Traditional use and management of NTFPs in Kangchenjunga Landscape: implications for conservation and livelihoods

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Abstract

Non-timber Forest Products (NTFPs), an important provisioning ecosystem services, are recognized for their contribution in rural livelihoods and forest conservation. Effective management through sustainable harvesting and market driven commercialization are two contrasting aspects that are bringing challenges in development of NTFPs sector. Identifying potential species having market value, conducting value chain analyses, and sustainable management of NTFPs need analysis of their use patterns by communities and trends at a regional scale. We analyzed use patterns, trends, and challenges in traditional use and management of NTFPs in the southern slope of Kangchenjunga Landscape, Eastern Himalaya and discussed potential implications for conservation and livelihoods. A total of 739 species of NTFPs used by the local people of Kangchenjunga Landscape were reported in the reviewed literature. Of these, the highest number of NTFPs was documented from India (377 species), followed by Nepal (363) and Bhutan (245). Though the reported species were used for 24 different purposes, medicinal and edible plants were the most frequently used NTFP categories in the landscape. Medicinal plants were used in 27 major ailment categories, with the highest number of species being used for gastro-intestinal disorders. Though the Kangchenjunga Landscape harbors many potential NTFPs, trade of NTFPs was found to be nominal indicating lack of commercialization due to limited market information. We found that the unsustainable harvesting and lack of marketing were the major constraints for sustainable management of NTFPs sector in the landscape despite of promising policy provisions. We suggest sustainable harvesting practices, value addition at local level, and marketing for promotion of NTFPs in the Kangchenjunga Landscape for income generation and livelihood improvement that subsequently contributes to conservation.

Keywords: Traditional knowledge, Medicinal plants, Trade, Potential species, NTFP policy, Sustainable use and management

Background

Non-timber forest products (NTFPs) are the most important provisioning services people obtain from forest ecosystems [1]. The importance of NTFPs in rural livelihoods and forest conservation has been well recognized as they provide income generation opportunities to millions of people around the world [2–5], and they are also a major source of supplementary food, medicines, fibre, and construction materials [6, 7]. In developing countries, biological resources obtained from forests, mostly NTFPs, may contribute as much as 20–25 % of income to rural people [7]. However, the economic potential of NTFPs is highly contextual and depends on a combined set of socio-cultural, ecological, geo-political, and economic conditions. Nevertheless, access to market/commercialization of NTFPs and sustainable harvesting are two important aspects that need attention for sustainable development of the NTFP sector (also see [8]). The ecological diversity of the Himalaya makes the area a habitat of a vast range of NTFPs. In the Himalayan
region, harvesting NTFPs is a tradition that also contributes significantly to the local economy. Some NTFPs play an important role in traditional health care systems, while others have important cultural values and are sources of food and housing material [9–11]. Among all categories of NTFPs, medicinal plants have received much focus while the contribution of other categories of NTFPs has been overlooked. For example, the contribution of wild edible plants towards food security and income generation has been undervalued in Nepal [12].

Common threats to NTFPs in the Himalayan region include unsustainable harvesting and habitat loss due to land use change, deforestation and over-grazing [13, 14]. Several other challenges have also been identified for sustainable management of NTFPs, such as policies that are ambiguous or poorly implemented due to the lack of resources, lack of comprehensive information on the ecology of the species and its socio-ecological impacts, and poor infrastructure for bioprospecting [15–17]. However, unsustainable harvesting is one of the major issues that affects ecological processes at many levels, from individual and population to community and ecosystem [2, 18]. Commercialization of NTFPs is another important aspect involving different processes such as production, collection, processing, storage, transport, marketing, and sale. Marshall et al. [19] found that product marketing and sale were the most important of all factors that constrained overall success of NTFPs commercialization. However, Ghate et al. [20] found a clear relationship between the degree of proximity to the market and NTFP dependence; remote places with low market access had high NTFPs dependency.

The demand for NTFPs is increasing not only in local markets, but also in international markets. Therefore, some important steps to facilitate integration of NTFPs into the development agenda that benefits local communities include identifying potential species having trade value and conducting research on their ecology and sustainable harvest levels; conducting analyses on value chain and use patterns; and analyzing trends and challenges in marketing and management [21]. Here we focus on these aspects of NTFPs in the Kangchenjunga Landscape within the Eastern Himalaya [22] and explore the implications for conservation and livelihoods.

Methods
Study area
The Kangchenjunga Landscape is a transboundary landscape shared by Bhutan, India, and Nepal. It is one of the richest landscapes in the Hindu Kush Himalaya (HKH) in terms of cultural and biological diversity and forms part of the Himalaya Biodiversity Hotspot, one of 34 global Biodiversity Hotspots [23]. It extends over 25,000 sq. km within 26° 21′ 40.49″ to 28° 7′ 51.25″ North latitudes and 87° 30′ 30.67″ to 90° 24′ 31.18″ East longitudes (Fig. 1). The altitude in the landscape ranges from 50 masl in the south to 8,586 masl, the height of Mount Kangchenjunga—the world’s third highest peak. Vegetation zones in the landscape is comprised of tropical, subtropical, temperate, subalpine, alpine, and nival.

The Kangchenjunga Landscape provides a range of ecosystem services that supports millions of people [24]. However, like many other landscapes worldwide, biodiversity and ecosystems within the landscape face threats mainly from anthropogenic pressures [25] and global climate change [26]. As a result, the people living in the landscape are economically, physically, and socially vulnerable [25, 27].

Recognizing the global and regional significances and challenges that lie within this landscape, the Kangchenjunga Landscape Conservation and Development Initiative (KLCDI) has been initiated by the governments of Bhutan, India and Nepal to achieve biodiversity conservation and sustainable development by applying ecosystem approaches to transboundary landscape management [22]. One of these priority areas is sustainable utilization of NTFPs in the Kangchenjunga Landscape. Several species of high value NTFPs that are also threatened are found in the landscape such as Chiraito (Swertia chirayita), Panch aunle (Dactylorhiza hatagirea), Kutki (Neopicrorhiza scrophulariiflora), Laghupatra (Podophyllum hexandrum) and Lauth salla (Taxus wallichiana).

Data collection and analysis
We reviewed scientific studies published in journals and books on traditional uses of NTFPs in the Kangchenjunga Landscape. Various online databases were used (ISI Web of Science, Scopus, and Google Scholar) using specific search terms such as ‘non-timber forest products,’ ‘medicinal plants,’ ‘wild edible plants,’ and ‘Kangchenjunga Landscape,’ ‘Nepal,’ ‘India,’ ‘Sikkim,’ ‘Darjeeling,’ and ‘Bhutan.’ We also explored hard copies of relevant publications. We reviewed a total of 47 publications and one database to enumerate the NTFPs in the Kangchenjunga Landscape. The precision of species identification in this review was dependent on the original source. However, we verified currently accepted name(s) in online nomenclature sources (http://www.thelplantlist.org and http://www.tropicos.org). Vernacular names when available have also been provided. A master list was produced providing Linnaean taxonomy, vernacular name(s), mode(s) of use, and reference(s) for each species (Table 1). We also collected trade data and reviewed policy documents on NTFPs of Bhutan, India and Nepal.

We listed ailments as mentioned in the publications but we followed the method proposed by Cook [28] to classify plants according to the different ailment categories they used to cure. However, in some cases Cook’s categories were not precise enough and plants were assigned to
Fig. 1 The Kangchenjunga Landscape in the Eastern Himalaya
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya

| SN | Botanical name                          | Habit    | Family         | Vernacular name(s)                          | Distribution (Altitude in meter) | Part(s) used, Use(s), Location and Reference(s)* |
|----|----------------------------------------|----------|----------------|--------------------------------------------|----------------------------------|-----------------------------------------------------|
| 1  | Justicia adhatoda L.                    | Shrub    | Acanthaceae    | Asuro (Np); Bashakha (Dz); Jantrashi (Me); Khatiernmu (Sh); Vasakdog (S) | 500-1600                         | Roots: Extract taken to cure cholera and epilepsy (KL Nepal: [53]); Roots, bark and leaves: Used as insecticide, expectorant, and antispasmodic. Used as remedy for asthma, cough, fever, gonorrhea leprosy, and phthisis (Sikkim: Database). Tender shoots: Used to treat asthma (Jhapa: [66]; Panchthar: [67]). Leaves: Extract given orally to cure wheezing in children (Jhapa: [68]). Decoction used in bronchitis, cold, and venereal diseases (Jhapa: [66]). Paste applied on abdomen and vagina just minutes before childbirth for easy delivery (Sikkim: [69]). Leaves and shoots: Taken orally against fever, headache and bodyache (Darjeeling: [52]). Flowers: Edible (KL Bhutan: [70]) and also used as medicine (KL Bhutan: [71]). |
| 2  | Strobilanthes cusia (Nees) Kuntze       | Herb     | Acanthaceae    | Ankhlay Jhar, Datiwan (Np)                  | 2000-3500                        | Leaves: Use to extract dye (KL Bhutan: [70]). |
| 3  | Viburnum erubescens Wall.              | Shrub    | Adoxaceae      | Asaray (Np)                                | 150-300                          | Seeds: Edible (Darjeeling: [72]). |
| 4  | Trianthema portulacastrum L.            | Herb     | Aizoaceae      | Seto Punarnava (Np)                         | 800-2300                         | Young shoots: Used as vegetable (Jhapa: [92]). |
| 5  | Alangium salvifolium (L.) Wangerin      | Tree     | Alanginaceae   | Dhela (S); Asare (Np)                       | 150-350                          | Bark: Paste used for abortion and antifertility (Jhapa: [66]). Fruit: Edible (Jhapa: [92]). |
| 6  | Achyranthes aspera L.                   | Herb     | Amaranthaceae   | Apamarga, Ulte kuro (Np)                    | 800-2300                         | Whole plant: Juice taken in cough (Panchthar: [67]; Ilam: [73]); dropsy, piles, stomachache (Ilam: [73]) and diarrhoea (Panchthar: [67]). Roots and stem: Juice used as diuretic and also given in rheumatism (Darjeeling: [74]; Sikkim: [75]; Ilam: [73, 76, 77]) and hypertension (Ilam: [73, 76, 77]). |
| 7  | Achyranthes bidentata Blume             | Herb     | Amaranthaceae   | Ankhlay Jhar, Datiwan (Np)                  | 200-2100                         | Roots: Pounded with seeds of Foeniculum vulgare and taken orally to cure piles (Jhapa: [66]). Leaves and twigs: Decoction taken to cure fever (Darjeeling: [78]). |
| 8  | Alternanthera sessilis (L.) DC.          | Herb     | Amaranthaceae   | Saranchi Saag (Np); Garundi (S)            | 200-2000                         | Roots: Extract used as diuretic (KL Nepal: [53]). Decoction taken with warm water to check excessive bleeding at post delivery stage (Jhapa: [66]). Leaves: Used as vegetable (Jhapa: [92]). Eaten as curry to treat burns, boils and as laxative (Darjeeling: [74]). |
| 9  | Amaranthus spinosus L.                   | Herb     | Amaranthaceae   | Janum arak (S); Lude (Np)                  | 150-1200                         | Whole plant: Used as spices (KL Bhutan: [70]). |
| 10 | Amaranthus spp.                         | Herb     | Amaranthaceae   | Zimtsi (Dz); Naam (Sh)                      | 200                              | Leaves: Used to stop diarrhea (Sikkim: [11]). Seeds: Taken to cure gastric problems, fried beaten seeds with butter are given to pregnant women to lessen pregnancy pains (Sikkim: [11]). |
| 11 | Amaranthus tricolor L.                   | Herb     | Amaranthaceae   | Ghama (S); Naam (Sh)                        | 150-1200                         | Young shoots and leaves: Used as vegetable (Jhapa: [92]). Juice with sugar taken to cure colic and as laxative (Darjeeling: [74]). |
| 12 | Amaranthus viridis L.                    | Herb     | Amaranthaceae   | Gandhari (S); Lude (Np)                     | 500-1600                         | Leaves: Juice administered orally in diarrhoea and dysentery (Sikkim: [79]). |
| 13 | Celosia argentea L.                     | Herb     | Acanthaceae     | Bhale Phul, Sahastaajadi (L)               | 2300-4800                        | Whole plant: Used as medicine (KL Bhutan: [71]). Plant: Used in digestion (Sikkim: [69]). Bulbs and aerial parts: Used as spice (Sikkim: [10, 80]; Database; Taplejung: [81, 82]; Sikkim: Database). Bulbs: Boiled, fried, or clarified butter and taken in cholera and diarrhea; chewed to treat cough, colds, and altitude sickness (Taplejung: [83]). Bulbs and flowers: Use to treat gastric disorders (Sikkim: [75]). |
| 14 | Allium sp.                              | Herb     | Amaryllidaceae  | Lagok (Dz/Sh)                              | 11                                | Root: Extract taken to cure cholera and epilepsy (KL Nepal: [53]). Roots, bark and leaves: Used as insecticide, expectorant, and antispasmodic. Used as remedy for asthma, cough, fever, gonorrhea leprosy, and phthisis (Sikkim: Database). Tender shoots: Used to treat asthma (Jhapa: [66]; Panchthar: [67]). Leaves: Extract given orally to cure wheezing in children (Jhapa: [68]). Decoction used in bronchitis, cold, and venereal diseases (Jhapa: [66]). Paste applied on abdomen and vagina just minutes before childbirth for easy delivery (Sikkim: [69]). Leaves and shoots: Taken orally against fever, headache and bodyache (Darjeeling: [52]). Flowers: Edible (KL Bhutan: [70]) and also used as medicine (KL Bhutan: [71]). |
| 15 | Allium wallichii Kunth                   | Herb     | Amaryllidaceae  | Wild Garlic (Eg); Palengu (Gr); Gokpa, Koji, Ri Gokpa (Km, Sh); Ban Lusun, Ban Phaj, Jimbu, Jimbu jhar (Np); Bathatuva (Ri) | 750-1600                         | Whole plant: Used as vegetables (KL Bhutan: [70]). Root: Extract taken to cure cholera and epilepsy (KL Nepal: [53]). Roots, bark and leaves: Used as insecticide, expectorant, and antispasmodic. Used as remedy for asthma, cough, fever, gonorrhea leprosy, and phthisis (Sikkim: Database). Tender shoots: Used to treat asthma (Jhapa: [66]; Panchthar: [67]). Leaves: Extract given orally to cure wheezing in children (Jhapa: [68]). Decoction used in bronchitis, cold, and venereal diseases (Jhapa: [66]). Paste applied on abdomen and vagina just minutes before childbirth for easy delivery (Sikkim: [69]). Leaves and shoots: Taken orally against fever, headache and bodyache (Darjeeling: [52]). Flowers: Edible (KL Bhutan: [70]) and also used as medicine (KL Bhutan: [71]). |
| No. | Species                          | Type      | Family       | Common Names                                   | Origin                | Uses                                                                 |
|-----|---------------------------------|-----------|--------------|------------------------------------------------|-----------------------|----------------------------------------------------------------------|
| 16  | Choerospondias axillaris (Roxb.)| Tree      | Anacardiaceae| Nepali Hug Plum (Eg); Phindhuwa (Li); Lapsi (Np); Arnali (Nw); Pinlumsi, Pintupsi (Ri); Nying Sho Sha (Tb) | 1200-1900             | Fruits: Edible (KL Bhutan: [70]). Edible and also used to make pickle (Darjeeling: [80]), Sikkim: [10, 47, 72, 95], Ilam: [94], Taplejung: [88]. Used to treat cough, cold, tonsillitis, diabetes, worm infestation, and heart ailment [97]. Bark: Paste applied around bone fracture to set bone (Jhapa: [66]). Plant: Effective for jaundice patient (Darjeeling: [105]). Flowers and fruits: Use to extract dye (KL Bhutan: [70]). |
| 17  | Lannea coromandelica (Houtt.)   | Tree      | Anacardiaceae| Doka (S)                                       | 100-1400              | Bark: Paste applied around bone fracture to set bone (Jhapa: [66]). |
| 18  | Mangifera indica L.             | Tree      | Anacardiaceae| Thaijau (Me); Ul (Np)                           | 300-700               | Fruits: Edible (Jhapa: [94]). Green unripe fruit skin crushed and drunk to get relief from stomachache (Jhapa: [68]). Leaves: Young leaves chewed during cough and sore throat (Sikkim: [79]). |
| 19  | Mangifera sylvatica Roxb.       | Tree      | Anacardiaceae| Chuchiam, Kathorkung (Lp)                       |                      | Fruits: Used as laxative (Sikkim: [85]). Used to make sour pickle (Ilam: [94]). |
| 20  | Rhus chinensis Mill.            | Tree      | Anacardiaceae| Bhakimlo (Np); Chokashing (Dz); Roptangshing (Sh); | 1000-2700             | Fruits: Edible (KL Bhutan: [70]). Used as medicine (KL Bhutan: [71]). Flowers and fruits: Use to extract dye (KL Bhutan: [70]). Fruits: Edible and also used in the treatment of diarrhea, dysentery (Taplejung: [88]), Panchthar: [67], Ilam: [73]) and stomach problems (Taplejung: [88], Ilam: [73]). Dried and extract used in diarrhea, swellings and wounds (Sikkim: Database). Juice used as food preservative, juice boiled with water and mixed with raw egg and the mixture given to treat diarrhea (Sikkim: [11]) and dysentery (Darjeeling: [80], Sikkim: [11]). Juice administered orally during blood dysentery (Sikkim: [79]). Boiled and isolated vinegar used to make pickles (Ilam: [94]). Roots: Used to treat skin infection (Sikkim: [11, 75]). Bark: Decoction given to animals to remove worms (Sikkim: [111]). Latex: Used as antitetanus (Jhapa: [66]). Fruits: Edible (Jhapa: [92]). Also used to treat headache (Jhapa: [68]). Seeds: Used as medicine (KL Bhutan: [71]). Seed oil taken in cough and colds (Jhapa: [66]). Flowers: Used to make curry and for flavoring (Ilam: [94]). Fruits: Edible (KL Bhutan: [70]). |
| 21  | Rhus javanica Miller            | Tree      | Anacardiaceae| Tibru, Tsakshing (Gr); Rushi (Km, Sh); Yaseba, Isewa (Li); Bhaki Amilo, Bhalau (Me); Mahada, Oksarempo, Osreksi (Ri); Bokumba, Thaking (Sh); Tibi Sing (Tm); Da Trig (Tb) | 1000-2700             | Fruits: Edible and also used in the treatment of diarrhea, dysentery (Taplejung: [88], Panchthar: [67], Ilam: [73]) and stomach problems (Taplejung: [88], Ilam: [73]). Dried and extract used in diarrhea, swellings and wounds (Sikkim: Database). Juice used as food preservative, juice boiled with water and mixed with raw egg and the mixture given to treat diarrhea (Sikkim: [11]) and dysentery (Darjeeling: [80], Sikkim: [11]). Juice administered orally during blood dysentery (Sikkim: [79]). Boiled and isolated vinegar used to make pickles (Ilam: [94]). Roots: Used to treat skin infection (Sikkim: [11, 75]). Bark: Decoction given to animals to remove worms (Sikkim: [111]). Latex: Used as antitetanus (Jhapa: [66]). Fruits: Edible (Jhapa: [92]). Also used to treat headache (Jhapa: [68]). Seeds: Used as medicine (KL Bhutan: [71]). Seed oil taken in cough and colds (Jhapa: [66]). Flowers: Used to make curry and for flavoring (Ilam: [94]). Fruits: Edible (KL Bhutan: [70]). |
| 22  | Semecarpus anacardium L.f.      | Tree      | Anacardiaceae| Soso (S); Rani bhalayo (Np); Bhalau (Me)       | 150-1200              | Roots: Used to treat skin infection (Sikkim: [11, 75]). Bark: Decoction given to animals to remove worms (Sikkim: [111]). Latex: Used as antitetanus (Jhapa: [66]). Fruits: Edible (Jhapa: [92]). Also used to treat headache (Jhapa: [68]). Seeds: Used as medicine (KL Bhutan: [71]). Seed oil taken in cough and colds (Jhapa: [66]). Flowers: Used to make curry and for flavoring (Ilam: [94]). Fruits: Edible (KL Bhutan: [70]). |
| 23  | Spondias pinnata (L. f.) Kurz   | Tree      | Anacardiaceae| Amaro (Np)                                      | 300-1400              | Flowers: Used to make curry and for flavoring (Ilam: [94]). Fruits: Edible (KL Bhutan: [70]). |
| 24  | Toxicodendron hookeri (K.C. Sahni & Bahadur) C.Y. Wu & T.L. Ming | Tree      | Anacardiaceae| Tarishing (Sh)                                  |                      | Flowers: Used to make curry and for flavoring (Ilam: [94]). Fruits: Edible (KL Bhutan: [70]). |
| 25  | Annona squamata L.             | Tree      | Annonaceae   | Saripha (Np); Mandargom (S)                     | 500-900               | Roots: Used as medicinal (KL Bhutan: [71]). Roots and seeds: Paste applied on forehead during headache (Sikkim: [79]). Bark: Juice drunk to control fever (Jhapa: [68]). Leaves and seeds: Used to kill lice (Panchthar: [67]). Thalamus is used as antifertility (Jhapa: [66]). Seeds: Useful in abortion and menstrual disorders (Jhapa: [66]). Roots and seeds: Paste applied on forehead during headache (Sikkim: [79]). Roots: Used as medicinal (KL Bhutan: [71]). Roots: Used as medicinal (KL Bhutan: [71]). Fruits: Used as medicine (KL Bhutan: [71]). Leaves: Used as vegetable (Taplejung: [87]). |
| 26  | Angelica cyclocarpa             | Herb      | Apiaceae     |                                             |                      | Fruits: Edible (KL Bhutan: [70]). |
| 27  | Angelica sinesis (Oliv.) Diels  | Herb      | Apiaceae     |                                             |                      | Fruits: Edible (KL Bhutan: [70]). |
| 28  | Carum carvi L.                 | Herb      | Apiaceae     | Caraway (Eg); Chir (Gr-Mn); Ban Jeera (Np); Sushavi (Sr); Chhonyo, Khoda (Sh,Wi) | 2500-5100             | Roots: Used as medicinal (KL Bhutan: [71]). Roots: Used as medicinal (KL Bhutan: [71]). Fruits: Used as medicine (KL Bhutan: [71]). Leaves: Used as vegetable (Taplejung: [87]). |
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No. | Scientific Name | Family | Common Name | Uses | Altitude |
|-----|----------------|--------|-------------|------|----------|
| 29  | Centella asiatica (L.) Urb. | Apiaceae | Ghortaapre, Gol patta, Gora taprey, Goltaprey (Np); Dalka chatumana (S) | 500-2100 | Plant: Used to cure heating and tenderness of limb skin (Jhapa: [68]). Juice taken orally to get rid of pneumonia, fever (Sikkim: [75]), asthma (Jhapa: [68]), illam: [76, 77]; Sikkim: Database, [69]), mental tension, urinary problems, and stomachache (Illam: [76, 77]; Jhapa: [68]; Sikkim: [75]). Infusion massaged on the forehead to relieve from headache (Jhapa: [66]). Leaves: Used for skin disease and improving memory (Sikkim: Database). Leaves and young shoots taken to cure tonsil (Darjeeling: [53]). Aerial parts mixed with young shoots of Justicia adhatoda and taken against diarrhoea (Darjeeling: [86]).

| 30  | Coriandrum sativum L. | Herb | Dhaniya (Np) | 1000-2500 | Seeds: Used as spice (Illam: [76]) and in flatulence (Darjeeling: [91]). Leaves: Used in flatulence (Darjeeling: [91]). Green leaves used to enhance aroma on food (Illam: [76]). Plant: Used in cough, bronchitis, rheumatism and urinary problem (Illam: [76]).

| 31  | Cortis depressa (D. Don) C. Norman | Herb | Nigale Sag (Np); Gholo, Ghundu, Kholo, Nhopchhema (Sh); Tangkyun (Sh, Tb); Ghundu (Wl) | 3600-5100 | Leaves: Tender leaves used as vegetable (Tablejung: [88]). Seeds: Used as spice (Tablejung: [81]).

| 32  | Heracleum nepalense D. Don | Herb | Sunaga, Hablowa (Km); Samben (Lp); Chimphing (Np); Bhoote-Jeera, Nabo (Np-Dl); Chimphing (Np-Tb); Pnakhi, Thar (Sh); Chimbing, Chimphing (Sh, Wl); Chapho Karpo, Zira Goepa (Tb) | 1800-3700 | Plant: Used as good winter fodder (Tablejung: [81, 87]). Roots: Given to cattle as tonic; juice and roasted seeds taken in cough and diarrhoea (Panchthar: [67], Ilam: [73, 77]). Flowers and fruit: Suggested to cure influenza and body ache (Sikkim: [75]). Fruit: Used as pickle and also in typhoid, nausea, and vomiting (Darjeeling: [78]). Seeds: Used in case of bodyache, headache, and faint (Panchthar: [67], Ilam: [73]).

| 33  | Heracleum wallichii DC. | Herb | Chimphing (Np) | 3600-4100 | Roots: Used as medicine (KL Bhutan: [71]). Used as tonic and aphrodisiac (Darjeeling: [78]). Juice taken to cure diabetes (Sikkim: [11]). Seeds: Taken in diarrhoea and gastric disorders (Sikkim: [75]), used as chatni (Sikkim: [11]). Decoction of dried seeds taken in influenza (Darjeeling: [78], Sikkim: [11]).

| 34  | Heracleum cannitum Willd. ex DC. | Herb | Golpata (Np) | 1500-2500 | Whole plant: Used as medicinal (KL Bhutan: [71]).

| 35  | Heracleum dissectifolium K.T. Fu | Herb | Golpata (Np) | 1500-2500 | Roots: Used as medicine (KL Bhutan: [71]).

| 36  | Hydrocotyle himalaica P. K. Muhk. | Herb | Golpata (Np) | 1500-2500 | Plant: Extract taken to cure pneumonia and throat infection (Sikkim: [75]).

| 37  | Hydrocotyle javanica Thunb. | Herb | Golpata (Np) | 1500-2500 | Plant: Taken to cure throat problem (Sikkim: [75]).

| 38  | Hydrocotyle sibirrhoides Lam. | Herb | Tike Ghor Tapre (Np) | 600-2500 | Plant: Useful in treatment of migrant and to improve memory (Panchthar: [67]).

| 39  | Selinum wallichianum (DC.) Raizada & Saxena | Herb | Sunaga (Km); Bhutkesh (Np); Bhatauri, Dhaneli, Kalo Chhetaro (Np-Dl); Tunak (Tb); Chyadukpa (Sh, Wl) | 2700-4800 | Roots and fruits: Used for cuts, wounds, colic, gastritis, and intestinal pain (KL Nepal: [83]). Roots: Smoked inhaled in case of faint, fever, and headache. Also used as fodder (Tablejung: [81]). Decoction taken to get relief from pain and fever (Illam: [76]). Flowers and leaves: Smooked to treat headache (KL Nepal: [53]). Leaves: Leaves, aromatic, carminative. Fruits: Used in skin diseases and scabies (Sikkim: Database).

| 40  | Alstonia scholaris (L.) R. Br. | Tree | Chhatiwan (Np); Chhatri (S) | 100-1400 | Bark: Used in malarian fever and also given to lactating mothers for increasing milk (Jhapa: [66]). Extract used to treat piles (KL Nepal: [53]). Filtered bark juice used to cure leanness in man (Jhapa: [66]). Powder mixed with common salt and given to cattle to cure fever (Sikkim: [97]). Bark, latex and flowers: Used as tonic and in fever and leucoderma (Sikkim: [97]). |
| No. | Scientific Name                          | Morphological Form | Family          | Common Names                                      | Habitat and Uses                                                                                                                                 |
|-----|-----------------------------------------|--------------------|-----------------|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 41  | Catharanthus roseus (L.) G. Don          | Shrub              | Apocynaceae     | Barhamase Phool, Sadabahar (Np); Goaftbhivar (Me) | Plant: Anti cancer and antitumour (Sikkim: Database). Leaves: Used as diuretic (Sikkim: Database). Flowers: Eaten to maintain sugar level for diabetic patients (Jhapa: [68]). |
|     |                                         |                    |                 |                                                  |                                                                                                                                                  |
| 42  | Holarrhena pubescens (Buch.-Ham.) Wall. ex G. Don | Shrub              | Apocynaceae     | Ban Khirro, Khuria, Arley Khirr, Madhese Khirro (Np); Hat (S) | Plant: Powder or decoction taken to treat acute diarrhea and dysentery (Darjeeling: [86]; Sikkim: [11, 85]). Bark: Powdered with black pepper and taken to cure cough, cold, fever, diarrhea, and dysentery (Jhapa: [65]). Juice taken in amoebic dysentery (Sikkim: [11, 85]). Bark and seeds: Useful to treat gastric troubles and have anthelmintic property (Panchthar: [67]). Fruit: Used as medicine (KL Bhutan: [71]). Stem: Bark powder or decoction given to livestock to treat constipation, problems during stool passing and dysentery (Sikkim: [84]). |
| 43  | Ichnocarpus frutescens (L.) R. Br.       | Climber            | Apocynaceae     | Dudilata (S); Dudelaharo (Np)                    | Leaves: Extraction used in stomach pain (Jhapa: [66]). Stem: Extraction used in toothache and gum swelling (Jhapa: [65]).                                                                                   |
| 44  | *Rauvolfia serpentina (L.) Benth. Ex Kurz | Herb               | Apocynaceae     | Kharokha (Me); God (S)                           | Young shoots: Extract given to cure pneumonia (Jhapa: [68]). Roots, stems and leaves: Used to treat fever (Panchthar: [67]). Roots: Extract used as medicine (KL Bhutan: [71]). Useful in insomnia (Sikkim: Database), high blood pressure, and snake bite (Jhapa: [66]; Sikkim: Database). Extract taken in stomach pain and intestinal worms (Jhapa: [66]). Powder administered orally as antidote to snake-bite (Sikkim: [84]). |
| 45  | Vincetoxicum hirundinaria Medik.         | Herb               | Apocynaceae     |                                                 | Fruits: Used as medicine (KL Bhutan: [71]).                                                                                                                                                                  |
| 46  | *Acorus calamus L.                       | Herb               | Araceae         | Sweet Flag (Eg); Sadakappa (Lu); Ruklop (Lp); Bohji (Np); Chhovas (Rl); Vachia (Sh); Chota, Jota (Gr-Mn); Suda, Syueda (Sh); Shete (Tm); Tshedak (Sh); Shudag (Tb) | Rhizomes: Used in treatment of epilepsy and other mental ailments, chronic diarrhoea (Darjeeling: [80]; Sikkim: [69]), colic pains and as a brain tonic (Sikkim: [69]). Used to cure cold, cough (Jhapa: [68]; Sikkim: [11, 79]; Ilam: [73]), sore throat, bronchitis, tonsil, toothache, headache (Jhapa: [68]; Ilam: [73]), bodypain (Jhapa: [68]), scabies, sinusitis (Panchthar: [67]) and also as vermifuge and antispasmodic (Sikkim: [75]). Used in skin disease (Darjeeling: [80]; Sikkim: [11, 79, 89]), malaria and asthma (Darjeeling: [80, 89]). Juice used as insecticide (Panchthar: [67]; Sikkim: [75]). Decoction taken as antipyretic (Sikkim: [11, 68]; Darjeeling: [78]) and also to treat rheumatism (Darjeeling: [78]). Pounded with the rhizome of Curcuma zedoaria and given in ulcers and abdominal pains (Jhapa: [66]). Extract taken to cure measles (Sikkim: [79]). Crushed and boiled with salt and decoction used to massage for fortnight (Darjeeling: [74]). Paste applied as ointment on wounds in cattle, also administered in indigestion in cattle (Sikkim: [84]). |
|     |                                         |                    |                 |                                                 |                                                                                                                                                  |
| 47  | Acorus gramineus Alton                   | Herb               | Araceae         | Silijam (Dz), Bortsl (Sh)                        | Rhizomes: Used as medicine (KL Bhutan: [71]).                                                                                                                                                                  |
| 48  | Alacasia macrorhizos (L.) G. Don          | Herb               | Araceae         | Man kachui (S); Karkalo (Np).                    | Petioles and tuber: Edible as vegetable (Jhapa: [92]). Young petioles: Cooked with Colocasia esculenta and taken orally in cold and cough (Jhapa: [66]).                                                                 |
| 49  | Alacasia spp.                           | Herb               | Araceae         |                                                 | Tubers: Edible (KL Bhutan: [70]).                                                                                                                                                                          |
| 50  | Amorphophallus paeoniifolius C. Y. Wu ex H. Li, Y. Shiao & S. L. Tseng | Herb               | Araceae         | Pindo (S); Ol (Np)                               | Tubers and petioles: Used as vegetable (Jhapa: [92]).                                                                                                                                                         |
| No. | Scientific Name                  | Common Name | Family | Part Used | Habitat | Application |
|-----|----------------------------------|-------------|--------|-----------|----------|-------------|
| 51  | *Arisaema costatum* (Wall.) Mart. ex Schott | Herb | Araceae | Glatli (Gr); Asek kaki (Li); Dhakayo, Jangali Makai (Np); Thwa (Sh) | 1900-2800 | Leaves: Dried leaves boiled and cooked as vegetable (Taplejung: [87]). Young shoots used to make curry and corn eaten after repeated boiling (Ilam: [94]). Roots: Juice or paste taken in ulcer and fever (Ilam: [73, 77]). |
| 52  | *Arisaema griffithii* Schott | Herb | Araceae | Asek Makai, Yakla Khomba (Li); Dhokayo (Np); Doka Banko (Np-Dl); Thwa (Sh); Thwa (Wl) | 2400-3500 | Leaves: Sundried, stored and consumed as vegetable in winter; dried leaves are also used to make Sinki (dried fermented leaves) (Sikkim: [98], Taplejung: [81, 88]). |
| 53  | *Arisaema intermedium* Blume | Herb | Araceae | Sarpa Makai (Np) | 2600-3400 | Roots: Juice or paste taken in ulcer and fever (Ilam: [73, 77]). |
| 54  | *Arisaema jacquemontii* Blume | Herb | Araceae | Banko (Np) | 2700-4700 | Roots: Juice taken orally to treat menstrual disorders, toothache, and pain (Ilam: [73, 77]). Bulbs: Used as medicine (KL Bhutan: [71]). |
| 55  | *Arisaema sp.* | Herb | Araceae | Dowo (Dz), Rungenengsae (Sh) | 200-300 | Fruit: Pounded and applied on rheumatism and bodyache (Jhapa: [66]). |
| 56  | *Caladium bicolor* (L.) Vent. | Herb | Araceae | Dungasaru (S) | 200-300 | Rhizome: Paste applied externally to cure rheumatism (Jhapa: [66]). |
| 57  | *Scindapsus officinalis* (Roxb.) Schott | Climber | Araceae | Kammare lahara (Np); Dari jappa (S) | 200-300 | Fruit: Pounded and applied on rheumatism and bodyache (Jhapa: [66]). |
| 58  | *Typhonium trilobatum* (L.) Schott | Herb | Araceae | Nirbish (S) | 450 | |
| 59  | *Arala cachemirica* Decne. | Shrub | Araliaceae | Dal kabro (Np); Dumbak (Wl) | 2400-4200 | Plant: Powder contains high nutrient and generates heat in the body of animal (Taplejung: [81]). Roots: Used to treat cuts and contraction of muscles (Panchthar: [67]). |
| 60  | *Brassaiopsis hainla* (Buch.-Ham. ex D. Don) Seem. | Tree | Araliaceae | Chuletro (Np, Li) | 1000-1900 | Roots: Administered orally in case of dysentery (Sikkim: [79]). |
| 61  | *Hedera nepalensis* K. Koch | Shrub | Araliaceae | Ivy (Eg); Dudela (Np) | 2000-3200 | Plant: Juice taken orally as antispasmodic (Sikkim: [85]). |
| 62  | *Helwingia himalaica* Hook. f. & Thomson ex C. B. Clarke | Shrub | Araliaceae | | 2100-2700 | Fruits: Enhance fertility (Sikkim: [75]). |
| 63  | *Macropanax undulatus* (Wallich ex G. Don) Seemann | Tree | Araliaceae | Chenday (Np) | 400-2200 | Bark: Administered against diabetes (Darjeeling: [52]). |
| 64  | *Merrilliopanax alpinus* (C. B. Clarke) C. B. Shang | Tree | Araliaceae | | | |
| 65  | *Panax pseudo-ginseng* subsp. *himalaicus* H. Hara | Herb | Araliaceae | Mangan, Panchpattery (Np) | | Young shoots: Useful in gastric disorders (Sikkim: [75]). Roots: Taken to reduce fever, indigestion, and vomiting; also used as tonic (Sikkim: [75], Database). |
| 66  | *Panax pseudo-ginseng* Wall. | Herb | Araliaceae | Panchpattey (Np) | | Roots: Used as medicine (KL Bhutan: [71]). Used as stimulant, combating general debility, headache, vomiting, expectorant, carminative, tonic, in blood pressure (Sikkim: [69]) and weakness (Ilam: [76], Sikkim: [69]). Juice given to cure liver disorders, colic, fever and menstrual disorders (Darjeeling: [74]). |
| 67  | *Pentapanax leschenaultii* (DC.) Seem. | Tree | Araliaceae | Chinde (Np) | 1600-3700 | Leaves: Tender leaves after boiling used as curry (Ilam: [94]). |
| 68  | *Areca catechu* L. | Tree | Arecaceae | | | Fruit/seed: Used as medicine (KL Bhutan: [71]). |
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No. | Scientific Name | Taxonomic Family | Genus | Number of Uses |
|-----|----------------|------------------|-------|----------------|
| 69  | Borassus flabellifer L. | Herb | Arecaceae | Tari (S) |
| 70  | Calamus acanthospathus Griff. | Climber | Arecaceae | Cane (Eng) |
| 71  | Calamus erectus Roxburgh | Climber | Arecaceae | |
| 72  | Calamus latifolius Roxb. | Climber | Arecaceae | |
| 73  | Calamus tenuis Roxb. | Climber | Arecaceae | |
| 74  | Calotropis gigantea (L.) Dryand. | Shrub | Asclepiadaceae | |
| 75  | Campylandra aurantiaca Baker | Herb | Asparagaceae | |

