region; some of the tree species are similar with that of our findings. Nautiyal et al. (2018) recorded 26 fodder trees from Joshimath region of Chamoli, Uttarakhand. The domestic animals provide main drought power for agriculture system in hilly areas. The domestic animals depend on forest as well as agricultural residues and the major fodder trees of the region are *Grewia optiva*, *Celtis australis*, *Quercus leucotrichophora*, *Q. floribund*a and *Q. semecarpifolia*, etc. Many authors quantified average fodder collection in Himalayas which showed great variation (Sharma et al, 2009; Dhyani et al., 2011; Singh et al., 2017; Singh et al., 2021).

3.3.7 Religious significance

Informants reported 11 (5.88%) tree species of religious importance which are either used in worship of deities (especially flowers, fruits and leaves are offered) or worshiped (*Ficus religiosa*, *F. benghalensis*, *Aegle marmelos*, etc.) by the local people.

3.3.8 Fibre trees

We recorded a total of 4 fibre yielding tree species which were used to make a wide range of traditional products like ropes, nets, mats and other essential products. Presently, the production of natural fibres in India is more than 400 million tons and indigenous peoples and local community reliance on plant resources is high. The fibre trees are *Gewia optiva*, *G. asiatica*, *Bombex ceiba* and *Trema orientalis*.

3.3.9 Ornamental and avenue trees

Informants identified 10 Avenue and Ornamental tree species which are most commonly planted along the road sides, pathways, parks, etc. for shade purpose, control of soil erosion and to aesthetic value. Some prominent trees are *Grevillea robusta*, *Polyalthia longifolia*, *Cassia fistula*, *Thuja orientalis* and *Callistemon citrinus*.

3.3.10 Miscellaneous uses

Our field study revealed that 20 (10.69%) tree species such as *Cordia vestita*, *Betula utilis*, *Toxicodendron wallichii*, *Wrightia arborea*, *Alnus nepalensis*, *Phoenix sylvestris*, etc. are used for various major and minor purposes and are placed under miscellaneous category. Young twig, bark of *Juglans regia* and *Engelhardtia spicata* are used for cleaning tooth and leaves of *Phoenix sylvestris* are used for making brooms and fruits are eaten.

3.4 Relative frequency of citation (RFC)

In the present study, the value of the relative frequency (RFC) varied from 0 to 1. We recorded 28 most significant species (*Abies pindrow*, *A. spectabili*, *Betula utilis*, *Aegle marmelos*, *Cedrus deodara*, *Ficus benghalensis*, *F. religiosa*, *F. palmata*, *Grewia optiva*, etc.) with perfect 1 RFC value and thirteen species (*Alangium chinensis*, *Castanea sativa*, *Catunaregam spinosa*, *Hydrangea aspera*, *Itea nutans*, *Magnolia grandiflora*, *Wendlandia heynei*, etc.) with zero RFC value in the area (Table 2). RFC analysis suggests that most of the trees have good roles in delivering various services to the local communities.

3.5 Cultural importance (CI)

Cultural importance index is one of the most important tools which helps in selecting suitable tree species that contribute significantly to fulfill the needs of the residents. CI values varied from 3.09 to 0, the most important tree species in the area were *Quercus leucotrichophora* (3.09), *Q. semecarpifolia* (3.09), *Grewia optiva* (3.01), *Dalbergia sissoo* (2.69), *Pinus roxburghii* (2.14), *Rhododendron arboreum* (2.08), *Taxus wallichiana* (2.01), *Musa paradisiaca* (2.00), *Morus alba* (1.80), etc. and CI values for other species are given in Table 2.

