

Utilization and Status of Plant Resources in Northern Part of Pokhara valley, Central Nepal

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Abstract

Study on plants and plant products and their present status is helpful for proper management of those resources. Nepal is a multicultural and multilingual country. Present study on utilization of forest plant resources was carried out in Bhurjungkhola, Sardikhola VDC, northern part of Pokhara valley during October and November 2004. Altogether 116 plant species belonging to 61 families and 103 genera along with their vernacular names, their uses and present status of abundance were documented. Out of 116 plant species, 58 plant species are used as medicinal purposes, 2 as a food value, 22 as fruits, 20 as vegetables, 56 as fodder and forages, 19 as timber, 45 as fuelwood, 11 as religious and 5 species as ornamental. The status of 66 plant species are found in medium followed by 36 plant species with low status and 15 plant species with increasing number.

Key words: Forest resources, Medicinal plants, Pokhara, Sardikhola VDC.

Introduction

Nepal, a central Himalaya extends from 885 Km east to west along the Himalayan mountain system with a varying width from 145 Km to 241 Km. Within its narrow strip, it includes diverse physiographic structure and wide range of climatic conditions (Manandhar, 1999). As a result of the rugged and extremely diverse topographic structure, it contributed to the formation of isolated localities with unique flora and fauna (Chaudhary, 1998). Because of this Nepal is regarded as the showroom of biodiversity. Nepal falls in the 25th and 11th position in terms of species richness at the global and continental level respectively (MOPE, 2000). So far it is estimated that around 7000 species of flowering plants are present in Nepal, however, only 5,636 species have been reported (DPR 2001). Manandhar (2002) compiled informations on 1500 plant species and majority of them are medicinal.

Forest and people have been and still are intimately connected, socially as well as economically. Peoples' dependance on forest resource is of ancient. Fuelwood is one of major sources of energy accounting about 10% of total energy supply (FAO 2007) and with the ever higher prices of fuels, there will be even more pressure on forests. Not only that at least 80% of the world's population in the developing countries uses plant materials as their source of primary health care (Farnsworth *et al.*, 1985). The process of exploiting forest resources beyond the sustainable capacity has lead to a number of environmental problems such as loss of habitat and biodiversity. Nepal is not an exception. In Nepal, plant resources have contributed significantly to the social, economical, cultural and environmental development of particular area. Study of such resources has great importance that it brings to light numerous less known or unknown uses of plants, some of which have potential wider uses (Chaudhary, 1998). This paper provides the list of plant species, their uses and their current status in Sardikhola VDC -1, Bhurjungkhola.

Materials and Methods

Study site

Present study was carried out in Bhurjungkhola of Sardikhola VDC-1 is situated in the northern side of Pokhara valley just 15 Km away. It lies between 28^o20'N latitude and 83^o58'E longitude. The study area is dominated by Brahmins followed by Kami, Gurung, Damai, Sarki etc. The study area ranges between 990 to 1200 m a.s.l. The people depend upon the forest resources, which is *Schima-Castanopsis* forest and lies in North facing slope.

Methodology

Present study was conducted in October and November 2004. Information on uses of plant species and their current status were gathered by participatory methods such as Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA), focus group discussion and key informant interviews. The

documented information was further verified by group discussions and going through the relevant literatures (Joshi and Joshi, 2001 and Manandhar 2002). The voucher specimens were identified with the help of standard literatures (Stainton, 1997; Polunin & Stainton, 2000; Press *et al.*, 2000) and cross-checking with the specimens of Tribhuvan University Central Department of Botany Herbarium (TUCH). The specimens are deposited at TUCH.

Results and Discussion

Plants used as medicines

Forests of the study area provide a number of medicinal plant resources used for combating different health problems of human and livestock (Appendix 1). Out of 116 plant species, 58 plant species are used for medicinal purposes. Plants as a whole or its parts in the form of juice, decoction, ash or infusion are prescribed.

