

Ethnobotanical Knowledge of the Tharu Community Living in Tulsipur Sub-metropolitan City, Dang, Nepal

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Abstract

An ethnobotanical work was conducted in Tulsipur sub metropolitan city of Dang District, Rapti, Nepal. The main objective was to document the indigenous knowledge of the Tharu community in utilization of plant for various purposes. Ethnobotanical survey was made by direct field visit, herbarium collection and identification was done with the help of national and international literatures. The Tharus of Tulsipur Municipality were found to have diversified knowledge in utilization of plant resources in 8 different forms. From the study area, 114 species belonging 96 genera of 44 families that were utilized for various purposes were documented. Among the taxa, Poaceae and Leguminosae have more species (12 species each). Among the reported plant species, 55 species were food plant, 33 medicinal plant, 14 fodder plant, 11 used for cultural purposes, 11 for making utensil, 7 were wild vegetable plant, 7 were firewood plant and 7 were timber plant. From the research 18 plants were found to have multiple uses. The Tharus of the study area were found to have good knowledge on food plants followed by medicinal plants.

Keywords: Ethnobotany, Fodder plants, Food plants, Medicinal plants, Wild vegetable

Introduction

Nepal has a rich and varied flora due to its diversified topography and variable climatic conditions. The physical setup of the country comprises altitudinal gradient ranges from tropical region to alpine region. About 44.7% of the country's area is covered by forest (Government of Nepal [GoN], 2017). From the ancient period man lives closely associated with nature and are depended on it for their survival. Many living groups of people, having diversified ethnic history of rituals and performance, who are more of less isolated form modern world and are closely associated with their ambient vegetation is the emporia of ethno botanical research (Pal & Jain, 1998). The surrounding environment directly and indirectly influences the human life and culture.

The interaction between plant and people is as long as human being existence in this planet (Shah et al., 2015). Plants are the part of our environment. People uses plants around them for many proposes like; food, shelter, dyes, cosmetics, clothing, medicine etc. from their surrounding vegetation. They gathered the knowledge from the environment, use them and pass

them through generation to generation with or without written documents. But many have disappeared due to several reasons. Without proper documentation, these resourceful of information or knowledge may be disappeared for ever. So a recent branch of botany, ethnobotany arise which provide the proper documentation and preservation system of traditional plant use information, accumulated in a community through generation by generation in relation with their culture. Ethnobotany is a term used to encompass studies to describe local people's interaction with the natural surroundings (Eldeen et al., 2016). Ethnobotany is the scientific study of the relationships that exist between peoples and plants.

Mother tongue statistics of Nepalese people represent 100 different ethnic groups and more than 100 languages are spoken in Nepal, among which Tharu is one (Central Bureau of Statistics[CBS], 2011). Traditionally, ethnic groups are known to use large number of wild plants for various purposes like medicine, food, fodder, fuel, culture, etc (Mishra & Mishra, 2014).

Many people have done ethnobotanical works in

remote areas or in VDCs (Acharya & Acharya, 2009; Aryal, 2009; Acharya, 2012). Some work only deals with the medicinal plants only or wild plants only (Chapagain, (2004), Bhatt, (2012), Bajpai et al., (2016), etc.). So this work was carried out in order to know whether the Tharu people living in the developed places i.e. municipalities either have lost or retained their knowledge of utilizing both wild and cultivated plant for various purposes.

Materials and Methods

Study area

Tulsipur sub-metropolitan city was chosen as the study area. The rich floral diversity, the vast forest and large ethnic population provide the ideal condition for ethnobotanical study in this area. The study was conducted in ward number 6, 9,12,13,15 and 20 of Tulsipur municipality. It is situated between 28°08' N latitude and 82°00' E longitude with the total area of 384.63 sq. km. Its altitude ranges from 529 m asl

