FLORISTIC DIVERSITY AND TRADITIONAL USES OF PLANT RESOURCES OF KALI Gandaki Watershed, NEPAL

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Keywords: Useful plants, Ethnobotanical knowledge, Traditional uses, Kali Gandaki Watershed

ABSTRACT

Wild plants are widely used for domestic purposes to fulfill the basic needs in the villages of the Kali Gandaki Watershed, Nepal. In the present paper all together 156 plants belonging to 67 families with their traditional uses and practices are documented based on a field survey. Local people have remarkable detailed knowledge of species identity and characteristics and uses of plant resources. At present, these useful plants and their habitats are under serious threat due to anthropogenic pressure indicating the need of action for inventory, documentation and conservation of the species and their habitats in this area.
INTRODUCTION

Nepal’s position at the junction of the Indo-Malayan and Palaearctic biogeographic realms along with its diverse physiography and varying climatic zones have contributed to the occurrence of many species of useful plants on diverse habitats. These plant resources have been used to fulfill various basic needs by the rural people, such as food, firewood, timber, fodder, agricultural tools and raw drugs. The existing traditional knowledge and practices may lead to the establishment of plant-based rural industries that may lead to improvement of economic status of the local communities. However, at present, this vast store of information is being eroded as a result of human activities i.e. unsustainable land use practices and over-exploitation of natural resources etc. The loss of traditional knowledge within cultures undergoing rapid change is just as irreversible as the loss of species. Hence efforts should be made to document the various uses of plants before some of these plants are eliminated from the area. In this context, despite some works related to the documentation of useful medicinal plants of the Kali Gandaki watershed have already carried out (Joshi, 1997; Joshi and Joshi, 2000; 2007), the vast store of ethnobotanical information on the various uses of wild plants has not been comprehensively documented. In the present paper, an attempt has been made to enumerate the wild plants which are being used by local people of the villages and surrounding areas of the Kali Gandaki Watershed, Nepal.

METHODOLOGY

The study is carried out in Setiben, Harmichur, Mirmi, Bote Gau,(Adhi Muhan), Balam, Malunga, Jaipate, Beltari, Derpek, Ridi, Birgha villages and surrounding areas of the watershed of Kali Gandaki. The ecosystems of these areas are very complex with diverse physical, biological and social characteristics. The major characteristics are as follows:

1. The land forms of the areas are characterized by moderate to steep sloppy mountainous terrains.

2. The major rock types of the areas are dolomitic limestone and calcareous phyllite. There are also minor areas with quartzite, slate and chert.

3. The areas have temperate and subtropical climate with a hot and wet summer and a rather cool and comparatively dry winter. Monsoon rainfall during May to September accounts for about 80% of the annual rainfall. However, the climate is strongly affected by altitude, and as a consequence substantial differences occur over very short distances.

4. The major river of the watershed is Kali Gandaki originating from the Tibetan highland. The river bed is covered by a low level alluvium consisting of bouldery gravel, sand and silt.
5. The study areas are endowed with rich and varied ecosystems and vegetation. Land which is not cultivated consists of open grassland, wooded grassland and secondary forest. In places where the grass is not cut for fodder a densely woodland develops, and often takes the form of a secondary forest dominated by a few large and many small trees. The most dominant trees are *Acacia catechu, Bombax ceiba, Bauhinia variegata, Ficus semicordata, Litsea monopetala*.

6. The watershed area is inhabited by different ethnic tribes which are rich in folk-lore.

Several field trips in and around the study area were undertaken during the years 2005, 2007 and 2008 with a view to document the existing floral diversity and uses of plants and their resources with the indigenous practices. Ethnobotanical information was gathered using various techniques such as open and structured interview, and discussion with local informants, such teachers, experienced village elders, farmers, and workers and by direct observations on the way different plant materials were being collected and used (Joshi and Edington, 1990). The taxonomic identity of the plants was determined using available floras (Bista et al. 2002; DPR, 2001; Polunin and Stainton, 1984; Press et al, 2000) and was confirmed comparing collected voucher specimens with those of known identity in the National Herbarium and Botanical Laboratories, Department of Plant Resources, Godavari, Nepal. Voucher specimens are stored in the Department of Botany, Patan Campus. Tribhuvan University, Nepal and Environmental and Biodiversity Research Laboratory, SchEMS, Pokhara University, Nepal.

**RESULTS AND DISCUSSION**

**Vegetation and Floristic diversity**

Although the upper reaches of the Kali Gandaki watershed include alpine as well as sub-alpine vegetation types, the study areas contain subtropical vegetation type only and can be categorized into five major sections.

**Mixed Hardwood Forest**

The mixed hardwood forest is a very wide-spread forest type in the watershed. The major floristic components are *Acacia catechu, Adina cordifolia, Schima wallichii, Bombax ceiba, Terminalia becherica* with a rich moss and fern flora. *Shorea robusta* is sporadic in distribution in the forest. Herbs and grasses are relatively dense in comparison with other forest types. These forests are in degraded conditions due to heavy lopping and tree cutting for fuel wood.

**Mixed Hardwood and Pine Forest**

This type of forest is found on uphill slopes and ridges in the Kali Gandaki watershed. A few scattered *Pinus roxburghii, P. wallichinna* are found mixed with *Shorea robusta* in the upper elevation and *Acacia catechu, Adina cordifolia, Schima wallichii, Ficus semicordata, Litsea monopetala* in lower elevation. Most parts of the forest are disturbed by human activities.
Shorea forest

The sal forest occurs on steep slopes between 525 - 1000m in the watershed. Patches of pure stands of Shorea robusta are dominant in a few areas, mainly in Raniban, Manawa, Harmichur, Guthigaun. The major trees in the forests are Shorea robusta, Schima wallichi, Adina cordifolia and Ficus spp. trees. Common shrubs and herbs of forest edges are Woodfordia fruticosa, Artemisia indica, Colebrookia oppositifolia and Maesa macrophylla, Biden pilosa, Pennisetum sp. The sal trees are immature and intensively lopped for fodder.

Acacia forest

Regeneration of pole-size Acacia catechu are commonly found on the alluvial coarse materials in the flood plain or at the base of most low-gradient slopes of the watershed. Typically it is found along rivers. In some places, this forest is found mixed with Adina cordifolia, Bombax ceiba, Ficus spp and shrubs.