Plants used as food, Fruits and vegetables

Underground parts of *Dioscorea sagittata* and *Colocasia antiquorum* are used as food value during scarcity. Edible wild fruits are obtained from 22 different plant species (Appendix 1). Fruits of *Rubus ellipticus* and *Citrus medica* are sold in the markets of Pokhara valley. Whole plants or different parts of 20 plant species are used as vegetables (Appendix 1). Young shoots of *Asparagus racemosus*, *Dryopteris colcheata* and *Thamnocalamus spathiflorus* (Tusa) are collected and sold in Pokhara valley in high amount.

Plants used as fodder and forages

Altogether 56 plant species are used as fodder and forages. Seasonal grazing is allowed in the forest. After the inclusion of some part of the forest in community forest, only the remaining part of the forest is allowed for grazing.

Plants used for farming and manure

Leaves of *Artimesia indica*, *Eupatorium adenophorum* are used to prepare green manure. Dried leaves of *Schima wallichii* are collected to prepare compost as well as to provide bedding to animals during winter season.

Plants used for Timber and fuelwood

Altogether 19 plants are used for timber. Among them mostly used are *Castanopsis indica*, *Schima wallichii*, *Engelhardia spicata*. 45 plant species are used as fuel wood (Appendix 1).

Religious plants

Altogether 11 plants are used as religious. *Cynodon dactylon* is used in worshipping god 'Ganesh' and during 'Bhaitika'. Stems of *Archyranthes aspera* are used by women in 'Teej' (Rishi Panchami). *Desmostachya bipinnata* leaves are compulsory in Hindu culture i.e. during annual funeral ceremony called 'Sharad' and different 'Pujas'. Plants of *Ficus bengalensis* and *F. religiosa* are worshiped by women on Monday and Saturday. Leaves of *Castanopsis indica* and *Atrocarpus lakoocha* are used to prepare 'Duna' and 'Taparies' which are used as plates during 'Pujas'.

Plants used for pickles

Fruits of *Rhus javanica*, young stems of *Begonia picta*, young leaves of *Crateva unilocularis*, young bud and flower of *Bauhinia purpurea* are used to prepare pickles.

Current Status of Plants

According to the local people, out of 116 forest plant species, 65 plant species are in their medium state followed by 36 plant species that are decreasing in their population and 15 plant species with high population. (Appendix 1).

Conclusion

The villagers use different forest plant species in their daily life. Documentation of such informations is useful for further generations and well as for their daily lives. Detailed study upon the ethnobotanical studies is necessary to document the traditional knowledge that is at the state of disappearance.

Acknowledgment

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Appendix 1 List of Forest Plant species with their different uses in Sardikhola VDC.

S.N.	FAMILY/SPECIES	LOCAL NAME	1	2	3	4	5	6	7	8	9	10	Current Status
1	ACANTHACEAE <i>Justicia adhatoda</i> L.	Aasuro	+	-	-	-	-	-	-	+	-	Green Manure	Medium
2	AMARANTHACEAE <i>Acyranthes aspera</i> L.	Dattiwan	+	-	-	-	-	-	-	+	-		Medium
3	AMARANTHACEAE <i>Celosia argentea</i> L.	Sahasrabuti	+	-	-	-	-	-	-	-	-		Medium
4	ANACARDIACEAE <i>Rhus javanica</i> L.	Bhakamlo	-	-	+	-	-	-	+	-	-	Pickles	Low
5	ANACARDIACEAE <i>Spondias pinnata</i> (L.f.) Kurz	Amaro (M & F)	-	-	+	-	+	-	-	-	-		Low
6	APOCYNACEAE <i>Alstonia</i> sp.	Chhatiwan	+	-	-	-	-	+	+	-	-		Low
7	APOCYNACEAE <i>Holarrhena pubescens</i> (Buch.-Ham) Wall.ex G.Don	Madhise khirro	+	-	-	-	+	-	+	-	-		Medium
8	ARACEAE <i>Acorus calamus</i> L.	Bojo	+	-	-	-	-	-	-	-	-		Low
9	ARACEAE <i>Colocasia antiquorum</i> (L.) Schott	Karkalo	-	+	-	+	-	-	-	-	-		Medium
10	ASPIDIACEAE <i>Dryopteris cochleata</i> (D. Don) C. Chr	Pani Niuro	-	-	-	+	+	-	-	-	-		Low
11	ASPIDIACEAE <i>Tectaria macrodonta</i> (Fee.) C.Chr.	Kalo Niuro	+	-	-	+	+	-	-	-	-		Medium
12	BEGONIACEAE <i>Begonia picta</i> Smith	Makarkachi	-	-	-	-	-	-	-	-	-	Pickles	Low
13	BEGONIACEAE <i>Oroxylum indicum</i> (L.) Kurz	Tatahalo	+	-	-	+	-	-	-	+	-		Low
14	BERBERIDACEAE <i>Berberis aristata</i> DC.	Chutro	+	-	+	-	-	-	-	-	-		Low
15	BIGNONIACEAE <i>Stereospermum personatum</i> (Hassk.) Chatterjee	Padari	+	-	-	-	+	-	+	-	-		Low
16	BOMBACACEAE <i>Bombax ceiba</i> L.	Simal	+	-	-	-	+	-	+	-	-		Low
17	BORMELIACEAE <i>Ananas comosus</i> (L.) Merr.	Bhuikatar	+	-	+	-	-	-	-	-	-		Low
18	CAPPARACEAE <i>Crateva unilocularis</i> Buch.-Ham.	Siplikan	-	-	-	+	-	-	-	-	-	Pickles & Fertilizer	Medium
19	CARYOPHYLLACEAE <i>Drymaria diandra</i> Blume	Aavijalo	+	-	-	+	-	-	-	-	-		High
20	COMBRETACEAE <i>Terminalia alata</i> Heyne ex Roth	Saj	-	-	-	-	+	+	+	-	-		Medium