Table 2. Plant list with uses and basic ethnobotanical indices

Botanical name	Family	Local name	Part used	Uses	UR	FC	RFC	CI
Abies pindrow (Royle ex D.Don) Royle	Pinaceae	Rai	Wd, Ba	Me, Fu, Ti, Be	235	158	1.00	1.49
Abies spectabilis (D.Don) Mirb.	Pinaceae	Liur/ Raga	Wd	Fu, Ti	193	158	1.00	1.22
Acacia catechu (L. f.) Willd.	Fabaceae	Khair	Lf, Ba, Wd	Me, Fo, Fu, Ti, At	59	17	0.11	0.37
Acer acuminatum Wall. ex D.Don	Sapindaceae	Rathkanchul	Lf, Wd	Fo, Fu	17	10	0.06	0.11
Acer caesium Wall. ex Brandis	Sapindaceae	Kanjula	Lf,Wd	Fo, Fu	70	55	0.35	0.44
Acer cappadocicum Gled.	Sapindaceae	Manak/ Kenchli	Lf,Wd	Fo, Fu	21	12	0.08	0.13
Aegle marmelos (L.) Corrêa	Rutaceae	Bael	Fr,Lf	Me, Ed, Re	195	158	1.00	1.23
Aesandra butyracea (Roxb.) Baehni	Sapotaceae	Chiura	Fr	Me, Ed	5	3	0.02	0.03
Aesculus indica (Wall. ex Cambess.) Hook.	Sapindaceae	JangliPangar	Lf, Sd,Wd	Ed, Fo, Fu, Ti	116	51	0.32	0.73
Alangium chinensis (Lour.) Hams.	Cornaceae	-	-	NA	0	0	0.00	0.00
Albizia chinensis (Osbeck) Merr.	Fabaceae	Siris	Lf, Wd	Fo, Fu	51	30	0.19	0.32
Albizia julibrissin Durazz.	Fabaceae	Kuneri/ Kaunesa	Lf, Wd	Fo, Fu	25	13	0.08	0.16
Albizia lebbeck (L.) Benth.	Fabaceae	Siris	Lf, Ba, Wd	Fu, Ti, Ai	40	20	0.13	0.25
Alnus nepalensis D. Don	Betulaceae	Utees	Lf, Wd	Fo,Fu, Ti, At,Bri	93	30	0.19	0.59
Alstonia scholaris (L.) R.Br.	Apocynaceae	Chatiun	-	Or	8	8	0.05	0.05
Anogeissus latifolia (Roxb. ex DC.) Wall. ex Guill. & Perr.	Combretaceae	Bakla/Dhuda	Lf, Ba, Wd	Me,Fo, Fu, Ti,Ai	49	60	0.38	0.31
Araucaria bidwilli Hook.	Araucariaceae	Bunya tree	-	Or	5	5	0.03	0.03
Araucaria columnaris (J.R. Forst.) Hook.	Araucariaceae	Bunya tree	-	Or	5	5	0.03	0.03