**Table Notes:**

- **Flowers:** Juice taken to quench the thirst (Jhapa: [66]).
- **Shoots:** Edible (KL Bhutan: [70]). Edible and also used as a substitute for rope, as cable for suspension bridges, for wickerwork, baskets, and containers. Thicker cane used for making furniture frames, walking sticks and umbrella handles (KL Bhutan: [100]).
- **Shoots:** Edible (Bhutan: [99]).
- **Shoots:** Edible (KL Bhutan: [70]). **Leaves:** Juice used to cure eye diseases (Sikkim: [11]).
- ** Shoots:** Edible (KL Bhutan: [70]). Used to make household items, such as mats, screens and furniture (KL Bhutan: [100]).
- **Stem and buds:** Inner core pith and terminal bud consumed as vegetable (Ilam: [94]).
- **Fruits:** Raw fruits used to make vegetable curry (Ilam: [94]).
- **Stem:** Soft pith eaten raw (Ilam: [94]).
- **Young shoots:** Taken as vegetable (Bhutan: [99, 102]).
- **Flowers:** Used as medicine (KL Bhutan: [71]).
- **Roots and leaves:** Paste applied in stomachache and as an antidote in snake bite and scorpion sting (Jhapa: [66]).
- **Roots:** Used to treat cancer, warts, and snake bite (Panchthar: [67]).
- **Latex and Leaves:** Used in sprain and swelling (Jhapa: [66]; Panchthar: [67]). Sikkim: Database. **Roots:** Extraction given in fever and applied on chest and abdomen to relieve pains (Jhapa: [66]). **Latex:** Used as medicine (KL Bhutan: [71]). Applied on burns (Jhapa: [66]; and for ring worm (Jhapa: [68]).
- **Leaves:** Applied on burns (Panchthar: [67]).
- **Plant:** Used for cooling and alternative effect in gonorrhea (Sikkim: Database). **Roots, leaves and fruit:** Decoction used to relieve burning sensation of the genitals (Sikkim: [11]).
- **Roots:** Juice taken daily as purgative (Sikkim: [85]).
- **Leaves:** Juice taken for stomachache (Sikkim: [85]).
- **Roots:** Stocks given orally in case of food poisoning (Darjeeling: [52]). **Inflorescence:** Powdered and taken with water to relieve body pain (Sikkim: [11]). Given in food poisoning (Darjeeling: [74]). **Flowers:** Used as appetizer and taken in diabetes (Sikkim: [69, 70]). Database. Taken as curry (Sikkim: [89]).
Table 1: NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No. | Species | Life Form | Family | Part(s) Used | Local Name(s) | Altitude (m) | Uses |
|-----|---------|-----------|--------|--------------|---------------|-------------|-------|
| 87  | Chlorophytum arundinaceum Baker | Herb | Asparagaceae | Turam (S) | 500-1200 | Roots: Powder taken to relieve from body weakness (Jhapa: [66]). |
| 88  | Eucomis regia (L.) Aiton | Herb | Asparagaceae | Lily (C) |  | Bulb: Used as medicinal (KL Bhutan: [71]). |
| 89  | Tupistra nutans Wall. ex Lindl. | Herb | Asparagaceae | Nakima (Np) |  | Flower: Taken as appetizer and in diabetes (Sikkim: Database). Inflorescence: Powdered and taken to relieve from body pain (Sikkim: [11]). |
| 90  | Acmeilla calva (Candolle) R. K. Jansen | Herb | Asteraceae | Mareti (Np) | 1000-1900 | Fruit: Juice taken orally for headache and stomachache (66, 77), toothache (Darjeeling: [74]); Ilam: (73, 77) and sore mouth (Darjeeling: [74]). |
| 91  | Ageratina adenophora (Spreng) R.M. King & H. Rob. | Herb | Asteraceae | Banmara (Np) | 850-2500 | Plant: Juice applied on fresh cut (Darjeeling: [74]); Ilam: (73); Sikkim: [11, 75]) and also taken orally in fever (Ilam: (73). Leaves: Taken orally in dysentery (Darjeeling: [52]). Whole plant: Used as antidote (KL Nepal: [53]). |
| 92  | Ageratum conyzoides L. | Herb | Asteraceae | Ilamejhar (Np) | 200-2000 | Whole plant: Used as incense (KL Bhutan: [70]). Leaves: Juice applied on fresh cuts and wounds (Ilam: [73, 77]). Flower: Paste applied regularly to cure skin problems (KL Bhutan: [53]). |
| 93  | Ajania tibetica (Hook.f. & Thomson) Tzvelev | Shrub | Asteraceae |  |  |  |
| 94  | Anaphalis adnata Wall. ex DC | Herb | Asteraceae | Buki phul (Np) | 800-3200 | Leveas: Juice applied on fresh cuts and wounds (Ilam: [73, 77]). Flower: Paste applied regularly to cure skin problems (KL Bhutan: [53]). |
| 95  | Anaphalis triplinervis (Sims) C. B. Clarke | Herb | Asteraceae | Bhukiphul (Np) | 100-2300 |  |
| 96  | Artemisia dubia Wall. ex Beiser | Herb | Asteraceae | Pati, Titepati, Titaypati (Np); Sibuma, Sungimara (Ri); Chhaphung (Sh); Khenpa (Tb); Sangsin Khemba (M) | 1200-3400 | Whole plant: Used in ritual ceremony (Sikkim: [11]). Leaves: Used to treat pains and possess anthelmintic properties (Panchthar: [67]). Crushed fresh leaves used to open decongestant sinuses and to stop nasal bleeding (Taplejung: [81]; Sikkim: [11], Database). Extract used on cuts and bruises (Sikkim: [11], Database). Supposed to possess detergent effect and also used as anthelmintic (Panchthar: [67]). Decoction used as antipyretic (Darjeeling: [78]), and also in diarrhea, dysentery, colic, and flatulence (Sikkim: [11]). Tender shoots chewed to cure diarrhoea and dysentery. Flowers: chewed to treat throat pain (Sikkim: [79]). |
| 97  | Artemisia indica Willd. | Herb | Asteraceae | Namyohoba (Li); Tuknil (Lp); Titepati (Np); Tompe (Sh) | 300-2400 | Tender shoots and leaves: Used to treat inflammation (Taplejung: [87]). Leaves and flowers: Juice used to treat injuries (Sikkim: [75]). Juice taken in asthma, gastritis and skin disease (Ilam: [76, 77]). |
| 98  | Artemisia nilagirica (C.B. Clarke) Pamp. | Herb | Asteraceae | Titepati (Np) |  | Shoots and leaves: Used to cure mouth ulcer; paste applied externally on forehead during dizziness and headache (Darjeeling: [52]). Whole plant: Used as medicine (KL Bhutan: [71]). |
| 99  | Artemisia sieversiana Ehrh.ex Willd. | Shrub | Asteraceae |  |  |  |
| 100 | Artemisia vulgaris L. | Herb | Asteraceae | Titepati (Np); Titeypati (Li) | 1500-3800 | Leaves: Used to treat nose bleeding (Sikkim: [69, 79, 91]) nervous and spasmodic affections, asthma and the disease of the brain (Sikkim: [69]). Tender leaves chewed cures mouth ulcers; crushed leaves mixed with water and taken bath cures skin allergy. Juice used as anti-leech, besides its religious values (Sikkim: [79]). Used as deobstruent, antispasmodic, obstructed menses and hystera (Sikkim: [89]). Crushed and extract applied externally on skin to treat itching in cattle; fresh leaves grounded, sap extracted and used as nasal drop to stop nose bleeding in cattle (Sikkim: [84]).

Note: The table continues with additional NTFPs and their uses. Further details are provided in the text.
| S. No. | Common Name                          | Genus                        | Scientific Name                     | Place                        | Part Used                                                                 | Uses                                                                                                                                                                                                 |
|-------|-------------------------------------|------------------------------|-------------------------------------|------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 101   | Aster neo-elegans Grierson          | Shrub                        | Asteraceae                          |                              | Whole plant                                                               | Used as medicine (KL Bhutan: [71]).                                                                                                                                                    |
| 102   | Aucklandia costus Falconer           | Herb                         | Asteraceae                          |                              | Kapisful, Kuth (Np)                                                       | Plant: Believed to cure bronchitis, vomiting, epilepsy, headache, and hysteria (Sikkim: Database).                                                                                       |
| 103   | Bidens pilosa L.                    | Herb                         | Asteraceae                          |                              | Kuro (Li)                                                                 | Leaves: Juice applied to eyes and ears to reduce pain (Sikkim: [79]). Leaves and roots: Extract used in cut and jaundice (KL Nepal: [53]).                                          |
| 104   | Bidens spp.                         | Herb                         | Asteraceae                          |                              | Zumphirobu (Sh)                                                          | Edible (KL Bhutan: [70]).                                                                                                                                                               |
| 105   | Blumea hieraciifolia (D. Don) DC.    | Herb                         | Asteraceae                          |                              | Sahasrabooti (Np)                                                        | Leaves: Dried and taken smell to treat asthma (Darjeeling: [74]).                                                                                                                        |
| 106   | Blumea lacera (Burf. f.) DC.         | Herb                         | Asteraceae                          |                              | Gangansu (Me); Rando, Ghar nagharni (S)                                  | Roots: Paste stuck on and around swelling region to prevent cutaneous infection (Jhapa: [68]). Decoction given in urinary infections, and also with decoction of Plumeria acuta given in gonorrhoea and spermatorrhoea (Jhapa: [66]). |
| 107   | Calendula officinalis L.             | Herb                         | Asteraceae                          |                              | 2600-4400                                                                 | Whole plant: Used as medicine (KL Bhutan: [71]). Whole plant/flowers: Used as medicine (KL Bhutan: [71]).                                                                              |
| 108   | Chrysanthemum indicum L.             | Herb                         | Asteraceae                          |                              | Godawari (Li)                                                            | Whole plant/flowers: Used as medicine (KL Bhutan: [71]). Whole plant/flowers: Used as medicine (KL Bhutan: [71]).                                                                              |
| 109   | Cimicium sp.                        | Herb                         | Asteraceae                          |                              | 100-2900                                                                  | Whole plant/flowers: Used as medicine (KL Bhutan: [71]). Whole plant/flowers: Used as medicine (KL Bhutan: [71]).                                                                              |
| 110   | Cremanthodium humile Maxim.          | Herb                         | Asteraceae                          |                              | 200-1200                                                                  | Whole plant/flowers: Used as medicine (KL Bhutan: [71]). Whole plant/flowers: Used as medicine (KL Bhutan: [71]).                                                                              |
| 111   | Eclipta prostrata (L.) L.            | Herb                         | Asteraceae                          |                              | Bhringaraj (Np); Khetkeshari (S)                                        | Roots: Used in treatment of snake and scorpion bite (Jhapa: [66]). Leaves and tender shoots: Used to treat cut and wounds and jaundice (Panchthar: [67]). |
| 112   | Elephantopus scaber L.               | Herb                         | Asteraceae                          |                              | Sahsra Jari (Np); Dadari (Me)                                            | Roots: Paste applied on the muscular pain (Jhapa: [68]). Flowers: Used as tonic (Jhapa: [66]).                                    |
| 113   | Erigeron multiradiatus (Lindl. ex DC) Benth. ex C.B. Clarke | Herb | Asteraceae                          |                              | 200-1500                                                                  | Flowers: Used as medicine (KL Bhutan: [71]).                                                                                                                                   |
| 114   | Eupatorium adenophorum Spreng.       | Herb                         | Asteraceae                          |                              | Banmara (Np)                                                             | Plant: Juice applied on fresh cut (Sikkim: [75]; Ilam: [73]) and also taken in fever (Ilam: [73]).                                                                                     |
| 115   | Eupatorium cannabinum L.             | Herb                         | Asteraceae                          |                              | Banmara (Np)                                                             | Stem and Leaves: Extract used on cut and bruises to stop bleeding and infection (Darjeeling: [80]; Sikkim: [11], Database).                                                           |
| 116   | Eupatorium odoratum L.               | Herb                         | Asteraceae                          |                              | Aule banmara (Np); Daubanthu (Me)                                        | Leaves: Juice applied on cut and injury as haemostatic and to check nasal bleeding, extract dropped in nose to cure severe headache (Jhapa: [68]). Extract also used in cuts and wounds (Sikkim: Database). |
| 117   | Gnaphalium affine D. Don             | Herb                         | Asteraceae                          |                              | Pahelo Bukey (Np)                                                        | Plant: Whole plant crushed and given orally to infants suffering from diarrhoea (Darjeeling: [5-2]).                                                                                        |
| 118   | Grangea maderaspatana (L.) Poir.      | Herb                         | Asteraceae                          |                              | Chot Bhidimyan (S)                                                      | Aerial parts: Pounded together with Sphaeranthus indicus and taken orally as well as inhaled a few drops to restore consciousness during epileptic fit (Jhapa: [66]). |
| No. | Species | Life Form | Family | Use (Location) |
|-----|---------|-----------|--------|----------------|
| 119 | *Inula cappa* (Buch.-Ham. ex D.Don) DC. | Shrub | Asteraceae | Golden Samphire, Sheep's Year (Eg); Bakhrakane, Gaitihare, Kanpate, Tihare-Phul (Np); Basita, Machram (Ri). Roots: Juice used in fever, indigestion, and other stomach disorders (Taplejung: [81]). |
| 120 | *Inula helenium* L. | Herb | Asteraceae | Roots: Used as medicine (KL Bhutan: [71]). |
| 121 | *Ixeridium gracile* (DC.) Pak & Kawano | Herb | Asteraceae | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 122 | *Leontopodium jacotianum* Beauverd | Herb | Asteraceae | Bhuke Phul, Jhulo (Np-Dl); Tawa Thokar, Tawa Thokar Yungpa (Tb) Plant: Used as incense (Taplejung: [81]). |
| 123 | *Leontopodium monocephalum* Edgew. | Herb | Asteraceae | Bhuke Phul, Jhulo (Np-Dl); Tawa Thokar goepa (Tb).植| Rhizomes: Used as medicinal (KL Bhutan: [71]). Leaves: Edible (KL Bhutan: [70]). Whole plant/flowers: Used as medicinal (KL Bhutan: [71]). |
| 124 | *Leontopodium* sp. | Herb | Asteraceae | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 125 | *Lorentea* sp. | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). |
| 126 | *Pulicaria insignis* Drumm. ex Dunn | Herb | Asteraceae | Whole plant/flowers: Used as medicinal (KL Bhutan: [71]). |
| 127 | *Pulicaria* sp. | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). |
| 128 | *Saussurea costus* (Falc.) Lipsch. | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). Fibres: Used for various purposes (Taplejung: [81]). |
| 129 | *Saussurea gossypiphora* D.Don | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). Roots and leaves: Infusion used in fever and boils (Ilam: [73, 76]). |
| 130 | *Senecio cappa* Buch.-Ham. ex D. Don | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). |
| 131 | *Senecio chrysanthemoides* DC. | Herb | Asteraceae | Rhizomes: Used as medicinal (KL Bhutan: [71]). Roots: Used as medicine (KL Bhutan: [71]). |
| 132 | *Sonchus arvensis* L. | Herb | Asteraceae | Ban-rayo (Np) Roots: Paste applied to relieve from toothache (Darjeeling: [74]). Roots: Taken in jaundice (Sikkim: [75]). Whole plant: Used as medicine (KL Bhutan: [71]). |
| 133 | *Sonchus wightianus* DC. | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). |
| 134 | *Sonseris hookeriana* (C.B.Clarke) Stebbins | Herb | Asteraceae | Whole plant/flowers: Used as medicinal (KL Bhutan: [71]). Flowers: Used as medicinal (KL Bhutan: [71]). Roots: Used as medicine (KL Bhutan: [71]). |
| 135 | *Sphaeranthus indicus* L. | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). Roots and leaves: Infusion used in fever and boils (Ilam: [73, 76]). |
| 136 | *Tagetes erecta* L. | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). |
| 137 | *Tagetes patula* L. | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). |
| 138 | *Tanacetum matkinsonii* (C.B.Clarke) Kitam. | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). |
| 139 | *Tanacetum tattienense* (Bureau & Franch.) K. Bremer & Humphries | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). |
| 140 | *Tanaxacum officinale* F.H. Wigg. | Herb | Asteraceae | Whole plant: Used as medicinal (KL Bhutan: [71]). |
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No.  | Scientific Name                  | Family   | Common Name                                                                 | Uses                                                                                          |
|------|----------------------------------|----------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 141  | *Taraxacum sikkimense* Hand.-Mazz. | Herb     | *Asteraceae*                                                                 | *Wakhu* (Sh); *Tuki Phool* (Np); *Khurnang*; *Wakhu* (Tb)                                      |
| 142  | *Taraxacum tibetanum* Hand-Mazz. | Herb     | *Asteraceae*                                                                 | *Khenpa-karlo* (Dz/Sh/V8)                                                                   |
| 143  | *Vernonia anthelmintica* (L.) Willd. | Herb     | *Asteraceae*                                                                 | *Sauraj* (S)                                                                                    |
| 144  | *Vernonia cineana* (L.) Less.     | Herb     | *Asteraceae*                                                                 | *Jurishuri* (S)                                                                                 |
| 145  | *Waldheimia glabra* (Decne.) Regel | Herb     | *Asteraceae*                                                                 | *Gang Poe* (Tb); *Ghanga-Setik* (WI).                                                        |
| 146  | *Impatiens balsamina* L.         | Herb     | *Balsaminaceae*                                                              | *Tiuri* (Np)                                                                                   |
| 147  | *Basella alba* L.                | Climber  | *Basellaceae*                                                                | *Pune arak* (S); *Poi sag* (Np)                                                                 |
| 148  | *Begonia picta* Sm.              | Herb     | *Begoniaceae*                                                                | *Begonia* (Eg); *Magar Kanche* (Np); *Shovaparnee* (Sn)                                       |
| 149  | *Berberis angulosa* Wall. ex Hook. f. & Thomson | Shrub    | *Berberidaceae*                                                              | *Chutro* (Np)                                                                                 |
| 150  | *Berberis aristata* DC.          | Shrub    | *Berberidaceae*                                                              | *Berberry* (Eg); *Kaya* (Gr-Mn); *Kyatabukung* (Lp); *Chutro*; *Musa Lede* (Np); *Chotto* (Np-Dl); *Kyerva*; *Kyerkar* (Km, Tbd); *Chompairam* (Ri); *Danuharidra*; *Rasjan* (Sn); *Kerpa-Setk* (Dz) |
| 151  | *Berberis asiatica* Roxb. ex DC. | Shrub    | *Berberidaceae*                                                              | *Berberry* (Eg); *Tokong*; *Pirima* (Li); *Chutro*; *Musa Lede* (Np); *Chotto* (Np-Dl); *Danuharidra*; *Thakti-Layem* (Ri) |
| 152  | *Berberis nepalensis* Spreng.    | Shrub    | *Berberidaceae*                                                              | *Chutro* (Np)                                                                                 |
| 153  | *Mahonia acanthifolia* D.Don     | Shrub    | *Berberidaceae*                                                              | *Mahonia* (Eg); *Samlikhe*; *Samikhe* (Li); *Chutro*; *Jamane Mandro* (Np); *Khalsa* (Ri); *Danuharidra*; *Kanchan* (Sn); *Kerbe* (Tm); *Kerpa* (WI) |
| 154  | *Mahonia napaulensis* DC.        | Shrub    | *Berberidaceae*                                                              | *Himalayan May Apple* (Eg); *Balulu*; *Baluagu* (Km); *Laghlu Patgra* (Np); *Meme Gudruk* (Np-Dl); *Upaha*; *Ramassii*; *Ramassii* (Sh, Wi); *Wolmose* (Tb); *Goeygabetapi* (Sh) |
| 155  | *Sinopodophyllum hexandrum* (Royle) T.S.Ying | Herb    | *Berberidaceae*                                                              | *Himalayan May Apple* (Eg); *Balulu*; *Baluagu* (Km); *Laghlu Patgra* (Np); *Meme Gudruk* (Np-Dl); *Upaha*; *Ramassii*; *Ramassii* (Sh, Wi); *Wolmose* (Tb); *Goeygabetapi* (Sh) |

**Plant**: Used as vegetable. **Flowers and leaves**: Used as galactagogue for human and cattle (Tapelejung: [87]).

**Whole plant**: Used as medicinal (KL Bhutan: [71]).

**Fruits**: Pounded and taken to remove intestinal worms and to cure stomachache (Jhapa: [66]).

**Leaves**: Decoction given in fever (Jhapa: [66]).

**Plant**: Used as incense (Tapelejung: [87]).

**Plant**: Decoction used to cure burns and urinary problems (Ilam: [73, 76]).

**Young shoots**: Used as vegetable (Jhapa: [92]).

**Plant**: Juice taken in headache and conjunctivitis (Ilam: [73, 76]). **Stalks**: Extracts from stalks used for venereal disease (Sikkim: Database).

**Fruit**: Juice applied as an anti-leech agent (Taplejung: [67]).

**Stem**: Decoction taken orally in blood dysentery and jaundice (Darjeeling: [52]).

**Roots and bark**: Used as medicine (KL Bhutan: [71]). Used in jaundice, malaria, fever, and diarrhea; also used externally to cure eye disease (Sikkim: Database).

**Leaves, flowers and bark**: Used in eye disease, bile disorders, lymphy disorder, jaundice, malarian fever, swelling, and dysentery (Ilam: [73]; Panchtchar: [67]).

**Extract**: Extract used for hypoglycemic activities (Sikkim: [96]). **Fruit**: Juice used as an anti-leech agent (Taplejung: [67]); also used to cure rabies (Sikkim: [75]).

**Bark**: Decoction used to treat conjunctivitis, eye inflammation, and also used as laxative and tonic (KL Nepal: [83]). **Roots**: Source of dye (KL nepal: [83]).

**Fruit**: Eaten raw (Ilam: [73]; Panchtchar: [67]); also used to cure rabies (Sikkim: [75]).

**Bark**: Juice applied in eyes (Sikkim: [79]). **Fruit and leaves**: Juice taken in diarrhoea and dysentery (Sikkim: [79]).

**Bark**: Use to extract dye (KL Bhutan: [70]).

**Stem**: Decoction taken to treat blood dysentery, diarrhoea and jaundice (Darjeeling: [52]).

**Plant**: Used for fencing (Tapelejung: [81, 82]). **Fruit**: Used in the treatment of urinary disorders (Tapelejung: [81, 82]).

**Bark**: Juice applied in eyes (Sikkim: [79]). **Fruit and bark**: Decoction taken to treat dysentery, diarrhoea (Ilam: [73, 76]; Sikkim: [86]), and urinary disorders (Ilam: [73, 76]).

**Plant**: Useful for typhoid fever, mental disorder, and plague (Sikkim: Database).

**Use**: Used as medicine (KL Bhutan: [71]). **Roots**: Used as purgative, hepatic stimulant, bile expellant, bitter tonic and in skin diseases (Sikkim: [69]).