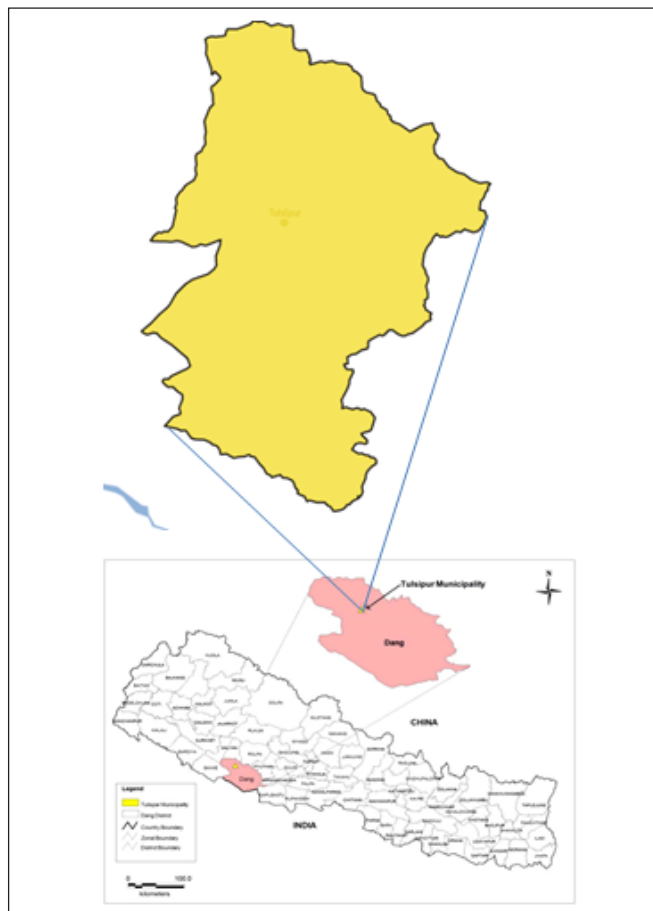


Figure 1: Map of the Study area

to 2050 m asl (Figure 1). It is a cosmopolitan and culturally diverse place. This place has majority of the Tharus ethnicity, Brahmins and Chhetris came from the Southern mountains where Nepali is the dominant language. Tulsipur contains a total population 141528 (CBS, 2011), where the Tharus people constitute more than 20% of the total population.

Data collection

A total of 12 weeks was spent for the field work in the study area. The area was visited frequently during the study period (2016-2018). 5 teachers, 3 herbalists, 25 farmers, 10 students, 12 social leaders, 7 traditional healers, 11 housewives were interviewed mainly concerning their knowledge on food, fodder, medicine from the plants and their parts, local names, with miscellaneous uses etc. Household survey was conducted on a random basis to obtain information on people's perception on conservation, use of plants, availability and method of use of plant parts, preference of plants for certain use etc. Structured and unstructured interview methods were used for the study. It was basically focused on the history, culture, tradition, socio-economic and present condition of the study. The secondary data was collected from different reports of ethnobotanical studies from central library of Tribhuvan University (TU), Kathmandu University and Department of Plant Resources, Government of Nepal. Similarly various books, journals published by native and foreign institutions, newspapers and documents from internet were consulted for relevant information.

The plant specimens those were collected and preserved were identified with the help of the references materials of National Herbarium (KATH), Tribhuvan University Central Herbarium (TUCH), Central Department of Botany, experts, taxonomists and other standard literatures like Hara et al. 1982, Press et al. 2000.

Results and Discussion

The Tharus of Tulsipur sub-metropolitan city are found to possess a very rich ethnobotanical

knowledge. They have been making use of a large number of plants species for various purposes such as medicine, fodder, firewood, timber, ceremonies, etc. A total 114 plant species representing 44 families with 96 genera have been reported to use among the Tharus of the study area. Both cultivated and non-cultivated plant species have been documented in the present study.

The Tharu community was found to use more herbs (39%) species followed by trees (35%), shrubs (17%) and vines (9%). This proportion was similar to other studies (Shrestha & Dhillion, 2003; Uprety et al., 2010; Singh et al., 2012). The higher uses for herbs may be due to easy availability and its multipurpose uses like food, fodder, medicine, wild vegetables, etc. (Figure 2)