Artocarpus heterophyllus Lam.	Moraceae	Kathal	Fr	Ed	15	15	0.09	0.09
Azadirachta indica A. Juss.	Meliaceae	Neem	Wd	Fu, Ti, Ai	22	12	0.08	0.14
Bauhinia purpurea L.	Fabaceae	Guiral	Lf, Fl, Wd	Fo,Fu, Ti, Ai	90	60	0.38	0.57
Bauhinia semla Wunder.	Fabaceae	Kanli	Lf, Wd	Fo, Fu, Ai	90	60	0.38	0.57
Bauhinia variegata L.	Fabaceae	Kanchnar	Lf, Fl,Wd	Ed, Fo, Fu, Ai	180	90	0.57	1.14
Betula alnoides Buch.-Ham. ex D.Don	Betulaceae	Soaur	Wd,Lf	Fo, Fu, Ai, Mis	69	25	0.16	0.44
Betula utilis D.Don	Betulaceae	Bhojpatr	Ba,Wd	Me, Fu, Re	176	158	1.00	1.11
Boehmeria rugulosa Wedd.	Urticaceae	Genthi	Lf, Wd	Fo, Fu	225	110	0.70	1.42
Bombax ceiba L.	Malvaceae	Semal	Lf, Fr, Wd	Ed, Fu,Ti, Fb	89	25	0.16	0.56
Broussonetia papyrifera (L.) L'Hér. ex Vent.	Moraceae	-	Lf,Wd	Fo, Fu	15	10	0.06	0.09
Butea monosperma (Lam.) Kuntze	Fabaceae	Dhak	Gum, Sd,Lf,Wd	Me, Fu	22	20	0.13	0.14
Buxus wallichiana Baill.	Buxaceae	Papri	Lf,Wd	Me, Fu, Ti, Mis	167	90	0.57	1.06
Callistemon citrinus (Curtis) Skeels.	Myrtaceae	Bottle brush	-	Or	10	10	0.06	0.06
Carica papaya L.	Caricaceae	Papita	Lf, Fr	Me, Ed	140	130	0.82	0.89
Carpinus viminea Lindl. ex Wall.	Betulaceae	Hamur	Lf,Wd	Fo, Fu, Mi	29	16	0.10	0.18
Casearia graveolens Dalzel	Salicaceae	Chilla	Lf, Wd	Fu, Ti	20	12	0.08	0.13
Casearia tomentosa Roxb.	Salicaceae	Chilla	Lf,Wd	Fu, Ti	20	12	0.08	0.13
Cassia fistula L.	Fabaceae	Amaltas	Fr, Ba, Lf, Wd	Me, Fu, A/O	32	15	0.09	0.20
Castanea sativa Mill.	Fagaceae	Chesnut	-	NA	0	0	0.00	0.00
Catunaregam spinosa (Thunb.) Tirveng.	Rubiaceae	-	-	NA	0	0	0.00	0.00
Cedrus deodara Loud.	Pinaceae	Deodar	Wd	Fu, Ti	238	158	1.00	1.51

