102-120 J. Nat. Hist. Mus. Vol. 30, 2016-18

Flora of community managed forests of Palpa district, western Nepal

Pratiksha Shrestha[1]✉, Ram Prasad Chaudhary[2], Krishna Kumar Shrestha[1], Dharma Raj Dangol[3]

[1]Central Department of Botany,Tribhuvan University, Kathmandu, Nepal
[2]Research Center for Applied Science and Technology (RECAST), Kathmandu, Nepal
[3]Natural History Museum, Tribhuvan University, Swayambhu, Kathmandu, Nepal

ABSTRACT

Floristic diversity is studied based on gender in two different management committee community forests (Barangdi-Kohal jointly managed community forest and Bansa-Gopal women managed community forest) of Palpa district, west Nepal. Square plot of 10m×10m size quadrat were laid for covering all forest areas and maintained minimum 40m distance between two quadrats. Altogether 68 plots (34 in each forest) were sampled. Both community forests had nearly same altitudinal range, aspect and slope but differed in different environmental variables and members of management committees. All the species present in quadrate and as well as outside the quadrate were recorded for analysis. There were 213 species of flowering plant belonging to 67 families and 182 genera. Barangdi-Kohal JM community forest had high species richness i.e. 176 species belonging to 64 families and 150 genera as compared to Bansa-Gopal WM community forest with 143 species belonging to 56 families and 129 genera. According to different life forms and family and genus wise jointly managed forest have high species richness than in women managed forest. Both community forests are banned for fodder, fuel wood and timber collection without permission of management comities. There is restriction of grazing in JM forest, whereas no restriction of grazing in WM forest.

Key words: management practice, jointly managed forest, women managed forest

INTRODUCTION

Nepal shares 0.1% of the total land area of the world but harbors over 3% of the world's flowering plants. The number of flowering plant enumerated in Nepal is 6,973 species of angiosperm and 26 species of gymnosperm (MoFSC, 2014). Nepal ranks 10th position in Asia and 27th in world for richness in flowering plant diversity (BPP, 1995). Flora refers to the brief taxonomic treatment of all plants occurring in a particular geographical location which generates a comprehensive account. A complete flora of a country is necessary to reflect the whole plant diversity of that country (Shakya *et al.,* 1997).sCommunity forestry program especially focuses on protection and production timber yielding species rather than lower herbs and shrubs in community forests. Non-timber and low quality yielding species are indiscriminately removed during various management practices (Belbase, 1999; Shrestha, 2005). The role of women in sustainable resource management and women's indigenous

knowledge are greater than that of men with respect to species and use. So the participation of women in community forest is increasing day by day (Upadhyay, 2005; Agarwal, 2009).

The pattern of species richness with respect to different management committees like women managed community forest and jointly managed community forest has not been studied for generating scientific data. Only the condition of forest on the basis of participation in management committee and decision making were analysed by different persons (Bhattarai, 1997; Agarwal & Ostrom, 2001; Upadhaya, 2005; Agarawal, 2009; Gurung, 2013). In Palpa district, there are some works done related to species richness and floristic diversity in different area (Shrestha *et al.,* 2003; Bhandari, 2006; Mahato, 2006; Ghubhaju, 2009). However, no any work done previously by researchers in this study area. This paper focus to generate scientific data on species diversity in two community forests having different management committees based on gender.

MATERIALS AND METHODS

Study area

The study was conducted in Palpa district, located in Lumbini zone in the western development region of Nepal. It is located between 27˚34'-27˚57' N and 83˚15'-83˚22' E in the central part of Nepal. Palpa is a hilly district bounded by Nawalparasi and Tanahun district towards east, Arghakhachi and Gulmi district towards west, Syanja and Tanahun district towards north and Nawalparasi and Rupandehi district towards south. The total land area of this district is about 1,373 sq. km. with approximate length of 70 km and breadth of 20 km. The altitude varies from tropical (about 213m) to upper subtropical region (1,900 m). About 711 sq. km area (51.8%) of Palpa district is covered by forests. Among total forest cover, 18% lies in Churiya range and 82% lies in Mahabharat range. The Palpa district comprises of 634 community forest cover an area of 321 sq. km (DFO, 2015). This study is mainly comprised of the tropical zone and *Schima- Castanopsis* forest type. Both community forests are community forests and there is only 4 year's difference in development of community forest. However, the physiographic and floristic such as altitude, forest type, slope, aspects are same between the forests.