**Decoction**: Decoction used in ulcer and liver troubles (Tapelejung: [81]). Crushed and applied externally on hoof to treat infection; decoction used for cattle to treat indigestion (Sikkim: [84]). **Roots and fruit**: Used as anticancer remedy (Sikkim: [75]), taken in fever and diarrhoea (Tapelejung: [81]; Sikkim: [75], Database). **Fruit**: Ripe fruits eaten raw; used in gynaecological diseases, menstrual disorders, kidney disease, skin disease, and cough (Tapelejung: [81]).
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No. | Species                                      | Family          | Use                                                      | Location               |
|-----|---------------------------------------------|-----------------|----------------------------------------------------------|------------------------|
| 156 | Betula alnoides ex. D. Don                   | Betulaceae      | Bark: Paste applied on snake bite (Sikkim: [75]). Chewed as a substitute of betel nut (Ilam: [94]). | Bark: Crushed and applied on injuries of cattle (Sikkim: [97]). Boiled and used for cleaning wounds as antiseptic (Sikkim: [75]). |
| 157 | Betula utilis D. Don                         | Betulaceae      | Leaves: Buds used as substitute for tea leaves (Sikkim: [72]). | Branch: Used during marriage ceremony (Taplejung: [81]). Bark: Crushed and applied on injuries of cattle (Sikkim: [97]). Boiled and used for cleaning wounds as antiseptic (Sikkim: [75]). |
| 158 | Betula utilis D. Don                         | Betulaceae      | Plant: Used useful in jaundice (Darjeeling: [105]). Roots, bark and fruit: Used in fever, bronchitis, dysentery, and asthma (Sikkim: [85]). Root bark: Improves appetite, taken in vomiting, asthma, and bronchitis (Darjeeling: [80], [89]). Bark and seeds: Powder used to treat dropsy, sprains, asthma, urinary disorders (Ilam: [73, 76, 77]), high fever and pneumonia (Sikkim: [11]). Seeds: Used as medicinal (KL Bhutan: [71]). Endosperms eaten to cure pneumonia (Jhapa: [69]). Bark: Powder applied on chronic wounds (Jhapa: [69]) and also used to treat burns, boils (Panchthar: [67]), and diarrhea (Darjeeling: [86], Panchthar: [67]). Flowers: Used as medicinal (KL Bhutan: [71]). Edible (Darjeeling: [80]). Flowers: Edible (Darjeeling: [80], Ilam: [94], Sikkim: [89]). |
| 159 | Oroxyllum indicum (L.) Kurz                  | Bignoniaceae    | Plant: Used useful in jaundice (Darjeeling: [105]). Roots, bark and fruit: Used in fever, bronchitis, dysentery, and asthma (Sikkim: [85]). Root bark: Improves appetite, taken in vomiting, asthma, and bronchitis (Darjeeling: [80], [89]). Bark and seeds: Powder used to treat dropsy, sprains, asthma, urinary disorders (Ilam: [73, 76, 77]), high fever and pneumonia (Sikkim: [11]). Seeds: Used as medicinal (KL Bhutan: [71]). Endosperms eaten to cure pneumonia (Jhapa: [69]). Bark: Powder applied on chronic wounds (Jhapa: [69]) and also used to treat burns, boils (Panchthar: [67]), and diarrhea (Darjeeling: [86], Panchthar: [67]). Flowers: Used as medicinal (KL Bhutan: [71]). Edible (Darjeeling: [80]). Flowers: Edible (Darjeeling: [80], Ilam: [94], Sikkim: [89]). |
| 160 | Steneospermum chelonaides (L. f.) DC.        | Bignoniaceae    | Fruit: Tied as an amulet to cure migraine (Jhapa: [66]). | Roots and bark: Used as emetic (Panchthar: [67]) and also used to treat diarrhea and dysentery (Darjeeling: [86], Panchthar: [67], Sikkim: Database). Roots: Decoction given in urinary infection, also with decoction of Plumeria obtusa given in gonorrhoea and spermatorrhoea (Jhapa: [66]). Flowers: Used as medicine (KL Bhutan: [71]). Buds cooked as vegetable (Jhapa: [92]). Pickled and eaten twice daily to get relief from diarrhea and dysentery (Jhapa: [68]). Paste applied externally on small pox in children (Sikkim: [79]). Exude used as gum (KL Bhutan: [70]). |
| 161 | Bombax ceiba L.                             | Bombacaceae     | Roots and bark: Used as emetic (Panchthar: [67]) and also used to treat diarrhea and dysentery (Darjeeling: [86], Panchthar: [67], Sikkim: Database). Roots: Decoction given in urinary infection, also with decoction of Plumeria obtusa given in gonorrhoea and spermatorrhoea (Jhapa: [66]). Flowers: Used as medicine (KL Bhutan: [71]). Buds cooked as vegetable (Jhapa: [92]). Pickled and eaten twice daily to get relief from diarrhea and dysentery (Jhapa: [68]). Paste applied externally on small pox in children (Sikkim: [79]). Exude used as gum (KL Bhutan: [70]). |
| 162 | Heliotropium indicum L.                     | Boraginaceae    | Leaves: Buds used as substitute for tea leaves (Sikkim: [72]). | Branch: Used during marriage ceremony (Taplejung: [81]). Bark: Crushed and applied on injuries of cattle (Sikkim: [97]). Boiled and used for cleaning wounds as antiseptic (Sikkim: [75]). |
| 163 | Onosma hookeri C. B. Clarke                | Boraginaceae    | Seeds: Used as medicinal (KL Bhutan: [71]). Endosperms eaten to cure pneumonia (Jhapa: [69]). Bark: Powder applied on chronic wounds (Jhapa: [69]) and also used to treat burns, boils (Panchthar: [67]), and diarrhea (Darjeeling: [86], Panchthar: [67]). Flowers: Used as medicinal (KL Bhutan: [71]). Edible (Darjeeling: [80]). Flowers: Edible (Darjeeling: [80], Ilam: [94], Sikkim: [89]). |
| 164 | Brassica campestris L. var. cumifolia Roxb. | Brassicaceae    | Whole plant: Used to make fermented material called ‘Gundruk’ (Darjeeling: [108], Sikkim: [101]). Used in fever, indigestion and irritation (Ilam: [76]). | Roots: Oil used externally as hair tonic (Sikkim: [49]). Used as medicinal (KL Bhutan: [71]). |
| 165 | Brassica sp.                                | Brassicaceae    | Seed: Used as medicine (KL Bhutan: [71]). | Plant: Used as green vegetable (Taplejung: [87]). Used as medicine (KL Bhutan: [71]). Leaves: Juice used in malarial fever (Darjeeling: [76]). |
| 166 | Capsella bursa-pastoris (L.) Medik.         | Brassicaceae    | Shoot: Extract taken to low blood pressure and in cardiac problems (Darjeeling: [74], Sikkim: [75]). | Plants: Used as vegetable (Sikkim: [98], Taplejung: [87]) and also made fermented vegetables (North-East India: [101]). |
| 167 | Cardamine hirsuta L.                        | Brassicaceae    | Seed: Used as medicinal (KL Bhutan: [71]). | Plant: Used as vegetable (Sikkim: [98], Taplejung: [87]) and also made fermented vegetables (North-East India: [101]). |
| 168 | Cardamine macrophylla Willd.                | Brassicaceae    | Seed: Used as medicinal (KL Bhutan: [71]). | Plant: Used as vegetable (Sikkim: [98], Taplejung: [87]) and also made fermented vegetables (North-East India: [101]). |
| No. | Common Name                          | Family          | Scientific Name                                  | Local Name       | Elevation (m) | Uses and Parts                                                                 |
|-----|-------------------------------------|-----------------|-------------------------------------------------|------------------|---------------|-----------------------------------------------------------------------------|
| 170 | Lepidium sativum L.                 | Herb            | Brassicaceae                                     | Chamsur (Np)     | 200-3000      | Plant: Consumed as vegetable; useful in piles, asthma, cough, syphilis and bodyache (Ilam: [76]). |
|     |                                     |                 |                                                 |                  |               | Whole plant: Used as medicine (KL Bhutan: [71]).                             |
| 171 | Malcolmia sp.                       | Herb            | Brassicaceae                                     |                  |               | Aerial parts: Decoction given to relieve body pain; young shoots taken as salad (Ilam: [76, 94]; Sikkim: [11, 79]). Plant: Juice given in indigestion and urinary disorder (Ilam: [76]). |
|     |                                     |                 |                                                 |                  |               | Whole plant: Used to make fermented material called ‘Sinki’ and ‘Gundruk’ (Darjeeling: [101, 108]). Used in indigestion, liver and gall bladder troubles, urinary complaints and ear pain (Ilam: [73, 76]). |
| 172 | Nasturtium officinale R. Brown      | Herb            | Brassicaceae                                     |                  |               | Tends to reduce swelling, used to relieve body pain (Ilam: [76, 94]; Sikkim: [11, 79]). |
|     |                                     |                 |                                                 |                  |               | Whole plant: Used as medicine (KL Bhutan: [71]). Exude as resin used as medicine (KL Bhutan: [71]). Used as incense (KL Bhutan: [70]). |
| 173 | Raphanus sativus L.                 | Herb            | Brassicaceae                                     | Mula (Np)        |               | Whole plant: Used to make fermented material called ‘Sinki’ and ‘Gundruk’ (Darjeeling: [101, 108]). Used in indigestion, liver and gall bladder troubles, urinary complaints and ear pain (Ilam: [73, 76]). |
|     |                                     |                 |                                                 |                  |               | Bark: Root bark used for curing skin disease; juice applied to treat dislocated bones and to heal wounds (Sikkim: [85]). |
|     |                                     |                 |                                                 |                  |               | Fruit: Taken to improve digestion (Sikkim: [85]). |
| 174 | Thlaspi arvense L.                  | Herb            | Brassicaceae                                     | Jay-kha (Dz)     |               | Whole plant: Used as medicine (KL Bhutan: [71]). Exude as resin used as medicine (KL Bhutan: [71]). Used as incense (KL Bhutan: [70]). |
|     |                                     |                 |                                                 |                  |               | Stem: Cut into small pieces and fed to livestock to treat inflammation; small pieces mixed with fodder to feed cattle as a tonic (Sikkim: [84]). Decoction given orally to treat severe diarrhoea (Sikkim: [75, 79]). Flowers: Dried flower paste taken in empty stomach to treat diarrhoea (Darjeeling: [86]). Seeds: Pounded and taken to relieve body pain (Sikkim: [75, 79]). |
| 175 | Canarium sikkimense                 | Tree            | Burseraceae                                      | theaters of KL Bhutan: [71]. |               | Whole plant: Used as medicinal (KL Bhutan: [71]). |
|     |                                     |                 |                                                 |                  |               | Leaves: Juice taken orally in dysentery and tonsillitis (Darjeeling: [74]). |
| 176 | Garuga pinnata Roxb.                | Tree            | Burseraceae                                      | Aule Dabdabe, Dubdabey (Np) | 300-1200      | Whole plant: Used as medicine (KL Bhutan: [71]). |
|     |                                     |                 |                                                 |                  |               | Plants: Infusion taken to cure stomach pain and flatulence (Jhapa: [66]). Leaf: Taken to cure urinary troubles (Jhapa: [66]). |
|     |                                     |                 |                                                 |                  |               | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 177 | Codonopsis foetens Hook.f. & Thom  | Climber         | Campanulaceae                                    | Gaytangru (Sh)   |               | Whole plant: Used as medicine (KL Bhutan: [71]). Fruit: Taken to improve digestion (Sikkim: [85]). |
|     | son                                   |                 |                                                 |                  |               | Plants: Infusion taken to cure stomach pain and flatulence (Jhapa: [66]). Flower: Dried flower paste taken in empty stomach to treat diarrhoea (Darjeeling: [86]). Seed: Pounded and taken to relieve body pain (Sikkim: [75, 79]). |
| 178 | Lobelia angulata G. Forst.          | Herb            | Campanulaceae                                    |                  |               | Whole plant: Used as medicine (KL Bhutan: [71]). Exude as resin used as medicine (KL Bhutan: [71]). Used as incense (KL Bhutan: [70]). |
|     | Lobelia pyramidalis Wall.           | Herb            | Campanulaceae                                    | Elkebir (Np)     |               | Leaves and flowers: Used as antispasmodic (Sikkim: [75]). |
| 179 | Pratia nummularia (Lam.) A. Br. & Asch. | Herb         | Campanulaceae                                    | Lanka Sanay (Np)  | 1000-2400     | Whole plant: Used as medicine (KL Bhutan: [71]). |
|     | Lobelia pyramidalis Wall.           | Herb            | Campanulaceae                                    |                  |               | Leaves: Juice taken orally in dysentery and tonsillitis (Darjeeling: [74]). |
| 180 | Cannabis sativa L.                  | Herb            | Cannabaceae                                      | Gaja (Np); Gaja (S) |               | Whole plant: Used as medicine (KL Bhutan: [71]). |
|     | Canna indica L.                     | Herb            | Cannaceae                                        |                  | 900           | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 181 | Capparis zeylanica L.               | Shrub           | Capparaceae                                      | Asaria (S)       | 150           | Whole plant: Used as medicine (KL Bhutan: [71]). |
|     |                                      |                 |                                                 |                  |               | Fruits: Edible (Jhapa: [92]). |
| 182 | Capparis zeylanica L.               | Shrub           | Capparaceae                                      | Asaria (S)       | 150           | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 183 | Dipsacus atratus Hook.f. & Thomson ex C.B.Clarke | Herb          | Caprifoliaceae                                   | Yika (Dz), Pinsa (Sh), |               | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 184 | Petrocephalus hookeri (CB.Clarke) E.Pritz. | Herb          | Caprifoliaceae                                   |                  |               | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 185 | Viburnum cylindricum                | Shrub           | Caprifoliaceae                                   | Arrow wood (Eg); Hanggase (Li); Gharaghi; Ghar ghure; Ghode khari (Np) | 1000-2500     | Whole plant: Used as medicine (KL Bhutan: [71]). |
|     | Buch.-Ham. ex D. Don                |                 |                                                 |                  |               | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 186 | Carica papaya L.                    | Herb            | Caricaceae                                       | Mewa (Np)        | 100-1000      | Whole plant: Used as medicine (KL Bhutan: [71]). |
|     | Arenaria densissima Wall. ex Edgew. & Hook.f. | Herb          | Caryophyllaceae                                  |                  |               | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 187 | Arenaria densissima Wall. ex Edgew. & Hook.f. | Herb          | Caryophyllaceae                                  |                  |               | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 188 |                                  |                 |                                                 |                  |               | Whole plant: Used as medicine (KL Bhutan: [71]). |
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No. | Species                                      | Family         | Common Names                        | Elevation (m) |
|-----|----------------------------------------------|----------------|-------------------------------------|---------------|
| 189 | Drymaria cordata (L.) Willd. ex. Roem. & Schult. | Caryophyllaceae | Abhijalo (Np); Hachiya-gara-gamso (Me) | 2200-4300     |
|     | Drymaria diandra Blume                        | Caryophyllaceae | Avijalo (Np)                         | 700-2000      |
|     | Drymaria villosa Cham. & Schlecht.            | Caryophyllaceae | Abijalo (Np)                         | 150-300       |
| 190 | Celastrus paniculatus Willd.                  | Celastraceae    | Kujur (S)                            | 100-1300      |
| 191 | Chenopodium album L                          | Chenopodiaceae  | Bethu Saag (Np)                      | 400-950       |
| 192 | Cleome gynandra L.                           | Cleomaceae      | Junge Phool (Np); Seta kata arak (S) | 300           |
| 193 | Garcinia cowa Roxb.                          | Clusiaceae      | Egg tree (Eg); Kaphal (Np)           | 100-1300      |
| 194 | Hyptericum uratum Buch.-Ham. ex D. Don        | Clusiaceae      | Urlilo (Np)                          | 1200-3600     |
| 195 | Mesua ferrea L.                              | Clusiaceae      | Nageeswari (Np)                      | 300           |
| 196 | Terminalia bellirica (Gaertn.) Roxb.         | Combretaceae    | Bhaayure (Me); Baro (Np); Lopong (S); Baru (Dz/Sh/Th/B) | 300-1100     |
| 197 | Terminalia chebula Retz.                     | Combretaceae    | Silikhaa (Me); Aaru (Dz/Sh)          | 150-1100      |

**Plant:** Burned and inhaled for antipyretic effect (Darjeeling: [78]). Paste useful to treat fever, cold and cough (Darjeeling: [78]) also used for dog bites (Sikkim: Database), headache and sore throat (Sikkim: [11]). Paste applied externally on fractured bone and bandaged with the help of cotton cloth; decoction administered to animal to treat mouth ulcer (Sikkim: [84]). Above ground parts: Steamed and smelled during sinus trouble (Darjeeling: [52, 78, 80]; Sikkim: [11, Panchthar: [67]]. Leaves: Pasted with Urena lobata applied for cutaneous infections (Jhapa: [68]). Useful in diarrhea and dysentery (Peptic: [67]).

**Above ground parts:** Steamed and smelled during sinus trouble (Darjeeling: [52, 78, 80]; Sikkim: [11], Panchthar: [67]).

**Leaves:** Pasted with Urena lobata applied for cutaneous infections (Jhapa: [68]). Useful in diarrhea and dysentery (Panchthar: [67]).

**Seeds:** Paste applied on the skin for allergies and good for gout (Sikkim: [11]).

**Fruit:** Sun dried and taken to treat dysentery (Sikkim: [85]).

**Bark:** Orally administered in various skin diseases (mostly poxes) and in menstrual disorder (Sikkim: Database). Bark or stem paste applied or taken orally in hydrocele and on wound (Sikkim: [53]).

**Fruit:** Used as medicine (KL Bhutan: [71]) and incense (KL Bhutan: [70]). Powder drunk to treat constipation (Jhapa: [68]). Useful in bronchitis (Jhapa: [66]). Bark and oil: Applied externally to treat acute stomach pain (Jhapa: [66]). Shoots: Juice taken to treat gastritis and constipation (Jhapa: [66]). Leaves: Juice used as eye drops to cure eye infection. Paste reduces swelling and applied on wounds to heal (Jhapa: [66]). Given to cattle to treat loss of appetite (Sikkim: [84]). Seeds: Paste applied on the skin allergies and good for gout (Sikkim: [11]).

**Fruits:** Edible (Sikkim: [47]), Used as medicine (KL Bhutan: [71]) and incense (KL Bhutan: [70]). Used as tonic and also to cure eye, heart and bladder diseases (Sikkim: Database). Powder taken to recover from gastric (Jhapa: [68]). Consumed during cough and sore throat and mouth ulcers (Sikkim: [79]). Powder of dried fruits and bark given in diarrhoea (Darjeeling: [80]). Fruit and/or bark decoction administered with small amounts of rock salt to cattle to treat diarrhea and dysentery (Sikkim: [84]).
| No. | Species                                      | Uses                                                                                              |
|-----|----------------------------------------------|---------------------------------------------------------------------------------------------------|
| 200 | *Terminalia myriocarpa* Van Heurck & Mull. Arg. | Bark: Juice applied externally on cuts and wounds (Sikkim: [79]).                                |
| 201 | *Terminalia tomentosa* Wight & Arn.          | Bark: Use to extract dye (KL Bhutan: [70]).                                                       |
| 202 | *Commelina benghalensis* L.                 | Leaves: Juice applied to treat conjunctivitis (Darjeeling: [74]).                                |
| 203 | *Commelina paludosa* Blume.                 | Root: Paste applied on boils (Darjeeling: [52]).                                                  |
| 204 | *Streptolirion volubile* Edgew.              | Leaves: Crushed and applied on wounds of ear, nose and navel (Darjeeling: [52]).                 |
| 205 | *Cuscuta reflexa* Roxb.                      | Plant: Decoction used to treat jaundice (Taplejung: [88]; Panchthar: [67]; Sikkim: [75]; Ilam: [73, 76]). Infusion taken in diarrhea, bronchitis (Panchthar: [67]; Ilam: [73, 76]), and also applied externally to treat body ache and skin infections (Jhapa: [66]). Shoots and seeds: Used to cure cough (Sikkim: [75]). |
| 206 | *Cuscuta sinensis* Lam.                      | Whole plant: Used as medicine (KL Bhutan: [71]).                                                 |
| 207 | *Evolvulus alsinoides* L.                    | Plant: Used as febrifuge and aphrodisiac (Panchthar: [67]).                                      |
| 208 | *Evolvulus nummularius* (L.) L.              | Plant: Applied on scorpion sting, cut, wounds and burns (Jhapa: [66]).                           |
| 209 | *Ipomoea aquatica* Forssk.                   | Leaves and twigs: Eaten as vegetable (Jhapa: [52]).                                               |
| 210 | *Maianthemum purpureum* (Wall.) LaFrankie   | Young leaves and tender shoots: Cooked as vegetables (Taplejung: [88]).                           |
| 211 | *Merremia umbellata* subsp. orientalis (Hallier f.) Ooststr. | Stem: Extraction taken to enhance lactation (Jhapa: [66]).                                       |
| 212 | *Comus capitata* Wall.                       | Fruits: Edible (KL Bhutan: [70]).                                                                |
| 213 | *Comus macrophylla* Wall.                    | Fruits: Edible (KL Bhutan: [70]).                                                                |
| 214 | *Griselinia lucida* (J.R.Forst. & G.Forst) G.Forst. | Fruits: Used as medicine (KL Bhutan: [71]).                                                     |
| 215 | *Bryophyllum pinnatum* (Lam.) Oken             | Leaves: Paste applied on wound, bruises, swelling and insect bites (Sikkim: [69]).               |
| 216 | *Kalanchoe integra* (Medikus) Kuntze          | Leaves: Juice taken orally as purgative (Sikkim: [85]).                                          |
| 217 | *Coccinia grandis* (L.) Voigt                | Fruit: Unripe fruits used as vegetable (Jhapa: [92]).                                            |
| 218 | *Cucurbita pepo* L.                          | Seeds: Powdered and taken orally for its vermifuge potency in children (Sikkim: [79]). Fruit: Used as medicine (KL Bhutan: [71]). |
| 219 | *Diplocyclus palamatus* (L.) C. Jeffrey        | Leaves: Decoction used in eye infections (Jhapa: [66]).                                           |
| Table 1 | NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued) |
|---------|------------------------------------------------------------------------------------------|
| 220     | **Herpetospermum pedunculosum** (Ser.) Baill. Climber Cucurbitaceae | Ban Karela (Np); Serkyi Metog (Tb); Mendok Sepu (W) | 1500-3600 |
| Fruit: | Inner par used in stomachache and to treat bile diseases (Taplejung: [81]). |
| 221     | **Momordica charantia** L. Climber Cucurbitaceae | Tite Karela (Np, Li) | 300-2100 |
| Fruit: | Juice taken as blood purifier and also helps to control diabetes (Ilam: [76]; Sikkim: [79, 96]) and treat opthalmia and bleeding (Ilam: [76]); **Leaves and fruit**: Useful in gastric troubles (Darjeeling: [91]). |
| 222     | **Trichosanthes tricuspidata** Lour. Climber Cucurbitaceae | Indreni (Np) | 1200-2300 |
| Roots and fruit: | Extract used to treat gonorrhea, asthma, earache, and hemicrania (Ilam: [73, 76, 77]); **Roots**: Used in lung diseases of cattle; **Fruit**: Taken to cure asthma (Sikkim: Database); **Leaves**: Tender shoots used for vegetable (Ilam: [94]). |
| 223     | **Daphniphyllum himalense** (Benth.) Mull. Arg. Tree Daphniphyllaceae | Chandan (Np) | 1200-2500 |
| Plant: | Plant has religious and aesthetic value (Sikkim: [72]). |
| 224     | **Dillenia indica** L. Tree Dilleniaceae | Ramphal (Np) | 150-250 |
| Fruit: | Juice with sugar used as cooling beverage in fever and cough (Sikkim: [11], Database); **Bark and leaves**: Taken to cure diarrhea and dysentery (Sikkim: [11], Database). |
| 225     | **Dillenia pentagyna** Roxb. Climber Dilleniaceae | Sahad (S); Tatar (Np) | 150-1500 |
| Leaves: | Tender shoots used for vegetable (Ilam: [94]). |
| 226     | **Dioscorea alata** L. Climber Dioscoreaceae | Ghartarul (Np) | 600-1200 |
| Roots: | Used in fever, rash and itch, constipation, intestinal worms, leprosy, piles, and gonorrhoea. (Sikkim: Database). Eaten raw to treat throat pain (Sikkim: [11]). |
| 227     | **Dioscorea bulbifera** L. Climber Dioscoreaceae | Kaching (Lp); Ban tarul, Gittha, Kukurtarul (Np); Bengo nari (S); Tshemakewa (Dz), Borang-Joktang/ Fantang (Sh) | 150-2100 |
| Whole plant: | Used as medicine (KL Bhutan: [71]); **Tubers**: Edible (KL Bhutan: [70]); Used as aphrodisiac, stomachic, appetizer (Sikkim: Database), tonic and to cure ulcer (Sikkim: [75]); Boiled and eaten after submerging them whole night in cold water (Jhapa: [92]; Darjeeling: [80]; Ilam: [94]; Sikkim: [89, 107], Database) and also used for washing clothes, to kill lice and fish and as contraceptive pills (Sikkim: Database). |
| Fruit: | Cooked as vegetable; juice taken as oral contraceptives and also used in lice problems (Ilam: [76]; Taplejung: [82]). |
| 228     | *Dioscorea detoidea* Wall. ex Griseb. Climber Dioscoreaceae | Ban Tarul, Kukur Tarul (Np); Kamanduki Saplokha (R) | 450-3100 |
| Tubers: | Cooked as vegetable; juice taken as oral contraceptives and also used in lice problems (Ilam: [76]; Taplejung: [82]). |
| 229     | **Dioscorea pentaphylla** L. Climber Dioscoreaceae | Kusok (Lp); Aser, Bantarul, Bhyakur (Np) | 600-1500 |
| Tubers and shoots: | Used as tonic and can also cure swelling (Sikkim: [75]). |
| 230     | **Shorea robusta** Gaertn. Tree Dipterocarpaceae | Sal (Np); Sasing (L) | 150-1500 |
| Whole plant: | Used as medicine (KL Bhutan: [71]); **Tubers**: Edible (KL Bhutan: [70]); Used as aphrodisiac, stomachic, appetizer (Sikkim: Database), tonic and to cure ulcer (Sikkim: [75]); Boiled and eaten after submerging them whole night in cold water (Jhapa: [92]; Darjeeling: [80]; Ilam: [94]; Sikkim: [89, 107], Database) and also used for washing clothes, to kill lice and fish and as contraceptive pills (Sikkim: Database). |
| Fruit: | Used in fever, rash and itch, constipation, intestinal worms, leprosy, piles, and gonorrhoea. (Sikkim: Database). Eaten raw to treat throat pain (Sikkim: [11]). |
| 231     | **Drosera peltata** Thunb. Herb Droseraceae | Whole plant: | 150-1500 |
| 232     | **Diospyros lotus** L. Tree Ebenaceae | Gundum (Dz), Arndebu (Sh) | 500 |
| Whole plant: | Used as medicine (KL Bhutan: [71]). |
| Fruit: | Used as medicine (KL Bhutan: [71]). |
| 233     | **Diospyros montana** Roxb. Tree Ebenaceae | Gada tarul (S) | 1500-2500 |
| Fruit: | Used as medicine (KL Bhutan: [71]); Exude used as incense (KL Bhutan: [70]). |
| 234     | **Elaeagnus infundibularis** Momly. Shrub Elaeagnaceae | Bastard-Oleaster (Eg); Pirima (Li); Gwenlo, Maldhendo, Madilo (Np); Tikun (Tm) | 700-2300 |
| Whole plant: | Used as medicine (KL Bhutan: [71]). |
| Fruit: | Used to extract oil (KL Bhutan: [91]); Exude used as incense (KL Bhutan: [70]). |
| 235     | **Elaeagnus latifolia** L. A. Nelson Tree Elaeagnaceae | Bark: Paste applied on wound and bone fracture (KL Nepal: [53]). |
| 236     | **Elaeagnus rhomnoides** (L.) A. Nelson Tree Elaeagnaceae | Whole plant: | 1500-2500 |
| Fruit: | Used to make alcohol (Taplejung: [81]). |
| Fruit: | Used as medicine (KL Bhutan: [71]). |
| **Table 1** NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued) |
|---|
| 237 Hippophae salicifolia D.Don | Shrub | Elaeagnaceae | Seabuckthorn (Eg), Achuk, Dale Chuk (Np) | 2200-3500 |
| **Bark and fruit:** Useful in lung diseases, skin eruptions, and irritations (Sikkim: Database).
| **Fruit:** Edible (Sikkim: [95]; KL Nepal: [83]) and also used to make vinegar (KL Nepal: [83]); Used in toothache, joint pain, liver, lungs, and phlegm diseases, menstrual disorders, dysentery, gum infection, blood disorders, diabetes and intestinal parasites (KL Nepal: [83]).
| **Roots:** Fresh root nodules chewed to stop vomiting and also to remove bad smell of mouth (Darjeeling: [49]). |
| 238 Hippophae tibetana Schlecht. | Shrub | Elaeagnaceae | Seabuckthorn (Eg), Bhui Chuk (Np) | 3800-4500 |
| **Fruit:** Edible and also used to obtain yellow dye (KL Nepal: [83]). |
| 239 Elaeocarpus sikkimensis Masters | Tree | Elaeocarpaceae | 1500-2100 |
| **Fruit:** Used in vata and kapha disease of head and epileptic fits (Sikkim: Database). Edible (Sikkim: [89]).
| **Seed:** Paste administered to cure cough (Sikkim: [79]). |
| 240 Elaeocarpus sphaericus (Gaertn.) K. Schum. | Tree | Elaeocarpaceae | Rudraksh (Np) | 700-1700 |
| **Flowers and young leaves:** Used in toothache, joint pain, liver, lungs, and phlegm diseases, menstrual disorders, dysentery, gum infection, blood disorders, diabetes and intestinal parasites (KL Nepal: [83]).
| **Roots:** Fresh root nodules chewed to stop vomiting and also to remove bad smell of mouth (Darjeeling: [49]). |
| 241 Elaeocarpus varunua Buch.-Ham. ex Mast. | Tree | Elaeocarpaceae | Gasha-thungsey (Sh) | 1500-2600 |
| **Flowers:** Edible (KL Bhutan: [70]). |
| 242 Agapetes serpens (Wight) Sleumer | Shrub | Ericaceae | Bandare Khorsani (Np) | 1200-2600 |
| **Leaves:** Used as antiseptic (Sikkim: [75]), fodder and in ritual ceremony; warm juice used to treat inflammation and swellings (Taplejung: [87]).
| **Leaves and fruit:** Decoction used to treat rheumatism (KL Nepal: [83]; Sikkim: [73]) and worms (KL Nepal: [83]; Ilam: [73]).
| **Fruit:** Ripe fruits are eaten raw (KL Nepal: [87]). |
| 243 *Gaultheria fragrantissima* Wall. | Shrub | Ericaceae | Wintergreen (Eg), Singjiang, Singhangma (Li), Dhasingare, Patpate (Np); Limbuni Phool (Np-Tp); Lamchassi (Ri); Chhyaro (Sh,Wi) | 1200-2600 |
| **Leaves:** Used to extract oil (KL Bhutan: [80, 89]). |
| 244 Gaultheria procumbens L. | Shrub | Ericaceae | Chanze kam (Dz); Shogshingma shing (Sh) | 2700-4500 |
| **Flowers:** Edible (Sikkim: [83]), fodder and in ritual ceremony; warm juice used to treat inflammation and swellings (Taplejung: [87]).
| **Leaves:** Used to make alcohol; paste applied around eyes for good sight (Taplejung: [81]).
| **Seed:** Paste administered to cure cough (Sikkim: [79]). |
| 245 Gaultheria sp. | Shrub | Ericaceae | Dukchhu, Dakchhu, Zawchhu, Tserkhwa, Dungchhu (Sh,Wi) | 1300-3300 |
| **Flowers:** Edible (Sikkim: [83]), fodder and in ritual ceremony; warm juice used to treat inflammation and swellings (Taplejung: [87]).
| **Leaves:** Dried and used as cigarette wrapper (Ilam: [81]). Infusion taken to treat scabies and dog bite (Ilam: [73, 76]). |
| 246 Gaultheria trichophylla Royle | Shrub | Ericaceae | Ani Gnoruing (Sh, Wi), Sanchanchewa (Tm) | 2000-3300 |
| **Roots:** Dust applied to treat rheumatism (KL Nepal: [53]).
| 247 Lyonia ovalifolia (Wall.) Drude | Tree | Ericaceae | Lyonia (Eg), Tapeba (Li); Angeri (Np); Sangemii Dongbu, Syanggomba (Wi), Sangemii Dongbu (Wi); Chhyaro (Sh,Wi) | 2000-3300 |
| **Aerial parts:** Used as incense and snuffed to induce sneezing (Sikkim: Database). **Leaves and flowers:** Used for stomach, liver, and lung disorders, indigestion, sore throat, and as appetizer and in vomiting (Darjeeling: [98]; KL Nepal: [83]). Used as incense (Sikkim: Database). **Flowers:** Used as medicine (KL Bhutan: [71]).
| **Leaves:** Used to cure blood dysentery (Sikkim: [75]). **Whole plant:** Used as incense (KL Bhutan: [70]). |
| 248 Pieris formosa (Wall.) D.Don. | Tree | Ericaceae | Balu (Np), Kekephel (Li) | 3500-5100 |
| **Roots:** Dust applied to treat rheumatism (KL Nepal: [53]).
| 249 Rhododendron anthropagon D. Don | Shrub | Ericaceae | Fragrant Rhododendron (Eg), Sunpati (Np); Balu (Dz/B/Sh) | 1400-3600 |
| **Flowers and young leaves:** Useful in dysentery (Darjeeling: [80]; Ilam: [76]; Sikkim: [11, 85]; KL Nepal: [83]), diarrhea and headache (Ilam: [76]; Sikkim: [85]).
| **Flowers:** Used to treat headache (Pancthar: [67]). Powder taken to stop bleeding in female. Flower petals clear throat choking due to fish or chicken bone (Darjeeling: [52]; Sikkim: [11]). Used to make alcohol; paste applied around eyes for good sight (Taplejung: [81]). Used to make local wine (Darjeeling: [108]; Ilam: [94]). Crushed with water and administered to livestock to treat diarrhea and dysentery (Sikkim: [97]). |
| 250 Rhododendron arboreum Smith | Tree | Ericaceae | Porota (Gr), Tokphekalaphun, Thukphewa (Li); Gurans, Laliguras (Np); Dakbu, Tokse (Ri); Pulasa (Sn); Laduksa, Sendok Dongbu (Wi) | 1400-3600 |
| No. | Scientific Name                        | Common Name | Family          | Uses                                                                 |
|-----|---------------------------------------|-------------|----------------|---------------------------------------------------------------------|
| 251 | *Rhododendron campanulatum* D. Don    | Tree        | Ericaceae       | Syapu (Gr); Chimal, Nilo Chimal, Seti Chimal (Np); Kalma (Sh); Takma Singya (Tb); Khama, Saje Medok (Wl). |
| 252 | *Rhododendron lepidotum* Wall. ex G. Don | Shrub       | Ericaceae       | Bhae sunpati (Np) 2100-4700                                        |
| 253 | *Rhododendron setosum* D. Don         | Shrub       | Ericaceae       | Sunpatay (Np); Sulo (Dz/Sh/B/T) 3700-5600                           |
| 254 | *Vaccinium gaultheriifolium* (Griff.) Hook. f. ex C. B. Clarke | Shrub       | Ericaceae       | Chyansi (Np-Tp); Khapusekma (Li) 1500-2300                         |
| 255 | *Antidesma acidum* Retz.               | Shrub       | Euphorbiaceae   | Archal (Np) 150-1200                                               |
| 256 | *Baccaurea ramiflora* Lour.           | Tree        | Euphorbiaceae   | 250-1300                                                           |
| 257 | *Balsamoporum montanum* (Willd.) Mull. Arg. | Shrub       | Euphorbiaceae   | Danti (S) 300-910                                                   |
| 258 | *Bischofia javanica* Blume            | Tree        | Euphorbiaceae   | Kainjal (Np) 150-1200                                              |
| 259 | *Bridelia retusa* (L.) A. Juss.       | Tree        | Euphorbiaceae   | Gayo (Li) 100-1400                                                  |
| 260 | *Croton roxburghii* N. P. Balakr.    | Tree        | Euphorbiaceae   | Guti (S) 300-750                                                   |
| 261 | *Euphorbia griffithii* Hook.f.        | Herb        | Euphorbiaceae   |                                                      |
| 262 | *Euphorbia hirta* L.                  | Herb        | Euphorbiaceae   | Aankle Jhar (Np); Gofatkhalkhachri (Me); Sangadare, pusitoa (S) |
| 263 | *Euphorbia pulcherrima* Willd. ex Klotzsch | Shrub       | Euphorbiaceae   |                                                      |
| 264 | *Euphorbia rosaleana* Boissier        | Shrub       | Euphorbiaceae   | Siundee (Np); Sijau (Me) 1100-1200                                 |
| 265 | *Euphorbia sieboldiana* C.Morren & Deane | Herb       | Euphorbiaceae   |                                                      |
| 266 | *Euphorbia sikkimensis* Boiss.        | Herb        | Euphorbiaceae   |                                                      |
| 267 | *Glochidion lancaelatum* Voigt.       | Shrub       | Euphorbiaceae   | Bangikath (Np)                                                      |