21	COMBRETACEAE <i>Terminalia bellirica</i> (Gaertn.) Rosb.	Barro	+	-	-	-	+	+	+	-	-	Medium
22	COMBRETACEAE <i>Terminalia</i> sp.	Kahulo	-	-	-	-	+	-	+	-	-	Medium
23	COMMELINACEAE <i>Floscopa scandens</i> Lour.	Kane	-	-	-	+	-	-	-	-	-	Medium
24	COMPOSITAE <i>Artemisia dubia</i> Wall ex Besser	Titepati	+	-	-	-	-	-	-	-	-	Green Manure High
25	COMPOSITAE <i>Bidens biternata</i> (Lour.) Merr. & Sherff.	Kurro	-	-	-	+	-	-	-	-	-	Medium
26	COMPOSITAE <i>Carpesium nepalensis</i> Less.	Padke	-	-	-	-	+	+	+	-	-	High
27	COMPOSITAE <i>Eupatorium adenophorum</i> Spreng	Banmara	+	-	-	-	-	-	-	-	-	High
28	CONVOLVULACEAE <i>Cuscuta reflexa</i> Roxb.	Akashbeli	+	-	-	-	-	-	-	-	-	Low
29	CUCURBITACEAE <i>Coccinia grandis</i> (L.) Viogot	Golkakri	+	-	+	-	-	-	-	-	-	Medium
30	CYPREACEAE <i>Cyperus rotundus</i> L.	Mothe	+	-	-	+	-	-	-	-	-	High
31	DAVALLIACEAE <i>Nephrolepis cordifolia</i> (L.) Presl.	Pani Aamala	+	-	+	-	-	-	-	-	-	Low
32	DIOSCOREACEAE <i>Dioscorea sagitta</i> Royle	Tarul	-	+	-	+	+	-	-	-	-	Low
33	ELAEAGNACEAE <i>Elaeagnus parviflora</i> Wall.ex Royle	Guhelo	-	-	+	-	+	-	+	-	-	Medium
34	ERICACEAE <i>Rhododendron arboreum</i> Smith	Lali Gurans	+	-	-	-	-	-	+	-	-	Low
35	EUPHORBIACEAE <i>Antidesma bunius</i> (L.) Spreng	Archal	-	-	+	-	+	-	-	-	-	Medium
36	EUPHORBIACEAE <i>Macarana indica</i> Wight.	Mallato	-	-	-	-	+	+	-	-	-	Medium
37	EUPHORBIACEAE <i>Mallotus philippensis</i> (Lam.) Mull. Arg.	Sindure	-	-	-	-	+	-	+	-	-	Medium
38	EUPHORBIACEAE <i>Sapium insigne</i> (Royle) Benth.ex Hook	Khirro	+	-	-	-	-	-	+	-	-	High
39	FAGACEAE <i>Castanopsis indica</i> (Roxb.) Miq.	Katus	+	-	+	-	+	+	+	+	-	High