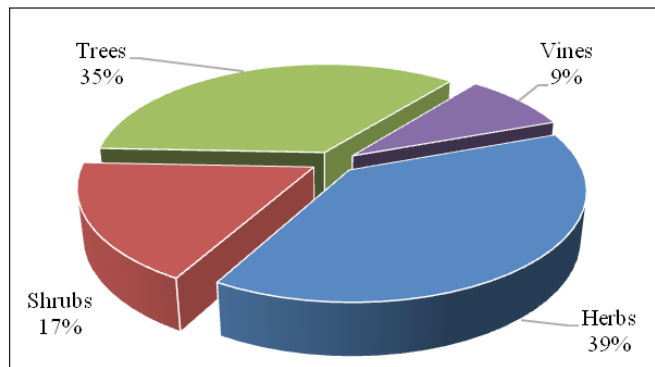


Figure 2: Used plants habit

In the study area, maximum number (55 species) of food plants was found to be used followed by medicinal plants (33 species) and fodder plants (14 species). The lower number of medicinal plants may be due to lack of faith on healers and wider use of modern medicine and inadequacy of plant availability (Mandar & Chaudhary, 1992). Less number of firewood plants and timber plants used may be due to restriction for firewood and timber collection in the forest. People also use gas and dung cake for cooking (Figure 3).

Fodder plants like *Bambusa sp.*, *Leucaena leucocephala*, *Oryza sativa*, *Zea mays*, firewood plants like *Lantana camara*, *Dalbergia sissoo* and food crops like *Raphanus raphanistrum* subsp. *sativus*, *Allium cepa*, *Brassica rapa* etc. are also used by the Tharus of Kapilvastu district, Nepal (Aryal, 2009).

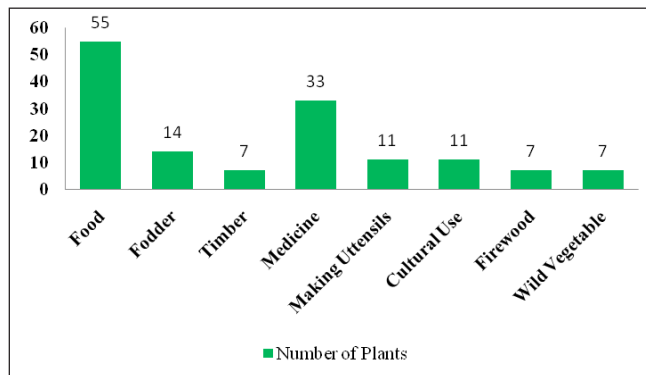


Figure 3: Application of plant and their number

Medicinal plants *Acorus calamus*, *Ageratum conyzoides*, *Artemisia vulgaris* and *Calotropis gigantea* are the common medicinal plants used by the Tharu people of Chitwan, Kapilvastu and Dang District (Dangol & Gurung, 1991; Aryal, 2009). *Achyranthes aspera*, *Musa paradisiaca* and *Plumbago zeylanica* are the common medicinal plants used by the Tharu people of India and Dang (Kumar & Bharati, 2014).

Maximum numbers of leaves were found to be used followed by fruit, stem, seed and roots. This is due to multiple uses of leaves (Figure 4). The different parts of plants such as leaves, flower, fruit, bark, latex, branch twig, rhizome, etc. were used as medicine and other purposes. The study showed that the people use different parts of the same plants for different purposes (food, fodder, firewood, timber, etc.) and for different ailments (Rokaya et al., 2012).

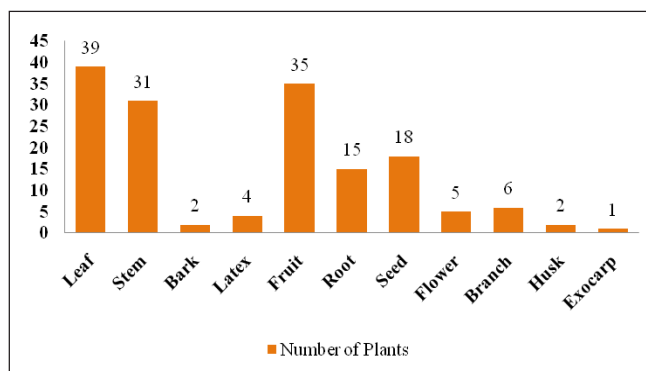


Figure 4: Plants parts used

Maximum numbers of food plants used were cultivated, while minimum numbers of plants used as medicine, making utensils, timber, firewood, fodder were wild (Figure 5). This situation of using

large number of uncultivated plants could in long term, lead to the depletion of resources or even extinction of the plant species if they are harvested in large amount.