**Wood:** Dried and infusion taken in fever (Darjeeling: [78]). **Leaves:** Used to wrap tobacco (Taplejung: [81]). **Flowers:** Nectar edible (Taplejung: [81]). **Leaves and flowers:** Paste used for bile and lung disease, cold, and blood disorders (KL Nepal: [83]). **Leaves:** Used for incense (KL Nepal: [83]). **Flowers:** Used as medicine (KL Bhutan: [71]). **Leaves:** Local Buddhist uses leaf as incense (Sikkim: [89]). **Whole plant:** Used as incense (KL Bhutan: [70]). **Fruit:** Eaten raw or pickled; juice used to treat diarrhea and dysentery (Taplejung: [81]). **Bark and leaves:** Used to treat cholera (Panchthar: [67]). **Fruit:** Consumed raw (Ilam: [94]). **Fruits:** Edible (Sikkim: [95]). **Seeds:** Used in gastric disorders, gouts, and rheumatism (Jhapa: [66]). **Leaves:** Chewed to cure sore throat (Sikkim: [11]). **Bark:** Juice taken to cure diarrhea (Sikkim: [11]). **Bark:** Paste prepared from the bark of *Bridelia retusa* and Schima wallchii applied externally on cuts and wounds (Sikkim: [79]). **Bark:** Pounded and mixed with little amount of oil of Varanus sp. and massage on the body to relieve from measles, chicken pox, and boils (Jhapa: [66]). **Roots and bark:** Used as purgative (Jhapa: [66]). **Roots:** Used as medicine (KL Bhutan: [71]). **Plant:** Extraction given to lactating mother to increase the milk production. **Root:** Given to stop vomiting (Jhapa: [66]). **Young shoots:** Used to treat excessive bleeding during menstruation and also in gonorrhea (Jhapa: [68]). **Latex:** Applied on pimples and old wounds (Jhapa: [68]) and also to treat warts and cuts (Darjeeling: [74]). **Latex:** Applied on toothache (Sikkim: [11]). **Latex:** Applied to cure swelling of skin due to cutaneous and sub-cutaneous infection (Jhapa: [68]). **Roots/roots:** Used as medicine (KL Bhutan: [71]). **Tubers:** Used as medicine (KL Bhutan: [71]). **Bark:** Juice taken to stop vomiting (Jhapa: [66]).
| #  | Scientific Name                  | Family      | Common Name         | Location            | Part                      | Uses                                                                                     |
|----|---------------------------------|-------------|---------------------|---------------------|---------------------------|------------------------------------------------------------------------------------------|
| 268| Homonoia riparia Lour.           | Shrub       | Khola ruis (Np); Mongthel-Kung (Lp) |                     | Roots: Decoction taken as laxative (Sikkim: [85]).                                    |
| 269| Jatropha curcas L.               | Shrub       | Aanda (Me); Kaden, Hathikane, Sjaiwan (Np); Ethernada (S); Ngera-kharshing (Sh) | 500-1200 Latex: Applied to treat toothache and swelling testicles (Jhapa: [68]). Used to stop bleeding from wounds; also applied to treat burns, eczema, ringworm (Sikkim: Database) and scabies (Jhapa: [66]). Bark: Cheewed to cure mouth sores (Jhapa: [66]). Seeds: Used as medicine (KL Bhutan: [71]). |
| 270| Mallotus philippinensis Muel. Arg.| Tree        | Sindure (Np); Rora (S) | 400                 | Roots: Used for skin diseases. Tied as an amulet on neck of children to stop vomiting (Jhapa: [66]). Leaves: Juice used to cure headache, boils, and dysentery; paste used to cure jaundice (Sikkim: Database). Warmed with mustard oil and massaged on the body of post delivery women to cure body pain (Jhapa: [66]). Seeds: Used as medicine (KL Bhutan: [71]). Endosperm applied as cream on dryness of skin to cure cracking heels (Jhapa: [68]). |
| 271| Ricinus communis L.              | Shrub       | Aadi (Me); Iradam (S); Chamlingshing (Sh) | 150-2400 Roots and fruits: Extract taken orally for abortion (KL Nepal: [53]) and also taken for tonsil and pneumonia (Sikkim: Database). Roots: Paste used to treat urinary troubles and skin disease (Ilam: [76]) and also in cough, cold and menstrual troubles and also applied to cure wounds (Jhapa: [66]). Powder taken to treat urinary troubles and skin disease (Ilam: [76]). Seeds: Juice taken orally to relieve urinary complaints (Jhapa: [66]). Fruit: Chewed or fresh root juice administered orally during throat pain (Sikkim: [79]). |
| 272| Tragia involucrata L.            | Climber     | Ban Sisnu (Np); Sangelsim (S) | 400                 | Roots: Paste applied on local swelling of hands and feet ([66]). Roots and fruits: Extract taken orally for abortion (KL Nepal: [53]) and also taken for tonsil and pneumonia (Sikkim: Database). Roots: Paste used to treat urinary troubles and skin disease (Ilam: [76]) and also in cough, cold and menstrual troubles and also applied to cure wounds (Jhapa: [66]). Powder taken to treat urinary troubles and skin disease (Ilam: [76]). Leaves: Juice taken orally to relieve urinary complaints (Jhapa: [66]). Fruit: Chewed or fresh root juice administered orally during throat pain (Sikkim: [79]). |
| 273| Abrus precatorius L.             | Climber     | Lalgedi (Np); Karmet (S) | 300-1100             | Roots: Paste used in fever, cough and cold, and also applied against snake and scorpion sting (Jhapa: [66]). Stem: Paste with pepper taken orally to cure blood dysentery (Jhapa: [66]). Leaves: Paste applied on sores and itches (Jhapa: [66]). |
| 274| Acacia catechu (L.f.) Willd.     | Tree        | Toeja (Dz); Jasenshing (Sh) | 900-1100             | Leaves: Chewed with sugar and cumin during bleeding gums; juice administered orally in indigestion in infants (Sikkim: [79]). Plant: Juice and cumin seeds used in reducing fever (Jhapa: [66]). |
| 275| Acacia intsia (L.) Willd.        | Shrub       | Kondru (S) | 900-1100             | Plant: Juice and cumin seeds used in reducing fever (Jhapa: [66]). |
| 276| Acacia pennata (L.) Willd.       | Climber     | Arare (Li) | 200-1100             | Plant: Juice and cumin seeds used in reducing fever (Jhapa: [66]). |
| 277| Aeschynomene indica L.           | Herb        | Tal Khukuri (Np); Sola (S) | 200-1300             | Plant: Juice and cumin seeds used in reducing fever (Jhapa: [66]). |
| 278| Albizia julibrissin Durazz.      | Tree        | Padke Siris (Np) | 1000-3000            | Bark: Extract or paste used to treat dandruff (KL Nepal: [53]). |
| 279| Albizia lebbeck (L.) Benth.      | Tree        | Harasisir (Np) | 300-1100             | Leaves and flowers: Used to cure boils, piles, and diarrheaa (Sikkim: [75]). Bark: Crushed into paste and applied on forehead during fever (Sikkim: [79]). |
| 280| Albizia procera (Roxb.) Benth.   | Tree        | Seti Siris (Li) | 300-1100             | Whole plant: Used as medicine (KL Bhutan: [71]). Plant: Paste orally administered to treat body swelling (Jhapa: [66]). |
| 281| Astragalus yunnanensis Franch.   | Herb        |                     |                     | Plant: Paste orally administered to treat body swelling (Jhapa: [66]). |
| 282| Atylosia scarabaeoides (L.) Benth.| Climber     | Jangali bhatmase jhar (Np); Birhorec (S) | 400-1200             | Plant: Paste orally administered to treat body swelling (Jhapa: [66]). |
| No. | Species | Type | Family | Common Names (Np, Me, S) | Use and Preparation | Description |
|-----|---------|------|--------|--------------------------|---------------------|-------------|
| 283 | Bauhinia purpurea L. | Tree | Fabaceae | Tanki (Np) | 300-1600 | Plant used against animal bites; useful as maturant for boils and eczemas (Sikkim: Database). Roots: Used as carminative (Sikkim: Database). Bark: Used to control diarrhea (Sikkim: Database). Flowers: Used as laxative (Sikkim: Database). Leaves: Used as fodder (Ilam: [73]). Shoots: Used as vegetable (Ilam: [94]). |
| 284 | Bauhinia semla Wunderlin | Tree | Fabaceae | Exude: | Used as gum (KL Bhutan: [70]). |
| 285 | Bauhinia vahlii Wight & Arn. | Climber | Fabaceae | Bark: | Used to control diarrhea (Sikkim: Database). Leaves: Used as demulcent (Sikkim: Database). Paste applied in fractured bone (Sikkim: [97]). Seeds: Used as tonic and aphrodisiac, and also given to treat snake bite (Panchthar: [67]; Sikkim: Database). Roasted and consumed (Ilam: [92]). Seeds and leaves: Given in dysentery and used as laxative (Sikkim: Database). |
| 286 | Bauhinia variegata L. | Tree | Fabaceae | Koiraalo, Koirala, Takki (Np) | 150-1900 | Roots: Dried root and bark administered orally in diarrhea (Darjeeling: [86]). Decoction given to expel placenta of cattle (Sikkim: [97]). Bark: Juice taken as tonic in toothache (Sikkim: [11]). Paste taken to cure swelling, leprosy, cough, and menstrual disorder (Ilam: [73], [76]; Sikkim: [79]). Flower: Juice taken to cure dysentery, diarrhea, and stomach pain (Sikkim: Database). Flowers: Used as medicine (KL Bhutan: [71]). Fruits: Used as medicine (Panchthar: [67]). Seeds: Used for blood purification (Sikkim: Database). |
| 287 | Butea minor Buch.-Ham. ex Baker | Shrub | Fabaceae | Bhujetro (Np) | 300-2000 | Seeds: Used as anthelmintic (Panchthar: [67]). |
| 288 | Butea monosperma (Lam.) Kuntze | Shrub | Fabaceae | Palans (Np); Marup (S); Flamingo tree (Eng) | 150-1200 | Fruits: Used as medicine (KL Bhutan: [71]). Roots: Used in tuberculosis (Jhapa: [66]). |
| 289 | Caesalpinia bonduc (L.) Roxb. | Shrub | Fabaceae | Sugrong-bithai (Me) | 400-500 | Seeds: Fried to black with coconut oil, crushed and paste applied on scalp with the help of cock's feather for baldness (Jhapa: [68]). |
| 290 | Cassia fistula L. | Tree | Fabaceae | Raj Brichhya (Np); Mukhralaudhi (Me); Noormui Mirfu Baha (S); Dongkoshing (Sh) | 150-1400 | Leaves: Juicy consumed to treat diarrhoea and ulcer, dried buds chewed to treat bleeding piles (Sikkim: [1]). Cooked as curry (Darjeeling: [80]; Ilam: [73], [76]; Sikkim: [89]). Fruits: Used as medicine (KL Bhutan: [71]). Fruits: Used for asthma, diabetes, and eczema (Sikkim: Database). Paste used to treat the whooping cough (Jhapa: [68]). |
| 291 | Cassia occidentalis L. | Herb | Fabaceae | Thulo Tapre (Np) | 200-1400 | Flowers and seeds: Paste applied in minor skin infection and inflammation (Jhapa: [68]). |
| 292 | Cassia sophera L. | Shrub | Fabaceae | Tapre (Np); Chakora (S) | 700-1000 | Bark and seeds: Infusion given in diabetes (Jhapa: [66]). |
| 293 | Cassia tora L. | Herb | Fabaceae | Tapre (Np); Chakora, Bhide deren (S) | 450-1300 | Used as medicine (KL Bhutan: [71]). Leaves: Extraction applied on ringworm and itch (Jhapa: [66]). |
| 294 | Crotalaria pallida Alton | Herb | Fabaceae | Chinchhinne (Np) | 200-1750 | Roots: Juice drunk to cure body-swelling problems (Jhapa: [68]). |
| 295 | Desmodium gangeticum (L.) DC. | Shrub | Fabaceae | Chinchhinne (Np) | 200-1750 | Roots: Juice drunk to cure body-swelling problems (Jhapa: [68]). |
| 296 | Desmodium triflorum (L.) DC | Herb | Fabaceae | Sano Chameli (Np) | 600-2300 | Leaves: Juice consumed to treat diarrhoea and dysentery (Darjeeling: [74]). |
| 297 | Entada phaseoloides (L.) Merr. | Climber | Fabaceae | Pangra (Np), Kolokpu-sae (Sh) | 350-1600 | Seeds: Used as astringent and emetic (Panchthar: [67]; Sikkim: Database) and also useful to treat dandruff (Panchthar: [67]). Used as medicine (KL Bhutan: [71]). |
| No. | Species                                      | Life Form | Family   | Common Names                                      | Habitat | Uses                                                                 |
|-----|---------------------------------------------|-----------|----------|--------------------------------------------------|---------|----------------------------------------------------------------------|
| 298 | *Entada pursaetha* subsp. *sinohimalensis* Grierson & D. G. Long | Climber   | Fabaceae |                                                   |         | **Bark:** Juice applied externally to cure skin disease (Sikkim: [11]). **Seeds:** Paste applied to treat mumps; powder acts as antifungal agent (Sikkim: [11]). |
| 299 | *Erythrina arborescens* Roxb.               | Tree      | Fabaceae |                                                   |         | **Leaves and bark:** Curative efficacies for skin diseases (Sikkim: [75]). **Seed:** Used as medicine (KL Bhutan: [71]). |
| 300 | *Erythrina stricta* Roxb.                  | Tree      | Fabaceae |                                                   |         | **Bark and leaves:** Paste given in rheumatism, fever, asthma, and epilepsy (Ilam: [73]). **Seed:** Used as medicine (KL Bhutan: [71]). |
| 301 | *Erythrina suzubera* Roxb.                 | Tree      | Fabaceae |                                                   |         | **Bark:** Grinded with bark of *Oroxylum indicum* and given as antidote (Jhapa: [66]). |
| 302 | *Flemingia macrophylla* (Willd.) Merr.      | Shrub     | Fabaceae |                                                   |         | **Plant:** Decoction given to cattle to cure blood dysentery (Sikkim: [97]). |
| 303 | *Glycyrrhiza glabra* L.                    | Herb      | Fabaceae |                                                   |         | **Roots:** Given in cough, fever, dysentery, and chronic hepatitis (Sikkim: Database). |
| 304 | *Indigofera* sp.                           | Tree      | Fabaceae |                                                   |         | **Leaves:** Use to extract dye (KL Bhutan: [70]). |
| 305 | *Macrotyloma uniflorum* (Lam.) Verdc.       | Tree      | Fabaceae |                                                   |         | **Seeds:** Decoction used to remove stone developed in kidney (Sikkim: [79]). |
| 306 | *Mimosa pudica* L.                         | Herb      | Fabaceae |                                                   |         | **Roots and leaves:** Paste used in case of piles (Darjeeling: [74]; Sikkim: Database) and kidney problems (Sikkim: Database). **Roots:** Used in treating asthma, fever, cough, dysentery, vaginal and uterine complaint (Sikkim: Database). Paste applied externally to treat boils (Sikkim: [11]). Juice taken to cure epilepsy and sexual weakness also used to cure eye troubles (Jhapa: [66]). Powder used to clean tooth (Darjeeling: [74]). |
| 307 | *Moghania strobilifera* (L.) J. St.-Hill. ex Kuntze | Shrub   | Fabaceae |                                                   |         | **Roots:** Juice taken in indigestion, insomnia and epilepsy (Darjeeling: [74]). |
| 308 | *Mucuna macrocarpa* Wall.                  | Shrub     | Fabaceae |                                                   |         | **Seeds:** Powder taken as anthelmintic (Sikkim: [11]). |
| 309 | *Mucuna monosperma* Wall.                  | Shrub     | Fabaceae |                                                   |         | **Roots:** Act as expectorant in cough (Sikkim: [79]). |
| 310 | *Mucuna pruriens* (L.) DC.                | Herb      | Fabaceae |                                                   |         | **Leaves:** Paste used in boils, blisters, and ulcers (Jhapa: [66]). **Roots and seeds:** Used as anti-inflammatory (Panchhat: [67]). **Roots:** Used in delirium (Jhapa: [66]). **Seeds:** Used as medicine (KL Bhutan: [71]). |
| 311 | *Oxytropis japonica* Maxim.                | Herb      | Fabaceae |                                                   |         | **Whole plant:** Used as medicinal (KL Bhutan: [71]). |
| 312 | *Tamarindus indica* L.                     | Tree      | Fabaceae |                                                   |         | **Bark:** Decoction given to cattle to cure blood dysentery. **Fruit:** Edible (Jhapa: [92]). **Roots and seeds:** For cough and bleeding disorders (Sikkim: Database). **Seeds:** Paste eaten to cure stomachache (Jhapa: [68]). |
| 313 | *Vigna vexillata* (L.) A. Rich.            | Herb      | Fabaceae |                                                   |         | **Tubers and seeds:** Eaten as vegetable (Jhapa: [68]). |
| 314 | *Castanopsis hystrix* Miq.                 | Tree      | Fagaceae |                                                   |         | **Fruit:** Eaten raw (Darjeeling: [80]; Ilam: [94]). **Sikkim:** [72, 89]. |
| 315 | *Castanopsis indica* (Roxb.) Miq.          | Tree      | Fagaceae |                                                   |         | **Fruit:** Roasted and consumed (Ilam: [94]). |
| No. | Species Name                          | Family       | Common Names/Local Use                                      | Height Range |
|-----|--------------------------------------|--------------|---------------------------------------------------------------|--------------|
| 316 | Castanopsis tribuloides (Sm.) A. D.C. | Fagaceae     | Musure Katus (Np)                                             | 450-2300     |
|     |                                      | Fruit: Edible (Sikkim: [89]), Leaves: Good ingredients for compost (Sikkim: [89]). |
| 317 | Quercus glauca Thunb.                | Fagaceae     | Phalat (Np), Yahi (Li)                                        |              |
|     |                                      | Bark: Paste applied on bone fracture (KL Nepal: [53]). |
| 318 | Quercus griffithii Hook. f. & Thomson ex Miq. | Fagaceae | Sisi (Dz), Renangshing (Sh)                                  |              |
|     |                                      | Seeds: Used as medicine (KL Bhutan: [71]). |
| 319 | Gymnocarida odorata Roxburgh          | Flacourtiaceae| Gantay (Np)                                                   | 800-1000     |
|     |                                      | Fruit: Used to extract oil (KL Bhutan: [93]), Juice taken or eaten raw in fever (Darjeeling: [78]). Seeds: Seed oil applied on skin diseases and leprosy (Sikkim: [75]), also used for massage purpose for infants (Sikkim: [79]), Ripen seeds roasted and the oil extracted to use in various purposes (Ilam: [94]). |
|     |                                      | Seeds: Seed oil applied on skin diseases and leprosy (Sikkim: [75]), also used for massage purpose for infants (Sikkim: [79]), Ripen seeds roasted and the oil extracted to use in various purposes (Ilam: [94]). |
| 320 | Gentiana grandiflora Laxm.           | Gentianaceae  | Whole plant: Used as medicine (KL Bhutan: [71]).              |              |
|     |                                      | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 321 | Gentiana stylophora C.B.Clarke       | Gentianaceae  | Floral parts: Used as medicine (KL Bhutan: [71]).             |              |
|     |                                      | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 322 | Gentiana umula Harry Sm.             | Gentianaceae  | Whole plant: Flowers: Used as medicine (KL Bhutan: [71]).      |              |
|     |                                      | Whole plant: Flowers: Used as medicine (KL Bhutan: [71]). |
| 323 | Gentiana veitchiorum Hemsl.          | Gentianaceae  | Whole plant: Flowers: Used as medicine (KL Bhutan: [71]).      |              |
|     |                                      | Whole plant: Flowers: Used as medicine (KL Bhutan: [71]). |
| 324 | Halenia elliptica D.Don              | Gentianaceae  | Whole plant: Used as medicine (KL Bhutan: [71]).              |              |
|     |                                      | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 325 | Swertia angustifolia Buch. Ham. ex D. Don | Gentianaceae | Vaale Chirayito (Np)                                          | 600-3300     |
|     |                                      | Plant: Extract used to treat fever, cough, and cold (Ilam: [73]). |
| 326 | Swertia bimaculata (Sieb. & Zucc) C. B. Clarke | Gentianaceae | Chiraito, Tite (Np)                                           | 900-3700     |
|     |                                      | Plant: Used to treat diarrhea, dysentery, and fever (Taplejung: [81]). |
| 327 | *Swertia chirayita* (Roxb. ex Fleming) Karsten | Gentianaceae | Tikta (Km, Sh, Wi), Sungkhinwa (Li), Chiraito, Chiraita, Tite (Np), Khalu (Nw), Kuple (Ri), Kirattikta (Sn), Timdla (Trm), Gya-Tig, Tiqta (Tb) | 1200-3000 |
|     |                                      | Plant and seeds: Plant infusion and crushed seeds considered most effective in treating fever (Taplejung: [81]), KL Nepal: [83, 103], Ilam: [73, 76], asthma, cold, and cough (Darjeeling: [80]), KL Nepal: [83, 103], Sikkim: [11], Ilam: [73, 76]. Whole plant: Used as medicine (KL Bhutan: [71]). Used to treat ulcer, asthma, inflammation, and piles (Darjeeling: [80]). Taken as tonic and also in leucoderma and skin diseases (Darjeeling: [69, 78, 80]). Decoction taken to cure cold, cough, diarrhea, and stomachache (Darjeeling: [69], Sikkim: [11, 79]). Shoots: Taken in dyspepsia (Sikkim: [75]). Leaves: Mixed with young stem of Achyranthes aspera and stem bark of Phyllanthus emblica and decoction given to cure fever and cholera (Jhapa: [66]). |
|     |                                      | Roots: Decoction used to treat fever, cough, bodyache, and internal injuries; paste applied to prevent bleeding and infection from cuts and wounds (Taplejung: [81, 82, 87, 88]). |
| 328 | Swertia multicaulis D. Don           | Gentianaceae  | Sharma Guru (Np, Trm), Sepu Gumund (Sh, Wi)                   | 4000-4900    |
|     |                                      | Roots: Used to treat fever, cough, bodyache, and internal injuries; paste applied to prevent bleeding and infection from cuts and wounds (Taplejung: [81, 82, 87, 88]). |
| 329 | Swertia nervosa (G. Don) C. B. Clarke | Gentianaceae  | Chiraito, Bhaie Chiraito, God Tito (Np)                       | 700-3000     |
|     |                                      | Roots: Used to treat fever, cough, and cold (Taplejung: [82, 88]). |
| 330 | Geranium donianum Sweet              | Geraniaceae   | Rагатgerei (Np)                                               | 3200-4800    |
|     |                                      | Plant: Juice consumed in renal complications and dysentery (Darjeeling: [74]). |
| 331 | Geranium lambentii Sweet             | Geraniaceae   |                                                             |              |
|     |                                      | Roots: Used as medicine (KL Bhutan: [71]). |
| 332 | Geranium nepalense Sweet             | Geraniaceae   | Bhanda (Np)                                                   |              |
|     |                                      | Whole plant: Used as an astringent (Sikkim: [75]). |
| 333 | *Aeschynanthus parviflorus* (D.Don) Spreng. | Shrub | Gesneriaceae | Himalayan Walnut (Eg); Akhor (Gr); Katutung, Takshing, Koto (Gr-Mn); Khayusin, Khesik (Li); Okhar, Hande, Okhkar (Np); Khaisi (Ri); Akshotak (Sn) | 1200-3000 |
| 334 | *Didymocarpus villosus* D.Don | Herb | Gesneriaceae | Kurnum (Np) | 900-2400 |
| 335 | *Dichroa febrifuga* Lour. | Shrub | Hydrangeaceae | Aseru, Basauli, Bhalak, Pahare Basak (Gr); Kiplisang (Ri); Dharben (Tm); Borang-yangshabu (Sh) | 900-2500 |
| 336 | *Curculigo orthoides* Gaertn. | Herb | Hypoxiadaceae | Kalo musali, Musali Kanda (Np); Gahot (S) | 500-1100 |
| 337 | *Belamcanda chinensis* (L.) Redoute | Herb | Iridaceae | Tarware phool (Np) | 100-2200 |
| 338 | *Iris decora* Wall. | Herb | Iridaceae | | |
| 339 | *Engelhardia spicata* Lesch. ex Blume | Tree | Juglandaceae | Yakpohama (Li), Mauwa (Np), Bokto, Oksipou (Ri) | 400-2500 |
| 340 | *Juglans regia* L. | Tree | Juglandaceae | Okhkar (Np) | 1000-2000 |
| 341 | *Juglans regia* var *kamaonia* L. | Tree | Juglandaceae | | |
| 342 | *Juncus grisebachii* Buchenau | Herb | Juncaceae | Juncus (C) | |
| 343 | *Anisomeles indica* (L.) Kuntze | Herb | Lamiaceae | Nirepati, Jhusule, Rato Charpate, Rato Pat (Np); Jinting (Sh) | 200-2400 |
| 344 | *Clerodendrum infortunatum* L. | Shrub | Lamiaceae | Chitu (Np) | |
| 345 | *Clerodendrum viscosum* Vent. | Herb | Lamiaceae | Rajbeli (Np); Lakhanan (Me); Varni (S) | 100-1500 |
| 346 | *Clinopodium umbrosum* (M.Bieb.) C. Koch | Climber | Lamiaceae | Suparnasa (Np) | 180-3400 |

Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)
| No. | Species | Class | Family | Common Names | Uses and Properties |
|-----|---------|-------|--------|--------------|---------------------|
| 347 | Colebrookea oppositifolia Sm. | Herb | Lamiaceae | Dhursuli (Np); Dhusor (Me) | Leaves: Applied in wounds and inflammation of skin (Jhapa: [68]). Juice used to treat cuts and bruises (Panchthar: [67]). Juice taken in dysentery (Sikkim: [79]). Bud extract applied in opthalmic problems (KL Nepal: [53]). |
| 348 | Elsholtzia blanda (Benth.) Benth. | Herb | Lamiaceae | Jungali Tulsi, Ban Silam (Np) | Roots: Powder paste with mustard oil applied on the scabies affected area of cattle (Sikkim: [84]). Leaves and spikes: Used as incense (Taplejung: [81]). |
| 349 | Elsholtzia fruticosa (D.Don) Rehder | Shrub | Lamiaceae | Chhink (Np); Aarmgora, Kansata (Sh); Jirug Serpo (Km, Tb); Furmi (Wl) | Leaves: Paste applied in wounds and inflammation of skin (Jhapa: [68]). Juice used to treat cuts and bruises (Panchthar: [67]). Juice taken in dysentery (Sikkim: [79]). Bud extract applied in opthalmic problems (KL Nepal: [53]). |
| 350 | Eriophyton wallichii Benth. | Herb | Lamiaceae | Mire (Np) | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 351 | Hyptis suaveolens (L.) Poit. | Shrub | Lamiaceae | Arridari (S) | Leaves: Juice given in diarrhoea (Darjeeling: [74]). |
| 352 | Isodon coetsa (Buch.-Ham. ex D.Don) Kudô | Herb | Lamiaceae | Padina (Np), Li | Leaves: Paste taken in bodyache (Darjeeling: [52]). |
| 353 | Leucas cephalotes (Roth) Spreng. | Herb | Lamiaceae | Khaangkareh (Me); Gummi (Np); Durup (S) | Plant: Used to treat pneumonia and wounds (Panchthar: [67]). Leaves: Juice taken with honey to cure fever (Darjeeling: [78]). |
| 354 | Leucas indica (L.) R. Br. ex Vatke | Herb | Lamiaceae | Cheeongkung (L) | Leaves: Juice taken with honey to cure fever (Darjeeling: [78]). |
| 355 | Leucosceptrum canum Sm. | Herb | Lamiaceae | Sugandhi (Np) | Leaves: Juice taken with honey to cure fever (Darjeeling: [78]). |
| 356 | Melissa axillaris (Benth.) Bakh. f. | Herb | Lamiaceae | Pudhina (Np) | Leaves: Juice given to treat rheumatism, fever, weakness, ulcer, wounds, jaundice, cough, asthma and cuts (Ilam: [76]). Fresh leaves chewed during gastritis and acidity (Sikkim: [79]). |
| 357 | Mentha arvensis L. | Herb | Lamiaceae | Tulasipatta (S) | Leaves: Juice taken with honey to cure fever (Darjeeling: [78]). |
| 358 | Mentha piperita L. | Herb | Lamiaceae | Tite (Np) | Leaves: Juice given to treat tooth decay, diarrhoea, wounds, and cuts (Ilam: [76]). |
| 359 | Mentha sp. | Herb | Lamiaceae | Silam (Np, Li) | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 360 | Ocimum tenuiflorum L. | Herb | Lamiaceae | 400-900 | Seeds: Dried seeds chewed to cure cough and nausea (Sikkim: [79]). |
| 361 | Orthosiphon incurvus Benth. | Herb | Lamiaceae | 900-2100 | Whole plant: Used as medicine (KL Bhutan: [71]). |
| No. | Species Name | Type | Family | Uses | Habitat | Altitude |
|-----|-------------|------|--------|------|---------|----------|
| 365 | Pogostemon benghalensis (Burm. f.) Kuntze | Shrub | Lamiaceae | Young shoots: Grounded and given to treat sores of mouth and tongue (Jhapa: [66]). | | 150-1300 |
| 366 | Salvia campanulata Wall. ex Benth. | Herb | Lamiaceae | Flowers: Used as medicine (KL Bhutan: [71]). | | |
| 367 | Salvia moorcroftiana Wall. ex Benth. | Herb | Lamiaceae | Whole plant: Given against diabetes (Darjeeling: [52]). | | 2000-3000 |
| 368 | Salvia sp. | Herb | Lamiaceae | Flower: Used as medicine (KL Bhutan: [71]). | | |
| 369 | Siphocranion macranthum (J. D. Hooker) C. Y. Wu | Herb | Lamiaceae | Shoots: Taken in gastric (Sikkim: [75]). | | 1300-3200 |
| 370 | Holboellia latifolia Wall. | Tree | Lardizabalaceae | Roots: Effective for rheumatism (Sikkim: [75]). Fruit: Edible (Darjeeling: [72, 80]; Sikkim: [89]). Stem: Used to make bangles, which are believed to give from orthopedic problems (Darjeeling [80]). | | 2400-3200 |
| 371 | Cinnamomum bejolghota (Buch.-Ham.) Sweet | Tree | Lauraceae | Bark: Used as condiment (Sikkim: [71]). | | 600-1800 |
| 372 | *Cinnamomum glaucescens (Nees) Hand.-Mazz. | Tree | Lauraceae | Wood: Used as incense (KL Bhutan: [70]). | | |
| 373 | *Cinnamomum impressinervium Meisn. | Tree | Lauraceae | Seeds: Edible (Darjeeling: [80]). Leaves: Used as substitute of bay leaf (Sikkim: [72]). Bark: Used as medicine (KL Bhutan: [70]). Given in gonorrhea (Sikkim: Database). Extract used in stomach disorders (Sikkim: [79]). Leaves: Used as stimulant in rheumatism, and also in colic and diarrhea (Sikkim: Database). Rubbed on the body to cure scabies (Sikkim: [11]), throat allergy and to increase appetite (Jhapa: [68]). Used as condiments (KL Bhutan: [70]; Ilam: [94]). | | 1220-1830 |
| 374 | *Cinnamomum tamala (Buch.-Ham.) Nees & Eberm. | Tree | Lauraceae | Bark: Used as condiment (Sikkim: [71]). Leaves: Used as stimulant in rheumatism, and also in colic and diarrhea (Sikkim: Database). Rubbed on the body to cure scabies (Sikkim: [11]), throat allergy and to increase appetite (Jhapa: [68]). Used as condiments (KL Bhutan: [70]; Ilam: [94]). | | 450-2000 |
| 375 | Cinnamomum verum J.Presl | Tree | Lauraceae | Leaves: Used as incense (KL Bhutan: [70]). | | |
| 376 | Lindera neesiana (Wall ex Nees) Kurz | Tree | Lauraceae | Bark and fruit: Used as aromatic and carminative (Sikkim: [85]). Fruit: Used in cough, cold, fever, and cholera; fried in butter and used during gastritis; also used in pickle (Taplejung: [87, 88]). Given to treat headache (Panchthar: [67]). Seeds: Powder taken to stop vomiting (Sikkim: [11]). | | 1800-2700 |
| 377 | Litsea cubeba (Lour.) Pers. | Tree | Lauraceae | Leaves and bark: Decoction taken to treat dysentery (Sikkim: [79]). | | |
| 378 | Litsea glutinosa Lour. | Tree | Lauraceae | Leaves and bark: Decoction taken to treat diarrhea (Sikkim: [85]). | | |
| 379 | Litsea monopetala (Roxb.) Pers. | Tree | Lauraceae | Fruit: Used in stomach disorders (Sikkim: [11, 75], Database). Fruit: Taken orally as carminative (Sikkim: [85]). Used to make chutney (Darjeeling: [80]). | | |
| 380 | Machilus edulis King. | Tree | Lauraceae | Fruit: Edible (KL Bhutan: [70]; Ilam: [94]; Sikkim: [47, 89]). Leaves: Used as fodder (Sikkim: [89]). | | |
| 381 | Machilus sp. | Tree | Lauraceae | Fruit: Edible (KL Bhutan: [70]; Ilam: [94]; Sikkim: [47, 89]). Leaves: Used as fodder (Sikkim: [89]). | | |
| 382 | Persea odoratissima (Nees) Kostermans | Tree | Lauraceae | Fruit: Edible (KL Bhutan: [70]; Ilam: [94]; Sikkim: [47, 89]). Leaves: Good fodder (Sikkim: [89]). | | 1000-2000 |
| No. | Species Name                  | Scientific Name                        | Family       | Common Name       | Habitat   | Uses                                                                                                    |
|-----|------------------------------|----------------------------------------|--------------|-------------------|-----------|---------------------------------------------------------------------------------------------------------|
| 383 | Careya arborea Roxb.         | Tree Lecythidaceae                     | Khumbhi (S)  | 200-600           | Bark: Grounded with cumin seeds and given to treat indigestion and flatulence.                         |
|     |                              |                                        |              |                   | Root: Used to cure snake bite.                                                                      |
|     |                              |                                        |              |                   | Seeds: Chewed to treat viral fever. Wrapped by cloths and tied around the neck of the children to cure stomach pain. |
| 384 | Leea macrophylla Roxb. ex Hornem. | Shrub Leeaceae                          | Galeni, Galoni (Np) | 1500-1700    | Grounded with cumin seeds and given to treat indigestion and flatulence.                             |
|     |                              |                                        |              |                   | Root: Used to cure snake bite.                                                                      |
|     |                              |                                        |              |                   | Seeds: Chewed to treat viral fever. Wrapped by cloths and tied around the neck of the children to cure stomach pain. |
| 385 | Aloe vera (L.) Burm.         | Herb Liliaceae                          | Ghiu kumari (Np) | 1200-1400    | Plant: Used for antihypergycemic effect.                                                             |
|     |                              |                                        |              |                   | Purgative (Sikkim: [96]).                                                                            |
|     |                              |                                        |              |                   | Leaves: Chewed to cure skin and uterine disorder and jaundice.                                       |
|     |                              |                                        |              |                   | Roots: Used as medicine (KL Bhutan: [71]). Used for diabetes, jaundice and urinary disorder (Sikkim: Database). |
|     |                              |                                        |              |                   | Leaves: Chewed to cure skin and uterine disorder and jaundice.                                       |
| 386 | *Asparagus racemosus Willd.  | Herb Liliaceae                          | Kurilo (Np); Kedar nari (S); Ngalkom (Sh); Ngakhacho (Dz) | 300-2200    | Leaves: Chewed to cure skin and uterine disorder and jaundice.                                       |
|     |                              |                                        |              |                   | Roots: Used as medicine (KL Bhutan: [71]). Used for diabetes, jaundice and urinary disorder (Sikkim: Database). |
|     |                              |                                        |              |                   | Leaves: Chewed to cure skin and uterine disorder and jaundice.                                       |
| 387 | Disporum cantoniense (Lour.) Merr. | Herb Liliaceae                          | Mhajari (Np) | 700-3000          | Roots: Used to treat sprains (Panchthar: [67]).                                                    |
| 388 | Fritillaria cirrhosa D. Don  | Herb Liliaceae                          | Snake’s head fritillary (Eg); Ban lasun, Kakoolee (Np) | 3000-4600   | Bulb: Boiled and eaten (KL Nepal: [83]). Used in tuberculosis (Sikkim: [75]) and to treat asthma (KL Nepal: [83], Sikkim: [75]). |
| 389 | Fritillaria delavayi Franch. | Herb Liliaceae                          | Tisika (Dz)  | 400-2200          | Roots and flowers: Useful in chronic ulcers, leprosy, piles, and abdominal pains (Sikkim: Database). |
| 390 | Gloriosa superba L.         | Herb Liliaceae                          | Langarey Tarul (Np) | 400-2200  | Roots and flowers: Useful in chronic ulcers, leprosy, piles, and abdominal pains (Sikkim: Database). |
|     |                              |                                        |              |                   | Plant: Powder used to flavouring dishes; juice taken as tonic (Ilam: [73]).                            |
|     |                              |                                        |              |                   | Roots: Used as medicine (KL Bhutan: [71]).                                                           |
| 391 | Lilium nepalense D. Don     | Herb Liliaceae                          | Ban Lasun (Np) | 2300-3400   | Roots and flowers: Useful in chronic ulcers, leprosy, piles, and abdominal pains (Sikkim: Database). |
| 392 | Paris polyphylla Smith      | Herb Liliaceae                          | Love Apple (Eg); Satuwa (Gr); Tangma (Km); Satuwa, Tintale Banko (Np); Haimavati (Sn); Natar Dhap (Tm) | 1800-3500 | Roots: Used as medicine (KL Bhutan: [71]).                                                           |
| 393 | Polygonatum hookeri Baker   | Herb Liliaceae                          | Ranye (Km), Pangi Ranye (Tb) | 2900-5000 | Roots: Eaten raw (Taplejung: [87]).                                                                |
| 394 | Smilax bracteata C. Presl   | Climber Liliaceae                       | Kukurdine (Np) | 1900      | Roots: Used for brushing teeth to cure pyorrhoea and gingivitis (Darjeeling: [52]).                  |
| No. | Species | Type | Family | Common Names | Range | Uses |
|-----|---------|------|--------|--------------|-------|------|
| 395 | Smilax ovalifolia Roxb. ex. D. Don | Climber | Liliaceae | Kukurdaino (Np) | 200-1000 | Roots and fruit: Juice used to cure venereal diseases, rheumatism, and wounds (Ilam: [73, 76]). Leaves and shoots: Used as curry (Ilam: [76]). Stem and leaves: Used in skin complaints and as abortifacient (Sikkim: [73], Database). |
| 366 | Buddleja asiatica Lour. | Shrub | Loganiaceae | Bhinsenpatee (Np); Pndam (L) | 350-2000 | Leaves and shoots: Used in skin complaints and as abortifacient (Sikkim: [73], Database). |
| 397 | Dendrophthoe falcata (L.f.) Etting. | Herb | Loranthaceae | Mandargon banda (S); Aijeru (Np) | 150-900 | Leaves: Paste applied externally to treat skin diseases (Jhapa: [66]). |
| 398 | Scurrula elata (Edgew.) Danser | Shrub | Loranthaceae | Hadchur (Np); Hadjor, Kathkomjunga (S) | 200-1700 | Plant: Used to treat bone fracture (Jhapa: [66]; Panchthar: [67]); also given in ulcers, epilepsy, muscular pains (Sikkim: Database), injuries, and fracture (Darjeeling: [80]; Sikkim: [11, 79], Database). Stem: Used in body pain, fracture, and fever (Ilam: [76]; Sikkim: [75]. Bark: Paste used in sprain and rheumatism (Jhapa: [66]). |
| 399 | Woodfordia fruticosa (L.) Kurz | Shrub | Lythraceae | Dhairo (Np); Icha (S) | 200-1800 | Bark: Used for gastric trouble. Bark and flowers: Used in burns, dysentery, and fracture (KL Nepal: [53]; Panchthar: [67]). Flower: Dried and taken in piles, liver complaints. Honey like secretion consumed (Ilam: [94]). Flowers and fruit: Use to extract dye (KL Bhutan: [70]). Flowers: Passed with leaves of Lawsonia inermis applied on the foot to cure wound caused by muddy water during rainy season (Jhapa: [68]). Leaves: Given to cattle to cure ulcer (Sikkim: [85]). Decoction taken in malarian fever (Jhapa: [66]). |
| 400 | Michelia champaca L. | Tree | Magnoliaceae | Chanpak (Eg); Oulichamp (Np) | 900-1400 | Flowers: Taken for stomachache (Ilam: [76]; Sikkim: [85]) and as carminative in the treatment of dyspepsia (Sikkim: [85]). Flowers and fruit: Use to extract dye (KL Bhutan: [70]). Flowers: Young flowers given against tonsillitis. Leaves and flowers: Juice used to cure dandruff and hair problems (Darjeeling: [52]). |
| 401 | Hibiscus rosa-sinensis L. | Shrub | Malvaceae | Jawa Kusum (Np) | 200-1300 | Flower: Edible (Jhapa: [92]). Flowers: Passed with leaves of Lawsonia inermis applied on the foot to cure wound caused by muddy water during rainy season (Jhapa: [68]). Leaves: Given to cattle to cure ulcer (Sikkim: [85]). Decoction taken in malarian fever (Jhapa: [66]). |
| 402 | Sida acuta Burm. f. | Shrub | Malvaceae | Khatoreto (Np) | 250-3700 | Bark: Used to make ropes (KL Bhutan: [100]). |
| 403 | Sida cordifolia L. | Shrub | Malvaceae | Bamonmara (Np) | 200-1300 | Leaves: Paste with aerial part of Drymaria cordata applied to cure skin infection and eczema (Jhapa: [68]). |
| 404 | Sterculia villosa Roxb. | Tree | Malvaceae | Odal (Np) | 200-1300 | Leaves: Paste with aerial part of Drymaria cordata applied to cure skin infection and eczema (Jhapa: [68]). |
| 405 | Urena lobata L. | Herb | Malvaceae | Samthai (Me) | 200-1300 | Leaves: Paste with aerial part of Drymaria cordata applied to cure skin infection and eczema (Jhapa: [68]). |
| 406 | Melastoma malabathricum L. | Herb | Malvaceae | Augeri, Chulesi (S & Np) | 200 | Leaves: Used in fever; decoction given to cattle (Sikkim: [97]). Fruit: Edible (Jhapa: [92]). Stem and roots: Bark paste applied on wounds and skin disease (Darjeeling: [74]). Roots: Decoction given in urinary complaints and diabetes. Leaves: Extract of young leaves or tender shoots applied on forehead and to treat pneumonia, fever and common cold (Darjeeling: [74]). Leaves and flowers: Paste used in foot sores of cattle (Darjeeling: [49]). |
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No. | Species Name | Family | Common Names | Altitude (m) |
|-----|--------------|--------|--------------|-------------|
| 411 | *Azadirachta indica* A. Juss. | Meliaceae | Meemee (S); Neem (Np); Nimbilai (Me) | 60-1200 |
| 412 | *Dysoxylum hamiltonii* Blume. | Meliaceae | Sipochikang (Np) | |
| 413 | *Melia azedarach* L. | Meliaceae | Bakaina (Np); Bokom Bana (S) | 700-1100 |
| 414 | *Toona ciliata* M. Roem. | Meliaceae | Tooni (Np); Toon (S) | 200-1700 |
| 415 | *Trichilia connaroides* (Wight & Arn.) Bentv. | Meliaceae | Aankha Taruwa (Np) | 700-2400 |
| 416 | *Cissampelos pareira* L. | Menispermaceae | Batulpate (Np); Tejomala (S) | 500-1000 |
| 417 | *Stephania glabra* (Roxb.) Miers | Menispermaceae | Tamarke (Np) | 1000-2500 |
| 418 | *Stephania glandulifera* Miers | Menispermaceae | Tamarkay (Np) | |
| 419 | *Stephania japonica* (Thunb.) Miers | Menispermaceae | | |
| 420 | *Tinospora sinensis* (Lour.) Merr. | Menispermaceae | Garjo, Gurjo (Np); Sarasatilata (S) | |
| 421 | *Artocarpus heterophyllus* Lam. | Moraceae | Rukh Kathar (Li) | 1000 |
| 422 | *Artocarpus lakoocha* Wall. ex Roxb | Moraceae | Badahar, Barar (Li) | 100-1000 |

**Plant:** Used as an antiseptic and febrifuge. Useful in treatment of small pox, and as tooth brush, prophylactic for mouth and teeth (Sikkim: Database).

**Leaves:** Cooked with rice and eaten during the name giving ceremony of newly born child. Boiled in water and bath taken with warm water to cure scabies and eczema. Dried leaf power taken as blood purifier (Sikkim: [92]). Juice taken for blood purification and intestinal worms, also applied externally on wounds, sores, blisters, ans skin diseases (Jhapa: [66]). Fresh/dried leaves chewed to control diabetes (Sikkim: [79, 96]). Bark powder used as insecticide (Sikkim: [79]).

**Bark:** Decoction taken orally to treat stomachache (Sikkim: [85]).

**Roots:** Used as astringent, and in biliousness, heart pain, vomiting, and leucoderma. **Leaves:** Juice taken orally as anthelmintic (Sikkim: [85]). **Bark:** Used as anthelmintic (Jhapa: [66]). **Fruit:** Used in leprosy (Jhapa: [66]).

**Leaves:** Use to extract dye (KL Bhutan: [70]). **Fruit:** Used for chest pain, fever and measles (Sikkim: [79]).

**Leaves and fruits:** Useful in cough, gastric troubles, and sore throat (Panchthar: [67]).

**Leaves:** Extract given to treat diarrhea (Jhapa: [66]; Sikkim: [11]), dysentery, urinary disorders, and indigestion (Jhapa: [66]). **Roots:** Used as antidote; paste taken orally in stomach pain, malarian fever, and cold (Jhapa: [66]). Decoction consumed in empty stomach to cure diabetes (Darjeeling: [74]). Extract given to treat blood in urine (Sikkim: [84]). **Leaves:** Paste applied on wound and juice taken to cure stomach pain (Sikkim: [11]). **Roots and leaves:** Useful in cough, gastric troubles, and sore throat (Panchthar: [67]).

**Tubers:** Powder used in diabetes, tuberculosis, asthma, and fever (Darjeeling: [49, 78]). Oil used externally in the treatment of leucoderma, leprosy and other skin complaints (Darjeeling: [49]). **Stem:** Bark used to extract fibres (Darjeeling: [49]). **Plant:** Useful in jaundice (Darjeeling: [105]).

**Tubers:** Eaten in jaundice (Sikkim: [75]).

**Root:** Dipped in water and sprinkled in poultry farm to prevent from bird flu. **Leaves:** Paste applied on boils for opening (Sikkim: [11]).

**Roots:** Useful in diabetic. Extract used in menstruation disorders and piles (KL Nepal: [53]). **Stem and roots:** Infusion given in fever (Darjeeling: [69, 78]). Used to make broom (KL Bhutan: [100]). **Leaves:** Warmed and wrapped around the fractured and painful joints (Jhapa: [66]). **Fruit:** Boiled in milk and drunk to get rid from tuberculosis (Darjeeling: [74]). Used as medicine (KL Bhutan: [71]).

**Latex:** Applied on the boils and on the fractured bone (Sikkim: [79]).

**Latex:** Applied on boils and on fractured bone (Sikkim: [79]). **Fruit:** Edible (KL Bhutan: [70]). Raw fruits used as vegetable and ripen fruits eaten raw (Ilam: [94]).
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| Item No. | Scientific Name | Plant Type | Family | Part Used | Use | Place | Use Notes |
|----------|----------------|------------|--------|-----------|-----|-------|----------|
| 423 | Ficus auriculata Lour. | Tree | Moraceae | Nimaro, Nilbargo, (Np) | Roots and fruit: Chewed in constipation and warts (Ilam: [73]); Fruit: Consumed (Ilam: [94]). | | |
| 424 | Ficus benghalensis L. | Herb | Moraceae | Banidare (S); Bar (Np) | Fruit: Edible (Jhapa: [92]). Also given in fever (Jhapa: [66]). | | |
| 425 | Ficus elastica Roxb. ex Hornem. | Tree | Moraceae | Brongshig (Sh) | Exude used as gum (KL Bhutan: [70]). | | |
| 426 | Ficus hirta Vahl | Tree | Moraceae | Khasare, Khaneu, Khaniu (Np) | Root: Decoction used to treat food poisoning (Sikkim: [11]). | | |
| 427 | Ficus hidalgo L.f. | Tree | Moraceae | Setapodo (S); Khasreto (Np) | Fruits: Edible (Jhapa: [92]). | | |
| 428 | Ficus racemosa L. | Tree | Moraceae | Loa (S); Gulmar Durnri (Np) | Fruit: Edible (Jhapa: [92]); Also taken to enhance lactation (Jhapa: [66]). | | |
| 429 | Ficus religiosa L. | Tree | Moraceae | Peepal (Np) | Fruit: Edible (Jhapa: [92]). | | |
| 430 | Ficus semicordata Buch.-Ham. ex Sm. | Tree | Moraceae | Khasarey, Khaneu, Khaniu (Np) | Bark and latex: Applied on boils to check infection (Sikkim: [11], Database). | | |
| 431 | Ficus subincisa Buch.-Ham. ex Sm. | Herb | Moraceae | Lute Khaneu (Np) | Bark and latex: Applied on fresh cut (Panchthar: [67]). Fruit: Edible (Ilam: [94]; Jhapa: [92]). | | |
| 432 | Ficus virens Dryand. | Tree | Moraceae | Kabra (Np) | Leaf buds: Young unopened leaf buds boiled and used as pickle (Ilam: [94]). | | |
| 433 | Morus alba L. | Tree | Moraceae | | Leaves, stem and roots: Contains active phytochemical to lower blood glucose level (Sikkim: [96]). | | |
| 434 | Morus australis Poir. | Shrub | Moraceae | Kodaz (S); Kimu (Np) | Bark and leaves: Decoction used to cure sore throat (Sikkim: [11]); Fruits: Edible (KL Bhutan: [70]; Jhapa: [92]; Sikkim: [11]). Seeds: Extract applied to treat foot cracks (Sikkim: [11]). | | |
| 435 | Morus macroura Miq. | Tree | Moraceae | Kimbu (Np); Tschendey (Dz); Sengdengshing (Sh) | Bark and leaves: Decoction used to cure sore throat (Sikkim: [11]); Fruits: Edible (KL Bhutan: [70]; Jhapa: [92]; Sikkim: [11]). Seeds: Extract applied to treat foot cracks (Sikkim: [11]). | | |
| 436 | Streblus asper Lour. | Tree | Moraceae | Khaki (Np); Sada (S) | Stem: Extract from heartwood used as medicine (KL Bhutan: [71]); Fruit: Edible (KL Bhutan: [70]). | | |
| 437 | Moringa oleifera Lam. | Tree | Moringaceae | Mungo (S); Sajwang, Sajana (Np); Sajanamakharia (Me) | Leaves, flowers and fruit: Used as vegetable (Ilam: [94]; Jhapa: [92]). Cooked vegetable taken to control blood pressure (Jhapa: [68]). Bark: Paste mixed with black goat’s milk and taken to cure tuberculosis (Jhapa: [66]). Stem: Paste used by women for long hairs (Jhapa: [94]). | | |
| 438 | Musa balbisiana Colla | Herb | Musaceae | Bankera (Np) | Fruit: Green fruits used as vegetable after boiling and spath for pickle (Ilam: [94]). | | |
| 439 | Musa paradisiaca L. | Herb | Musaceae | Kera (Np) | Root bark: Pound together with stem bark of Mango, Jack fruit, Ziziphus mauritiana, Shorea robusta and Azadirachta indica and taken to cure diarrhoea and dysentery (Jhapa: [66]). Sap: Taken to cure fever (Sikkim: [11]). | | |
| 440 | Musa sp. | Herb | Musaceae | Bankera (Np) | Leaves: Used in house construction, roofing, and for making temporary sheds, also used as fodder. Flowers and fruit: Edible (KL Bhutan: [70], 100%). | | |
| 441 | Myrica esculenta Buch.-Ham. ex D. Don | Tree | Myricaceae | Box Myrtle (Gg); Kaphal (Np, Gg); Katphala (Sn); Lallia (Lm); Chakchansi, Jherepsi (Ri) | Bark: Powder mixed with tobacco and snuffed to treat sinusitis (Panchthar: [67]; mixture also given to livestock to cure worm infestation (Taplejung: [87], 88)). Paste applied to fix fractured bone and cure internal injuries (Taplejung: [87], 88)). Paste applied on the chest to get relief from cough and bronchitis (Ilam: [76]; Sikkim: Database). Fruit: Ripen fruits consumed (Ilam: [73], 94%). | | |
| Table 1 | NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued) |
|---------|------------------------------------------------------------------------------------------|
| 442     | *Myrica nagi* Thunb. Tree Myricaceae Tsutsusey (Sh)                                        |
| 443     | *Horsfieldia kingii* (J. D. Hooker) Warburg Tree Myristicaceae Ramgua (Np) 300-1200       |
| 444     | *Kneea angustifolia* Roxb. Tree Myristicaceae Ramguwaa (Np)                                 |
| 445     | *Ardisia macrocarpa* Wall. Tree Myrtaceae                                                 |
| 446     | *Ardisia solanacea* Roxb. Tree Myristicaceae Ramguwa (Np) 1500-2400                      |
| 447     | *Embelia ribes* Burm.f. Shrub Myrsinaceae Buibidans (Np)                                  |
| 448     | *Maesa chisia* Buch.-Ham. ex D. Don Shrub Myrsinaceae Bilaune (Np); Purmu Kung (L)          |
| 449     | *Eugenia kurzii* Duthie Tree Myrtaceae Ambakay (Np)                                       |
| 450     | *Eugenia sp.* Tree Myrtaceae Mantsisey (Sh); Nasi or Nyassey (Dz)                         |
| 451     | *Psidium guajava* L. Tree Myrtaceae Amba (Np); Aprisam (S) 450-1200                       |
| 452     | *Syzygium cuminii* (L.) Skeels Tree Myrtaceae Sokod (S); Jamun (Np); Jamun (Me), Bjee (Sz), Dangbelingsae (Sh), Ngasi (Dz) 300-1200 |
| 453     | *Euryale ferox* Saliab. Herb Nymphaeaceae Poraini (S); Makrana (Np) 3000-4000               |
| 454     | *Fraxinus floribunda* Wall. Tree Oleaceae Lankuri (Np); Payjew (L)                         |
| 455     | *Nyctanthes arbor-tristis* L. Shrub Oleaceae Parijat (Np); Badibaha, Jhanti (S) 200-1200 |
| 456     | *Epilobium angustifolium* L. Herb Onagraceae Rosebay (Eg); Bahankot (Km); Seja (Sh, Wi); Char Pan, Chu Ts (Tb) 3300-4000 |
| 457     | *Bulbophyllum affine* Lindl. Herb Orchidaceae                                             |
| 458     | *Calanthe plantaginea* Lindley Herb Orchidaceae Wangpeimo (Bhu) 1800-2500                   |
| 459     | *Coelogynae cristata* Lindl. Herb Orchidaceae Chaandi gaava (Np) 1000-2000                 |
| 460     | *Coelogyne occultata* Hook.f. Herb Orchidaceae Churchurchbu (Sh)                          |
| 461     | *Cymbidium longifolium* D. Don Herb Orchidaceae Churchurchbu (Sh) 2100-2500               |

**Fruit:** Used as spices (KL Bhutan: [70]).

**Fruit:** Used to make pickle (Ilam: [94]).

**Fruit:** Powder taken orally to treat diarrhea (Sikkim: [85]).

**Fruit:** Edible (Sikkim: [47]).

**Bark:** Macerated with flowers of Hibiscus rosa-sinensis and taken to purify the blood and also to arrest bleeding (Jhapa: [66]).

**Seeds:** Used as medicine (KL Bhutan: [71]). Powdered with milk and given to dog for anthelmintic efficacies (Sikkim: [84]), Fruit: Crushed and given to pigs to kill tapeworm; also used as appetizer for cattle (Sikkim: [84]).

**Fruit and bark:** Semi ripe fruits and bark eaten to cure diarrhoea (Darjeeling: [86]).

**Bark:** Juice drunk in dysentery (Jhapa: [66, 68]) and diarrhea (Jhapa: [66]).

**Leaves:** Tender shoots chewed during cough and sore throat (Sikkim: [79]).

**Fruit:** Pulps consumed (Ilam: [94]).

**Fruit:** Edible (KL Bhutan: [70]).

**Fruit and bark:** Semi ripe fruits and bark eaten to cure diarrhoea (Darjeeling: [86]).

**Bark:** Pounded with bark of mango and given to cure piles (Jhapa: [66]).

**Leaves:** Extracted massaged on forehead of children for cooling and given orally to increase appetite (Jhapa: [66]).

**Fruits:** Used as medicine (KL Bhutan: [71]).

**Bark:** Paste used for dislocated bones. Leaves: Boiled and applied on gout (Sikkim: Database). Applied on bone fracture (Sikkim: [75]).

**Bark:** Paste used for dislocated bones. Leaves: Boiled and decanted water taken to control malaria fever. Flowers: Offered to god and goddesses (Sikkim: Database). Leaves and flowers: Pounded with warm water and given to woman to ease expulsion of placenta (Jhapa: [66]).

**Leaves:** Dried and used as tea; given as fodder (Tapplejung: [81, 88]).

**Plant:** Ornamental value (Bhutan: [99]). Flowers: Edible (Bhutan: [99]).

**Plant:** Cooked and eaten as vegetable (Bhutan: [102]).

**Bulbs:** Paste used in sores and boils (Ilam: [76]).

**Bulb/stem:** Used as medicine (KL Bhutan: [71]).

**Plant:** Used as ornamental (Bhutan: [99]).
| Table 1 | NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued) |
|---|---|
| **462** | Dactylorhiza hatagirea (D.Don) Soo |
| Herb | Orchidaceae |
| Wangpo Lagpa (Km, Sh, Wl); Nahisihukchok (Li); Panch Aunle (Np); Hathejara (Np-Dl); Munjataka (Sn); Lovha (Sh); Wang Lag, Wangpo Lagpa (Tb) |
| 2800-4200 | Tubers: Used as tonic and given in dysentery (Sikkim: Database) and chronic fever (Darjeeling: [78]); Sikkim: Database). Decoction used to treat fever, diabetes (Ilam: [73, 76]) and diarrhoea (Ilam: [73, 76]; Sikkim: Database). Paste applied on cuts and bruises; extract taken orally to cure body ache (Darjeeling: [52, 80]). Paste taken in gastric complaints, jaundice, body ache, bone fracture, and in the formation of bone marrow (Darjeeling: [71]). Young leaves and shoots: Eaten as vegetable (KL Nepal: [83]). |
| **463** | Dendrobium aphyllum (Roxb.) C.E.C.Fisch. |
| Herb | Orchidaceae |
| Stem: | Used as medicine (KL Bhutan: [71]). |
| **464** | Eulophia dabia (D. Don) Hochr. |
| Herb | Orchidaceae |
| Hattipaila (Np) |
| Tubers: Juicy taken orally as appetizer (Sikkim: [85]). |
| **465** | Gymnadenia crassinervis Finet |
| Herb | Orchidaceae |
| Wanglak (B) |
| Roots: Used as medicine (KL Bhutan: [71]). |
| **466** | Ponerorchis chusua (D. Don) Soo |
| Herb | Orchidaceae |
| Ongri (Sh); Wangla, Marpo, Wanglag Mempa (Tb) |
| 2400-4900 | Tubers: Rasted and eaten (Taplejung: [87]). |
| **467** | Pedicularis anas Maxim. |
| Herb | Orobanchaceae |
| Whole plant: | Used as medicine (KL Bhutan: [71]). |
| **468** | Pedicularis decorissima Diels |
| Herb | Orobanchaceae |
| Whole plant: | Used as medicine (KL Bhutan: [71]). |
| **469** | Pedicularis longiflora Rudolph |
| Herb | Orobanchaceae |
| Whole plant: | Used as medicine (KL Bhutan: [71]). |
| **470** | Pedicularis oederi Vahl |
| Herb | Orobanchaceae |
| Plant used as medicine (KL Bhutan: [71]). |
| **471** | Oxalis corniculata L. |
| Herb | Oxalidaceae |
| Chari Amilo (Np); Tandi, chatumarak, Kedumarajan (S) |
| 300-2900 | Plant: Juice used to treat indigestion, diarrhoea, piles, anemia, and eye problems (Ilam: [73, 76]). Chewed raw as appetizer and also checks boils (Sikkim: [11]). Pounded with cumin seeds and taken to cure dysentery and diarrhea. Paste applied on forehead to treat headache. Paste mixed with rhizome of Drymaria quercifolia and applied on bone fracture (Jhapa: [66]). Roots: Used in infamation (Sikkim: [75]). Leaves: Juice taken to cure dysentery (Sikkim: [11], Database) and fever, anemia, and for digestion (Sikkim: Database). Fruit: Consumed to cure throat pain (Sikkim: [11]). Leaves: Used as vegetable (Ilam: [94]; Jhapa: [92]). |
| **472** | Pandanus nepalensis St. John |
| Shrub | Pandanaceae |
| Leaves: Young leaves chewed as breath sweetener. Fresh leaves acts as cockroach repellant. Used to make mats, carry bags, fishing bags and thatching purpose (Ilam: [94]). |
| Fruit: Used to make pickle (Ilam: [94]). |
| **473** | Argemone mexicana L. |
| Herb | Papaveraceae |
| Thakal (Np); Dhamoi (S) |
| 150-1400 | Leaves: Juice applied on cut, wounds, blisters, and burns (Jhapa: [66]). Fruit: Used to make paint (Jhapa: [66]). Roots and leaves: Paste or juice used in skin disease, constipation, cough and fever (Ilam: [76]). |
| **474** | Corydalis chaerophylla DC. |
| Herb | Papaveraceae |
| Fruits: Taken in stomachache (Sikkim: [75]). |
| **475** | Corydalis crispa Prain |
| Herb | Papaveraceae |
| Whole plant: Used as medicine (KL Bhutan: [71]). |
| **476** | Corydalis dubia Prain |
| Herb | Papaveraceae |
| Whole plant: Used as medicine (KL Bhutan: [71]). |
| **477** | Dicentra scandens (D. Don) Walp. |
| Climber | Papaveraceae |
| 2200-3000 | Roots: Crushed and used to stop excessive bleeding in females (Sikkim: [11]). |
| **478** | Hypecoum erectum L. |
| Herb | Papaveraceae |
| Whole plant: Used as medicine (KL Bhutan: [71]). |