40	FAGACEAE <i>Castanopsis tribuloides</i> (Sm.)A.DC.	Musure Katus	-	-	-	-	+	+	+	-	-	Medium
41	FALCOURTIACEAE <i>Homalium napaulensis</i> (DC.) Benth.	Phalame	-	-	-	-	-	+	+	-	-	Medium
42	GRAMINEAE <i>Arundinellia</i> sp.	Kharu	-	-	-	-	+	-	-	-	-	Medium
43	GRAMINEAE <i>Coix lachryma-jobi</i> L.	Bhirkamle	+	-	-	-	-	-	-	-	-	Low
44	GRAMINEAE <i>Cynodon dactylon</i> (L.) Pers.	Dubo	-	-	-	+	-	-	-	+	-	Medium
45	GRAMINEAE <i>Dendrocalamus</i> sp.	Bans	-	-	-	+	+	-	-	-	+	High
46	GRAMINEAE <i>Dendrocalamus hamiltonii</i> Nees & Arn.ex Munro	Tame Bans	-	-	-	+	+	-	-	-	+	Medium
47	GRAMINEAE <i>Desmostachya bipinnata</i> (L.) Stapf.	Kush	+	-	-	-	+	-	-	+	-	Low
48	GRAMINEAE <i>Eulaliopsis binata</i> (Retz.) C.E. Hubbard	Babiyo	-	-	-	-	+	-	-	-	+	Medium
49	GRAMINEAE <i>Thamnochlamus spathiflorus</i> (Trin.)Munro	Nigalo	-	-	-	+	-	-	-	-	-	Medium
50	GRAMINEAE <i>Thysanolaena maxima</i> (Roxb.) O.Kuntze	Amriso	-	-	-	-	+	-	-	-	-	Medium
51	HYPERICACEAE <i>Hypericum cordifolium</i> Choisy	Areli	-	-	-	-	+	-	+	-	-	High
52	HYPOXIDACEAE <i>Curculigo orchioides</i> Gaertn.	Musalgandi	+	-	-	-	-	-	-	-	-	Low
53	JUGLANDACEAE <i>Engelhardia spicata</i> Lsch ex Bl.	Mauwa	-	-	-	-	-	+	+	-	-	Medium
54	LABIATAE <i>Leucas cephalotes</i> (Roth.) Spreng	Gumpati	+	-	-	-	-	-	-	-	-	Medium
55	LABIATAE <i>Origanum vulgare</i> L.	Sajibban	+	-	+	-	-	-	-	-	-	High
56	LABIATAE <i>Scutellaria discolor</i> Colebr.	Ratpate	-	-	-	-	+	-	-	-	-	Low
57	LAURACEAE <i>Cinnamomum glanduliferum</i> (Wall.) Meisn.	Sinkauli	+	-	-	-	-	-	-	-	-	Spices Low
58	LAURACEAE <i>Litsea monopetala</i> (Roxb.) Pers.	Kutmero	-	-	-	-	+	-	+	-	-	Low
59	LEGUMINOSAE <i>Albizia lebbek</i> (L.) Benth.	Siris	-	-	-	-	+	-	+	-	-	Medium