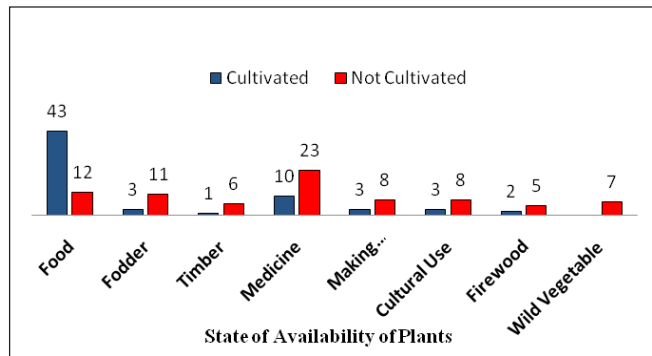


Figure 5: State of availability of used plants

Conclusion

The Tharus Community of Tulsipur sub metropolitan city was found to have very diversified knowledge in the utilization of the available plant resources. They were found to use 114 plant species belonging to 96 genera and 44 families. Various parts of the plants like leaves, root, branch, bark etc. were found to be used for various different purposes like food, fodder, timber, medicine, etc. Eighteen plants were also found to have multiple uses. We also believe that there may be other species of plants used for other purposes by the Tharu community.

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Table 1: Plants with their parts used and purpose of use