Scrub formation and Grassland

The forests cover which are degraded due to exploitation by the local population of villages represent the secondary formation of vegetation. This vegetation is common on the south and west facing slopes of the study areas. The dominant shrubs are Justica adhetoda, Woodfordia fruticosa, Colebrookia oppositifolia, Cassia tora, Zizyphus mauritiana. The grasslands and the wooded grasslands are dominated by the grasses Cymbopogon microtheca, Eulaliopsis binata, Hetropogon contortus and Chrysopogon gryllus. In the driest and most rocky places Eragrostiella bifaria, Pogonatherum crinitum and Eriophorum comosum are dominating. Livestock grazing, firewood collection and cutting of grass and fodder are quite common in these areas.

The overall composition of the floristic elements is greatly affected by changing topography and variable climatic condition. During the survey, 283 species belonging to 200 genera and 99 families were collected (Table 1).
Table 1. Analysis of Floral Elements

<table>
<thead>
<tr>
<th>Group</th>
<th>Family</th>
<th>Genus</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angiosperms</td>
<td></td>
<td></td>
<td>230</td>
</tr>
<tr>
<td>Dicot.</td>
<td>70</td>
<td>141</td>
<td>185</td>
</tr>
<tr>
<td>Monocot.</td>
<td>8</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>Gymnosperms</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Pteridophytes</td>
<td>6</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Bryophytes</td>
<td>4</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Fungi</td>
<td>4</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Algae</td>
<td>6</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>99</td>
<td>200</td>
<td>283</td>
</tr>
</tbody>
</table>

The human pressure on these vegetative resources are very heavy except on very steep, almost vertical and inaccessible rock faces near the river. However, the margins of the rivers: Kali Gandaki and Andhi Khola and upper parts of the watershed contain many interesting species.

Enumeration and Traditional Uses of Plants

During the field survey, ethnobotanical information of 156 species of plants belonging to 67 families have been collected from various habitats of the study area (Table 2). This total was made up in the following way: Pteridophytes 5, Gymnosperms 2 and Angiosperms (Dicotyledons 134, Monocotyledons 15). Among the Angiosperms, the family Gramineae was most frequently represented with a total of 12 species, followed by Compositae 8, Rosaceae 7, Moraceae 6, Polygonaceae 5, Fagaceae 5, Euphorbiaceae 5, Amaranthaceae 4, Euphorbiaceae 4, Leguminosae 4, Berberidaceae 4, Urticaceae 4, and others with less than 4 species. In Table 2, the collected species are arranged alphabetically with family, local names, habitats, parts used and uses. The analysis of the data indicate that 47 species were used as vegetables. 33 species as fruits, 41 species for fuel, 44 species for raw materials and timber, 64 species for fodder, 16 species as fish poison, 8 species as insecticides, 12 species for basket, mat, bags making, 12 species for religious purposes, 8 species as dyes etc.
Table 2. Traditional uses of plants in Kaligandaki watershed area