60	LEGUMINOSAE <i>Bauhinia purpurea</i> L.	Taaki	-	-	-	-	+	-	+	-	-	Pickles	Medium
61	LEGUMINOSAE <i>Bauhinia variegata</i> L.	Koiralo	+	-	-	+	+	-	+	-	-		Medium
62	LEGUMINOSAE <i>Cassia</i> sp.	Tapre	+	-	-	-	+	-	-	-	-	Manure	Medium
63	LEGUMINOSAE <i>Entada phaseoloides</i> (L.) Merr.	Pangra	+	-	-	-	-	-	-	-	-		Low
64	LEGUMINOSAE <i>Erythrina stricta</i> Roxb.	Phaledo	+	-	-	-	+	-	+	-	-		Medium
65	LEGUMINOSAE <i>Maghania</i> sp.	Chuletro	-	-	-	+	+	-	+	-	-		Medium
66	LEGUMINOSAE <i>Mimosa pudica</i> L.	Lajawati (Buharijhar)	+	-	-	+	-	-	-	-	-		Medium
67	LILIACEAE <i>Aloe vera</i> (L.) Blume.f.	Gheukumari	+	-	-	-	-	-	-	-	-		Medium
68	LILIACEAE <i>Asparagus racemosus</i> Wild.	Kurilo	+	-	-	+	-	-	-	-	-		Medium
69	LORANTHACEAE <i>Viscum</i> sp.	Hadchur	-	-	-	-	-	-	-	-	-		Medium
70	LYTHRACEAE <i>Lagerstroemia parviflora</i> Roxb.	But Dhayero	+	-	-	-	+	+	+	-	-		Medium
71	LYTHRACEAE <i>Woodfordia fruticosa</i> (L.) Kurz	Dahayaro	+	-	-	-	-	+	+	-	-		Medium
72	MELASTOMACEAE <i>Osbeckia</i> sp.	Aangeri	-	-	+	-	+	-	-	-	-		High
73	MELIACEAE <i>Azadirachta indica</i> A.Juss.	Neem	+	-	-	-	-	-	+	-	-		Low
74	MELIACEAE <i>Melia azederach</i> L.	Bakaino	-	-	-	-	+	+	+	-	-		Medium
75	MELIACEAE <i>Trichilia connaroides</i> (Wight & Arn.) Benth.	Aakhitare	-	-	-	-	-	-	+	-	-		High
76	MELIACEAE <i>Toona ciliata</i> M.Roem.	Tuni	-	-	-	-	+	-	+	-	-		Low
77	MENISPERMACEAE <i>Cissampelos pareira</i> L.	Batulpate (Gudargano)	+	-	-	+	-	-	-	-	-		Medium
78	MORACEAE <i>Atrocarpus lakoocha</i> Wall.ex Roxb.	Badahar	-	-	-	-	+	-	+	-	-		Low
79	MORACEAE <i>Ficus auriculata</i> Lour.	Niwaro	-	-	+	-	-	-	+	+	-		Medium
80	MORACEAE <i>Ficus bengalensis</i> L.	Bar	+	-	-	-	-	-	-	+	-		Medium
81	MORACEAE <i>Ficus glaberrima</i> Blume	Pakhuri	-	-	-	-	+	-	+	-	-		Medium
82	MORACEAE <i>Ficus racemosa</i> L.	Dumre (Male & Faemale)	-	-	-	+	+	-	+	-	-		Medium
83	MORACEAE <i>Ficus religiosa</i> L.	Pipal	+	-	-	-	-	+	-	+	-		Medium
84	MORACEAE <i>Ficus semicordata</i> Buch.-Ham.ex Sm.	Khaniyo	-	-	+	-	+	-	+	-	-		Low
85	MORACEAE <i>Streblus asper</i> Lour.	Bedulo	-	-	+	-	+	-	+	-	-		Medium
86	MYRICACEAE <i>Myrica essulenta</i> Buch.-Ham.ex D.Don	Kafal	+	-	-	-	+	-	+	-	-		Low
87	MYRTACEAE <i>Syzygium cuminii</i> (L.) Skeels	Jamun	-	-	-	-	+	+	+	-	-		Medium
88	OLEACEAE <i>Nyctanthes arbor-tristis</i> L.	Parijat	+	-	-	-	-	-	-	+	+		Medium
89	ORCHIDACEAE <i>Coelogynesp.</i>	Sunakhari	-	-	-	-	-	-	-	-	+		Low
90	OXALIDACEAE <i>Oxalis corniculata</i> L.	Chariaamili	+	-	-	-	-	-	-	-	-		Medium
91	PAPAVERACEAE <i>Dicentra macrocapnos</i> Prain.	Jogi Lahara	+	-	-	-	+	-	-	-	-		Medium
92	PIPERACEAE <i>Piper chaba</i> Hunter	Chabo	+	-	-	-	+	-	-	-	-	Spices & Marcha	Medium
93	PIPERACEAE <i>Piper longum</i> L.	Pipla	-	-	-	-	-	-	-	-	-	Spices	High
94	POLYGONACEAE <i>Aconogonum molle</i> (D.Don) H. Hara	Thotne	-	-	-	-	+	-	+	-	-		Medium
95	PTERIDACEAE <i>Cheilanthes</i> sp.	Kalisinki	+	-	-	-	-	-	-	-	-		Medium
96	RHAMNACEAE <i>Zizyphus mauritiana</i> Lam.	Bayar	+	-	+	-	-	-	-	-	-	Fencing	Low
97	ROSACEAE <i>Pyrus pashia</i> Buch.-Ham ex D. Don	Mayal	+	-	+	-	-	-	-	-	-		Low
98	ROSACEAE <i>Rubus ellipticus</i> Smith	Aainselu	+	-	+	-	-	-	-	-	-		Medium
99	RUBIACEAE <i>Anthocephalus chinensis</i> (Lam.) A.Rich.ex Walp.	Kadam	-	-	-	-	+	+	-	-	-		Low