S.N.	Botanical Name	Vernacular Name	Family	Nature	Part Used	Used For
1	<i>Abelmoschus esculentus</i> (L.) Moench.	Ramtoria	Malvaceae	C	Fruit	Fo.
2	<i>Acacia catechu</i> (L.f.) Willd.	Khayar	Fabaceae	NC	Stem, Bark	Ut., Me.
3	<i>Achyranthes aspera</i> L.	Datiwon	Amaranthaceae	NC	Root	Me.
4	<i>Achyranthes bidentata</i> Blume	Apamagra	Amaranthaceae	NC	Twig of branch, Root	Me
5	<i>Acorus calamus</i> L.	Bojho	Araceae	C	Rhizome	Me.
6	<i>Adenium obesum</i> (Forssc) Roem. & Schult.	Malati	Apocynaceae	NC	Flower	Cu.
7	<i>Aegle marmelos</i> (L.) Correa	Bel	Rutaceae	NC	Leaf, Fruit, Branch	Me.,Cu.
8	<i>Ageratum conyzoides</i> L.	Raunne	Asteraceae	NC	Leaf, Shoot	Me., Fd.
9	<i>Allium cepa</i> L.	Pyaj	Alliaceae	C	Leaf, Tuber	Fo.
10	<i>Allium sativum</i> L.	Lasun	Alliaceae	C	Leaf,Tuber	Fo.
11	<i>Aloe vera</i> (L.) Burm.f.	Gheu kumara	Asphodelaceae	C	Latex	Me.
12	<i>Arisaema tortuosum</i> (Wall.) Scrott	Banko	Araceae	NC	Shoot	Wv.
13	<i>Artemisia vulgaris</i> Mattf.	Paati	Compositae	NC	Leaf	Me.
14	<i>Artocarpus heterophyllus</i> Lam.	Katahar	Moraceae	C	Fruit, Seed	Fo.
15	<i>Azadirachta indica</i> A. Juss.	Neem	Meliaceae	NC	Leaf	Me.
16	<i>Bahunia malabarica</i> Roxb.	Malu	Fabaceae	NC	Leaf, Bark	Ut.
17	<i>Bambusa malingensis</i> McClure	Bans	Poaceae	C	Young shoot,leaf, Matured shoot	Fo., Fd., Ut., Tm., Fw.
18	<i>Bauhinia tomentosa</i> L.	Emli	Fabaceae	NC	Fruit	Fo.
19	<i>Bauhinia veriegata</i> (L.) Benth.	Koiralo	Fabaceae	NC	Flower	Wv.
20	<i>Bombax ceiba</i> L.	Simal	Malvaceae	NC	Stem	Tm.
22	<i>Brassica juncea</i> (L.) Vassilii	RayoSaag	Brassicaceae	C	Leaf	Fo.
21	<i>Brassica rapa</i> L.	Tori	Brassicaceae	C	Leaf twig, Seed	Fo.
23	<i>Cajanus cajan</i> (L.) Millsp.	Rahar	Leguminosae	C	Grain	Fo.
24	<i>Calotropis gigantea</i> (L.) Dryand.	Aakh	Apocynaceae	NC	Latex	Me.
25	<i>Capsicum annum</i> L.	Khursani	Solanaceae	C	Fruit	Fo.
26	<i>Carica papaya</i> L.	Mewa	Caricaceae	C	Fruit	Fo.
27	<i>Carissa macrocarpa</i> (Eckl.) A.DC.	Karauti	Apocynaceae	NC	Fruit	Fo.
28	<i>Centella asiatica</i> (L.) Urb.	Ghortapre	Apiaceae	NC	Leaf	Me.
29	<i>Cheilanthes micropteris</i> Sw.	Kuthrukay	Pteridaceae	NC	Shoot	Wv.
98	<i>Choerospondias axillaris</i> (Roxb.) B.L.Burt & A.W.Hill	Amaro	Anacardiaceae	NC	Fruit	Fo.
30	<i>Cicer arietinum</i> L.	Chana	Leguminosae	C	Seed	Fo.
31	<i>Citrus aurantifolia</i> (Christ.) Swingle	Kagati	Rutaceae	C	Fruit	Fo.
32	<i>Citrus junos</i> Siebold ex Tanaka	Jyamir	Rutaceae	C	Fruit	Fo.
33	<i>Citrus limon</i> (L.) Osbeck	Nibuva	Rutaceae	C	Fruit	Fo.
34	<i>Clerodendrum infortunatum</i> L.	Tite	Lamiaceae	NC	Leaf	Fd.
35	<i>Colocasia esculentas</i> (L.) Schott	Pidalu	Araceae	C	Leaf, Tuber	Fo.
37	<i>Cucumis sativus</i> L.	Kakro	Cucurbitaceae	C	Fruit	Fo.
38	<i>Cucurbita pepo</i> L.	Pharsi	Cucurbitaceae	C	Leaf twig, Fruit	Fo.
39	<i>Cynodon dactylon</i> (L.) Pers.	Dubo	Poaceae	NC	Shoot	Fd.
40	<i>Dalbergia sissoo</i> DC.	Sisoo/ Sisau	Leguminosae	NC	Stem, Leaf, Branch	Tm., Me., Fw