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Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No. | Species                   | Type      | Family       | Common Names                        | Uses                                                                 |
|-----|---------------------------|-----------|--------------|-------------------------------------|----------------------------------------------------------------------|
| 479 | *Hypecoum leptocarpum*    | Herb      | Papaveraceae | Upal Ngongpo (Sh, Tb); Upa Gono (Wl)| Whole plant: Used as medicine (KL Bhutan: [71]).                     |
| 480 | *Meconopsis grandis*      | Herb      | Papaveraceae |                       | Plant: Used as fodder for goat (Tapplejung: [81, 87]). Seeds: Edible (Tapplejung: [81, 87]). |
| 481 | *Meconopsis horridula*    | Herb      | Papaveraceae |                       | Whole plant: Used as medicine (KL Bhutan: [71]).                     |
| 482 | *Meconopsis paniculata*   | Herb      | Papaveraceae | Kheldar, Langur (Np-Dl); Upa Sepu (Wl)| Young twigs: Used as fodder for goat; young stems eaten raw (Tapplejung: [81, 87]). |
| 483 | *Meconopsis simplicifolia* | Herb      | Papaveraceae |                       | Rhizomes: Powder or decoction used as tonic in renal complaints (Darjeeling: [49]). Whole plant: Used as medicine (KL Bhutan: [71]). |
| 484 | *Passiflora foetida*      | Climber   | Passifloraceae | Sano Jhar (Np)         | Leaves: Infusion consumed to cure insomnia, hysteria, epilepsy and as painkiller (Darjeeling: [74]). |
| 485 | *Passiflora nepalensis*   | Climber   | Passifloraceae | Garendal (Np)         | Seeds: Chewed and applied on skin for sunburns and ringworm (Jhapa: [68]). |
| 486 | *Sesamum orientale*       | Shrub     | Pedaliaceae  | Siwing (Me)            | Bark: Infusion taken to cure stomatitis and aphthous (Jhapa: [66]). |
| 487 | *Phyllanthus acidus*      | Tree      | Phyllanthaceae | Atummeral (S); Amala (Np)| Fruit and leaves: Juice taken to cure jaundice, dyspepsia, cough, and asthma (Fanchinthisar: [67]; Ilam: [73, 76]). Fruit: Edible and also used as incense (KL Bhutan: [70]). Used as medicine (KL Bhutan: [71]). Good for burning sensation of heat and urinary discharge, liver complaint, and eye trouble (Sikkim: Database). Edible (Jhapa: [92]; Sikkim: [11]) and eaten raw to treat cough, dysentery and diarrhoea (Sikkim: [11]). Used as tonic (Jhapa: [66]). Used to make pickle (Ilam: [94]). Flowers and fruit: Use to extract dye (KL Bhutan: [70]). Seeds: Used in indigestion and eye problems (Ilam: [73, 76]). |
| 488 | *Phyllanthus emblica*     | Tree      | Phyllanthaceae | Amala (Np); Meral (S); Chhorgengsoi (Sh)| Leaves: Paste applied on burns and boils (Jhapa: [66]). |
| 489 | *Phyllanthus reticulatus* | Shrub     | Phyllanthaceae | Smeldam (S)            | Leaves: Paste applied in wounds and sores (Jhapa: [66]). |
| 490 | *Phyllanthus urinaria*    | Herb      | Phyllanthaceae | Kanthad (S)            | Roots: Used as medicine (KL Bhutan: [71]). Decoction used in jaundice (Tapplejung: [88]). Juice dropped in the nose to cure sinusitis (Sikkim: [79]). Leaves: Effective in high blood pressure (Darjeeling: [74]; Sikkim: [75]). Fresh juice applied on cuts and wounds to stop bleeding and infection (Sikkim: Database). Decoction taken to cure body ache and diarrhoea (Sikkim: [11]). Seeds and leaves: Used in indigestion and eye problems (Ilam: [73, 76]). |
| 491 | *Phytolacca acinosa*      | Herb      | Phytolaccaceae | Jaringe Sag, Jarko Sag (Np); Zalmathangru (Sh)| Roots: Used as anthelmintic, improves appetite, and abdominal pain (Darjeeling: [80]; Sikkim: [89]). Paste given to treat pneumonia in adults (Jhapa: [68]). Powder given to treat cold (Sikkim: [11]). Fruit: Used as medicine (KL Bhutan: [71]). Taken to cure diarrhea, dysentery, piles, and leprosy (Darjeeling: [80]). Dried unripe fruits used as alternative and tonic. Ripe fruits, aromatic, stomachic and carminative. Infusion of dried fruit taken in cough (Darjeeling: [78]; Sikkim: [11]) and fever (Darjeeling: [78]; Sikkim: [11]) and fever (Darjeeling: [78]; Sikkim: [11]). Seeds: Powder applied to reduce strains (Darjeeling: [80]). |
| 492 | *Piper longum*            | Climber   | Piperaceae   | Chimpri-gupai (Me)     | Fruit: Used as spices and medicine (KL Bhutan: [70]). Fruit: Juice administered orally to treat sore throat (Sikkim: [79]). |
| 493 | *Piper nigrum*            | Herb      | Piperaceae   |                       | Fruit: Used as spices and medicine (KL Bhutan: [70]). Fruit: Juice administered orally to treat sore throat (Sikkim: [79]). |
| 494 | *Hemiphragma heterophyllum*| Herb     | Plantaginaceae| Kanakmala (Li)         | Fruit: Used as spices and medicine (KL Bhutan: [70]). Fruit: Juice administered orally to treat sore throat (Sikkim: [79]). |
| No. | Latin Name | Scientific Name | Family | Common Names | Uses |
|-----|------------|-----------------|--------|--------------|------|
| 495 | Picrorhiza kurrooa | Royle ex Benth. | Plantaginaceae | Puti-shing (Dz), Kurki (N) | Roots: Used as medicine (KL Bhutan: [71]). Fresh root paste applied to cuts, wounds, bruises, and injuries (Sikkim: [91]). Leaves: Taken to cure toothache (Sikkim: [75]). Paste applied to treat wounds. Seeds: Powder taken to treat diarrhea and dysentery (Sikkim: [11]). Whole plant: Used as medicine (KL Bhutan: [71]). Plant: Decoction used to cure fever (Darjeeling: [78]). Leaves: Juice consumed in the case of throat pain. Flowers and fruit: Juice applied on cuts and wounds (Darjeeling: [74]). Roots: Paste applied externally on cuts and wounds for quick healing (Sikkim: [84]). |
| 496 | Plantago asiatica subsp. erosae | (Wall.) Z. Yu Li | Plantaginaceae | Isagbul (Np) | 400-3800 | Leaves: Taken to cure toothache (Sikkim: [75]). Paste applied to treat wounds. Seeds: Powder taken to treat diarrhea and dysentery (Sikkim: [11]). Whole plant: Used as medicine (KL Bhutan: [71]). Plant: Decoction used to cure fever (Darjeeling: [78]). Leaves: Juice consumed in the case of throat pain. Flowers and fruit: Juice applied on cuts and wounds (Darjeeling: [74]). Roots: Paste applied externally on cuts and wounds for quick healing (Sikkim: [84]). |
| 497 | Plantago depressa | Willd. | Plantaginaceae | Tsa-shokum (Sh) | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 498 | Plantago major | L. | Plantaginaceae | Jibray Jhar (Np) | Plant: Decoction taken to cure fever (Darjeeling: [78]). Leaves: Juice consumed in the case of throat pain. Flowers and fruit: Juice applied on cuts and wounds (Darjeeling: [74]). Roots: Paste applied externally on cuts and wounds for quick healing (Sikkim: [84]). |
| 499 | Plumbago zeylanica | L. | Plumbaginaceae | Chitu (Np); Chitigni (S) | Roots: Used in antifertility (Jhapa: [66]). Used to make traditional yeast or starter called ‘Marcha’ to make local wine (Darjeeling and Sikkim: [108]). Roasted with potato and taken orally in jaundice (Darjeeling: [105]). Roots: Ash mixed with mustard oil and paste applied externally on ringworm in cattle (Sikkim: [84]). Shoots: Used for fencing and to make food and drink containers, hats, arrows and quivers. Young shoots edible (KL Bhutan: [100]). Leaves: Used as fodder (KL Bhutan: [100]). Plant: Used to make mats, baskets and to construct temporary huts (Sikkim: [89]). Leaves: Used as fodder (KL Bhutan: [83]). Mixed with black pepper and feed with little salt to cattle to treat diarrhea and dysentery (Sikkim: [84]). Roots: Ash mixed with mustard oil and paste applied externally on ringworm in cattle. Shoots: Cooked as vegetable or pickled and eaten (Ilam: [94]; KL Nepal: [83]). Young shoots: Chopped and fermented in tight bamboo or glass bottles to make sour pickle locally called ‘Mesu’ (Darjeeling: [108]; North-east India: [101]). Roots: Ash mixed with mustard oil and paste applied externally on ringworm in cattle. Entrails: Used to make mats, baskets and to construct temporary huts (Sikkim: [89]). Shoots: Cooked as vegetable or pickled and eaten (Ilam: [94]; KL Nepal: [83]). Young shoots: Chopped and fermented in tight bamboo or glass bottles to make sour pickle locally called ‘Mesu’ (Darjeeling: [108]; North-east India: [101]). Roots: Ash mixed with mustard oil and paste applied externally on ringworm in cattle. Young shoots edible (KL Bhutan: [100]). Leaves: Used as fodder (KL Bhutan: [100]). Plant: Used to support prayer flags by Buddhist (Sikkim: [89]). Shoots: Edible (KL Bhutan: [70]). Split and woven mats (KL Bhutan: [100]). Plant: Burnt ash of seedlings applied in leprosy (Jhapa: [66]). Young shoots: Chopped and fermented in tight bamboo or glass bottles to make sour pickle locally called ‘Mesu’ (Darjeeling: [108]; North-east India: [101]). Fruit: Juice drunk regularly for a long time to cure tuberculosis (Jhapa: [66]). Leaves: Used to extract essential oil (KL Bhutan: [93]). Extract used as medicine (KL Bhutan: [71]). Plant: Juice taken orally to cure scabies, cut, wound, epilepsy, piles (Ilam: [73, 76]), and juice along with garlic and warm mustard oil used to rub on body to relieve body pain (Jhapa: [66]). Roots: Juice used in piles; paste used to heal cuts and wounds (Sikkim: [11]). Freshly prepared juice taken to cure liver cirrhosis (Darjeeling: [52]). Roots and leaves: Decoction used to cure diarrhea and dysentery (Sikkim: [11]). Young shoots: Chopped and fermented in tight bamboo or glass bottles to make sour pickle locally called ‘Mesu’ (Darjeeling: [101, 108]; Ilam: [94]). Used to make water pipes, water vessels, in house construction and also consumed as vegetable (Sikkim: [89]). |
| No. | Species Name | Family | Use | Location | Additional Information |
|-----|--------------|--------|-----|----------|------------------------|
| 510 | Dendrocalamus hookeri Munro | Poaceae | Shoots | Bans (Np) | Used in making baskets and in fencing (Sikkim: [89]). |
| 511 | Dendrocalamus sericeus Munro | Poaceae | Shoots | Bans (Np) | Used to make domestic and agricultural implements, such as water containers, baskets, trays, mats, etc. Young shoots edible (KL Bhutan: [100]). Leaves: Used as fodder (KL Bhutan: [100]). |
| 512 | Desmostachya bipinnata (L.) Stapf | Poaceae | Shoots | Kushi (Np) | Astringent and galactagogue (Panchthar: [67]). Roots: Astringent and galactagogue (Panchthar: [67]). |
| 513 | Drepanostachyum sp. | Poaceae | Shoots | Bans (Np) | Used to make baskets, trays, mats, sieves, livestock shelters and temporary dwellings. Young shoots edible (KL Bhutan: [100]). |
| 514 | Eleusine coracana (L.) Gaertn. | Poaceae | Seeds | Kodo (Np) | Used to make local wine called 'Jnard' (Darjeeling: [108]). |
| 515 | Himalayacalamus hoekkerianus (Munro) Stapleton | Poaceae | Shoots | Bans (Np) | Young shoots: Consumed as vegetable (Darjeeling: [89]). |
| 516 | Imperata cylindrica (L.) P. Beauvois | Poaceae | Roots | Siru (Np) | Juice taken in diarrhoea and dysentery (Ilam: [73]), taken during cough, cold and fever (Darjeeling: [91]; Sikkim: [79]). A piece of root tied in hair to ease delivery (Jhapa: [66]). Paste applied on boils (Darjeeling: [52]; Sikkim: [79]). |
| 517 | Phyllostachys edulis (Carrière) J. Houzeau | Poaceae | Shoots | Kash (Np); Kashim (S) | Used as abortifacient (Panchthar: [67]). Flowers: Poultic of young flowers used in rheumatic pain and skin swelling (Darjeeling: [49]). Inflorescence: Used to make broom (KL Bhutan: [100]). |
| 518 | Polygala arillata Buch.-Ham. ex D. Don | Polygalaceae | Roots | Kattabans (Np) | Juice taken for its laxative and emetic actions (Sikkim: [85]). |
| 519 | Bistorta vivipara (L.) Gray | Polygonaceae | Plant | Bish (Np); Bareputuli (Me) | Used as fodder (Taplejung: [87]). Leaves: Juice taken orally during stomachache and gastritis (Sikkim: [79]). |
| 520 | Fagopyrum esculentum Moench | Polygonaceae | Leaves | Mountain Sorrel (Eg); Boke (Np) | Paste with cloves of Allium sativum applied on ringworm after slightly scouring the wound by warm salt-water (Jhapa: [68]). |
| 521 | Persicaria barbata (L.) H. Hara | Polygonaceae | Seeds | Pareng (Np) | Whole plant dust applied to treat skin allergy (KL Nepal: [53]). |
| 522 | Oxyria digyna (L.) Hill | Polygonaceae | Roots | Kash (Np); Kashim (S) | Used as fodder (Taplejung: [87]). |
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| Code | Scientific Name | Family | Use | Elevation |
|------|----------------|--------|-----|-----------|
| 528  | Polygonum coriaceum Sam. | Herb Polygonaceae | Roots: Used as medicine (KL Bhutan: [71]). | 1300-4000 |
| 529  | Polygonum molle D. Don. | Herb Polygonaceae | Plant: Juice taken to treat diarrhea (Ilam: [75, 77]; Sikkim: [85]). Used as astringent (Sikkim: Database). **Young shoots:** Used for curry (Ilam: [94]) and pickle (Ilam: [73, 94]; Sikkim: Database). Useful in diarrhoea (Ilam: [73]). **Leaves:** Used as fodder (Taplejung: [81, 87]). | 1600-3800 |
| 530  | Polygonum runcinatum Buch.-Ham. ex D. Don | Herb Polygonaceae | Whole plant: Used to make vegetable (Ilam: [94]). | 3200-4300 |
| 531  | Polygonum sp. | Herb Polygonaceae | Roots: Used as medicine (KL Bhutan: [71]). | 3300-3600 |
| 532  | Polygonum verticillatum Birolí ex Colla | Herb Polygonaceae | Roots: Used as medicine (KL Bhutan: [71]). | 3600-5000 |
| 533  | Polygonum viviparum L. | Herb Polygonaceae | Roots: Juice boiled with water and given in fever (Sikkim: [11], Database), recommended for jaundice (Sikkim: Database) and stomach trouble (Sikkim: [11], Database). **Leaves:** Paste applied on insect bite (Darjeeling: [74]). | 3200-4300 |
| 534  | Rheum acuminatum Hook. f. & Thoms. ex Hook. | Herb Polygonaceae | Roots: Used as medicine (KL Bhutan: [71]). Herbal tea prepared from rootstock used to treat body pain; paste applied on forehead during severe headache (Sikkim: [79]). **Petioles:** Eaten raw (Taplejung: [87]) and also as appetizer (Sikkim: [79]). **Leaves:** Juice from the shoot portion taken in dysentery and intestinal problems (Sikkim: [79]). | 3200-4300 |
| 535  | *Rheum australe D. Don | Herb Polygonaceae | Roots: Dried and used as tea (Darjeeling: [80]). Taken in constipation, skin eruption, and liver complaints (Sikkim: [75]). Decoction used as tea during internal injuries, body pain, and for blood purification. Rootstocks also yields dye for coloring wool (Taplejung: [81, 87]; KL Nepal: [83]; Sikkim: Database). Rhizome powder taken in diarrhoea, dyspepsia, constipation and ulcer (Ilam: [70]). **Petioles:** Young petioles and leaves used to cure cuts and wounds, sprains and bodyache (Sikkim: [93]). Fresh petioles eaten raw (Taplejung: [81, 87]; KL Nepal: [83]; Sikkim: Database). | 3200-4300 |
| 536  | Rheum nobile Hook. f. & Thoms. | Herb Polygonaceae | Roots: Used as medicine (KL Bhutan: [71]). Effective in ulcer, bronchitis, and fever (Sikkim: [75]). Boiled and paste with flour and Tibetan salt applied on the fractured area. Boiled with rhizome of Bégonia and paste applied externally on the fractured bone (Taplejung: [81, 87]). Decoction or infusion aken to treat rheumatism, arthritis, heart complaints and as tonic after delivery (Darjeeling: [49]). Used as anti emetic, diuretic, laxative, heating potency and for swelling (Darjeeling: [98]). **Plant:** Consumed as vegetable or pickle (Darjeeling: [80, 96]). | 3200-4300 |
| 537  | Rumex nepalensis Spreng. | Herb Polygonaceae | Roots: Extract used orally in hepatitis and loss of hair (Darjeeling: [80]; Sikkim: [11, 89], Database) and as dyes (Sikkim: Database). Infusion taken to treat ulcer, cuts, and sprains (Darjeeling: [91]; Ilam: [73, 76, 77]). **Shoots:** Used in skin diseases (Sikkim: [75]). **Leaves and shoots:** Juice applied on woundt heal (Darjeeling: [86]; Sikkim: [11]). **Leaves:** Cooked and taken as vegetable (Ilam: [94]). Leaf and root paste taken in stomachache and applied on wound (KL Nepal: [53]). | 3200-4300 |
| 538  | Portulaca oleracea L. | Herb Portulacaceae | Young plants: Used as vegetable (Jhapa: [92]). | 300-1500 |
| 539  | Andrasace hookeriاما Klatt | Herb Primulaceae | Roots: Used as medicine (KL Bhutan: [71]). | 300-1500 |
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| Code | Common Name                          | Part(s) Used                                                                 | Plant Uses                                                                 |
|------|--------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| 540  | Primula sikkimensis Hook.             | Herb Primulaceae                                                             |.controlled for medicinal use by local people.                               |
| 541  | Helicia nylaginica Bedd.              | Tree Proteaceae                                                             |                                                                          |
| 542  | Aconitum ferox Wall. ex Ser.          | Herb Ranunculaceae                                                           |Rhizomes: Used as expectorant, febrifuge and in diabetes (Sikkim: [89]).  |
|      |                                      |                                                                              |Leaves: Use to extract dye (KL Bhutan: [70]).                              |
|      |                                      |                                                                              |Plant used as expecorant, febrifuge and in diabetes (Sikkim: [89]).        |
|      |                                      |                                                                              |Rhizomes: Used as in malaria and other fevers, abdominal pains, diarrhoea  |
|      |                                      |                                                                              |and indigestion particularly for children (Darjeeling: [69]).              |
|      |                                      |                                                                              |Given in cough, skin disease (Sikkim: [11, 85], Database), asthma, leprosy |
|      |                                      |                                                                              |and snakebite (Sikkim: Database). Decoction taken orally to treat abdominal |
|      |                                      |                                                                              |disorders (Darjeeling and Sikkim: [69]; Sikkim: [85], KL Nepal: [53]).      |
|      |                                      |                                                                              |Dried rhizome juice taken as antipyretic agent (Darjeeling: [78]; Sikkim:  |
|      |                                      |                                                                              |[11, 90]). Dried rhizome chewed in food poisoning, cold and cough (Sikkim:  |
|      |                                      |                                                                              |[79]). Chewed in headache, powder taken orally to cure nervousness and heart |
|      |                                      |                                                                              |problems (Ilam: [76]; KL Nepal: [53]).                                     |
| 543  | Aconitum heterophyllum Wall. ex Royle | Herb Ranunculaceae                                                           |Rhizomes: Used as bitter tonic and antidote for snakebite (Darjeeling: [69]);|
|      |                                      |                                                                              |taken orally against food poisoning (Darjeeling: [52]).                   |
|      |                                      |                                                                              |Used as anti-fertility agent, tonic, stomachic, anti-periodic and given in  |
|      |                                      |                                                                              |hysteria, piles and throat diseases (Sikkim: Database). Dried rhizomes      |
|      |                                      |                                                                              |taken to cure body ache (Sikkim: [11]; Darjeeling: [52]), fever, cold,     |
|      |                                      |                                                                              |cough and nose discharge (Sikkim: [11, 91]).                               |
| 544  | Aconitum lethale Griff.               | Herb Ranunculaceae                                                           |Roots: Used as medicine (KL Bhutan: [71]).                                |
| 545  | Aconitum naviculare (Bruhli) Stapf    | Herb Ranunculaceae                                                           |Rhizomes: Used as medicine (KL Bhutan: [71]).                              |
| 546  | Aconitum orochryseum Stapf            | Herb Ranunculaceae                                                           |Rhizomes: Used as medicine (KL Bhutan: [71]).                              |
| 547  | Aconitum palmatum D.Don              | Herb Ranunculaceae                                                           |Roots: Powder used to treat fever (Taplejung: [81, 88]; Sikkim: [75]),    |
|      |                                      |                                                                              |headache, stomachache (Taplejung: [81, 82, 87, 88]) and rheumatism (Sikkim:|
|      |                                      |                                                                              |[75]).                                                                      |
| 548  | *Aconitum spicatum (Bruhli) Stapf     | Herb Ranunculaceae                                                           |Rhizomes: Used for cholera, rheumatism (KL Nepal: [83]), and also to treat  |
|      |                                      |                                                                              |rabies used in stomachache (KL Nepal: [53]). Paste given in diarrhea (Ilam:|
|      |                                      |                                                                              |[73]). Buti (Amulet) prepared with tuber and tied on the body of a baby to  |
|      |                                      |                                                                              |keep far from bad spirit (Taplejung: [81]).                                |
| 549  | Anemone rivularis Buch.-Ham. ex DC.   | Herb Ranunculaceae                                                           |Fruits: Used as medicine (KL Bhutan: [71]).                               |
| 550  | Clematis acuminata DC.                | Climber Ranunculaceae                                                        |Roots: Given to treat sinusitis (Sikkim: [75]).                            |
| 551  | Clematis buchananiana DC.             | Climber Ranunculaceae                                                        |Roots: Juice or powder used in headache, sinusitis (Taplejung: [87]; Sikkim:|
|      |                                      |                                                                              |[11, 75, 89]; Database), half headache and to make fermenting agent         |
|      |                                      |                                                                              |(Taplejung: [87]). Fresh roots crushed and used to release effluvium through |
|      |                                      |                                                                              |nose to cure sinusitis and nose blocks (Darjeeling: [52, 74, 80]).          |
| 552  | Clematis montana Buch.-Ham. ex DC.    | Climber Ranunculaceae                                                        |Roots: Taken to cure sinusitis (Sikkim: [75]). Seeds/flowers: Used as      |
|      |                                      |                                                                              |medicine (KL Bhutan: [71]).                                                |
| 553  | Delphinium brunonianum Royle          | Herb Ranunculaceae                                                           |Whole plant: Used as medicine (KL Bhutan: [71]) and incense (KL Bhutan:   |
| 554  | Delphinium cashmerianum Royle         | Herb Ranunculaceae                                                           |Whole plant: Used as medicine (KL Bhutan: [71]).                           |
| 555  | Thalictrum cheilonii DC.              | Herb Ranunculaceae                                                           |Roots: Used as tonic and purgative (Sikkim: [75]).                         |
| No. | Species | Lifeform | Family | Common Names | Uses | Elevation |
|-----|---------|----------|--------|--------------|-------|-----------|
| 556 | Thalictrum foliolosum DC. | Herb | Ranunculaceae | Dampatey (Np) | Roots: Used as medicine (KL Bhutan: [71]). Used as tonic and purgative (Sikkim: [75]). Decoction taken in fever (Darjeeling: [78]). Leaves: Paste applied to cure sores and inflammation (Sikkim: [11]). | 1300-3400 |
| 557 | Thalictrum reniforme Wall. | Herb | Ranunculaceae | 2800-3300 | Roots: Used to treat jaundice (Panchthar: [67]). Paste applied to cheek boils (Sikkim: [11], Database). Decoction used as gargle in case of bad breath and kills worms in stomaching on drinking (Sikkim: [11]). | Roots: Used as purgative (Sikkim: [75]). Roots and leaves: Applied on fractured bone (Sikkim: [75]). | 200-1400 |
| 558 | Gouania leptostachya DC. | Climber | Rhamnaceae | | Leaves: Paste applied to cure sores and inflammation (Sikkim: [11]). | 150-800 |
| 559 | Hovenia dulcis Thunberg | Tree | Rhamnaceae | Janum (S); Bayer (Np) | Roots, seeds and bark: Useful in measles and pneumonia (Panchthar: [67]). Bark: Extract used in diarrhea; powder used for septic wounds (Jhapa: [66]). Fruit: Eaten raw (Jhapa: [92]). | 200-1200 |
| 560 | Rhamnus napalensis (Wall.) M. A. Lawson | Shrub | Rhamnaceae | | Roots and leaves: Applied on fractured bone (Sikkim: [75]). | 150-800 |
| 561 | Zizyphus mauritiana Lam. | Tree | Rhamnaceae | | Roots, seeds and bark: Useful in measles and pneumonia (Panchthar: [67]). Bark: Extract used in diarrhea; powder used for septic wounds (Jhapa: [66]). Fruit: Eaten raw (Jhapa: [92]). | Flowers and fruit: Use to extract dye (KL Bhutan: [70]). | 150-800 |
| 562 | Zizyphus rugosa Lam. | Shrub | Rhamnaceae | Sekra (S) | Roots, seeds and bark: Useful in measles and pneumonia (Panchthar: [67]). Bark: Extract used in diarrhea; powder used for septic wounds (Jhapa: [66]). Fruit: Eaten raw (Jhapa: [92]). | 150-800 |
| 563 | Zizyphus spp. | Shrub | Rhamnaceae | Khankarisey, Khanglchaling (Sh) | Roots, seeds and bark: Useful in measles and pneumonia (Panchthar: [67]). Bark: Extract used in diarrhea; powder used for septic wounds (Jhapa: [66]). Fruit: Eaten raw (Jhapa: [92]). | Flowers and fruit: Use to extract dye (KL Bhutan: [70]). | 150-800 |
| 564 | Chaenomeles speciosa (Sweet) Nakai | Shrub | Rosaceae | | Flowers and fruit: Use to extract dye (KL Bhutan: [70]). | 150-800 |
| 565 | Cotoneaster microphyllus Wall. ex Lindl. | Shrub | Rosaceae | | Flowers and fruit: Use to extract dye (KL Bhutan: [70]). | 150-800 |
| 566 | Dacrynia indica (Wall.) Decne. | Tree | Rosaceae | | Flowers and fruit: Use to extract dye (KL Bhutan: [70]). | 150-800 |
| 567 | Duchesnea indica (Andrews) Focke | Herb | Rosaceae | Bhui Aiselu (Li) | Flowers and fruit: Use to extract dye (KL Bhutan: [70]). | 150-800 |
| 568 | Fragaria nubicola Lindl. ex Lacaita | Herb | Rosaceae | Bhui Aiselu (Li) | Flowers and fruit: Use to extract dye (KL Bhutan: [70]). | 150-800 |
| 569 | Potentilla fructicosa L. | Herb | Rosaceae | Teba, Pangsermendo (Gr-Mn); Pera, Pama, Pang Ser Metog (Km); Bhairung Pate, Jhawi (Np) | Roots: Used for breast disease, stomach and lung disorders, and indigestion; also used as incense (KL Nepal: [83]). Stem: Used as brooms (Taplejung: [87]). Leaves and flowers: Used in making tea (Taplejung: [87]). | 2700-4600 |
| 570 | Potentilla fulgens Wall. ex Hook. | Herb | Rosaceae | Bajradanti (Np) | Roots: Used for breast disease, stomach and lung disorders, and indigestion; also used as incense (KL Nepal: [83]). Stem: Used as brooms (Taplejung: [87]). Leaves and flowers: Used in making tea (Taplejung: [87]). | 1600-4000 |
| 571 | Prinsepia utilis Royle | Shrub | Rosaceae | Phekray (Np) | Roots: Used for breast disease, stomach and lung disorders, and indigestion; also used as incense (KL Nepal: [83]). Stem: Used as brooms (Taplejung: [87]). Leaves and flowers: Used in making tea (Taplejung: [87]). | 1500-2000 |
| 572 | Prunus cerasoides D. Don | Tree | Rosaceae | Payun, Aaru Patay (Np) | Roots: Used for breast disease, stomach and lung disorders, and indigestion; also used as incense (KL Nepal: [83]). Stem: Used as brooms (Taplejung: [87]). Leaves and flowers: Used in making tea (Taplejung: [87]). | 1300-2400 |
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| N. | Plant Name | Family | Common Name | Habitat | Uses |
|---|---|---|---|---|---|
| 573 | Pyrus pashia Buch.-Ham. ex D. Don | Tree | Rosaceae | Mayal (Np) | Fruit and bark: Taken to cure menstrual disorders (Ilam: [73]). Fruit: Extract taken to cure dysentery (Darjeeling: [80]). |
| 574 | Rosa macrophylla Lindl. | Shrub | Rosaceae | Himalayan Rose (Eg); Jangali gulaf (Np) | Fruit: Used as medicine (KL Bhutan: [71]). Used for fever, diarrhea, and bile disorders; edible and also used for making local wine (KL Nepal: [83]). |
| 575 | Rosa sericea Lindl. | Herb | Rosaceae | Sewa (Gr-Mn); Sewa Metog (Km); Sebimendo (Sh); Segue-Karlo, Seroga, Sewa (Tb); Setokpa (Mt) | Fruit and ripe fruit: Used in liver, bile, wind and lung diseases and menstrual disorders. Ripe fruit: Eaten raw (Taplejung: [81]). Believed to have curative effects in headache, liver complaints, and constipation (Sikkim: [75, 79]). Leaves: Decoction used to wash wound (Sikkim: [79]). Flowers: Used as medicine (KL Bhutan: [71]). |
| 576 | Rubus ellipticus Sm. | Shrub | Rosaceae | Nepali Raspberry (Eg); Tinsek (Li); Kysyim (Lp); Aiselu, Aiselu (Np); Chees, Tudum (Rl); Chihilum, Nyaningma (Sh); Polang (Trm); Kandakari, Gah-Trah (Tb); Chihilum (Mt) | Fruit and bark: Useful in gastric problem and diarrhea (Darjeeling: [49, 74]; Panchthar: [67]). Roots: Juice given in fever (Sikkim: [75]). Paste applied on forehead during severe headache (Sikkim: [11]) and applied to treat wounds (Sikkim: [11]). Root used for abortion (Darjeeling: [52]). Roots and young shoots: Used for colic pain (Sikkim: [11]). Young shoots: Chewed to stop sudden stomach pain (Darjeeling: [51, 91]; Sikkim: [11]), mouth allergy and paste of tender shoots applied as antidote to snake bite (Taplejung: [87]). Tender leaves and/or young stem shoots pounded and administered to livestock to treat cold and fever (Sikkim: [84]). Bark: Crushed and applied on injuries of cattle (Sikkim: [97]). Fruit: Used as spices (KL Bhutan: [70]). Edible (Darjeeling: [80]; Ilam: [94]; Sikkim: [95]). Juice used to cure fever and cough; ripe fruits used to make local wine (Taplejung: [88]) and in dysentery and wounds (Ilam: [73]). |
| 577 | Rubus lineatus Reinw. | Shrub | Rosaceae | Susuk (L) | Roots: Taken in food poisoning (Sikkim: [75]). |
| 578 | Rubus rugosus Sm. | Shrub | Rosaceae | Jogi Aisnelu (Np) | Root bark: Used as anthelmintic drug (Panchthar: [67]). |
| 579 | Anthocyrhalus chinensis (Lam.) A. Rich. ex Walp. | Tree | Rubiaceae | Kadam (S and Np) | Fruit: Ripe pseudocarps edible (Jhapa: [68]). Consumed during stomachache (Sikkim: [79]). Seeds: Roasted and oil consumed (Ilam: [94]). |
| 580 | Anthagonium gracile Wall. ex Lindl. | Herb | Rubiaceae | Bhui Sunakhari (Np) | Rhizomes and pseudobulbs: Paste applied externally to treat bone fracture and dislocation; pseudobulbs crushed to make paste and applied externally to cure boils (Darjeeling: [52]). |
| 581 | Cinchona officinalis L. | Shrub | Rubiaceae | Sinchona (Np) | Bark: Used as remedy for malaria (Sikkim: Database). |
| 582 | Galium aparine L. | Herb | Rubiaceae | Zangtsi-rokpu (Sh) | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 583 | Halidina cordifolia (Roxburgh) Ridsdale | Tree | Rubiaceae | Pahenley (Np); Sinjio (S) | Bark: Decoction used for antipyretic actions (Darjeeling: [78]). Young shoots: Decoction applied in eye infections (Jhapa: [65]). |
| 584 | Hedyscytis corymbosa (L.) Lam. | Herb | Rubiaceae | Pirengo (Np) | Plant: Decoction taken orally to prevent gastric irritability and also act as an anthelmintic (Darjeeling: [74]; Sikkim: [85]). Whole plant and roots are useful in eye diseases, sprains and boils (Sikkim: [75]). Roots: Useful in eye diseases, sprains, and boils (Sikkim: [75]). |
| 585 | Hedyscytis scandens Roxb. | Herb | Rubiaceae | Bokre Lahara (Np); Kalhya (L) | Leaves: Used as spises (KL Bhutan: [70]). |
| 586 | Houstonia spp. | Herb | Rubiaceae | Nombareng (Sh) | Young leaves: Used as vegetable (Jhapa: [92]). Fruit: Edible (Jhapa: [92]). |
| 587 | Meyna pubescens (Kurz) Robyns | Shrub | Rubiaceae | Nombareng (Sh) | Plant: Decoction given to treat fever, cough, and asthma (Sikkim: [11]). |
| 588 | Mussaenda frondosa L. | Shrub | Rubiaceae | Dhotisara (Np) | Leaves: Extract given in fever (Darjeeling: [78]). Roots: Juice given in jaundice (Darjeeling: [74]). |
| Page | NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued) |
|------|--------------------------------------------------------------------------------------------|
| 589  | Mussaenda macrophylla Wall. | Herb | Rubiaceae | Tungbub (L) | Roots: Taken in jaundice (Sikkim: [75]). Juice taken in acidity, diabetes and fever (Ilam: [76]). |
| 590  | Mussaenda treutleri Stapf | Shrub | Rubiaceae | Tungbub (L) | Roots: Given in jaundice (Sikkim: [75]). |
| 591  | Paederia foetida L. | Climber | Rubiaceae | Banlahara (Np) | 300-1800 | Leaves: Decoction used as medicine (Darjeeling: [78]). |
| 592  | Paederia scandens (Lour.) Merr. | Shrub | Rubiaceae | Pate biree (Np) | 1400 | Stem: Swollen part of the stem used to treat rheumatism (Panchthar: [67]). Fruit: Dried and paste applied around tooth to cure toothache and prevent tooth decay (Sikkim: [11]). |
| 593  | Pavetta indica L. | Tree | Rubiaceae | White Pavetta (Eg); Kangyphul, Takali, Sundok (Np) | Roots: Juice used for purgative action (Sikkim: [85]). |
| 594  | Randia sp. | Tree | Rubiaceae | Nertingaey (Sh) | Fruit: Edible (KL Bhutan: [70]). |
| 595  | Rubia cordifolia L. | Herb | Rubiaceae | Majito | Roots and fruit: Taken in dysentery, uterian pains, and voice complexion (Sikkim: Database). Stem: Crushed, mixed with rice wash and given to cattle in post natal problem of cattle (Sikkim: [97]). Roots: Used as medicine (KL Bhutan: [71]). Decoction of dried roots taken to treat fever (Darjeeling: [78]). Decoction used in urinary infection; paste applied on skin diseases (Darjeeling: [91]; Sikkim: [11]). Roots and fruit: Given to treat menstrual disorders (Darjeeling: [49]; Sikkim: [75]). Roots: Juice used for purgative action (Sikkim: [85]). Paste applied on forehead to cure headache (Darjeeling: [52]). Paste also used as ointment to treat skin infection; decoction administered to cattle for quick recovery (Sikkim: [84]). Stem: Used in scorpion bite (Sikkim: Database). Roots: Used as alterative, astringent, and tonic. Used to obtain dye (KL Nepal: [83]). Roots and fruit: Given to treat menstrual disorders (Darjeeling: [49]; Sikkim: [75]). Roots: Juice used for purgative action (Sikkim: [85]). Paste applied on forehead to cure headache (Darjeeling: [52]). Paste also used as ointment to treat skin infection; decoction administered to cattle for quick recovery (Sikkim: [84]). |
| 596  | *Rubia manjith Roxb. ex Fleming | Climber | Rubiaceae | Majitho (Np) | 1200-2100 | Roots: Taken in jaundice (Sikkim: [75]). Juice taken in acidity, diabetes and fever (Ilam: [76]). |
| 597  | Rubia wallichiana Decne. | Climber | Rubiaceae | Vyem (L) | 300-2600 | Roots: Given in jaundice (Sikkim: [75]). |
| 598  | Spermadictyon suaveolens Roxb. | Shrub | Rubiaceae | Ban Champ (Np) | 500 | Roots: Given in jaundice (Sikkim: [75]). |
| 599  | Tamilnadia uliginosa (Retz.) Tirveng. & Sastre | Tree | Rubiaceae | Pendra (S); Pidar (Np) | 200-900 | Fruit: Used as medicine (KL Bhutan: [71]). |
| 600  | Uncaria sessilifructus Roxb. | Climber | Rubiaceae | Whole plant: Used as medicine (KL Bhutan: [71]). Fruit: Unripe fruits eaten as vegetable (Jhapa: [92]). |
| 601  | Uncari arhynchophylla (Miq.) Miq. ex Havil. | Climber | Rubiaceae | Whole plant: Used as medicine (KL Bhutan: [71]). Root: Used to treat bone fracture and crack (Panchthar: [67]). Whole plant: Used as medicine (KL Bhutan: [71]). |
| 602  | Aegle marmelos (L.) Correa | Tree | Rutaceae | Sinjo (S); Bel (Np) | 600-1100 | Fruit: Used as medicine (KL Bhutan: [71]). |
| 603  | Boenninghausenia albiflora (Hook.) Rchb. ex Metsn. | Herb | Rutaceae | Likhijari (Np) | 600-3300 | Fruit: Used as medicine (KL Bhutan: [71]). |
| 604  | Citrus medica L. | Tree | Rutaceae | Bimbira (Li) | 700-1200 | Fruit: Eaten raw in indigestion, vomiting, jaundice and typhoid. Dried skin powder administered in dysentery (Sikkim: [79]). |
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No. | Species                                                                 | Family       | Local Names                                      | Uses                                                                 |
|-----|-------------------------------------------------------------------------|--------------|--------------------------------------------------|----------------------------------------------------------------------|
| 605 | *Citrus reticulata* Blanco                                                | Rutaceae     | Suntala (Li)                                     | Fruit: Skin dried and paste applied on the face to soften (Sikkim: [79]). Leaves: Used to remove flies from wounds, sores, and cuts (Jhapa: [66]). |
| 606 | *Clausena excavata* Burm. f.                                             | Shrub        |                                                   | Bark: Juice given in dysentery and menstrual disorder (Ilam: [73]).    |
| 607 | *Evodia fraxinifolia* (D.Don) Hook. f.                                   | Tree         | Khanakpa (Np)                                    | Roots: Powder taken to treat dysentery (Darjeeling: [80]; Sikkim: [85]). Bark: Decoction given in fever (Darjeeling: [78]). Fruit: Used as antipyretic and in treatment of typhoid; eaten as vegetable (Darjeeling: [80]; Sikkim: [89]). Seeds: Used to make chutney and taken with food to improve appetite (Darjeeling: [91]; Sikkim: [79]). |
| 608 | *Evodia fraxinifolia* Hook. f.                                           | Tree         | Khanakpa, Kanu (Np)                              | Roots: Powder taken to treat dysentery (Darjeeling: [80]; Sikkim: [85]). Bark: Decoction given in fever (Darjeeling: [78]). Fruit: Used as antipyretic and in treatment of typhoid; eaten as vegetable (Darjeeling: [80]; Sikkim: [89]). Seeds: Used to make chutney and taken with food to improve appetite (Darjeeling: [91]; Sikkim: [79]). |
| 609 | *Murraya koenigii* (L.) Spreng.                                          | Tree         |                                                   | Leaves: Used as spices (KL Bhutan: [70]).                              |
| 610 | *Tetradium fraxinifolium* (Hooker) T. G. Hartley                         | Tree         | Khanakpa (Np); Kanu (L)                          | Whole plant: Taken as antipyretic and diuretic (Sikkim: [75]). Fruit: Taken as antipyretic and diuretic (Sikkim: [75]). |
| 611 | *Zanthoxylum acanthopodium* DC.                                          | Shrub        | Boke timur (Np); Gee (Sh); Thingne (Dz)         | Fruit: Taken in indigestion (Darjeeling: [80]; Sikkim: [74, 75, 79]). Fruit and roots: Decoction used to treat toothache, fever, cough, rheumatism, and asthma (Darjeeling: [78]; KL Nepal: [83]; Panchthar: [67]; Ilam: [73, 76, 77]). Fruit: Used as spice (KL Nepal: [83]; Panchthar: [67]; Ilam: [73]). Fruit: Used as spices (KL Bhutan: [70]). |
| 612 | *Zanthoxylum armatum* DC.                                                | Shrub        | Timur (Np)                                       | Fruit: Pickled and eaten; paste of immature fruit kept between teeth to relieve from toothache (KL Nepal: [83]). Flowers and fruit: Extract given to treat pain, tumor, fever, cholera and snake bite (Ilam: [76]). |
| 613 | *Zanthoxylum burchungensis* Wall.                                        | Shrub        |                                                   |                        |
| 614 | *Zanthoxylum oxyphyllum* Edgew.                                          | Shrub        | Nepalese Pepper (Eg): Ban Timur, Lekh Timur (Np) |                        |
| 615 | *Salix babylonica* L.                                                    | Tree         | Bains (Np)                                       |                        |
| 616 | *Salix calyculata* Hook. f. ex Andersson                                  | Shrub        | Leng Junye, Langma Parma (Km); Lansip (Sh); Langma Chhung (Tb); Langma (Wt) |                        |
| 617 | *Osyris wightiana* Wall. Ex Wight                                        | Shrub        | Nundhiki (Np)                                    |                        |
| 618 | *Pyrularia edulis* (Wall.) A. DC.                                         | Tree         | Ampphi (Np)                                      |                        |
| 619 | *Cardiospermum halicacabum* L.                                            | Climber      | Fuka fucha (S)                                   |                        |
| 620 | *Sapindus mukorossi* Gaertn.                                             | Tree         | Ritha (Np)                                       |                        |