<table>
<thead>
<tr>
<th>Botanical name / Family</th>
<th>Local name</th>
<th>Habitat</th>
<th>Parts used and uses</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Acacia catechu</em> (L. f.) Willd.</td>
<td>Khayer</td>
<td>Forest, bank of river</td>
<td>Wood is used for fuel wood and raw materials for house frames, furniture; young leaves are used as fodder.</td>
</tr>
<tr>
<td><strong>Leguminosae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Achyranthes aspera</em> L.</td>
<td>Apamarg, Ulto Kuro</td>
<td>Shady places of forest, open meadow</td>
<td>Twigs are used as a toothbrush in the festival of Teej; ash of the burned plant is used for washing clothes.</td>
</tr>
<tr>
<td><strong>Amaranthaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Achyranthes bidentata</em> Blume</td>
<td>Datiwan, Rato apamarga</td>
<td>Roadside, open places</td>
<td>Stems are used for religious purpose; twigs are used as a toothbrush in the festival of Teej.</td>
</tr>
<tr>
<td><strong>Polygonaceae</strong></td>
<td>Thotne</td>
<td>Moist places of forest, open meadow</td>
<td>Tender shoots are used as vegetables and pickles.</td>
</tr>
<tr>
<td><em>Aconogonum molle</em> (D. Don.) Hara</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Adina cordifolia</em> (Willd. Ex Roxb.) Benth. &amp; Hook. f. ex Brandis</td>
<td>Karam, Haldu</td>
<td>Forest</td>
<td>Wood is used to make furniture and agricultural tools and for house buildings.</td>
</tr>
<tr>
<td><strong>Rubiaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Aegle marmelos</em> (L.) Correa</td>
<td>Bel</td>
<td>Forest</td>
<td>Leaves are used as fodder; aromatic pulp of the ripe fruit is eaten preparing a juice with water; leaves are offered to “Shiva” in religious functions.</td>
</tr>
<tr>
<td><strong>Sapotaceae</strong></td>
<td>Chiuri</td>
<td>Forest; scrub</td>
<td>Fruits are edible; vegetable butter extracted from the seed is used for lighting lamps.</td>
</tr>
<tr>
<td><strong>Agave cantula</strong> Roxb.</td>
<td>Ketuki</td>
<td>Wasteland, edges of agricultural lands, roadsides</td>
<td>Fiber extracted from leaves are used in making ropes and strings; plants are also planted on the roadsides in order to check erosion and landslides; squish leaf is spread in water to poison fish.</td>
</tr>
<tr>
<td><strong>Agavaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Allium wallichii</strong> Kunth.</td>
<td>Jimbu jhar, Ban lansun</td>
<td>Shady places, forest, open meadow, scrub</td>
<td>Tender leaves are used as vegetables; bulbs and dried leaves are also used as spices in curry, meat and pickles.</td>
</tr>
<tr>
<td><strong>Amaryllidaceae</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Alnus nepalensis</strong> D. Don</td>
<td>Uttis</td>
<td>Forest, scrub</td>
<td>Wood is used as firewood and timber for making furniture; leaves are lopped for fodder; plants are planted in eroded areas to check erosion; uses of twinges in mulching or in making green manure are common practices.</td>
</tr>
<tr>
<td><strong>Betulaceae</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Alternanthera sessilis</strong> (L) DC</td>
<td>Bhringi jhar, Jibre pate</td>
<td>Forest, edges of cultivated field</td>
<td>Tender parts are eaten as vegetables.</td>
</tr>
<tr>
<td><strong>Amaranthaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Amaranthus spinosus</strong> L.</td>
<td>Ban lunde, Luran latte</td>
<td>open and sunny places, waste ground</td>
<td>Tender shoots and leaves are consumed as vegetables.</td>
</tr>
<tr>
<td><strong>Amaranthaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anaphalis busua</strong> (Buch.-Ham. ex D. Don) DC</td>
<td>Buki phul, Seto ekle ghans</td>
<td>Open areas</td>
<td>Flower head is offered to god and goddess.</td>
</tr>
<tr>
<td><strong>Compositae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Apluda mutica</strong> L.</td>
<td>Dakle khar</td>
<td>Open places</td>
<td>Plants are used for fodder and for thatching roofs.</td>
</tr>
<tr>
<td><strong>Gramineae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td>Location</td>
<td>Growth Habit</td>
<td>Uses</td>
</tr>
<tr>
<td>------------------------------------</td>
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<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td><em>Andropogon munroi</em> C.B. Clarke</td>
<td>Dakle khar, Rocky places, open areas</td>
<td>Leaves are lopped for fodder; plants are used as hedge.</td>
<td></td>
</tr>
<tr>
<td>Gramineae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Artemisia indica</em> Willd</td>
<td>Titepati, Forest, scrub. Open meadow and agricultural land</td>
<td>Dried shoots are also used as incense during death rites; leaves have insecticidal properties and placed in the mouth of grain bags to protect entrance of moths, bugs and other pests; shoots are used for making compost.</td>
<td></td>
</tr>
<tr>
<td>Compositae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Arundinaria falcate</em> Nees</td>
<td>Nigalo, Roadside, edges of cultivated field, open waste land</td>
<td>Young shoots are eaten as vegetables while foliage as fodder; stems are used for making baskets and construction works i.e. poles, lining of roof of huts.</td>
<td></td>
</tr>
<tr>
<td>Gramineae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Asparagus filicinus</em> Buch.-Ham. ex D. Don</td>
<td>Kurilo, Shady places</td>
<td>Young shoot is cooked and taken as vegetable.</td>
<td></td>
</tr>
<tr>
<td>Liliaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Bauhinia variegata</em> L.</td>
<td>Koiralo, Forest</td>
<td>Wood is used for house construction and to make house implements; leaves are lopped for fodder; young flowers are cooked as vegetable.</td>
<td></td>
</tr>
<tr>
<td>Legumonosae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Benthamidia capitata</em> (Wall.) Hara</td>
<td>Dimmar, Forest</td>
<td>Ripe fruits are eaten and are also used for preserved.</td>
<td></td>
</tr>
<tr>
<td>Cornaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Berberis aristata</em> DC</td>
<td>Chutro, ban chutro, Open hills</td>
<td>Ripe fruits are taken raw; root and stem bark are a source of yellow dye; branches are useful for fields.</td>
<td></td>
</tr>
<tr>
<td>Berberidaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Berberis asiatica</em> Roxb. ex DC</td>
<td>Chutro, Forest, open meadow, trailside</td>
<td>Ripe fruits are eaten fresh; wood is used as firewood and for fencing; root and stem are a source of yellow dye.</td>
<td></td>
</tr>
<tr>
<td>Berberidaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientific Name</td>
<td>Common Name(s)</td>
<td>Location</td>
<td>Uses</td>
</tr>
<tr>
<td>----------------</td>
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<td>----------</td>
<td>------</td>
</tr>
<tr>
<td>Berberis chitria Lindl.</td>
<td>Chutro</td>
<td>Open meadow or scrub, open areas</td>
<td>Fruits are eaten when they ripe; wood is used as firewood and also for fencing; yellow dye from woody stem is used for dying.</td>
</tr>
<tr>
<td>Bidens pilosa L.</td>
<td>Kaalo kuro, Kurkure</td>
<td>Open waste land</td>
<td>Tender leaves are cooked as vegetables.</td>
</tr>
<tr>
<td>Blumea lacera (Burm. F.) DC</td>
<td>Kurkure</td>
<td>Open meadow and agricultural land</td>
<td>Plant is used to prepare ‘madcha’, a fermenting cake from which liquor is prepared</td>
</tr>
<tr>
<td>Boehmeria rugulosa Wedd.</td>
<td>Dar, githa</td>
<td>Open meadow</td>
<td>Wood is used as timber and raw materials for making good containers while leaves as fodder</td>
</tr>
<tr>
<td>Bombax ceiba L.</td>
<td>Simal</td>
<td>Forest</td>
<td>Wood is used for construction and as raw materials for furniture; stem is used as firewood; floss surrounding seeds is used for stuffing pillow, curtains.</td>
</tr>
<tr>
<td>Brassaiopsis hainla (Buch.-Ham ex D. Don) Seem</td>
<td>Hati paila, seto chuletro</td>
<td>Forest, waste land</td>
<td>Leaves are used as fodder</td>
</tr>
<tr>
<td>Buddleja asiatica Lour.</td>
<td>Bhimsen pati</td>
<td>Open sunny place,</td>
<td>Young shoots are offered to god and goddess during religious worships while leaves as fodder; leaves are used as fish poison.</td>
</tr>
<tr>
<td>Camellia kissi Wall.</td>
<td>Chiyapate, hinguwa</td>
<td>Forest, scrub Moist land</td>
<td>Young leaves are steamed, dried and used as a substitute for tea; flowers are boiled and pickled.</td>
</tr>
<tr>
<td><strong>Capsella bursa-pastoris</strong> (L.) Medik.</td>
<td>Tori ghans, Chamsure jhaar</td>
<td>Open meadow or scrub,</td>
<td>Tender parts are eaten as vegetable.</td>
</tr>
<tr>
<td><strong>Cruciferae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Castanopsis indica** (Roxb.) Miq. | Dhale katus | Forest and scrub | Leaves are used as fodder; wood is used for fuel and home frames, windows, shutters, furniture; cotyledons of the fruit are consumed as well as used to sell in markets |
| **Fagaceae** | | | |

| **Castanopsis tribuloides** (Sm) A. DC | Sano katus, Musure katus | Forest | Dried cotyledons of the fruit are eaten raw or roasted and used to sell in market; wood is used as firewood and for construction purposes i.e. home frames, windows, shutters; leaves are lopped for fodder. |
| **Fagaceae** | | | |

| **Centella asiatica (L) Urban** | Ghortapre | Moist places | Plant is cooked as vegetable; leaves are used as fodder. |
| **Umbelliferae** | | | |

| **Chenopodium album** L. | Bethe saag | cultivated fields, , wastelands | Tender shoots are cooked as vegetable. |
| **Chenopodiaceae** | | | |

| **Chrysopogon gryllus** (L.) Trin. | Patapate khar | Waste land, forest, cultivated areas | Plant is used as fodder |
| **Gramineae** | | | |

| **Cinnamomum tamala** (Buch.-Ham.) Nees & Eberm. | Dalchini, Tejpat | Forest | Bark and leaves are used as spices in curries, meats and vegetable and picked. |
| **Lauraceae** | | | |