S.N.	Botanical Name	Vernacular Name	Family	Nature	Part Used	Used For
42	<i>Datura metel</i> L.	Dhaturo	Solanaceae	NC	Seed	Me.
41	<i>Desmodium oojainense</i> (Roxb.) H. Ohashi	Sadan	Leguminosae	NC	Stem	Ut.
43	<i>Dioscorea alata</i> L.	Tarul	Dioscoreaceae	NC	Tuber	Fo.
44	<i>Diploknema butyracea</i> (Roxb.) H.J.Lam	Cheuri	Sapotaceae	NC	Fruit, Seed	Fo.
45	<i>Dolichos aciphyllus</i> R.Wilczek	Hiundesimi	Leguminosae	C	Fruit, Leaf	Fo., Me.
46	<i>Dryopteris cochleata</i> (D.Don.) C.Chr.	Neuro	Dryopteridaceae	NC	Shoot	Wv.
36	<i>Eichhornia crassipes</i> (Mart.) Solms	Jaluko	Pontederiaceae	NC	Leaf	Wv.
47	<i>Eucalyptus oblique</i> L'Her.	Masala	Myrtaceae	NC	Stem	Tm.
48	<i>Ficus benghalensis</i> L.	Bar	Moraceae	NC	Leaves, Latex	Cu., Me.
49	<i>Ficus lacor</i> Buch. (Ham.)	Kavro	Moraceae	NC	Flower	Fo.
50	<i>Ficus religiosa</i> L.	Pipal	Moraceae	NC	Leaf	Cu.
51	<i>Garuga pinnata</i> Roxb	Jingat	Burseraceae	NC	Leaf, Branch	Fd., Fw.
52	<i>Glycine max</i> (L.) Merr.	Bhatmas	Leguminosae	C	Grain	Fo.
53	<i>Hedychium densiflorum</i> Wall.	Besar	Zingiberaceae	C	Tuber	Fo., Me.
54	<i>Hordeum vulgare</i> L.	Jahu	Poaceae	C	Grain	Fo.
55	<i>Imperata cylindrical</i> (L.) Raeusch.	Siru	Poaceae	NC	Shoot	Ut.
56	<i>Ipomoea batatas</i> (L.) Lam.	Sakharkhand	Convolvulaceae	C	Root	Fo.
57	<i>Justicia adhatoda</i> L.	Asuro	Acanthaceae	NC	Leaves	Me.
58	<i>Lagenaria siceraria</i> (Molina.) Standl.	Lauka	Cucurbitaceae	C	Fruit	Fo., Ut.
59	<i>Lantana camara</i> L.	Banmara	Verbenaceae	NC	Shoot	Fw.
60	<i>Lawsonia intermis</i> L.	Mehendi	Lythraceae	NC	Leaves	Me.
61	<i>Lens culinaris</i> Medik.	Masuro	Leguminosae	C	Grain	Fo.
62	<i>Leucaena leucocephala</i> (Lam.) de Wit.	Ipil/ Epilepil	Leguminosae	C	Leaf, Branches, Stem	Fd., Fw., Tm
63	<i>Linum usitatissimum</i> L.	Arsi	Linaceae	C	Seed, Husk (Testa)	Fo., Me.
64	<i>Litsea monopetala</i> (Roxb.) Pers.	Kutmiro	Lauraceae	NC	leaf	Fd.
65	<i>Luffa cylindrical</i> (L.) M.Roem.	Ghiraula	Cucurbitaceae	C	Fruit	Fo.
66	<i>Mangifera indica</i> L.	Aap	Anacardiaceae	C	Fruit	Fo.
67	<i>Mentha spicata</i> L.	Pudina	Lamiaceae	C	Leaf	Me.
68	<i>Morus australis</i> Poir.	Kimbu	Moraceae	C	Fruit	Fo.
69	<i>Murraya koenigii</i> (L.) Spreng.	Ban Bakaino	Rutaceae	NC	Leaves	Fd.
70	<i>Musa paradisiaca</i> L.	Kera	Musaceae	C	Fruit, Root	Fo., Me.
71	<i>Nasturtium officinale</i> R.Br.	Simsag	Brassicaceae	NC	Shoot	Wv.
72	<i>Ocimum basilicum</i> L.	Babari	Lamiaceae	NC	Flowering twig	Cu.
73	<i>Ocimum tenuiflorum</i> L.	Tulsi	Lamiaceae	C	Leaf twig	Me.
74	<i>Opuntia monacantha</i> (Willd.) Haw.	Seuri	Cactaceae	NC	Latex	Me.
75	<i>Oryza sativa</i> L.	Dhan	Poaceae	C	Grain, Shoot, Husk	Fo., Fd., Fw., Ut., Cu.
76	<i>Pennisetum alopecuroides</i> (L.) Spreng.	Napear	Poaceae	NC	Shoot	Fd.
77	<i>Phoenix dactylifera</i> L.	Khajuri	Arecaceae	NC	Fruit	Fo.
78	<i>Phyllanthus emblica</i> L.	Amala	Phyllanthaceae	NC	Fruit	Fo.