Table 2. cd

Botanical name	Family	Local name	Part used	Uses	UR	FC	RFC	CI
Celtis australis L.	Cannabaceae	Kharik	Lf, Fr, Wd	Ed, Fo, Fu	90	145	0.92	0.57
Cinnamomum tamala (Buch.-Ham.) Nees. & Eberm.	Lauraceae	Guradaroo	Lf, Ba,Wd	Ed, Fu	115	80	0.51	0.73
Citrus jambhiri Lushington.	Rutaceae	Jamir	Fr	Ed	40	40	0.25	0.25
Citrus medica L.	Rutaceae	Nimboo	Fr	Ed	65	65	0.41	0.41
Citrus sinensis (L.) Osbeck	Rutaceae	Santara	Fr	Ed	67	67	0.42	0.42
Cocculus laurifolius DC.	Menisperma-ceae	Tilphara	Lf	Me	14	14	0.09	0.09
Cordia dichotoma G. Forst.	Boraginaceae	Bairala	Lf, Fr, Wd	Ed, Fo, Fu, Mi	28	10	0.06	0.18
Cordia vestita (A.DC.) Hook.f. & Thomson	Boraginaceae	-	Fr, Lf,Wd	Ed, Fo, Fu, Mi	30	12	0.08	0.19
Cornus capitata Wall.	Cornaceae	Bhamor	Fr	Ed, Fo, Fu	63	35	0.22	0.40
Cornus macrophylla (Wall.) Sojak	Cornaceae	Khagsi	Lf	Fo	35	44	0.28	0.22
Cornus oblonga (Wall.) Sojak	Cornaceae	Gauntia	Lf	Fo	35	35	0.22	0.22
Corylus jacquemontii Decne.	Betulaceae	Kabasi	Lf,Wd	Fo, Fu	53	33	0.21	0.34
Cupressus torulosa D. Don	Cupressaceae	Surai	Wd	Fu, Ti	95	70	0.44	0.60
Dalbergia sericea G. Don	Fabaceae	Ghogra	Wd	Fu	15	15	0.09	0.09
Dalbergia sissoo Roxb.	Fabaceae	Sisham	Lf, Fl,Wd	Me,Ed, Fo,Fu. Ti,Ai	425	118	0.75	2.69
Daphniphyllum himalayense (Benth.) Müll. Arg.	Daphniphylla-ceae	Ratnali	Lf, Wd	Fo,Fu	25	20	0.13	0.16
Diospyros kaki L.	Ebenaceae	Kaku	Fr	Ed	10	10	0.06	0.06
Diospyros montana Roxb.	Ebenaceae	Tendu/Pinna	Wd	Ed	17	17	0.11	0.11
Ehretia acuminata R.Br.	Boraginaceae	Pudila	Lf, Fr, Wd	Ed,Fu,Ai, Mis	17	8	0.05	0.11
Ehretia laevis Roxb.	Boraginaceae	Chamror	Lf, Fr, Wd	Ed,Fo,Fu	17	10	0.06	0.11
Elaeagnus umbellata Thunb.	Elaeagnaceae	Giwain/ Kankal	Fr,Lf,Wd	Ed, Fo, Fu	86	80	0.51	0.54
Elaeodendron glaucum (Rottb.) Pers.	Celastraceae	Dhebari	Wd	Fu, Mis	30	15	0.09	0.19
Engelhardtia spicata Blume.	Juglandaceae	Garmahwa	Lf,Wd,Tw	Fu, Ti, Mis	28	11	0.07	0.18
Erythrina suberosa Roxb.	Fabaceae	Rungar	Lf, Fl, Ba,	Me	6	6	0.04	0.04
Eucalyptus citriodora Hook.	Myrtaceae	Safeda	Wd	Fu,Ti	22	20	0.13	0.14
Eucalyptus globulus Labill.	Myrtaceae	Safeda	Wd	Fu, Ti	22	20	0.13	0.14
Euonymus fimbriatus Wall.	Celastraceae	Lichholi	Wd	Fu, Ai	11	6	0.04	0.07
Euonymus hamiltonianus Wall.	Celastraceae	-	Wd	Fu	7	7	0.04	0.04
Euonymus pendulus Wall. ex Roxb.	Celastraceae	Bhambeli	Lf, Wd	Fo, Fu	10	6	0.04	0.06
Eurya acuminata DC.	Celastraceae	Chameri	Wd	Fu	35	35	0.22	0.22
Falconeria insignis Royle	Euphorbiaceae	Khina	Wd	Fu	12	12	0.08	0.08
Ficus auriculata Lour.	Moraceae	Timla	Lf, Fr, Ba, Wd	Me, Ed, Fo	205	110	0.70	1.30
Ficus benghalensis L.	Moraceae	Bargad	Lf, Fr,Ba	Me	162	158	1.00	1.03
Ficus elastic Roxb.	Moraceae	-	-	Or	9	9	0.06	0.06
Ficus hispida L.f.	Moraceae	Totmila	Lf, Fr	Ed, Fo	109	90	0.57	0.69
Ficus neriifolia Sm.	Moraceae	Dhudhi	Lf,Wd	Fo	90	90	0.57	0.57
Ficus palmata Forsk.	Moraceae	Bedu	Lf, Fr	Ed, Fo	214	158	1.00	1.35
Ficus racemosa L.	Moraceae	Gular	Lf,Fr	Ed, Fo	21	19	0.12	0.13
Ficus religiosa L.	Moraceae	Pipal	Lf,Wp	Re	158	158	1.00	1.00