<p>| <strong>Colobrookea oppositifolia</strong> Smith | Bhogate, Dhusure | Scrub, forest | Plant is lopped for fodder; dried branches are collected for fuel; inflorescence is sold in market for worshipping. |
| <strong>Labiatae</strong> | | | |</p>
<table>
<thead>
<tr>
<th><strong>Plant</strong></th>
<th><strong>Common Name</strong></th>
<th><strong>Habitat</strong></th>
<th><strong>Uses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Colquhounia coccinea</em> Wall.</td>
<td>Sano tusare</td>
<td>Rocky places</td>
<td>Leaves and flowers are used in incense.</td>
</tr>
<tr>
<td><strong>Labiatae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Commelina benghalensis</em> L.</td>
<td>Ban kane</td>
<td>Moist</td>
<td>Young leaves are eaten as vegetable.</td>
</tr>
<tr>
<td><strong>Commelinaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Coriaria nepalensis</em> Wall.</td>
<td>Machaaino Bhojinsi</td>
<td>Forest</td>
<td>Ripe fruits are eaten fresh; leaves are used to stupefy fish; branches are used for making baskets.</td>
</tr>
<tr>
<td><strong>Coriariaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Cynodon dactylon</em> (L.) Pers</td>
<td>Dubo</td>
<td>Forest, scrub, open meadow</td>
<td>Shoots are collected for fodder; leaves are used in rituals and religious purposes.</td>
</tr>
<tr>
<td><strong>Gramineae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Cyperus rotundus</em> L.</td>
<td>Kasur, Mothe</td>
<td>Moist places</td>
<td>Tubers are eaten fresh.</td>
</tr>
<tr>
<td><strong>Cyperaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Debregeasia longifolia</em> (Burm.f.) Wedd.</td>
<td>Tusare</td>
<td>Bank of stream</td>
<td>Wood is used for fuel; stem bark yields a strong fiber and used for making ropes.</td>
</tr>
<tr>
<td><strong>Urticaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Dendrocalamus hamiltonii</em> Nees ex Arn. ex Munro</td>
<td>Tama bans, Chya bans</td>
<td>Forest, waste land, edges of cultivated field</td>
<td>Foliage is used as fodder; young sprouts are used as food; culms are used as beams, poles and as raw materials for mats, baskets etc.; waste are utilized as firewood.</td>
</tr>
<tr>
<td><strong>Gramineae</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><em>Dendrocalamus strictus</em> (Roxb.) Nees</td>
<td>Taru bans, Lathi bans</td>
<td>Forest, edges of cultivated field</td>
<td>Foliage is used as fodder; culms are used as water pipes, beams, poles and as raw materials for mats, baskets etc., branches and waste culm materials used as firewood.</td>
</tr>
<tr>
<td><em>Datura stramonium</em> L.</td>
<td>Kalo dhaturo</td>
<td>Waste land, roadside</td>
<td>Leaves are used as green manure.</td>
</tr>
<tr>
<td>Species</td>
<td>Location</td>
<td>Habitat</td>
<td>Use</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>----------</td>
<td>---------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Diplazium stoliczkae</td>
<td>Kalo neuro</td>
<td>Forest, pathside</td>
<td>Tender shoots are eaten as delicious vegetable.</td>
</tr>
<tr>
<td>Bedd.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woodsiaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dioscorea bulbifera L.</td>
<td>Githa</td>
<td>Forest</td>
<td>Underground tubers are boiled and eaten.</td>
</tr>
<tr>
<td>Dioscoreaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dioscorea deltoidea Wall. Ex Griseb.</td>
<td>bhyakur</td>
<td>Moist open places</td>
<td>Tuberous roots are consumed as substitute of food after through boiling or cooking.</td>
</tr>
<tr>
<td>Dioscoreaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dryopteris cochleata (Ham. ex D. Don.) C. Christesen</td>
<td>Danthe nyuro</td>
<td>Moist places</td>
<td>Tender shoots and fronds are cooked as vegetable.</td>
</tr>
<tr>
<td>Dryopteridaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drymaria cordata (L.) Willd. ex Roem. &amp; Schult</td>
<td>Abhijaalo</td>
<td>Forest</td>
<td>Tender leaves and shoots are cooked as vegetable.</td>
</tr>
<tr>
<td>Caryophyllaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duranta repens L.</td>
<td>Nil kanda</td>
<td>Agricultural land, garden</td>
<td>Plants are grown as a hedgerow</td>
</tr>
<tr>
<td>Verbenaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edgeworthia gardneri (Wall.) Meisn.</td>
<td>Argeli</td>
<td>Forest, scrub</td>
<td>Bark and leaf are used as fish poison; bark is used to prepare Nepali handmade paper</td>
</tr>
<tr>
<td>Thymelaeaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elaeagnus infundibularis Momiy. Elaeagnaceae</td>
<td>Madilo</td>
<td>Forests</td>
<td>Ripe fruit are eaten fresh; branches are used as fuel.</td>
</tr>
<tr>
<td>Engelhardia spicata Lesch. ex Blume Juglandaceae</td>
<td>Mauwa</td>
<td>Forest, scrub, cultivated field</td>
<td>Leaves are valued as green manure; young leaves are used as fish poison</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Species</th>
<th>Location</th>
<th>Habitat</th>
<th>Uses and Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Eulaliopsis binata</em> (Retz.) C.E.Hubbard</td>
<td>Babiyo</td>
<td>Forest</td>
<td>Long needle like leaves are used in making ropes and strings</td>
</tr>
<tr>
<td>Gramineae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Euphorbia royleana</em> Boiss.</td>
<td>Siudi</td>
<td>Open dry places</td>
<td>Plant juice is applied to stupefy fish.</td>
</tr>
<tr>
<td>Euphorbiaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Eurya acuminata</em> DC</td>
<td>Jhingane</td>
<td>Open and dry places, forest</td>
<td>Leaves are lopped for fodder, while wood as fuel.</td>
</tr>
<tr>
<td>Theaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Eupatorium adenophorum</em> Spreng</td>
<td>Banmara</td>
<td>Shubby and open dry places, forest</td>
<td>Plants are used as green manure; young shoot is used as fodder.</td>
</tr>
<tr>
<td>Compositae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Ficus bengalensis</em> L.</td>
<td>Bar</td>
<td>Roadsides</td>
<td>Leaves are lopped as fodder; ripe receptacles are eaten by village children; plant is planted for a religious purposes; wood is used as poles and for making furniture.</td>
</tr>
<tr>
<td>Moraceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Ficus benjamina</em> L.</td>
<td>Sami</td>
<td>Forest</td>
<td>Leaves are used as fodder</td>
</tr>
<tr>
<td>Moraceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Ficus hispida</em> L. f.</td>
<td>Khasreto</td>
<td>Roadsides, bushes and thickets</td>
<td>Leaves are lopped for as fodder</td>
</tr>
<tr>
<td>Moraceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Ficus religiosa</em> L.</td>
<td>Pipal</td>
<td>Roadsides</td>
<td>Plant is held sacred by Hindu and Buddhist and worshiped; leaves are used as fodder.</td>
</tr>
<tr>
<td>Moraceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Ficus semicordata</em> Buch.- Ham. ex Sm.</td>
<td>Khanyu</td>
<td>Forest</td>
<td>Leaves are lopped for fodder; ripe figs are edible.</td>
</tr>
<tr>
<td><strong>Fimbristylis miliacea (L.) Vahl.</strong></td>
<td>Jwane jhar</td>
<td>Open places</td>
<td>Leaves are lopped for fodder.</td>
</tr>
<tr>
<td>-----------------------------------</td>
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</tr>
<tr>
<td><strong>Cyperaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Fragaria nubicola</em> Lindley ex Lacaita Rosaceae</td>
<td>Bhuin ainselu</td>
<td>Forest, open grassland</td>
<td>Fruits are eaten fresh.</td>
</tr>
<tr>
<td><strong>Rosaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Guizotia abyssinica</em> (L.f.) Cass. Compositae</td>
<td>Jhuse til</td>
<td>Open space</td>
<td>Seed oil is used in cooking.</td>
</tr>
<tr>
<td><strong>Compositae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Gaultheria fragrantissima</em> Wall. Ericaceae</td>
<td>Dhasingare</td>
<td>Forest, shady place,</td>
<td>Ripe fruits are eaten without seeds and also prepare local wine from them; leaves are lopped for fodder</td>
</tr>
<tr>
<td><strong>Ericaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Girardinia diversifolia</em> (Link) Friis Urticaceae</td>
<td>Allo</td>
<td>Wasteland and edges of cultivated field</td>
<td>Young tender leaves and inflorescence are cooked as vegetable; fibers are obtained from the stem bark and used to prepare coarse clothes, ropes etc.</td>
</tr>
<tr>
<td><strong>Urticaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Garuga pinnata</em> Roxb. Burseraceae</td>
<td>Dabdabe</td>
<td>Forest</td>
<td>Fruit is eaten fresh or pickled; Wood is utilized for home frames, poles, furniture, firewood, handle of axes and sticks; bark yields a fiber used for rope; leaves are lopped for fodder.</td>
</tr>
<tr>
<td><strong>Burseraceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Hedera nepalensis</em> K. Koch Araliaceae</td>
<td>Dudhilo</td>
<td>Moist</td>
<td>Plant is used as fodder.</td>
</tr>
<tr>
<td><strong>Araliaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Hibiscus sabdariffa</em> L. Malvaceae</td>
<td>Patuwaa</td>
<td>Open places</td>
<td>Young leaves are used as vegetables.</td>
</tr>
<tr>
<td><strong>Malvaceae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Houttuynia cordata</strong></td>
<td>Gande</td>
<td>Moist shady places</td>
<td>Tender parts are consumed as vegetable.</td>
</tr>
<tr>
<td>-----------------------</td>
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<td>----------------------------------------</td>
</tr>
<tr>
<td>Thunberg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saururaceae</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Holboellia latifolia** | Guphala | Shady places | Ripe fruits are eaten fresh. |
| Wall.                  |         |              |                              |
| Lardizabalaceae        |         |              |                              |