The study is mainly focused on assessment of floristic diversity in two community forests: one is Barangdi-Kohal of Madanpokhara VDC which is jointly managed (JM) community forest handed over to community in 2051 B.S. (1994) where the management committee has both male and female members to regulate the forest utilization and another is Bansa-Gopal women managed (WM) community forest of Pravas, Tansen municipality, handed over to community in 2055 B.S. (1998) where all the members of forest management committee and users groups who manage the forest are women.

For floristic diversity study, four field visits were made in between April 2013 to July 2014. The first field visit was from 12th to 16th April 2013 for the selection of site and collection of general information about forests from the local informants as well as management committees. The second field visit was done from June 25th to 2nd July 2013 for and plant specimens were collected. Third and fourth visit was conducted in 16th to 20th October 2013 and February 4th to 7th, 2014 respectively for collection of plant specimens which were not collected in previous field visit.

Most of the plant species was identified in the field with the help of standard floras (Malla *et al.,* 1984; Polunin & Staintion 1984; Stainton, 1988; Shrestha 1998). Then unidetified plants were identified later with the help of experts. All the herbarium specimens were tallied and identified later at TUCH, Kirtipur and KATH Godawari, Lalitpur. Only the angiosperms and gymnosperms were collected from the study area. The species which were not in flowering/ fruiting stage during field visit and most popular species as voucher specimens were not collected. Digital photographs were taken of most of the plants for future references. The collected specimens were tagged, pressed and dried naturally and prepare herbarium by following technique of Bridson & Forman (1989). Generally 2 to 3 specimens for each species were collected. Nomenclature of plant species follows Press *et al.* (2000). The specimens were deposited in TUCH, KATH and TMC Tansen, Palpa.