Table 2. cd

Botanical name	Family	Local name	Part used	Uses	UR	FC	RFC	CI
Ficus semicordata Buch.-Ham. ex Sm.	Moraceae	Khunia	Lf	Fo	108	108	0.68	0.68
Ficus subincisa Buch.-Ham. ex Sm.	Moraceae	Chanchari	Lf	Fo	9	9	0.06	0.06
Ficus virens Aiton	Moraceae	Pilkhan	Lf,Fr	Ed, Fo	50	35	0.22	0.32
Flacourtia indica (Burm.f.) Merr.	Salicaceae	Kangu	Lf, Fr,Ba,Wd	Ed, Fo, Fu, Ai	46	17	0.11	0.29
Fraxinus micrantha L.	Oleaceae	Angu	Lf, Wd	Fo, Fu, Ai	214	80	0.51	1.35
Glochidion heyneanum (Wight & Arn.) Wight	Phyllanthaceae	-	Lf	Fo	79	79	0.50	0.50
Grevillea robusta A. Cunn. ex R. Br.	Proteaceae	Silver oak	-	A/O	10	10	0.06	0.06
Grewia asiatica L.	Malvaceae	Pharsniya	Lf,Wd	Fo,Fu	78	37	0.23	0.49
Grewia optiva J. R. Drumm.exBurret.	Malvaceae	Bhimal	Ba, Lf, Fr,Wd	Ed, Fo, Fu, Fi	476	158	1.00	3.01
Griffitharia vestita (Wall. ex G.Don) Rushforth	Rosaceae	Mole	Fr	Ed	25	25	0.16	0.16
Haldina cordifolia (Roxb.) Ridsdale	Rubiaceae	Haldu	Wd	Fu,Ti	41	35	0.22	0.26
Hippophae salicifolia D.Don	Elaeagnaceae	Amash/ Chuk	Lf,Fr,Wd	Me, Ed, Fo, Fu	25	15	0.09	0.16
Holarrhena pubescens Wall. ex G. Don	Apocynaceae	Kwera	Lf, Wd, Ba,Lt	Me, Fo, Fu	39	25	0.16	0.25
Holoptelea integrifolia (Roxb.) Planch.	Ulmaceae	Kanju	-	Av,Fu	16	10	0.06	0.10
Hydrangea aspera Buch.-Ham. ex D.Don	Hydrangeaceae	-	-	NA	0	0	0.00	0.00
Hymenodictyon orixense (Roxb.) Mabb.	Rubiaceae	-	Lf	Fo	7	7	0.04	0.04
Ilex dipyrena Wall.	Apocynaceae	Kandela	Lf, Wd	Fo, Fu, Re	38	15	0.09	0.24
Itea nutans Royle	Iteaceae	-	-	NA	0	0	0.00	0.00
Jacaranda mimosifolia D. Don.	Bignoniaceae	Jacranda	-	Or	5	15	0.09	0.03
Juglans regia L.	Juglandaceae	Akhrot	Wd, Fr	Ed, Fu, Ti	280	158	1.00	1.77
Kydia calycina Roxb.	Malvaceae	Patha	Lf,Wd	Fo, Fu	80	40	0.25	0.51
Lagerstroemia indica L.	Lythraceae	Dhaura	-	Or	10	10	0.06	0.06
Lagerstroemia parviflora Roxb.	Lythraceae	Dhauri	-	Or	10	10	0.06	0.06
Lannea coromandelica (Houtt) Merr.	Anacardiaceae	Jhingan/ Kalmina	Lf, Wd	Fo, Fu	101	51	0.32	0.64
Leucaena leucocephala (Lam.) De Wit.	Fabaceae	Vilaitibaval	Lf, Wd	Fo, Fu	60	40	0.25	0.38
Lindera pulcherrima (Nees) Benth. ex Hook. f.	Lauraceae	-	Wd	Fu	12	12	0.08	0.08
Litsea glutinosa (Lour.) C.B.Rob.	Lauraceae		Lf, Wd	Fo, Fu	37	20	0.13	0.23
Lyonia ovalifolia (Wall.) Drude.	Ericaceae	Anyar	Lf, Wd	Fo, Fu	45	40	0.25	0.28
Machilus duthiei King ex Hook.f.	Lauraceae	Kaula	Lf,Wd	Fo,Fu	28	16	0.10	0.18
Machilus gamblei King ex Hook.f.	Lauraceae	Kaula	Lf,Wd	Fo,Fu	27	16	0.10	0.17
Machilus odoratissima Nees	Lauraceae	Kaula	Lf,Wd	Fo,Fu	30	19	0.12	0.19
Madhuca longifolia (J. Koenig ex L.) J.F Macbr.	Sapotaceae	Mahwa	Wd	Fu	9	9	0.06	0.06
Magnolia grandiflora L.	Magnoliaceae	-	-	NA	0	0	0.00	0.00
Mallotus philippensis (Lam.) Müll.Arg.	Euphorbiaceae	Riyona	Lf, Fr, Sd, Rt, Wd	Fo, Fu, Ti, Dy	225	90	0.57	1.42
Mangifera indica L.	Anacardiaceae	Am	Fr, Lf, Wd	Me, Ed, Fu, Ti	213	158	1.00	1.35
Melia azedarach L.	Meliaceae	Batain	Lf, Fr, Fr,Wd	Me, Fu, Ai	55	30	0.19	0.35
Meliosma dillenifolia (Roxb.) Wall.	Sabiaceae	Gogna	-	NA	0	0	0.00	0.00