| **Hypericum cordifolium** | Mali phul | Open spaces | Flowers are offered during the religious functions. |
| Choisy                 |           |            |                                               |
| Hypericaceae           |           |            |                                               |

| **Imperata cylindrica** | Siru | Weed | Plants are used for thatching roofs and as also fodder. |
| (L) P. Beauv.          |      |      |                                                        |
| Gramineae              |      |      |                                                        |

| **Indigofera pulchella** | Raato mirmire | Open dry | Flowers are either pickled or eaten as vegetable. |
| Roxb.                  |               |         |                                               |
| Leguminosae            |               |         |                                               |

| **Inula cappa**        | Gaitihare | Forest, scrub | Shoots are used as fodder; Plant is used to make ‘marcha’, a fermenting cake for which liquor is distilled. |
| (Buch.-Ham. Ex D. Don.) DC |        |             |                                               |
| Compositae             |        |             |                                               |

| **Justicia adhatoda** | Asuro | Open | Leaves are mixed with manure to keep harmful insects away from the field; used for making compost. |
| L.                    |       |      |                                               |
| Acanthaceae           |       |      |                                               |

| **Kalanchoe spathulata** | Ajamaari jhar | Dry sandy places | Leaves have insecticidal properties and are used to keep away insects. |
| DC                    |               |               |                                                                       |
| Crassulaceae          |               |               |                                                                       |