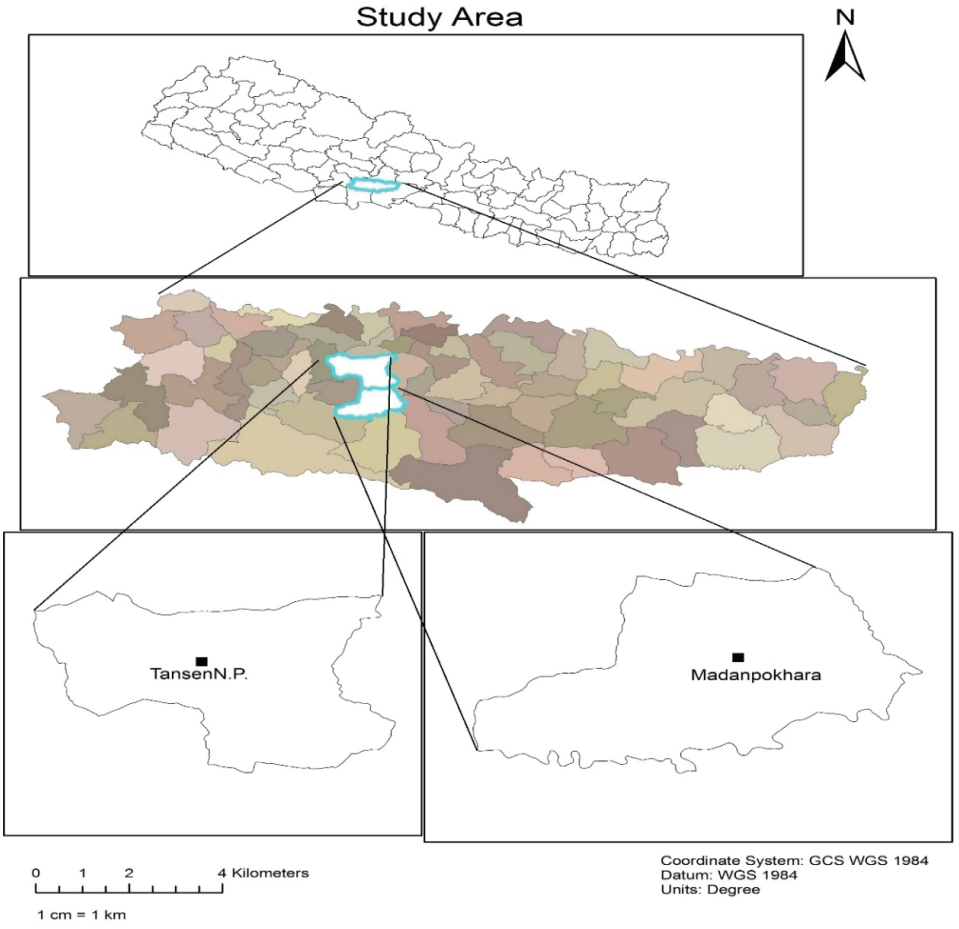

FIG. 1. Map of the study area.

RESULTS AND DISCUSSION

Floristic diversity

Altogether, 213 species of flowering plants belonging to 64 families and 182 genera (excluding 3 unidentified species), which included 46 trees, 36 shrubs, 107 herbs and 24 climbers were recorded in two community forests of Palpa district (appendix 1). Out of 213 species, 178 species belong to dicotyledons, 34 species of monocotyledons and 1 species of gymnosperm. The largest family was Leguminosae which consist 15 genera and 24 species. The second largest genera were Compositae comprising 20 genera and 21 species.

In Barangdi-Kohal jointly managed community forest, 176 species belonging to 64 families and 150 genera were recorded. Among them, 148 species belong to dicotyledons, 27 species to monocotyledons and 1 species to gymnosperm. Out of 176 species, 78 species belong to herbs, 31 species to shrubs, 45 species to trees and 22 species to climbers. Fabaceae was found to be largest family comprising 14 genera and 20 species. The other larger families were Poaceae (13 genera and 13 species), Asteraceae (11 genera and 12 species), Lamiaceae (6 genera and 10 species), Euphorbiaceae (7 genera and 9 species) and Moraceae (3 genera and 8 species).

In Bansa-Gopal women managed community forest, 143 species belonging to 56 families and 129 genera were recorded. Among them 118 species belong to dicots, 24 species to monocots and 1 species to gymnosperm (table 1). Out of 143 species, 73 species belong to herbs, 18 species to shrubs, 37 species to trees and 15 species to climbers.

In jointly managed forest, high number of families and genera were found as compared to women managed forest. Also according to different life forms higher number of species were found in jointly managed forest than in women managed forest.

TABLE 1. The number of family, genus, and species of Dicotyledos, Monocotyledons and Gymnosperms in two community forests of Palpa district, Nepal.

Major taxa	JM forest			WM forest		
	Family	Genus	Species	Family	Genus	Species
Dicot	52	122	148	48	106	118
Monocot	11	27	27	7	22	24
Gymnosperm	1	1	1	1	1	1
Total	64	150	176	56	129	143

Of the 64 families, the Leguminosae, Compositae, Poaceae, and Lamiaceae were four largest families with more than 10 species (fig. 2). Leguminosae and Lamiaceae were two dominant families in JM forest whereas Compositae and Poaceae were two dominant families in WM forest. The family Poaceae shared highest common species (9) in JM and WM. JM forest had highest unique species (13) of Leguminosae and WM had 9 unique species of Compositae (fig. 2).