Table 2. cd

Botanical name	Family	Local name	Part used	Uses	UR	FC	RFC	CI
Meliosma simplicifolia (Roxb.) Walp.	Sabiaceae	Goghsa	-	NA	0	0	0.00	0.00
Michelia champaca L.	Magnoliaceae	Champa	-	NA	0	0	0.00	0.00
Mitragyna parvifolia (Roxb.) Korth.	Rubiaceae	Phaaldu	Fr, Lf,Ba	Me	11	11	0.07	0.07
Moringa oleifera L.	Moringaceae	Sehjan	Fr,Lf,Fl,Wd	Me, Ed, Fo, Fu	32	32	0.20	0.20
Morus alba L.	Moraceae	Shatoot	Fr,Lf,Wd	Ed, Fo, Fu, Ai	285	158	1.00	1.80
Morus serrata Roxb.	Moraceae	Kimu	Lf, Fr, Ba, Wd	Fo, Fu	69	45	0.28	0.44
Musa paradisiaca L.	Musaceae	Kela	Fr,Wp, Lf	Ed, Re	316	158	1.00	2.00
Myrica esculenta Buch.-Ham. ex D. Don	Myricaceae	Kaphal	Fr,Lf,Wd	Ed, Fo, Fu	233	158	1.00	1.47
Neolitsea cuipala (D.Don) Kosterm.	Lauraceae	-	Wd,Lf	Fo,Fu	42	30	0.19	0.27
Neolitsea umbrosa (Nees) Gamble	Lauraceae	Belaru	Lf, Wd	Fo, Fu	60	40	0.25	0.38
Olea grandiflora Wall. ex G. Don	Oleaceae	Garur	Wd	Fu	10	10	0.06	0.06
Oroxylum indicum (L.) Kurz	Bignoniaceae	Tarulu	Ba, Lf, Fr, Wd	M, Re, Mis	29	9	0.06	0.18
Ougeinia oojeinensis (Roxb) Hochst.	Fabaceae	Sandan	Lf,Wd	Fo, Fu	98	62	0.39	0.62
Phoenix sylvestris (L.) Roxb.	Arecaceae	Khajoor	Lf, Fr	Ed, Br	52	30	0.19	0.33
Phyllanthus emblica L.	Phyllanthaceae	Amla	Fr,Wd	Me, Ed	178	158	1.00	1.13
Picea smithiana (Wall.) Boiss.	Pinaceae	-	Lf, Wd	Fu, Ti, Be	167	90	0.57	1.06
Pinus rouxburghii Sarg.	Pinaceae	Kulyon	Ba,Wd,Lf, Res	Me, Fu, Ti, Be, Resin	338	158	1.00	2.14
Pinus wallichiana A.B. Jacks.	Pinaceae	NeluKulyon	Ba,Wd,Lf	Fu, Ti,Mis	188	158	1.00	1.19
Pistacia khinjuk Stocks	Anacardiaceae	Kakra	Lf, Fr, Wd	Me, Fu, Ti, Ai	45	22	0.14	0.28
Pittosporum eriocarpum Royle	Pittosporaceae	Khukhdya	Lf,Wd	Fo, Fu	10	5	0.03	0.06
Polyalthia longifolia (Sonn.) Benth. & Hook.f. ex Thwaites	Annonaceae	Ashoka	-	Me, Or	8	6	0.04	0.05
Populus ciliata Wall. ex Royle	Salicaceae	Pahari papal	Lf, Wd	Fo, Fu, Ti	63	26	0.16	0.40
Premna barbata Wall. ex Schaner.	Lamiaceae	Bakr	Lf,Wd	Fo, Fu	82	42	0.27	0.52
Prunus armeniaca L.	Rosaceae	Khubani	Fr	Ed	158	158	1.00	1.00
Prunus cerasoides Buch.-Ham. ex D. Don	Rosaceae	Payaina	Fr,Wd,Lf,Ba	Me, Ed, Fu, Fo, Ai, Re	131	40	0.25	0.83
Prunus domestica L.	Rosaceae	Pulam	Fr	Ed	158	158	1.00	1.00
Prunus persica (L.) Batsch.	Rosaceae	Aru	Fr	Ed	158	158	1.00	1.00
Psidium guajava L.	Myrtaceae	Amrud	Lf, Wd	Ed	158	158	1.00	1.00
Pterospermum diversifolium Blume	Sterculaceae	-	-	NA	0	0	0.00	0.00
Punica granatum L.	Punicaceae	Darim	Lf, Fr, Ba,Wd	Me, Ed	213	158	1.00	1.35
Pyrus communis L.	Rosaceae	Nashpati	Fr	Ed	158	158	1.00	1.00
Pyrus malus L.	Rosaceae	Seb	Lf	Ed	158	158	1.00	1.00
Pyrus pashia Buch-Ham.ex D. Don	Rosaceae	Janglimehal	Lf,Wd,Fr	Ed, Fo, Fu	67	20	0.13	0.42
Quercus floribunda Lindl. ex A.Camus	Fagaceae	Moru	Lf, Wd	Fo, Fu,Ti, Ai	200	80	0.51	1.27
Quercus glauca Thunb.	Fagaceae	Phalyant	Lf, Wd	Fo, Fu,Ti, Ai	200	10	0.06	1.27
Quercus leucotrichophora A.Camus	Fagaceae	Banj	Lf, Wd	Fo, Fu	489	158	1.00	3.09
Quercus semecarpifolia Sm.	Fagaceae	Kharsu	Lf, Wd	Fo, Fu,Ti, Ai	489	158	1.00	3.09
Rhamnus triquetra (Wall.) Brandis	Rhamnaceae	Gaunta	Lf	Fo	9	9	0.06	0.06
Rhododendron arboreum Sm.	Ericaceae	Burans	Fl, Lf, Wd	Ed, Fo, Fu	329	158	1.00	2.08