<p>| <strong>Lagerstroemia parviflora</strong> | Bot dhaiyaaro | Forest | Wood is used for fuel, agricultural tools and construction while leaves as fodder. |
| Roxb.                   |               |       |                                                                       |
| Lythraceae             |               |       |                                                                       |</p>
<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Location</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Lindera pulcherrima</em> (Nees) Benth. ex Hook. f.</td>
<td>Phusuro</td>
<td>Forest</td>
<td>Ripe fruits are eaten without seeds; wood is utilized for fuel while leaves fodder.</td>
</tr>
<tr>
<td><em>Litsea monopetala</em> (Roxb.) Pers.</td>
<td>Kutmiro</td>
<td>Forest</td>
<td>Leaves are used as fodder; branches are used for fuel.</td>
</tr>
<tr>
<td><em>Lycopodium japonicum</em> Thunb. ex A. Murray</td>
<td>Nagbeli</td>
<td>Forest</td>
<td>Plants are used for decoration of gates during the function.</td>
</tr>
<tr>
<td><em>Lyonia ovalifolia</em> (Wall.) Drude</td>
<td>Angeri</td>
<td>Forest</td>
<td>Wood is used as fuel, timber and raw materials for carpentry, while leaves are used as fodder; leaves are also used as insect repellent; young leaves are used for fish poisoning.</td>
</tr>
<tr>
<td><em>Macaranga pustulata</em> King ex Hook. f.</td>
<td>Banare</td>
<td>Open areas</td>
<td>Leaves are used as plate for wrapping for foodstuffs; wood is used for fuel; leaves are lopped for fodder.</td>
</tr>
<tr>
<td><em>Maclura cochinchinensis</em> (Lour.) Corner</td>
<td>Amali, Damaru</td>
<td>Forest</td>
<td>Ripe fruits are eaten fresh.</td>
</tr>
<tr>
<td><em>Mangifera indica</em> L.</td>
<td>Aamp</td>
<td>Forests, Cultivated areas</td>
<td>Ripe fruit is eaten; wood is used as raw materials for construction.</td>
</tr>
<tr>
<td><em>Mahonia napaulensis</em> DC</td>
<td>Jamanemandro</td>
<td>Forest</td>
<td>Ripe fruits are eaten raw; bark yields a dye.</td>
</tr>
<tr>
<td><em>Melia azedarach</em> L.</td>
<td>Bakaino</td>
<td>Cultivated field, scrub, forest</td>
<td>Leaves are used as fodder; wood is used for fuelwood, and construction i.e. doors, frames, bed and to make the handles of agricultural tools;</td>
</tr>
</tbody>
</table>
Dried fruits, stem, bark and leaves are largely employed to protect woolen fabrics from insect attacks; fruits are used as fish poison.