S.N.	Botanical Name	Vernacular Name	Family	Nature	Part Used	Used For
79	<i>Pisum sativum</i> L.	Kerau	Leguminosae	C	Grain, Leaf twig	Fo.
80	<i>Plumbago zeylanica</i> L.	Cheet/ Chito	Plumbaginaceae	NC	Root	Me.
81	<i>Pogostemon cablin</i> (Blanco) Benth.	Rudelo	Lamiaceae	NC	Leaf twig	Me.
82	<i>Premna serratifolia</i> L.	Agnimantha	Lamiaceae	NC	Stem	Cu.
83	<i>Prunus persica</i> (L.) Batsch	Aaru	Rosaceae	C	Fruit	Fo.
84	<i>Psidium guajava</i> L.	Belauti/ Amba	Myrtaceae	C	Fruit	Fo.
85	<i>Punica granatum</i> L.	Anar	Lythraceae	C	Fruit	Fo.
86	<i>Pyrus bourgaeana</i> Decene.	Naspati/ Naaspaati	Rosaceae	C	Fruit	Fo.
87	<i>Raphanus raphanistrum</i> subsp. <i>sativus</i> (L.) Domin	Mula	Brassicaceae	C	Leaves, Root	Fo.
89	<i>Saccharum bengalense</i> Retz.	Bankash	Poaceae	NC	Shoot	Ut.
90	<i>Saccharum officinarum</i> L.	Ukhu	Poaceae	C	Shoot	Fo.
91	<i>Saccharum spontaneum</i> L.	Kans	Poaceae	NC	Shoot	Ut.
88	<i>Semecarpus anacardium</i> L.f.	Bhalayo	Anacardiaceae	NC	Fruit, Leaf	Fo., Cu.
92	<i>Shorea robusta</i> Gaertn.	Saal	Dipterocarpaceae	NC	Leaf, Stem	Ut., Cu., Tm.
93	<i>Sida rhombifolia</i> L.	Bishkhapro	Malvaceae	NC	Leaves	Me.
94	<i>Solanum lycopersicum</i> L.	Tamatar	Solanaceae	C	Fruit	Fo.
95	<i>Solanum melongena</i> L.	Bhyanta	Solanaceae	C	Fruit	Fo.
96	<i>Solanum subinerme</i> Jacq	B	Solanaceae	NC	Seed, Leaf	Me.
97	<i>Solanum tuberosum</i> L.	Aalu	Solanaceae	C	Tuber	Fo.
99	<i>Stephania hernandifolia</i> (Willd.) Walp.	Ghoryaful	Menispermaceae	NC	Leaf twig	Wv.
100	<i>Stylosanthes guianensis</i> (Aubl.)Sw.	Stailo	Leguminosae	C	Shoot	Fd.
101	<i>Syzygium cumini</i> (L.) Skeels	Jamun	Myrtaceae	NC	Fruit	Fo.
102	<i>Tectona grandis</i> L.f.	Treak	Lamiaceae	C	Stem	Tm.
103	<i>Terminalia alata</i> Heyne ex Roth	Saj	Anacardiaceae	NC	Branch	Fw.
104	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Barrho	Combretaceae	NC	Fruit	Me.
105	<i>Terminalia chebula</i> Retz.	Harro	Combretaceae	NC	Fruit	Me.
106	<i>Themeda triandra</i> Forssk.	Khar	Poaceae	NC	Shoot	Fd.
107	<i>Tinospora sinensis</i> (Lour.) Merr.	Gurjo	Menispermaceae	NC	Tuber	Me.
108	<i>Triticum aestivum</i> L.	Gahu	Poaceae	C	Grain	Fo.
109	<i>Vicia faba</i> L.	Bakula Simi	Leguminosae	C	Fruit	Fo.
110	<i>Vigna mungo</i> (L.) Hepper.	Mas	Leguminosae	C	Grain	Fo.
111	<i>Woodfordia fruticosa</i> (L.) Kurtz	Dhaira	Lythraceae	NC	Leaf, Flower	Fd., Me.
112	<i>Zea mays</i> L.	Makai	Poaceae	C	Grain, Shoot, Leaf, Exocarp, Bracts	Fo., Fd., Ut., Me., Cu.
113	<i>Zingiber officinale</i> Roscoe	Aduwa	Zingiberaceae	C	Rhizome	Me.
114	<i>Ziziphus jujuba</i> Mill.	Bayar	Rhamnaceae	NC	Fruit	Fo.

Note: Here, C= Cultivated, NC= Not cultivated, Fo.= Food, Fd.= Fodder, Me.= Medicinal Use, Fw.= Firewood, Tm.= Timber, Wv.= Wild vegetable, Ut.= Utensils making, Cu.= Cultural uses