Table 2. cd

Botanical name	Family	Local name	Part used	Uses	UR	FC	RFC	CI
Rhus chinensis Mill.	Anacardiaceae	-		Me, Fu	25	20	0.13	0.16
Rhus punjabensis J.L.Stewart ex Brandis	Anacardiaceae	-	Wd	Fu	40	40	0.25	0.25
Robinia pseudocasia L.	Fabaceae	Robinia	Lf, Wd	Fo, Fu	25	15	0.09	0.16
Salix babylonica L.	Salicaceae	Majnu	Lf, Wd	Fu, Ai	13	8	0.05	0.08
Sapindus mukorossi Gaertn.	Sapindaceae	Ritha	Lf, Fr,Wd	Me, Fu	43	35	0.22	0.27
Sapium sebiferum (L.) Dum. Cours.	Euphorbiaceae	Charbi	-	NA	0	0	0.00	0.00
Schleichera oleosa (Lour.) Oken.	Sapindaceae	Kusum	Wd	Ti	8	8	0.05	0.05
Shorea robusta Gaertn. f.	Dipterocarpaceae	Sal	Rs, Lf, Wd	Fo, Fu, Ti	22	15	0.09	0.14
Stercullia villosa Roxb.	Malvaceae	Udala	-	NA	0	0	0.00	0.00
Symplocos paniculata Miq.	Symplocaceae	Lodhar	Lf, Ba, Wd	Me, Fo, Fu	30	9	0.06	0.19
Symplocos ramosissima Wall. ex G.Don	Symplocaceae	Lodhra	Wd	Fu	9	15	0.09	0.06
Syringa emodi Wall. ex Royle	Oleaceae	Ghiya	Fl, Sd	Me	2	2	0.01	0.01
Syzygium cumini (L.) Skeel.	Myrtaceae	Jamun	Fr	Ed	45	45	0.28	0.28
Taxus wallichiana Zucc.	Taxaceae	Thuner	Lf, Ba, Wd	Ed, Fu, Ti	318	158	1.00	2.01
Tectona grandis L. f.	Lamiaceae	Sagon	Lf,Wd	Fu, Ti	15	15	0.09	0.09
Terminalia alata B.Heyne ex Roth	Combretaceae	Asin	Lf, Wd	Fo, Fu	120	60	0.38	0.76
Terminalia bellirica (Gaertn.) Roxb.	Combretaceae	Bahera	Fr	Me	54	54	0.34	0.34
Terminalia chebula Retz.	Combretaceae	Harar	Fr	Me	54	54	0.34	0.34
Thevetia peruviaria (Pers.) Schum.	Apocynaceae	Pili kaner	-	Or	10	10	0.06	0.06
Thuja orientalis L.	Cupressaceae	Mor-pankhi	-	Av, Fu	17	15	0.09	0.11
Toona ciliata M. Roem.	Meliaceae	Toon	Wd	Ti	120	120	0.76	0.76
Toona hexandra (Wall.) M.Roem.	Meliaceae	-	Wd	Ti	89	89	0.56	0.56
Toxicodendron succedaneum (L.) Kuntze	Anacardiaceae	-	Wd	Ti	20	20	0.13	0.13
Toxicodendron wallichii (Hook.f.) Kuntze	Anacardiaceae	Akoria	Wd	Mis	15	15	0.09	0.09
Trema orientalis (L.) Blume	Ulmaceae	Koyali / Khagsi	Lf, Wd, Ba	Fo, Fu, Fi	135	90	0.57	0.85
Ulmus wallichiana Planch.	Ulmaceae		Lf,Wd,Ba	Me, Fo, Fu	42	20	0.13	0.27
Viburnum cotinifolium D.Don	Adoxaceae	Ghenu	Lf,Wd	Ed, Fo, Fu	26	12	0.08	0.16
Viburnum cylindricum Buch.-Ham. ex D.Don	Adoxaceae	Tit, Titmoya,	Lf,Wd	Fo, Fu	47	22	0.14	0.30
Viburnum grandiflorum Wall. ex DC.	Adoxaceae	-	Fr, Wd	Ed, Br	39	30	0.19	0.25
Viburnum mullaha Buch.-Ham. ex D.Don	Adoxaceae		Fr,Wd	Ed, Fu	27	17	0.11	0.17
Wendlandia heynei (Schult.) Santapau & Merchant	Rubiaceae	Tirchunia	-	NA	0	0	0.00	0.00
Wrightia arborea (Dennst.) Mabb.	Apocynaceae	Dudhi	Fr, Lf	Fo, Fu, Mi	10	3	0.02	0.06
Xylosma longifolia Clos.	Salicaceae	Gardar	Lf, Wd	Fo, Fu	35	20	0.13	0.22

Abbreveiations: Wd = Wood, Lf = Leaf, Ba = Bark, Fl = Flower, Fb = Fibre, Fr = Fruit, Sd = Seed, Tw = Twig, Res = Resin, Me = Medicine, Br = Broom, Ed = Edible, Fodder, Fu= Fuel, Ti = Timber, Ai= Agricultural Implements, A/O = Avenue / Ornamental, Fi = Fibre, Re= Religious, Mis = Miscellaneous, UR = Use report, RFC = Relative frequency of citation, CI = Cultural importance.