<table>
<thead>
<tr>
<th>Species</th>
<th>Location</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Michelia kisopa</em> Buch.-Ham ex DC</td>
<td>Seto champ</td>
<td>Wood is used as timber and fuelwood while leaves as fodder.</td>
</tr>
<tr>
<td>Magnoliaceae</td>
<td>Forest</td>
<td></td>
</tr>
<tr>
<td><em>Maesa chisia</em> Buch-Ham ex D. Don</td>
<td>Bilaune</td>
<td>Plant is lopped for fodder; root and bark are used as fish poison; twigs are used as fuel; bark, root and leaves are used as insecticides.</td>
</tr>
<tr>
<td>Myrsinaceae</td>
<td>Shady places</td>
<td></td>
</tr>
<tr>
<td><em>Mimosa rubiculis</em> Lam.</td>
<td>Areri kanda</td>
<td>Plant is used as fodder.</td>
</tr>
<tr>
<td>Leguminosae</td>
<td>Forest, scrub, open place,</td>
<td></td>
</tr>
<tr>
<td><em>Myrica esculenta</em> Buch.-Ham ex D. Don</td>
<td>Kaphal</td>
<td>Ripe fruits are eaten as well as used to sell in markets; wood is used for fuel; leaves are lopped for fodder; bark decoction is used for stupefying fish.</td>
</tr>
<tr>
<td>Myricaceae</td>
<td>Forest, cultivated fields</td>
<td></td>
</tr>
<tr>
<td><em>Myrsine capitellata</em> Wall</td>
<td>Bakal pate</td>
<td>Leaves are gathered for fodder; ripe fruit is edible.</td>
</tr>
<tr>
<td>Myrsinaceae</td>
<td>Phalane kath</td>
<td></td>
</tr>
<tr>
<td><em>Myrsine semiserrata</em> Wall</td>
<td>Phalame</td>
<td>Wood and twigs are used as fuel and for construction; leaves are used as fodder.</td>
</tr>
<tr>
<td>Myrsinaceae</td>
<td>Forest, open hill</td>
<td></td>
</tr>
<tr>
<td><em>Nephrolepis cordifolia</em> (L.) K. Presl</td>
<td>Panisaro, Pani amala</td>
<td>Fleshy root tubers are eaten by village children.</td>
</tr>
<tr>
<td>Nephrolepidaceae</td>
<td>Shady places</td>
<td></td>
</tr>
<tr>
<td>Botanical Name</td>
<td>Scientific Name</td>
<td>Family</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td>Osyris wightiana</td>
<td><em>Osyris wightiana</em> Wall. Ex Wight</td>
<td>Santalaceae</td>
</tr>
<tr>
<td>Oxalis corniculata</td>
<td><em>Oxalis corniculata</em> L.</td>
<td>Oxalidaceae</td>
</tr>
<tr>
<td>Persicaria barbata</td>
<td><em>Persicaria barbata</em> (L) Hara</td>
<td>Polygonaceae</td>
</tr>
<tr>
<td>Persicaria hydropiper</td>
<td><em>Persicaria hydropiper</em> (L.) Spach.</td>
<td>Polygonaceae</td>
</tr>
<tr>
<td>Phyllanthus emblica</td>
<td><em>Phyllanthus emblica</em> L.</td>
<td>Euphorbiaceae</td>
</tr>
<tr>
<td>Pilea symmeria</td>
<td><em>Pilea symmeria</em> Wedd.</td>
<td>Urticaceae</td>
</tr>
<tr>
<td>Pinus wallichiana</td>
<td><em>Pinus wallichiana</em> A. B. Jackson</td>
<td>Pinaceae</td>
</tr>
<tr>
<td>Pinus roxburghii</td>
<td><em>Pinus roxburghii</em> Sarg.</td>
<td>Pinaceae</td>
</tr>
<tr>
<td>Plant Name</td>
<td>Common Name</td>
<td>Habitat Description</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><em>Plantago major</em> L.</td>
<td>Esapogol</td>
<td>Open moist place, roadside, road side, scrub, cultivated field, exposed areas,</td>
</tr>
<tr>
<td>Plantaginaceae</td>
<td></td>
<td>road side, forest</td>
</tr>
<tr>
<td><em>Phragmites karka</em> (Retz.) Trin. ex Steudel</td>
<td>Narkat</td>
<td>Roadside, cultivated field, exposed areas, forest</td>
</tr>
<tr>
<td>Gramineae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Polystichum squarrosum</em> (D. Don) Fee.</td>
<td>Phusre neuro, thulo neuro</td>
<td>Shady and exposed areas, forest</td>
</tr>
<tr>
<td>Dryopteridaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Premna barbata</em> Wall. Ex Schaur</td>
<td>Gineri</td>
<td>Forest, shady places</td>
</tr>
<tr>
<td>Verbenaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Prinsepia utilis</em> Royle</td>
<td>Dhatelo</td>
<td>Dry slopes, shady places, forest</td>
</tr>
<tr>
<td>Rosaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Prunus cerasoides</em> D. Don</td>
<td>Paiyun, ban paiyun</td>
<td>Forest, open places</td>
</tr>
<tr>
<td>Rosaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Prunus napaulensis</em> (Seringe) Steud.</td>
<td>Jungali aaru, aaru pate</td>
<td>Forest, scrub</td>
</tr>
<tr>
<td>Rosaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Psidium guajane</em> L.</td>
<td>Amba</td>
<td>Forest, cultivated field</td>
</tr>
<tr>
<td>Myrtaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Pyrus pashia</em> Buch.-Ham. Ex D. Don</td>
<td>Mayal</td>
<td>Open shady places, forest</td>
</tr>
<tr>
<td>Rosaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td>Location</td>
<td>Forest Type</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------------</td>
<td>-------------</td>
</tr>
<tr>
<td><em>Quercus glauca</em> Thunb. Fagaceae</td>
<td>Phalat</td>
<td>Forest</td>
</tr>
<tr>
<td><em>Quercus lanata</em> Sm. Fagaceae</td>
<td>Banjh</td>
<td>Forest</td>
</tr>
<tr>
<td><em>Quercus semicarpifolia</em> Sm. Fagaceae</td>
<td>Kharsu, Khasru</td>
<td>Forest, Wood is used as timber and fuel wood; stump is used for making charcoal; leaves are lopped for fodder</td>
</tr>
<tr>
<td><em>Rheum australe</em> D. Don. Polygonaceae</td>
<td>Chulthi amilo, Padamchal</td>
<td>Open slopes, forest</td>
</tr>
<tr>
<td><em>Rhododendron arboretum</em> Smith Ericaceae</td>
<td>Laligurans</td>
<td>Forest</td>
</tr>
<tr>
<td><em>Rhus javanica</em> L. Anacardaceae</td>
<td>Bhaki amilo, dudhe bhalayo, chuk amilo</td>
<td>Forest, open places</td>
</tr>
<tr>
<td><em>Ricinus communis</em> L. Euphorbiaceae</td>
<td>Ander, Andi</td>
<td>Wasteland</td>
</tr>
<tr>
<td><em>Rorippa nasturtium-aquaticum</em> (L) Hayek Cruciferae</td>
<td>Sim saag</td>
<td>Damp places, bank of river</td>
</tr>
<tr>
<td><strong>Species</strong></td>
<td><strong>Location</strong></td>
<td><strong>Habitat</strong></td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td><em>Rubia manjith</em> Roxb. Ex Fleming</td>
<td>Majitho</td>
<td>Forest</td>
</tr>
<tr>
<td><em>Rubus ellipticus</em> Smith</td>
<td>Ainselu</td>
<td>Open place</td>
</tr>
<tr>
<td><em>Rubus foliolosus</em> D. Don.</td>
<td>Kalo ainselu</td>
<td>Forest, open place</td>
</tr>
<tr>
<td><em>Rubus paniculatus</em> Smith</td>
<td>Kalo ainselu, Bhalu ainselu</td>
<td>Exposed shady place, forest, scrub</td>
</tr>
<tr>
<td><em>Rumex nepalensis</em> Spreng.</td>
<td>Halhale</td>
<td>Wasteland, roadsides, scrub</td>
</tr>
<tr>
<td><em>Salix babylonica</em> L.</td>
<td>Bains, Tissi</td>
<td>Riverside, forest</td>
</tr>
<tr>
<td><em>Sarcococca hookeriana</em> Baillon</td>
<td>Chilekath</td>
<td>Forest, scrub</td>
</tr>
<tr>
<td><em>Sambucus adnata</em> Wall. Ex DC.</td>
<td>Moti phul</td>
<td>Open places</td>
</tr>
<tr>
<td><em>Saurauia napaulensis</em> DC</td>
<td>Gogane</td>
<td>Open places</td>
</tr>
<tr>
<td><strong>Schima wallichii</strong> (DC.) Korth.</td>
<td>Chilaune</td>
<td>Forest, Open places</td>
</tr>
<tr>
<td>Theaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scurrula elata</strong> (Edgeworth) Danser</td>
<td>Ainjero</td>
<td>Forest</td>
</tr>
<tr>
<td>Loranthaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scutellaria repens</strong> Buch. – Ham. ex D. Don</td>
<td>Chaarpate</td>
<td>Open areas, rock crevices</td>
</tr>
<tr>
<td>Labiatae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Setaria pallidefusca</strong> (Schumach.) Stapf. &amp; C.E. Hubbard</td>
<td>Golphuki</td>
<td>Open rocky soil</td>
</tr>
<tr>
<td>Gramineae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shorea robusta</strong> Gaertn.</td>
<td>Sal, Agarth</td>
<td>Forest</td>
</tr>
<tr>
<td>Dipterocarpaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Smilax aspera</strong> L.</td>
<td>Syal daino</td>
<td>Forest, moist places</td>
</tr>
<tr>
<td>Liliaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Solanum nigrum</strong> L.</td>
<td>Jungali bihi, Kaalo bihi</td>
<td>open place, wasteland,</td>
</tr>
<tr>
<td>Solanaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sonchus oleraceus</strong> L.</td>
<td>Dudhe kandaa</td>
<td>Forest, moist places</td>
</tr>
<tr>
<td>Compositae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stellaria monosperma</strong> Buch.-Ham. ex D. Don</td>
<td>Jethmadhu</td>
<td>Moist shady places, forest</td>
</tr>
<tr>
<td>Carryophyllaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientific Name</td>
<td>Common Name</td>
<td>Location</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------</td>
<td>----------------</td>
</tr>
<tr>
<td><em>Symplocos sumuntia</em> Buch-Ham ex D. Don</td>
<td>Hakulal Forest</td>
<td>wood is used to make handles of tools and agricultural implements, and as timber, fuel; leaves are lopped for fodder.</td>
</tr>
<tr>
<td><em>Symplocos theifolia</em> D. Don</td>
<td>Ghole, Hakulal Forest</td>
<td>Branches are used as raw material to prepare household utensils and as fuel.</td>
</tr>
<tr>
<td><em>Syzygium cumini</em> (L) Skeels</td>
<td>Jamun Open places</td>
<td>Ripe fruits are eaten fresh and sold in market.; wood is utilized for furniture, handles of agricultural implements, tools, household utensils, fuel wood.</td>
</tr>
<tr>
<td><em>Talauma hodgsonii</em> Hook f. &amp; Thoms.</td>
<td>Bhalu kath Forest</td>
<td>Leaves are lopped for fodder; wood is used for handle of Khukuri (Nepalese knife) and as fuelwood.</td>
</tr>
<tr>
<td><em>Terminalia alata</em> Heyne ex Roth</td>
<td>Asnaa, Saaj Forest</td>
<td>Plants are used as fodder; wood is used as timber, fuelwood and for making charcoal.</td>
</tr>
<tr>
<td><em>Terminalia bellirica</em> (Gaertn,) Roxb.</td>
<td>Barro Forest</td>
<td>Kernels of the fruits are edible; bark used for dye; leaves are lopped for fodder; wood as fuel wood and timber for construction and agricultural implements.</td>
</tr>
<tr>
<td><em>Terminalia chebula</em> Retzius</td>
<td>Harro Forest</td>
<td>Kernels of the fruits are edible; wood is used for construction, agricultural implements, furniture, and other domestic purpose; leaves are lopped for fodder.</td>
</tr>
<tr>
<td><em>Thysanolaena maxima</em> (Roxb.) Kuntze</td>
<td>Amreso Forest, cultivated area, open rocky places</td>
<td>Inflorescence is used for brooms and sell in market.</td>
</tr>
<tr>
<td><strong>Trichilia connaroides</strong> (Wight &amp; Arn.) Bentvelzen</td>
<td>Aankha taruwa</td>
<td>Wood is used for fuel.</td>
</tr>
<tr>
<td>Meliaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Urena lobata</strong> L. Malvaceae</td>
<td>Nalu kuro</td>
<td>Weed Bark provides a good fiber for making ropes and twine</td>
</tr>
<tr>
<td><strong>Urtica dioica</strong> L. Urticaceae</td>
<td>Sisnu</td>
<td>Scrub, wasteland, roadside Young leafy parts are collected in the time of scarcity and are cooked as vegetable; stem fiber is used to make ropes</td>
</tr>
<tr>
<td><strong>Vitex negundo</strong> L. Verbenaceae</td>
<td>Simali</td>
<td>Forest Branches are used as toothbrushes, branches are made into brooms.</td>
</tr>
<tr>
<td><strong>Woodfordia fruticosa</strong> (L) Kurz Lythraceae</td>
<td>Dhaero, Amaphul</td>
<td>Forest, dry places Flowers have red dye which is used for dyeing the clothes; plants are used for fuel</td>
</tr>
<tr>
<td><strong>Zanthoxylum acanthopodium</strong> DC Rutaceae</td>
<td>Jangali Timur, Bhote timur,</td>
<td>Forest, rocky places Dried fruits with seeds are used for flavoring foodstuffs, fresh fruits are picked.</td>
</tr>
<tr>
<td><strong>Zanthoxylum armatum</strong> DC Rutaceae</td>
<td>Timur, Bhale Timur</td>
<td>Forest Fresh fruits are pickled and used as spices in vegetable and pickles; paste of the fruit is mixed with water and spread on vegetables as an insecticides; fresh bark is used as fish poison.</td>
</tr>
<tr>
<td><strong>Zizyphus mauritiana</strong> Lam. Rhamnaceae</td>
<td>Hadebayer</td>
<td>Scrub, dry land, open areas Fruits are eaten fresh and also dried for selling; wood is used to make handles of tools and agricultural implements, and as fuel; leaves are lopped for fodder.</td>
</tr>
</tbody>
</table>
Inventory and Documentation of the useful species with Indigenous knowledge and Practices