100	RUBIACEAE <i>Mussaenda macrophylla</i> Wall.	Dhobini	+	-	-	-	+	-	-	-	-	Medium
101	RUTACEAE <i>Aegle marmelos</i> (L.) Corr.	Bel	-	-	+	-	+	+	+	+	-	Low
102	RUTACEAE <i>Citrus</i> sp.	Bhogate	-	-	+	-	-	-	-	-	-	Medium
103	RUTACEAE <i>Citrus limon</i> (L.) Burm.	Jyamir	-	-	+	-	-	-	-	-	-	Medium
104	RUTACEAE <i>Citrus medica</i> L.	Bimiro	+	-	+	-	-	-	-	-	-	Medium
105	SOLANACEAE <i>Solanum</i> sp.	Bihi	+	-	-	-	-	-	-	-	-	Medium
106	SYMPLOCACEAE <i>Symplocos ramosissima</i> Wall.ex G.Don	Dabdabe	-	-	-	-	+	-	+	-	-	Medium
107	THEACEAE <i>Eurya acuminata</i> DC.	Jhiyano	-	-	-	-	+	-	+	-	-	High
108	THEACEAE <i>Schima wallichii</i> (DC.) Korth.	Chilaune	+	-	-	-	-	+	+	-	-	High
109	UMBELLIFERAE <i>Centella asiatica</i> (L.) Urban.	Ghodtapre	+	-	-	-	-	-	-	-	-	Medium
110	URTICACEAE <i>Gonostegia</i> sp.	Chiple	-	-	-	-	+	-	-	-	-	Medium
111	VERBENACEAE <i>Callicarpa arborea</i> Roxb.	Masgedi	+	-	-	-	-	+	+	-	-	Low
112	VERBENACEAE <i>Clerodendrum indicum</i> (L.) Kuntze	Chinne	-	-	-	-	+	-	+	-	-	Low
113	VERBENACEAE <i>Gmelina arborea</i> Roxb.	Khamari	-	-	-	-	+	+	-	-	-	Medium
114	VERBENACEAE <i>Premna barbata</i> Wall.ex Schauer	Gidari	-	-	-	-	+	-	-	-	-	Low
115	VITACEAE <i>Ampelocissus divaricata</i> (Wall ex M.A. Lawson) Planch.	Pureni	+	-	+	-	+	-	-	-	-	Medium
116	ZINGIBERACEAE <i>Curcuma angustifolia</i> Roxb.	Haledo	-	-	-	-	-	-	-	-	-	Spices Low

+ : Used; - : Not used; 1: Medicinal; 2: Food; 3: Fruits; 4: Vegetables; 5: Fodder and Forages; 6: Timber; 7: Fuelwood; 8: Religious; 9: Ornamental; 10: Miscellaneous