Table 3. FIC and some with high cultural importance

UC	UR	% UC	Nt	%Taxa	FIC	Species with CI > 1or =1in the area
Me	404	0.03	37	0.13	0.91	*Dalbergia sissoo*, *Pinus rouxburghii*, *Abies pindrow*, *Mangifera indica*, *Punica granatum*, *Ficus auriculata*, *Aegle marmelos*, *Phyllanthus emblica*, *Betula utilis*, *Buxus wallichiana* and *Ficus benghalensis*
Ed	3490	0.23	53	0.18	0.99	*Punica granatum*, *Diospyros*, *Aegle marmelos*, *Citrus jambhiri*, *Elaeagnus umbellata*, *Artocarpus heterophyllus*, *Carica papaya*, *Morus alba*, *Cornus capitata*, *Hippophae salicifolia*, *Mangifera indica* and *Bauhinia variegate*
Fo	3292	0.22	86	0.30	0.97	*Cornus capitata*, *Rhododendron arboretum*, *Meliosma simplicifolia*, *Ficus auriculata, Kydia calycina*, *Flacourtia indica*, *Holarrhena pubescens*, *Elaeagnus umbellata*, *Lannea coromandelica*, *Bauhinia purpurea*, *Hymenodictyon orixense*, *Pyrus pashia*, *Prunus cerasoides*, *Bauhinia variegate* and *Ficus hispida*
Fu	3656	0.25	112	0.39	0.97	*Toxicodendron succedaneum*, *Ehretia laevis*, *Symplocos paniculata*, *Robinia pseudocasia*, *Hippophae salicifolia*, *Neolitsea umbrosa*, *Pyrus pashia*, *Acer cappadocicum*, *Eurya acuminata*, *Pinus wallichiana*, *Ficus racemosa*, *Mangifera indica*, *Carpinus viminea*, *Morus serrata*, *Holarrhena pubescens*, *Aesculus indica*, *Celtis australis* and *Flacourtia indica*
Ti	2046	0.14	34	0.12	0.98	*Dalbergia sissoo*, *Eucalyptus globulus*, *Mangifera indica*, *Albizia lebbeck*, *Tectona grandis*, *Juglans regia*, *Elaeagnus umbellata*, *Eucalyptus citriodora*, *Anogeissus latifolia*, *Mallotus philippensis* and *Abies pindrow*
Ai	470	0.03	20	0.07	0.96	*Pyrus pashia*, *Acacia catechu*, *Melia azedarach*, *Bauhinia semla*, *Alnus nepalensis*, *Pistacia khinjuk*, *Lannea coromandelica* and *Betula alnoides*
A/O	103	0.01	10	0.03	0.91	*Cassia fistula*, *Thuja orientalis*, *Callistemon citrinus* and *Grevillea robusta*
Fi	194	0.01	4	0.01	0.98	*Bombax ceiba* and *Grewia optiva*
Re	1034	0.07	11	0.04	0.99	*Prunus cerasoides*, *Ilex dipyrena*, *Phyllanthus emblica*, *Musa paradisiaca*
Mis	228	0.02	20	0.07	0.92	*Cordia vestita*, *Betula utilis*, *Toxicodendron wallichii*, *Wrightia arborea*, *Alnus nepalensis*, *Juglans regia*, *Engelhardtia spicata* and *Phoenix sylvestris*

Abbreviations: UC = Use Category, % UC = Percentage of Use category**, Σ**UR = Sum of Use Reports, Nt = Number of Taxa, %Taxa = Percentage of Taxa, FIC = Information Consensus Factor.

3.6 Informant consensus factor (FIC)

The different indigenous uses of the tree species were classified into ten use categories and informant consensus factor (FIC) for each category was examined. The FIC value varied from 0.91 to 0.99 with an average value of 0.95. Religious category obtained highest FIC value of 0.99 with 1034 use reports for11trees and fodder scored second highest value of 0.98 with 3292 use reports for 86 species. Plants have special position in the worship of Hindu deities and are offered in prayers and some holy trees like *Aegle marmelos* and *Ficus religiosa* are often planted close to temples and places of worship. FIC values for fuelwood and timber were 0.98 with 3656 and 2046 use reports for 112 and 34 species respectively. FIC value for edible was 0.98 followed by fibre 0.98, agricultural implement 0.96, avenue / ornamental 0.91, miscellaneous 0.92 and medicine with the lowest value of 0.91 (Table 3).

4. Conclusion

This study provided comprehensive information on tree diversity, local uses, relative frequency of citation, cultural importance and consensus of the local residents. Results reflect that the area is floristically rich and has a great potential for horticulture-based agroforestry. Local people are still dependent on tree species to meet their daily needs and there is a heavy anthropogenic pressure on some species like *Taxus wallichiana*, *Quercus leucotrichophora*, *Pinus roxburghii*, *Abies pindrow*, *Cedrus deodara*, etc. This may lead to gradual decrease of the species from the natural habitats. Hence, the awareness programs regarding the importance of the plant species for the survival of human beings on the planet Earth and their sustainable uses and conservation of biodiversity among local people are the need of hour. This study generates the baseline data which can be useful for policy making and sustainable development in the area.

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