| Plant and stem bark: Infusion taken in fever (Darjeeling: [78]). |

| Leaves and flowers: Used as incense (Taplejung: [81, 88]). |

| Root bark: Used to treat body pain and fractured bone (Panchthar: [67]). |

| Fruit: Edible; kernel possess wax which is used for lighting (Sikkim: [89]). |

| Plant: Powder mixed with mustard or coconut oil applied to cure sores and wounds (Jhapa: [66]). |

| Fruit: Juice used to cure burnt part of the body; also used for epilepsy (Sikkim: Database). Extract applied on head to remove dandruff and lice (Darjeeling and Sikkim: [69]; Sikkim: [11]). Used to extract oil (Ilam: [94]). Fruit and root bark: Used as tonic, anthelmintic, purgative, in asthma and piles (Darjeeling and Sikkim: [69]). |
**Table 1** NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| N°  | Scientific Name | Family         | Common Name | Habitat | Uses |
|-----|-----------------|----------------|-------------|---------|------|
| 621 | *Schleichenia oleosa* (Lour.) Oken | Sapindaceae | Baru (S); Kusum (Np) | 200-300 | Fruits: Edible (Jhapa: [92]). |
| 622 | *Aesandra butyracea* (Roxb.) Baehni | Sapotaceae | Chiri (Np) | 200-1500 | Bark and seeds: Paste applied on fractured bone and in piles (KL Nepal: [53]). Fruits: Used to extract oil (KL Bhutan: [93]). Edible (94); Sikkim: [11, 47, 89, 95]; KL Bhutan: [70]; Used in rheumatism (Sikkim: Database; [47]); Juice taken to soften the skin (Sikkim: [11]). Oil extract applied on body during winter (Sikkim: [70]). Leaves: Used as fodder (Sikkim: [89]). |
| 623 | *Diplokern abutyracea* (Roxb.) H.J.Lam | Sapotaceae | Yika (Dz), Pinsa (Sh) | | |
| 624 | *Madhuca longifolia* (Roxb.) Macbride | Sapotaceae | Mahuwa (Np) | 150-300 | Fruits: Edible (KL Bhutan: [70]). Bark: Used to treat bone crack (Panchthar: [67]). Shoots: Used as vegetable (Bhutan: [102]). Leaves: Decoction given to treat tuberculosis (Darjeeling: [74]). |
| 625 | *Houttuynia cordata* Thurb. | Saururaceae | Gaytso (Bhu) | 1300-2500 | |
| 626 | *Astilbe rivularis* Buch.-Ham. ex D. Don | Saxifragaceae | Tangphung, Tangphung Supari, Toksong Supari (li); Bansupari, Buriokaht, Budo Okhati, Thulo Ausadi (Np); Thappasid (Ri); Tongsergugay (Sh), | 2000-3600 | Roots: Used as medicine (KL Bhutan: [71]). Taken as tonic for post natal women (Sikkim: [75]). Chewed to relieve from pain (Darjeeling: [80]; Sikkim: [89]). Paste applied to treat wound and juice used in fever, dysentery, back pain, waist pain, and throat pain (Taplejung: [82, 87, 88]) body ache, bleeding at pre and post pregnancy (Darjeeling: [52, 74]; Ilam: [73, 76, 77]; Sikkim: [69]). Powder taken in jaundice (Sikkim: [60]). Roots and leaves: Taken in diarrhea, dysentery, and as blood purifier (Sikkim: Database). Leaves: Chewed raw in toothache (Sikkim: [49, 79]). |
| 627 | *Bergenia ciliata* (Haw.) Sternb. | Saxifragaceae | Rockfoil (Eg); Pakhanved (Np); Sallipat, Salpari, Simgadi (Np-Dl); Sediwakthosida (Ri); Pashanaveda (Sn); Hyorna, Kopsokpa, Silviro (Sh); Bhramhendo (Tm) | 900-3600 | Roots: Used as medicine (KL Bhutan: [71]). Used as analgesic and in piles, heart diseases (Darjeeling: [80, 89]), and spleen enlargement (Darjeeling: [80]; Sikkim: [69]). Juice taken as tonic (Sikkim: [75]) and used to treat wound, boils, diarrhea (Taplejung: [87]; Sikkim: [11, 75], Database; Panchthar: [67]) sinusitis, body pain, cough and cold, eye infection, dysentery, abdominal pain, fever, and to check bleeding during menstruation (Taplejung: [87, 88]; Panchthar: [67]). Crushed and tied around the factured bone (Darjeeling: [80]), also used with root of Bergenia ciliata, Kaempferia rotundata, and Viscum articulatum for the same (Sikkim: [79]). Paste given to treat dysentery (Sikkim: [74, 91]); also applied on burns and cuts; dried rhizome used as astringent, given in ulcers and tuberculosis (Sikkim: [69]). Crushed and extract given to cattle to treat diarrhea and dysentery (Darjeeling: [85]; Sikkim: [84]). |
| 628 | *Bergenia purpurascens* (Hook. f. & Thomson) Engl. | Saxifragaceae | Pakhanved (Np); Chhurcha, Kopsokpa (Sh); Gadur, Ligadur (Tb) | 3800-4700 | Roots: Paste used in wound, bodyache (Taplejung: [82, 87]; Darjeeling: [80, 89]) and bone fracture (Taplejung: [82]). Decoction used in fever, diarrhea (Taplejung: [87]; Sikkim: [75]), knee ache, and loss of eye sight (Taplejung: [87]). Dried roots used as substitute of tea by high altitude dwellers to get relief from bodyache (Sikkim: [79]). |
| 629 | *Chrysosplenium camasum* Hook. f. & Thomson | Saxifragaceae | Churtsa, Simjhar (Sh); Ya Ki Ma, Ser Ya Ki Ma (Tb) | 3800-5500 | Whole plant: Used as medicine (KL Bhutan: [71]). Leaves and stem: Used in common fever and typhoid fever (Taplejung: [82]). Rhizomes: Used for bile disease, eye diseases, and gastritis (KL Nepal: [83]). Decoction used to treat cold and cough, throat pain, fever, bodyache, and high blood pressure (Darjeeling: [49]; Taplejung: [81, 87, 88]). Taken in cold, fever and snake bite (Darjeeling: [52]). Used as bitter tonic, laxative, stomachic, effective in dropsy and scorpion stings (Sikkim: [69]). Effective in diseases of liver and spleen including jaundice and anemia (Sikkim: [69]). |
| 630 | *Nepocirrhiza schruthulaniflora* (Pennell) Hong | Saxifragaceae | Gorki, Gurki (Gr-Mn); Katuki, Kutki (Np); Katuko (Np-Dl); Katukua (Sn); Hogling, Hunglen (Sh, Wi) | 3500-4800 | Roots: Paste in wound, bodyache (Taplejung: [82, 87]; Darjeeling: [80, 89]) and bone fracture (Taplejung: [82]). Decoction used in fever, diarrhea (Taplejung: [87]; Sikkim: [75]), knee ache, and loss of eye sight (Taplejung: [87]). Dried roots used as substitute of tea by high altitude dwellers to get relief from bodyache (Sikkim: [79]). |
| No. | Species | Type | Family | Common Names | Use and Benefits |
|-----|---------|------|--------|--------------|-----------------|
| 631 | Saxifraga mucronulata | Herb | Saxifragaceae | | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 632 | Schisandra neglecta | Climber | Schisandraceae | Sighatta Lahara (Np) | Fruit: Used as tonic and given in insomnia (Sikkim: [75]). |
| 633 | Digitalis purpurea | Herb | Scrophulariaceae | Fox glove (Np) | Leaves: Used as heart tonic and cardiac stimulant (Sikkim: Database). |
| 634 | Lancea tibetica | Herb | Scrophulariaceae | | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 635 | Scoparia dulcis | Herb | Scrophulariaceae | Chineebimfang (Me) | Plant: Decoction used in eye troubles (Jhapa: [66]). Leaves: Extract drunk and also applied externally on the body as a remedy for the babies weeping all days (Jhapa: [68]). Young leaves taken in diabetes (Sikkim: [75]). Roots: Decoction taken orally in diarrhoea and dysentery (Jhapa: [66]). |
| 636 | Smilax zeylanica | Climber | Smilacaceae | Kukur Dainey (Np) | Fruit: Used in Urinary complaints and dysentery. Roots: Used as medicine (KL Bhutan: [71]). |
| 637 | Anisodus luridus | Herb | Solanaceae | Langthang, Longtankobu (Wl) | Seeds: Used to treat toothache (Taplejung: [81]). Fruit: Used as medicine (KL Bhutan: [71]). |
| 638 | Datura metel | Herb | Solanaceae | Dhaturo, Dhontrey (Np) | Seeds: Powder used in skin diseases in cattle (Sikkim: [97]; Ilam: [73, 76]), dandruff, leprosy, ulcer, and fever (Ilam: [73, 76]). Burned and smoke inhaled in chronic asthmatic fits (Sikkim: [79]). Leaves: Crushed leaf applied on insect bite of cattle (Sikkim: [97]). Warmed leaves placed on joint to reduce the pain and swelling (Sikkim: [79]). Fruit: Used as medicine (KL Bhutan: [71]). Smoked for toothache; powdered and mixed with warm mustard oil to treat earache (Jhapa: [66]). Taken in mad dog bites (Sikkim: [79]). |
| 639 | Datura stramonium | Shrub | Solanaceae | Gofatdothrabithai (Me) | Seeds: Used as medicine (KL Bhutan: [71]). Used to treat scabies (Jhapa: [68]). Used as narcotic and also to treat dandruff and hairfall (Panchthar: [67]). Given orally against rabies, nervousness, nausea and hysteria (Darjeeling: [52]). |
| 640 | Hyoscyamus sp. | Shrub | Solanaceae | | Fruit/Whole plant: Used as medicine (KL Bhutan: [71]). |
| 641 | Mandragora officinarum | Herb | Solanaceae | | Roots: Used as medicine (KL Bhutan: [71]). |
| 642 | Physalis minima | Shrub | Solanaceae | Jangali phokhokey (Np) | Fruit: Used as tonic, diuretic, laxative, and useful in inflammations (Sikkim: Database). |
| 643 | Solanum aculeatissimum | Herb | Solanaceae | Goglang (Me); Hinje, Bhingakheta (S) | Seeds: Powdered and mixed with warm mustard oil to treat earache (Jhapa: [66]). Taken in mad dog bites (Sikkim: [79]). |
| 644 | Solanum myriacanthum | Herb | Solanaceae | | Roots and fruit: Extraction taken in cold and bronchitis. Fruit: Used for relieving toothache (Jhapa: [66]). Seeds: Boiled and vapour taken through mouth to kill germs of teeth (Jhapa: [68]). |
| 645 | Solanum nigrum | Herb | Solanaceae | Sano bini (Np) | Seeds: Smoke directed to the infected tooth to cure toothache and tooth decay (Sikkim: [11]). |
| 646 | Solanum sp. | Shrub | Solanaceae | Khalanji (Sh.) | Aerial parts: Used as sedative (Darjeeling: [74]). Roots, leaves and fruit: Used in the treatment of leucoderma, dysentery, vomiting, asthma, bronchitis, fever, and urinary discharge (Sikkim: Database). Fruit: Edible (Ilam: [94]; Jhapa: [92]). |
| 647 | Urechis caeruleus | Shrub | Solanaceae | | Fruit: Edible (KL Bhutan: [70]). |
Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No. | Scientific Name                   | Family                  | Common Names          |
|-----|----------------------------------|-------------------------|-----------------------|
| 647 | Solanum surattense Burm. f.      | Shrub Solanaceae        | Kalchudo (Np); rangani kate (S) |
| 648 | Solanum torvum Sw.              | Shrub Solanaceae        | Henje (S); Thulo bini (Np) |
| 649 | Melochia corchorifolia L.        | Herb Sterculiaceae      | Thuik (S)             |
| 650 | Pterospermum acerifolium (L)     | Tree Sterculiaceae      | Hattipala, Numbong (Np) |
| 651 | Punica granatum L.               | Tree Sterculiaceae      | Darim (Np)            |
| 652 | Symplocos lucida (Thunberg)      | Tree Symplocaceae       | Kharane (Np)          |
| 653 | Symplocos paniculata (Thunb.) Miq.| Shrub Symplocaceae   | Pangtsi (Dz)          |
| 654 | Symplocos sp.                    | Shrub Symplocaceae      |                       |
| 655 | Myricaria rasea W. W. Smith      | Shrub Tamaricaceae      | Angmeeo (Gr); Thrishing (Km); Chhusin-Ghumbu, Hunbu (Sh, Wi); Hunbu Chungwa (Tb) |
| 656 | Schima wallichii (DC.) Korth.    | Tree Theaceae           | Chilone (Np); Sakriphal (S) |
| 657 | Aquilaria malaccensis Lam.       | Tree Thymelaceae        | Aagurushing (Dz/Sh/T) |
| 658 | Daphne bholua Buch.-Hamex D.Don | Shrub Thymelaceae       | Tunguma (LI); Baruwa, Kagay Pate, Lokta, Seto Baruwa, Seto Lokta, Sikre (Np); Sugumendo, Da Mendok (Sh); Da Mendok (Wi) |
| 659 | Daphne papyracea Wall. ex Steud  | Shrub Thymelaceae       | Tunguma (LI); Aule Lokta, Dongma, Jhapi Lokta, Kangaye, Kalo Baruwa (Np); Khultum (RI) |
| 660 | Daphne sp.                       | Shrub Thymelaceae       |                       |
| 661 | Edgeworthia gardneri (Wall)      | Shrub Thymelaceae       | Nepalese paper bush (Eg); Argeli, Argaly (Np) |
| 662 | Trapa bispinosa Roxb.            | Herb Trapaceae          | Paniphalz (S); Paniphal singara (Np) |
| 663 | Trema orientalis (L). Blume      | Tree Ulmaceae           | Sitauandu (S); Khari (Np) |

| Roots: | Grounded with Alternanthera sessilis and given in urinary troubles (Jhapa: [66]). |
| Fruit: | Used as vegetables and pickle (Jhapa: [92]). Fried and eaten to cure cold and cough (Jhapa: [66]). Leaves: Smoked to treat toothache (Darjeeling: [74]). Young leaves: Eaten as vegetable (Jhapa: [66]). Flowers: Juice taken to treat peptic ulcer (Sikkim: [85]). Unripe fruit: Useful in vomiting, fever, heart diseases, sore throat, diarrhea and dysentery (Sikkim Database). Fruit/seeds: Used as medicine (KL Bhutan: [71]). Seeds: Powder applied against spider sting (Sikkim: [75]). In the past people used to extract oil from the seed (Sikkim: [89]). |
| Fruit: | Used as medicine (KL Bhutan: [71]); Edible (KL Bhutan: [70]). Seeds: Used to extract oil (KL Bhutan: [93]). Leaves: Use to extract dye (KL Bhutan: [70]). Whole plant: Used as medicine (KL Bhutan: [71]). Leaves and flowers: Used for incense (Taplejung: [87, 88]). Stem: Used to treat cough and cold (Taplejung: [87, 88]). Bark: Crushed with common salt and used as vermicide in cattle (Sikkim: [97]). Rubbed on caterpillar infected portion to remove hair (Sikkim: [11]). Pounded and given to cure fever and stomach pain, and also applied in bone fracture and sprain (Jhapa: [66]). Bark paste with the bark of Beldela retusa applied externally on deep cuts and wounds (Sikkim: [79]). |
| Stem: | Heartwood used as medicine (KL Bhutan: [71]) and incense (KL Bhutan: [70]). Roots and bark: Used in the manufacture of handmade paper (KL Nepal: [83]; KL Bhutan: [93]). Roots: Used for intestinal troubles (Sikkim: Database). Decoction given in food poisoning (Sikkim: [79]); Darjeeling: [91]; KL Nepal: [83]). Used as a substitute of Aconitum sp. (Sikkim: [79]). Bark: Decoction given to treat fever (Sikkim: Database). Juice used to treat intestinal worms and used as anti-leech agent; powder cause nasal irritation (Taplejung: [87]). Used to make handmade paper (KL Nepal: [83]; Sikkim: [11]). Leaves: Given to baby goat during diarrhea and fever; stalks used to make locally used mats (Sikkim: [11]). |
| Inner wood: | Used as incense (KL Bhutan: [70]). Bark: Used to make paper (KL Bhutan: [93]; KL Nepal: [83]; Sikkim: [72]; Database). Bark: Used as fish poison (Sikkim: Database). Fruit: Edible (Jhapa: [92]). Fruit: Edible (Jhapa: [92]). |
| No. | Species                                                                 | Type     | Family         | Common Names                          | Uses                                                                 |
|-----|-------------------------------------------------------------------------|----------|----------------|---------------------------------------|----------------------------------------------------------------------|
| 664 | *Dendrocside sinuate* (Blume) Chew                                      | Shrub    | Urticaceae     | Morange (Np)                          | Roots: Powder taken to stop vomiting and diarrhoea (Jhapa: [66]).     |
| 665 | *Elatostema lineolutum* Wight                                           | Shrub    | Urticaceae     | Dambroo (Bhu)                         | Young shoots: Used as vegetable (KL Bhutan: [70, 102]).               |
| 666 | *Elatostema platypylhim* Wedd.                                          | Shrub    | Urticaceae     | Gakleto (Li)                          | Shoots: Young shoots consumed as vegetable in gastritis (Sikkim: [79]).|
| 667 | *Girardinia diversifolia* (Link) Friis                                | Herb     | Urticaceae     | Himalayan Nettle (Eg); Mayu Sagi (Li);Kuju (Lp); Allo (Np); Ptale (Ri) | Roots: Juice taken in constipation (Ilam: [73, 76]). Young shoots: Eaten as green vegetable (Ilam: [84]; Taplejung: [87]; KL Nepal: [83]). Used as substitute for dal which is good for diabetes (Darjeeling: [86]). Leaves: Paste given in headache and joint pain (Ilam: [78]). Flowers: Taken to treat blood pressure (Sikkim: [75]). |
| 668 | *Girardinia palmata* (Forrsk.) Gaudich.                                | Shrub    | Urticaceae     | Zochha (Dz); Gomjazu (Sh);            | Bark: Used to make ropes (KL Bhutan: [100]).                          |
| 669 | *Girardinia sp.*                                                       | Herb     | Urticaceae     | Sissnu (Np); Sisoron (L)              | Leaves and flowers: Used in blood pressure complaints (Sikkim: [75]).|
| 670 | *Laportea terminalis* Wight                                            | Herb     | Urticaceae     | Sissnu (Np); Sisoron (L)              | Bark: Used to make ropes (KL Bhutan: [100]).                          |
| 671 | *Urtica dioica* L.                                                     | Herb     | Urticaceae     | Stinging Nettle (Eg); Polo (Gr, Tm);Sagi (Li); Sisnu (Np); Sajlim, Sokhima (Ri); Sadukpa (Wf) | Whole plant and roots: Useful in skin diseases, leprosy, ulcers, and cough. Roots: Used for incense and also in wounds, cough, cold, chronic fever, high blood pressure, and stomach diseases (Sikkim: [49]; Taplejung: [87]; KL Nepal: [83]). Infusion taken to treat stomachache and as laxative (Sikkim: [75, 85]). Decoction used in fever (Darjeeling: [49, 78]). Juice or decoction taken in dysentery and constipation (Ilam: [76]). Used as tonic, stimulant, antispasmodic, diuretic and anti-flatulent (Sikkim: [69]). Used as medicine (KL Bhutan: [71]) and incense (KL Bhutan: [70]). |
| 672 | *Nardostachys grandiflora* DC.                                          | Herb     | Valerianaceae   | Spikenard (Eng); Pangbon, Pangbo, Pangbewang (Li); Pangpoy (Dz/Si); Bhulte, Bhutle, Jatamasi (Np); Bhultya (Np-Di); Ngorochi (Ri); Jatamansi (Np); Pangboe (Wf) | Whole plant and roots: Useful in skin diseases, leprosy, ulcers, and cough. Roots: Used for incense and also in wounds, cough, cold, chronic fever, high blood pressure, and stomach diseases (Sikkim: [49]; Taplejung: [87]; KL Nepal: [83]). Infusion taken to treat stomachache and as laxative (Sikkim: [75, 85]). Decoction used in fever (Darjeeling: [49, 78]). Juice or decoction taken in dysentery and constipation (Ilam: [76]). Used as tonic, stimulant, antispasmodic, diuretic and anti-flatulent (Sikkim: [69]). Used as medicine (KL Bhutan: [71]) and incense (KL Bhutan: [70]). |
| 673 | *Valeriana hardwickii* Wall.                                            | Herb     | Valerianaceae   | Nakkali Jatamansi (Np)                | Roots: Given in hysteria, epilepsy, and neurosis (Sikkim: [75]). Used as carminative and stimulant (Sikkim: Database). Extract taken to cure urine trouble (Sikkim: [111]). |
| 674 | *Valeriana jatamansi* Jones                                            | Herb     | Valerianaceae   | Indian Valerian (Eng); Nappu (Gr-Mn);Sarnayo, Sugandhawal (Np); Bhutakesi (Sn); Jaboe (Wf) | Whole plant and roots: Useful in skin diseases, leprosy, ulcers, and cough. Roots: Used for incense and also in wounds, cough, cold, chronic fever, high blood pressure, and stomach diseases (Sikkim: [49]; Taplejung: [87]; KL Nepal: [83]). Infusion taken to treat stomachache and as laxative (Sikkim: [75, 85]). Decoction used in fever (Darjeeling: [49, 78]). Juice or decoction taken in dysentery and constipation (Ilam: [76]). Used as tonic, stimulant, antispasmodic, diuretic and anti-flatulent (Sikkim: [69]). Used as medicine (KL Bhutan: [71]) and incense (KL Bhutan: [70]). |
| 675 | *Callicarpa arborea* Roxb.                                              | Tree     | Verbenaceae     | Guahelo (Np)                          | Rhizome: Used in fever, cold (Taplejung: [82]), headache, eye complaints, sore throat, wounds, and indigestion (KL Nepal: [83]). Dried rhizome also used as incense (KL Nepal: [83]). Juice given in hysteria, epilepsy, cholera, cough, asthma, weakness and hairfall (Ilam: [76]). |
| 676 | *Callicarpa macrophylla* Vahl                                         | Shrub    | Verbenaceae     | Guenlo, Sumali (Np); Tichangsa (Che);Dahidhula (Dar); Dahigun (Tha) | Bark: Juice given to treat fever (Sikkim: Database). Roots: Chewed in cases of boils on the gums (Sikkim: Database). Fruit: Juice administered to cure fever (Sikkim: [79]). |
| 677 | *Gmelina arborea* Roxb.                                                | Tree     | Verbenaceae     | Kharami (Np); Kasnar (S)              | Bark: Used to treat pneumonia (Panchthar: [67]). Decoction drunk to cure bronchitis (Jhapa: [68]). Bark: Used in rheumatism and gonorrhoea (Sikkim: Database). |

*Note: The table continues with similar information for other species.*
| Species Name                                      | Type       | Family     | Common Names                      | Uses                                                                 |
|--------------------------------------------------|------------|------------|-----------------------------------|----------------------------------------------------------------------|
| *Lantana camara* L.                               | Shrub      | Verbenaceae|                                   | Leaves: Juice applied in cut to heal; crushed and tied over the sprain to relieve pain (Sikkim: [11, 79]). Roots: Decoction taken as laxative and carminative (Sikkim: [85]). Plant: Juice used to treat fever, ulcer, asthma, and cough (Ilam: [73]). Roots: Decoction taken as laxative and carminative (Sikkim: [85]). |
| *Premna serratifolia* L.                          | Shrub      | Verbenaceae| Gineri (Np), Sindware (S)          | 200-1400                                                                |
| *Vitex negundo* L.                                | Shrub      | Verbenaceae| Simali (Np), Sindware (S)          | 200-1400                                                                |
| *Viola biflora* L.                                | Herb       | Violaceae  | Ghattey Ghans (Np)                | 2100-4500                                                               |
| *Viola diffusa* Ging. ex DC.                      | Herb       | Violaceae  | Ghatey Ghans (Np)                 | 1400-2000                                                               |
| *Ampelocissus latifolia* (Roxb.) Planch.          | Climber    | Vitaceae   | Janila Lahara (Li)                | 200-1400                                                                |
| *Ampelocissus sikkimensis* (M. A. Lawson) Planch. | Climber    | Vitaceae   | Icewar (S)                        | 300-1600                                                                |
| *Alpinia allughas* (Retz.) Roscoe                 | Herb       | Zingiberaceae| Churampha (Np)              | 400-600                                                                 |
| *Amomum subulatum* Roxb.                          | Herb       | Zingiberaceae| Bada alaichi (Li)               | 500-2000                                                                |
| *Caulokaempferia sikkimensis* (King ex Baker) K. Larsen | Herb           | Zingiberaceae| Bhuin Champa (Li)             | 200-1400                                                                |
| *Curcuma angustifolia* Roxb.                      | Herb       | Zingiberaceae| Bakhe Saro (Np); Nauhaine- haldai (Me) | 100-1500                                                                |
| *Curcuma aromatica* Salisb.                       | Herb       | Zingiberaceae| Wild turmeric (Eg); Bandhale, Banhaledo, Kalohaledo (Np); Vanharida (Sn) | 700-1100                                                                |
### Table 1 NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No. | Plant Name | Family | Use | Location |
|-----|------------|--------|-----|----------|
| 693 | *Curcuma caesia* Roxb. | Zingiberaceae | Kalo haledo (Np) | 200-1500 | Rhizomes: Powder taken to treat leucoderma, piles, bronchitis, and asthma (Ilam: [73, 76]; Sikkim: [69]). Fresh rhizomes eaten raw to expel gas (Sikkim: [11]). Used as stomachic, diuretic, aromatic, stimulant, carminative and to cure sprains and bruises (Sikkim: [69]).
| 694 | *Curcuma longa* L. | Zingiberaceae | Hardi (Np); Juung (Sh); Yongka (Dz) | | Rhizomes: Used as medicine (KL Bhutan: [71]). Paste prepared from powder and applied on the fractured bones (Darjeeling: [52]).
| 695 | *Curcuma zeodaria* Rosc. | Zingiberaceae | Kalo Hardi (Np); Zalmathangru-tsalu (Sh) | | Rhizomes: Used as medicine (KL Bhutan: [71]). Eatern raw to cure diarrhea, colic and indigestion; paste applied to treat skin diseases (Sikkim: [11]). Decoction taken to get rid from fever (Darjeeling: [78]). Cut into small pieces and administered orally to treat stomach pain, loss of appetite and also used as antidote to food poisoning (Darjeeling: [52]).
| 696 | *Elettaria cardamomum* (L.) Maton | Zingiberaceae | | | Used as medicine (KL Bhutan: [71]).
| 697 | *Hedychium spicatum* Sm. | Zingiberaceae | Pankha Phool, Sara (Np) | | Rhizomes: Used as medicine (KL Bhutan: [71]). Taken to treat diarrhea, vomiting, and asthma (Sikkim: [69, 75]). Used in liver disorders and stomach ailments (Sikkim: [69]).
| 698 | *Kaempferia agalanga* L. | Zingiberaceae | Borangisaga (Sh) | | Rhizomes: Used as medicine (KL Bhutan: [71]).
| 699 | *Kaempferia rotunda* L. | Zingiberaceae | Vuinchampa (Np) | 1300-2000 | Rhizomes: Used as medicine (KL Bhutan: [71]). Paste prepared along with the roots of *Laportea terminalis* and aerial portion of *Viscum album* and applied on bone fracture and dislocated joints (Darjeeling: [52]). Root decoction used analgesic and sedative (Darjeeling: [74]).
| 700 | *Zingiber cassumunar* Roxb. | Zingiberaceae | Banada (Np) | | Rhizomes: Used as medicine (KL Bhutan: [71]). Juice used in gastric problems, tumors, ulcers, wounds (Ilam: [73, 76]) and swelling, and wounds (Ilam: [76]). *Tubers*: Used as bone settlers (Sikkim: [69], Database) and as poultice in fracture, healing fresh wounds, and removes coagulated bloods from the body (Darjeeling: [80]). Paste prepared along with the roots of *Laportea terminalis* and aerial portion of *Viscum album* and applied on bone fracture and dislocated joints (Darjeeling: [52]). Root decoction used analgesic and sedative (Darjeeling: [74]).
| 701 | *Zingiber officinale* Rosc. | Zingiberaceae | Aduwa (Np) | 100-1800 | Rhizomes: Used as medicine (KL Bhutan: [71]). Used as laxative, aphrodisiac, carminative, also useful in heart diseases, throat, and asthma (Sikkim: Database). Used as spice; juice and powder used to cure joint pain, headache, cough, and cold (Ilam: [73, 76]). Roasted rhizome chewed with salt during severe dry cough (Sikkim: [79]).