The ecosystems of the watershed are rich in biodiversity with various useful species due to its environmental characteristics of the Kali Gandaki watershed. Moreover, the people of the studied villages have also developed unique indigenous knowledge related to the uses of plant resources due to constant association with the forests and agricultural ecosystems. During the present study, it was also recorded that some plants are not only utilize to cure diseases, but also use for the fulfillment of domestic needs of the people. For example, juice of leaves is drunk twice a day for five consecutive days to treat bronchitis (Joshi and Joshi, 2000), whereas leaves of same species are mixed with manure to keep harmful insects away from the field. These existing valuable information are needed to be documented before lost or disappeared. As there is absent of the documentation system in this areas, priority should be given to develop a system to document the valuable ethnobotanical species, their habitats, uses, and knowledge and practices relating to the uses of plants. It is strongly recommended that major thrust should also be given to a chemical screening of the species.

Income generation, and People participation

Plant resources are the major sources of income in the watershed. The local people used to collect and sell non-wood forest products to the traders and in market. Though the exact data on trade of the parts of the useful plants is not available, the existing local information indicate that every year large amount of drugs, and other plant-based raw materials are exported from this watershed. The already exporting species and other potential useful species can be scientifically cultivated and managed in the studied areas. It is obvious that the success and sustainability of the management activities depend upon the involvement of the local people. Emphasis should be given to initiate a special program for raising people's awareness as well as or the domestication, conservation and sustainable management of species.

Resource depletion and conservation aspects

At present, various activities related to land use change are under implementation near the Mirmi village and in the bank of Kali Gandaki and Adhi Kholo rivers. Some of plants such as Berberis sp., Melia azederach, Terminalia bellirica, Terminalia chebula are already in the list of threatened species of Nepal (HMG/MFSC, 2002; Manandhar, 2002; Joshi and Joshi, 2005). When questioned about the changing status of plants of the kali gandaki watershed, the respondents listed some useful species such as Portulaca oleracea, Potentilla flugens, Zanthoxylum armatum, which had also declined in abundance during the last decade. Hence, efforts should be directed to investigate the status of the useful species and their habitats and to initiate the conservation of plants and habitats.
ACKNOWLEDGEMENTS

The author is thankful to the inhabitants of the study areas for their kind cooperation and help during the field survey. Thanks are due to Dr. John F. Edington, University of Wales, Cardiff, UK. and to Dr. S. K. Jain, Founder and Ex-Director, Institute of Ethnobiology, Lucknow, India for encouragement and Mr. D. P. Joshi, Ex- Senior Scientific Officer, National Herbarium and Botanical Laboratories, Department of Plant Resources, Godavari, Patan, Nepal for his help in identification of the species.

REFERENCES