### Fungi

| No. | Plant Name | Family | Use |
|-----|------------|--------|-----|
| 1   | *Lycoperdon pyriforme* Schaeff. | Agaricaceae | Whole plant: Used as medicine (KL Bhutan: [71]). |
| 2   | *Ophiocordyceps sinensis* (Berk.) Sung et al. | Ophiocordycipitaceae | Rhizomes: Used as medicine (KL Bhutan: [71]). Taken to treat diarrhea, vomiting, and asthma (Sikkim: [69, 75]). Used in liver disorders and stomach ailments (Sikkim: [69]). Species has high commercial value (Bhutan: [99]; Sikkim: [98]). Known to treat health complaints like aging, cancer, diabetes, fatigue, heart diseases, lungs and liver ailments (Sikkim: [96]). Taken as aphrodisiac (KL Nepal: [53]). |

### Lichen

| No. | Plant Name | Family | Use |
|-----|------------|--------|-----|
| 1   | *Usnea logissima* Ach. | Usneaceae | Thallus: Useful in wounds, lung, liver, and fever from poisoning; also useful as incense (KL Nepal: [53]). |
| 2   | *Usnea sikkimensis* Biswas | Usneaceae | Thallus: Used to bandage surface of wound and skin eruptions; inserted into the nose to stop bleeding (Sikkim: [11]). |
| Algae                  | Herb (Algae) | Ulvaceae | NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued) |
|-----------------------|--------------|----------|------------------------------------------------------------------------------------------|
| 1 Ulva spp.           | Herb         | Ulvaceae | Whole plant: Edible (KL Bhutan: [70]).                                                   |
| **Pteridophytes**     |              |          |                                                                                           |
| 1 Adiantum capillus-veneris L. | Herb | Adiantaceae | Kane Uniu (Np)                                                                               |
| 2 Diplazium asperum Blume | Herb | Athyriaceae | Decoction taken as antipyretic (Darjeeling: [78]).                                         |
| 3 Diplazium esculentum (Retzius) Swart | Herb | Athyriaceae | Roots: Used to cure dysentery (Sikkim: [11]).                                              |
| 4 Diplazium laxifrons Rosenstock | Herb | Athyriaceae | Young fronds cooked and eaten as vegetable (Jhapa: [92]; Darjeeling: [78]; Bhutan: [102]). |
| 5 Diplazium maximum (D. Don) C. Christensen | Herb | Athyriaceae | Young fronds cooked and eaten as vegetable (Bhutan: [102]).                                |
| 6 Dryopteris fragrans (L.) Schott | Herb | Dryopteridaceae |                                                                                           |
| 7 Equisetum diffusum D. Don | Herb | Equisetaceae | Stem: Used as medicine (KL Bhutan: [71]).                                                  |
| 8 Equisetum ramosissimum subsp. debile (Roxb. ex Vaucher) Hauke | Herb | Equisetaceae | Plant: Paste applied on bone fracture, sprains, and in urinary troubles (Ilam: [73]).       |
| 9 Lycopodium clavatum L. | Herb | Lycopodiaceae | Whole plant: Edible (KL Bhutan: [70]).                                                     |
| 10 Nephrolepis cordifolia (L.) C. Presl | Herb | Nephrolepidaceae |                                                                                           |
| 11 Lepisorus thunbergianus (Kaulf.) Ching | Herb | Polypodiaceae |                                                                                           |
| 12 Drymaria cordata (Fraser-Jenk.) Fraser-Jenk. | Herb | Polypodiaceae |                                                                                           |
| 13 Aleuritopteris leptolepis (Fraser-Jenk) Fraser-Jenk. | Herb | Pteridaceae | Rhizomes: Juice with sugar drunk to cure stomach inflammation and sensation of internal heat of cattle; grounded with Oxalis corniculata and applied on bone fracture (Jhapa: [66]). |
| 14 Pteris biaurita L. | Herb | Pteridaceae | Root: Used to cure dysentery (Sikkim: [11], Database).                                    |
| 15 Pteris terminalis Wallich ex J. Agardh | Herb | Pteridaceae | Juice consumed to treat dysentery (Darjeeling: [74]).                                      |
| 16 Lygodium flexuosum (L.) Sw. | Herb | Schizaceae | Young fronds soaked in mustard oil and applied externally on affected areas to treat rheumatism and sprains (Darjeeling: [74]). |

**Table 1** NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)
Table 1  NTFPs used by the local people of the Kangchenjunga Landscape, Eastern Himalaya (Continued)

| No.  | Species                                      | Family       | Part Used                      | Uses                                                                 |
|------|----------------------------------------------|--------------|--------------------------------|----------------------------------------------------------------------|
| 17   | Sphagnum squarrosum                          | Herb         | Sphagnaceae                    | Plant: Used as fuel; hunters and graziers use whole moss for dressing wound (Sikkim: [11]). |
| 18   | Tectaria coadunata (J.Sm.)                   | Herb         | Tectariaceae                   | Plant: Boiled and taken as soup for a week to treat dysentery (Darjeeling: [74]). |
|      | C.Chr.                                        |              |                                |                                                                        |
|      | **Gympnosperms**                             |              |                                |                                                                        |
| 1    | Ephedra gerardiana Wall. ex Stapf             | Shrub        | Ephedraceae                    | Plant: Used as medicine (KL Bhutan: [71]); Raises blood pressure and used to relieve high fever (KL Nepal: [83]); Sikkim: Database) and asthma (Sikkim: Database). Juice used for liver fever, bleeding, and cuts (KL Nepal: [83]). Fruit: Used as digestive (KL Nepal: [83]). Ripe fruits taken to get relief from altitude sickness and indigestion (Sikkim: [79]). Stem: Powder inhaled to treat headache (Sikkim: [79]). |
| 2    | Cupressus spp.                                | Tree         | Cupressaceae                   | Whole plant: Used as incense (KL Bhutan: [70]). |
| 3    | Juniperus communis L.                         | Tree         | Cupressaceae                   | Fruits: Dried and chewed as a nut or decoction taken in fever (Darjeeling: [78]). |
| 4    | Juniperus indica Bertol.                      | Tree         | Cupressaceae                   | Leaves and fruits: Used in kidney disorders, skin and lymph disease, fever, cough, and cold, sores, wounds and paralysis of limbs (KL Nepal: [83]); Fruit: Powder put on the glowing red fire coal and the scent smelt to relief from headache and reduce blood pressure. Dried fruit powder mixed with tea or milk to treat cough, cold in high altitude (Sikkim: [79]). Leaves: Used as incense (KL Nepal: [83]). |
| 5    | Juniperus recurva Buch.-Ham. ex D.Don         | Shrub        | Cupressaceae                   | Aerial parts: Used as incense (KL Nepal: [83]); Leaves: Used as medicine (KL Bhutan: [71]). Used as incense (KL Bhutan: [70]). |
| 6    | Juniperus spp.                                | Shrub        | Cupressaceae                   | Leaves: Used as medicine (KL Bhutan: [71]) and incense (KL Bhutan: [70]). Juice taken orally to relieve from stomach pain and fever (Sikkim: [11]). Extract used in asthma, bronchitis, and stomach trouble (Sikkim: [79, 80, 89]). Extract given to cattle to treat fever and loss of appetite (Sikkim: [84]). |
| 7    | Abies densa Griff. ex Parker                  | Tree         | Pinaceae                       | Leaves: Used as incense (Taplejung: [81, 88]); Leaves and gum: Used as tonic and also useful in tuberculosis and internal hemorrhage (Sikkim: Database). Fruit: Boiled to obtain black ink (Taplejung: [87]). Oil applied externally to treat ringworm (Sikkim: [97]). |
| 8    | Abies spectabilis (D.Don) Mirb.              | Tree         | Pinaceae                       | Leaves: Used as medicine in rheumatism (KL Bhutan: [93]). |
| 9    | Cedrus deodara (Roxb. ex D. Don) G. Don       | Tree         | Pinaceae                       | Leaves: Extract used in hydrocele and also during bone fracture (KL Nepal: [53]); Resin: Used as medicine in rheumatism (KL Bhutan: [71, 93]). |
| 10   | Pinus roxburghii Sarg.                        | Tree         | Pinaceae                       | Bark: Used as medicine (KL Bhutan: [71]). Taken as herbal tea, especially to treat piles (Taplejung: [87]); KL Nepal: [104]) and in muscular pain and fever. Leaves: Extract used to cure asthma, bronchitis, and other respiratory diseases (KL Nepal: [83]; Ilam: [73, 76]); Leaves: Used as medicine (KL Bhutan: [71]). Antispasmodic, used in nervousness, hysteria and epilepsy (Darjeeling: [69]; Sikkim: [106]). Young shoots used in headache, giddiness, diarrhoea and liver disorders (Darjeeling: [69]; KL Nepal: [104]). Fruits: Eaten raw (KL Nepal: [83]; Ilam: [73]). |
| 11   | *Taxus wallichiana Zucc.*                     | Tree         | Taxaceae                       | Plant: Extract used in hydrocele and also during bone fracture (KL Nepal: [53]). Resin: Used as medicine in rheumatism (KL Bhutan: [71, 93]). |

Abbreviations: Bhu Bhutanese, OZ Dongkha, Eg English, Gr Gurung, Gr-Mn Gurung of Manang, Km Kham, Li Limbu, Lp Lepcha, M Meche, Np Nepali, Np-DlNepali in Dolpo, Np-Tp Nepali in Taplejung, Nw Newari, Ri Rai, S Satar, Sh Sherpa, Sh Sharchop-kha, Sn Sanskrit, Tb Tibetan, Tho Tharu, Wf Walung.

†Sikkim: Datadase = Medicinal Plant Database of Government of Sikkim: http://www.sikkimforest.gov.in/medicine_main.html

*National priority herbs of Government of Nepal
additional ailment categories. Chi-square ($\chi^2$) was used to test the null hypothesis that there is no difference in use of NTFPs under various use categories among the three countries in the Kangchenjunga Landscape.

Results and discussion

Pattern of publications

Majority of publications on NTFP were from India (60 %), while 34 % were from Nepal and 6 % from Bhutan. This is quite obvious as Darjeeling and the state of Sikkim in India make up a large part of the KL (56.3 %). The presence of two state level universities and research institutes has made significant contribution to the research in KL India [29]. Except for Bhutan, the species reported in this study were mostly documented through ethnobotanical studies conducted in different parts of the landscape. A few studies were focused on particular ethnic communities whereas most of the studies were on general ethnobotany of the region with mixed ethnic composition. Publication on NTFPs date back to 1988 in India while in Nepal and Bhutan it was started after 1996 (Fig. 2). However, majority of the publications (86 %) were published after 2000. All publications are qualitative in nature.

Frequency of NTFPs use

We reported on a total of 739 species of NTFPs used by the local people of Kangchenjunga Landscape. Of these, the highest number of NTFPs was documented from India (377 species), followed by Nepal (363) and Bhutan (245). These numbers, however, overlap in terms of distribution. The NTFPs used only in India were 185 species, while this number was 189 for Nepal and 166 for Bhutan.

Taxonomic diversity and growth habit

Angiosperms were predominant with 705 taxa belonging to 137 families followed by Gymnosperms (10), Pteridophytes (17), Fungi (3), Lichens (2), Bryophyte (1) and Algae (1). Families with the highest number of species used belong to Asteraceae (56 species), Fabaceae (41), Lamiaceae (27), Rubiaceae (24), Poaceae (23), Moraceae (16), Ranunculaceae (16), Rosaceae (15), Zingiberaceae (15), Polygonaceae (14), Ericaceae (13), Rutaceae (13), and Liliaceae (11). NTFPs were distributed into different life forms, with herbs having the most species followed by trees and shrubs (Fig. 3). Pattern of NTFPs used according to different life forms was similar in Bhutan, India and Nepal. Such herbaceous species were mostly medicinal and their extensive use could be because they were frequently found in the forest, and it is believed that the more abundant a plant is the more medicinal virtues it may possess [30].

Major use categories

People from Kangchenjunga Landscape used NTFPs for 24 different purposes (Table 2). A comparative analysis revealed that the highest number of use categories were reported from the Kangchenjunga Landscape region of India (20 categories) followed by Nepal (18) and Bhutan (14). Despite common occurrence of many species in India and Nepal, use pattern differed greatly in these two countries. Medicinal plants were among the main valuable NTFPs in the landscape. Of the total NTFPs, 334 species were used in traditional medicinal practice in India, whereas 297 species used in Nepal and 176 species used in Bhutan. A considerable number of species were also used as edibles as fruit, vegetables, and pickles in all three countries (Table 1 and Table 2). Fruit and shoots were the most frequently eaten parts.

The relatively higher number of diversity in wild edible NTFPs in Nepal could be because of higher diversity of ethnic groups living in the lowland Tarai to highland regions. There was a significant difference ($\chi^2 = 35.06$, df = 64, $\alpha = 0.05$ and $1-\alpha = 83.67$) in medicinal plants use pattern in major disease/ailment categories in India and Nepal. These results indicate differences between the traditions of NTFP use in different cultures of India and Nepal. Similar results were also obtained from East Timor [31]. NTFPs use varies from site to site because of the heterogeneity of the community and different traditional practices by ethnic groups [14].

Among 739 species used by the local people, most species were used for a single (550 species) purpose, while fewer were used for two (147) or multiple (42) purposes. Local people were well aware of collecting seasons, mode of collection, and frequency of collection of specific parts of plant species. Medicinal plants such as Heracleum nepalense is plucked on the first Tuesday after the Teej festival. This practice is known as ‘Harlo’. The people believe that the medicinal plants plucked on that day are extremely effective and potent [32]. Similar practice of harvesting season can be found among the Amchis of the Himalaya where they believe that for better medicinal efficacy, specific parts of specific medicinal plants should be collected during specific seasons [33].

Ailments treated and preparation methods

The use of medicinal plant in treatment of particular ailment and the preparation method were not specified from Bhutan. In India and Nepal, a total of 27 major ailments were reportedly treated with medicinal plants with most species being used to treat multiple ailments (Table 3). Gastro-intestinal disorders; fever; cold, cough and sore throat; musculoskeletal disorders; injuries; dermatological infections; respiratory system disorders; nutritional disorders; and poisoning effects were treated with the highest diversity of medicinal plant species (Table 1 and Table 3). The high diversity of species use in gastro-intestinal disorders
could be because of poor sanitation and drinking water quality in the Kangchenjunga Landscape as in many developing countries [34, 35].

Mode of preparation included juice, paste, decoction, powder, infusion, and chewing raw plant parts (Fig. 4, Table 1). The majority of formulations were prepared as juice followed by paste and decoction. Proper selection of species, parts, as well as preparation and administration methods were very important in traditional health care systems.

Almost all plant parts were used to prepare different medicinal formulations: roots, rhizomes, tubers, bark, leaves, flowers, fruit, seeds, young shoots, whole plants, and gum and latex (Table 1). The most frequently used plant parts were underground parts, followed by leaves, fruit, bark, whole plants, seeds and flowers (Fig. 5). Use of multiple plant parts was often documented (Table 1). The preference for roots and rhizomes to prepare traditional remedies follows the scientific basis that roots generally contain high concentrations of bioactive compounds [36]. Such a trend is also reported from other studies from the Himalaya [35, 37, 38].

**NTFPs trade and livelihoods potential**

The role of NTFPs is particularly important in the Himalayan region where a large proportion of the rural population depends on them as a source of medicine, food, fibre, dye and other useful materials [39–41]. In the Kangchenjunga Landscape, many of the NTFPs are used for subsistence, while others are the main or only source of income generation. However, the role of non-marketed NTFPs that were used for subsistence is largely ignored when estimates are made of the economic importance of NTFPs to rural populations [42]. Understanding the economic value of non-marketed NTFPs helps to determine the true income of the gatherers and also helps ascertain the true value of the standing forest, leading to more rational decisions about its alternative uses [42].

Domestic as well as cross-border trade of NTFPs, both legally and illegally, is a historical practice in this region [43]. The traded NTFPs mostly include medicinal plants and to a lesser extent some wild edible plants and fibre yielding plants. The handmade paper from Argeli (*Edgeworthia gardneri*) is the only NTFPs that was sold after value addition in Nepal. Many of the species documented in this study possess high economic potential (Table 4) and could thus supplement family income [44] while generating incentives for biodiversity conservation [45].

Commonly traded NTFPs from the Nepal part of the Kangchenjunga Landscape include medicinal plants such as *Dactylorhiza hatagirea*, *Fritillaria cirrhosa*, *Neopicrorhiza scrophulariiflora*, lichens, and *Taxus wallichiana*. Other important species under trade are *Aconitum* species, *Valeriana jatamansi*, *Viscum album* and *Zanthoxylum* species. Species such as *Daphne bholua*, *Edgeworthia gardneri*, *Rhododendron anthropogon*, *Rubia manjith*, *Swertia chirayita*, *Valeriana jatamansi*, and *Zanthoxylum* species are traded in large volume following legal procedures. The collected plant materials are normally sold to middlepersons (local traders), with only a few collectors selling or exporting NTFPs directly in local and cross-border markets. The total amount of NTFPs traded from Nepal in the last five years was 2,029,960 kg and the amount of revenue generated was around US$ 76,066 (Fig. 6, Table 4). The lack of openly accessible information on traded species of NTFPs from Bhutan and India limited our ability to conduct a comparative analysis.

Despite the high potential for trade and livelihoods through NTFPs, local people in the Kangchenjunga Landscape are not able to adequately benefit from engaging in the NTFP sector. In most cases, collectors were not aware of the market price for their products and

![Fig. 2 Pattern of publications on NTFP from the Kangchenjunga Landscape](image-url)
were compelled to sell based on the offers of the middlepersons [46]. Thus, ensuring that market information is available to local people is one of the challenges in the NTFP sector in the landscape. Moreover, traders reported several other issues including multiple taxation system, hurdles during transportation, and duration of transport permit.

As reported by Sundriyal and Sundriyal [47] from Sikkim within the Kangchenjunga Landscape, the sale of fruit provides minimum returns due to fairly low shelf life and market costs. Therefore, some value addition in the form of pickle, chutney, jam, jelly, etc. may increase fruit shelf-life and economic profit to local communities. This reflects a clear need to diversify the product base and to ensure that wild edible plants fetch higher prices [47]. There is also need for value addition for other NTFPs. Therefore, value addition at the local level is an essential part of NTFP trade. Untapped but potential species of NTFPs such as wild edible fruit and vegetables could be promoted in local markets. These could also be promoted for visitors in hotels and restaurants.

Another major problem in commercialization of NTFPs is the low volume in which they are collected and produced, in contrast to the large quantities that are required for the markets. This problem could be addressed by establishing cooperatives, and using these cooperatives for collective marketing which will ensure optimum benefits to collectors [48].

Threats and conservation challenges
Unsustainable harvesting of NTFPs, mostly medicinal and edible plants, is the major threat to conservation and management of NTFPs in the Kangchenjunga Landscape [47, 49]. Sustainable harvesting is essential for conservation of NTFPs, and in turn for ensuring the livelihoods of many rural peoples. Indeed, promotion of commercial extraction of NTFPs as a conservation strategy is based on the argument that forest conservation must be able to offer economic incentives to local peoples in order to counter the threat from destructive land uses such as logging and grazing. This strategy has gained wide acceptance as a conservation paradigm [2]. As indicated by Ticktin [2], despite growing concern over the conservation of these species, as well as their potential to enhance forest conservation and livelihoods, information on the ecological implications of harvest is not available in the Kangchenjunga Landscape.

Illegal trade of NTFPs from the landscape often includes some of the CITES Appendix listed species such as Sunakhari (Orchids), Kutki (Neopicrorhiza scrophulariiflora), and Lauth salla (Taxus wallichiana). The trade also includes some plant species under legal protection of the Government of Nepal like Orchids, Champ (Michelia champaca), Jhyau (Lichens), Jatamansi (Nardostachys grandiflora), and Sughandhawal (Valeriana jatamansi) [43]. These species are mostly traded to India via local collectors, whereas limited quantity of these items are exported to Tibet [50, 51]. Conserving such species is challenging, yet illegal trade has
Table 3 Major disease categories and number of taxa reported from Kangchenjunga Landscape

| Disease/ailment/condition category | Number of taxa* (India Nepal) |
|-----------------------------------|-------------------------------|
| Blood system disorders (purification, anaemia, etc.) | 9 (9) |
| Circulatory system disorders (heart problems, blood pressure, etc.) | 23 (9) |
| Cough, cold and sore throat | 84 (54) |
| Dermatological infections (boils, eczema, itch, leucoderma, leprosy, running sore, dropsy, irritated, small pox, chicken pox, skin problems, etc.) | 86 (63) |
| Diabetes | 19 (11) |
| Earache, ear irritation | 3 (5) |
| Fainting and fits | – (2) |
| Fever/malarian fever | 83 (64) |
| Gastro-intestinal disorders (bile disorder, cholera, colic, constipation, indigestion, diarrhoea, dysentery, dyspepsia, emetic, laxative, liver disorders, piles, purgative, stomach pain, ulcer, intestinal worms, vomiting, etc.) | 312 (219) |
| General health (alterative, antiperiodic, prophylactic, etc.) | 7 (5) |
| Gynaecological problems (menstrual disorders, pain, vaginal and uterine problems, etc.) | 8 (12) |
| Haemorrhages (internal bleeding, nasal haemorrhage, etc.) | 2 (2) |
| Hair care (prevent hair loss, scalp problems, lice) | 7 (8) |
| Headache | 18 (20) |
| Injuries (cuts and wounds, burns) | 65 (54) |
| Mental disorders (Hysteria, insomnia, seizures, nervousness, etc.) | 23 (10) |
| Musculoskeletal disorders (analgesic, arthritis, gouts, bone facture, rheumatism, body pain, joint pain, sprains, swellings, cramps, muscle relaxant, etc.) | 76 (84) |
| Nervous system disorders (paralysis, hypertenson, etc.) | 5 (4) |
| Nutritional disorders (weight loss, tonic, appetizers, etc.) | 42 (17) |
| Odontological problems (tooth ache, gum problems, decayed teeth) | 17 (15) |
| Ophthalmological disorders (eye wash, sore eyes, infection, etc.) | 13 (12) |
| Poisoning (insect bites, leech bites, rabies, snake bites, bee stings, food intoxication) | 25 (26) |
| Pregnancy, child birth, puerperium (labour induction, labour pain, after child birth, miscarriages, abortion, lactation stimulant, pregnancy prevention) | 8 (17) |
| Respiratory system disorders (asthma, bronchitis, plague, chest pain, expectorant, pneumonia, tuberculosis, altitude sickness, nasal irritation) | 65 (55) |
| Sexual health/dysfunction | 7 (8) |
| Urinary system disorders (hematuria, kidney, urination, diuretic etc.) | 26 (27) |
| Venereal diseases (gonorrhoea, spermatorrhoea etc.) | 7 (11) |

*Most taxa were reported to be used in more than one disease/ailment/condition category (see Table 1)
Biodiversity Act and Framework of Bhutan 2003, 2006 [57]. The Indian National Forest Policy (1988) makes a special mention of NTFPs emphasizing on protection, improvement and their enhanced production for generation of employment and income [58]. Likewise, in Nepal there are several sectoral as well as specific policy provisions for sustainable use and management of NTFPs [15, 55]. The most comprehensive policy is the Herbs and Non-Timber Forest Product Development Policy 2004 [59]. The recent Nepal National Biodiversity Strategy and Action Plan 2014 and Forest Policy 2015 also emphasize sustainable use and management of NTFPs and critically provide special opportunity to support livelihoods of marginalized propoor and women through wise use of NTFP. Nevertheless, present policy formulation, implementation and field reality reflects power structures and domination by certain stakeholders and interests [60].

Gender participation in policy formulation is also challenging. For example, 75 % of people collecting NTFPs in India were women and 100 % involved in NTFP processing were women, but their inclusion in Joint Forest Management committees was less than 10 % [61]. Similarly, in Nepal, although women contribute a large share of the labor for forest and biodiversity conservation in community forests, they represent only 22 % in the executive bodies of Community Forest User Groups [62]. Similar situation exists in Bhutan where the women’s involvement is generally low in the designing, planning, and implementation of forestry policies, and there is limited understanding of the roles, knowledge, aspirations and contributions made by women towards NTFP management [63].

Considerable efforts have been made to develop the NTFP sector, but the contribution of NTFPs in national economies remains insignificant. As pointed by Shackleton and Pandey [21], the reason behind this is that their economic value remains invisible to external observers as most NTFPs are used for household purposes; production and harvest of NTFPs is a seasonal event, with their use or trade involving only small quantities; much of the NTFP trade is via informal and closed markets which are hard to enumerate; production and markets is dispersed; and their use is highest in rural areas, which are often remote and marginalised in terms of human resources and development policies.

**Gaps on knowledge based conservation and management of NTFPs**

Like in other parts of the Himalayas, there is still a severe paucity of in-depth field based information on the abundance, reproductive biology and ecological impacts of harvesting of NTFPs in the Kangchenjunga Landscape. There is no standard method available to estimate the economic contribution of NTFPs and their products. Research on the inventory, life history of NTFPs, and...
The impact of harvesting on the ecosystem is a prerequisite for their sustainable management, yet very few such activities have been documented from the landscape [64]. Similarly, ecological impacts of NTFPs harvesting for domestic and commercial purposes must be estimated to ensure their sustainability and the implementation for effective conservation measures.

Market size, structure and value chain of NTFP species depend on the demand and supply characteristics of products and their beneficiaries in different areas. Understanding market information is important for value addition and in devising investment strategies [16] for NTFPs based products, their diversification, and related enterprises. At present, the majority of NTFPs from the Kangchenjunga Landscape are traded in the raw forms, and NTFP harvesters lack necessary support for market-based strategies from both private, as well as government sectors.

Indigenous knowledge and management systems have been recognized for contributing to sustainable use of NTFPs, and consequently they have secured legal rights to manage forest resources [55]. In the Kangchenjunga Landscape, indigenous knowledge on NTFP use is well documented, but indigenous management systems need to be assessed and used for sustainable management.

**Conclusion**

We documented NTFPs collected and used for various purposes by the local people of the Kangchenjunga Landscape. The diversity of NTFPs was highest in India, followed by Nepal and Bhutan. Though the landscape possesses many potential species for trade, their nominal contribution to local livelihoods was due to lack of value addition and commercialization. Unsustainable harvesting and lack of value addition and commercialization could be considered as major challenges for conservation and development of the NTFP sector in the landscape.

Tracing the trend of NTFP research and exploitation, it shows much focus on medicinal plants resulting in over-harvesting of some highly potential medicinal plants, with

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**Table 4** Major NTFPs traded (in kg) and revenue generated (USD) from 2008 to 2013 in the Nepal part of Kangchenjunga Landscape

| Species/products and parts | Traded quantity (kg) | Revenue (USD) |
|----------------------------|----------------------|---------------|
| Argeli (Edgeworthia gardneri)/Bark | 97,000 | 4109 |
| Ban lasun (Fritillaria cirrhosa)/Bulb | 1500 | 150 |
| Bish jara (Aconitum ferox)/Root | 4300 | 301 |
| Chiraito (Swertia chirayita)/Whole plant | 88,765 | 7445.97 |
| Chutro (Berberis wallichian)/Bark | 5000 | NA |
| Daruhaldi (Mahonia napaulensis)/Bark | 6500 | 130 |
| Dhupi pat (Juniperus indica)/Twig | 3800 | 76 |
| Khayar (Acacia catechu)/Heartwood | 97,784.6 | 38,456.88 |
| Lauth salla (Taxus wallichiana)/Twig | 290,500 | 9441.25 |
| Lichen (Unea sp., Parmelia sp.)/Whole plant | 11,000 | 1650 |
| Lokta (Daphne bholua)/Bark | 71,076 | 1940 |
| Majitho (Rubia manjith)/Whole plant | 78,800 | 2199.24 |
| Nagbeliko powder (Lycopodium clavatum)/Pollens | 8000 | 160 |
| Khoto (Pinus roxburghii)/Resin | 1,256,334 | 9799.40 |
| Ritha (Sapindus mukorossi)/Fruit | 1600 | 48 |
| Total | 2,021,959.6 | 75,906.74 |

Source: Compiled from Hamro Ban - a yearly publication of Department of Forests, Ministry of Forests and Soil Conservation, Government of Nepal
very negligible amount of other plant species reported for other purposes. At present, NTFPs are synonymous with medicinal and aromatic plants and vice versa. Only small amounts of other NTFPs are marketed. Therefore, research must also focus on other potential categories of NTFPs. NTFP collectors need to be educated about forest ecology and the adverse impacts of unsustainable harvesting for conservation and local livelihoods. Sustainable harvesting techniques should be provided through training and capacity building programs to local people. Biological studies of high value NTFPs must be carried out in order to ensure sustainability of these resources.

Phytochemical screening of medicinal plants and nutrient value analysis of wild edible plants would foster their commercialization. Traditional knowledge of medicinal plant use could be integrated with ‘modern’ health care systems [65]. Highly potential NTFPs must be identified and grown for commercial cultivation and adopted in traditional agroforestry systems. This will reduce pressure on these species in their natural environments while providing economic benefits to poor farmers [47].

Conservation and development organizations, together with government agencies and private sectors, must provide technical and innovative inputs to add value to NTFP products. They must also facilitate community mobilization for assessment and identification of potential NTFPs. The latter role will be of significant importance considering the limited human and financial resources of government agencies in the Kangchenjunga Landscape. An integrated approach will promote sustainable use of NTFPs while contributing to income generation and livelihood improvement for local people. Transboundary landscape conservation programs will provide opportunities for transboundary cooperation through policy reforms, as well as providing opportunities to diversify livelihoods of forest dependent communities. However, marketing and commercialization of NTFPs can be successful only if the activity is transparent, equitable and sustainable, with important implications for poverty reduction and better resource management [20]. Increasing access to NTFP-selling outlets could be achieved through information dissemination, empowerment of collectors and establishment of linkages between collectors and traders [41]. The role of small and medium sized enterprises and cooperatives is extremely important to achieve sustainable management of NTFPs.

Competing interests
The authors declare that they have no competing interests.

Authors’ contributions
YU, RCP, NC, and RPC designed the study. YU, RCP and NC carried out the literature search. YU, RCP, JG, NC and RPC analyzed the data and wrote the manuscript. All authors approved the final version of the manuscript.

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