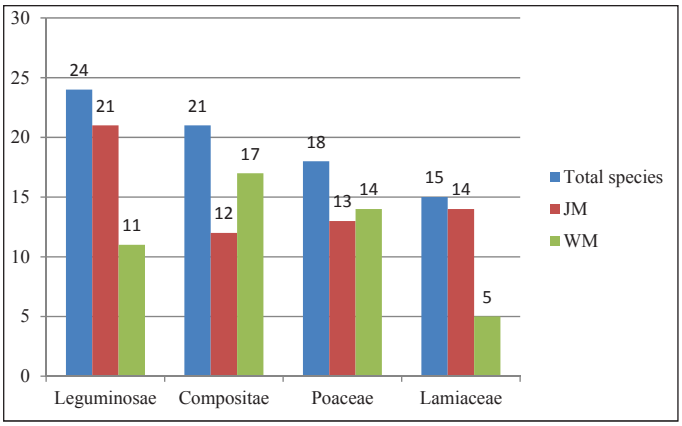

FIG. 2. Four major families with more than 10 species in two community forests of Palpa, Nepal.

Life form diversity

The number of climbers, herbs, shrubs and trees are highest in JM forests in compared to WM forests (table 2).

TABLE 2. Life forms of plants of two community forests, Palpa district, Nepal.

Forests	Climbers	Herbs	Shrubs	Trees	Total species
JM Forest	22	78	31	45	176
WM forest	15	73	18	37	143

In JM forest, 9 species of climbers, 34 species of herbs, 18 species of shrubs and 9 species of trees are found only in this forest (Table 3). Whereas, 2 species of climbers, 29 species of herbs, 12 species of shrubs and 1 species of trees are found only in women managed forest. 13 species of climbers, 44 species of herbs, 13 species of shrubs and 36 species of trees are found in both community forests (table3).

TABLE 3. Unique and common of plant species (by life forms) in two community forests.

Life forms	JM only (%)	WM only (%)	JM+WM (%)	Total (%)
Climbers	9 (37.50)	2 (8.33)	13 (54.17)	24(100.00)
Herbs	34 (31.78)	29 (27.10)	44 (41.12)	107 (100.00)
Shrubs	18 (37.50)	5 (37.50)	13 (36.11)	36 (100.00)
Trees	9 (19.56)	1 (2.17)	36 (78.26)	46 (100.00)
Total	70	37	106	**213** (100.00)

The study areas were dominated by *Schima wallichi* and *Castanopsis indica*. In the study area, there were found many medicinal and highly valuable plant which are conserved by nationally and international organization.

Status of flora

Plant species	Forests	Status
Asparagus racemosus	JM forest	Nationally threatened, Vulnerable
Curculigo orchioides	JM forest	Nationally threatened, Vulnerable
Piper longum	JM forest	Nationally threatened, Vulnerable
Rauvolfia serpentina	JM forest	Nationally threatened, Vulnerable, Plant species protected under Forest Act 1993; IUCN threat category (Endangered)
Bombax ceiba ,	JM	Plant species protected under Forest Act 1993
Dioscorea deltoidea	JM & WM	CITES LIST (appendix II)

Jointly managed forest is rich in many threatened and protected plants species by government of Nepal as compared to women managed forest. Only *Dioscorea deltoidea* are found in women managed forest which falls under CITES Appendix II, but other species are not found in this forest.

The floral diversity of jointly managed community forest is higher than the women managed forest. It may be due to collection pattern for feeding animals and for fuelwood. In WM forests, women collect fodder and fuel wood species and mainly focus to conserve tree species but the jointly managed community forest focus to conserve the all species. Both community forests are banned for fodder, fuel wood and timber collection without permission of management committees. There is restriction for grazing in jointly managed forest, whereas no restriction of grazing in women managed forest which also affect the availability of plant species.

ACKNOWLEDGEMENTS

The authors are thankful to the Central Department of Botany, Tribhuvan University, Kirtipur for giving permission to conduct this work. The authors are grateful to peoples of two community forests and also grateful to Cornell Nepal Study Program (CNSP) and Tansen Guthi Kathmandu for providing partial financial support.

REFERENCES

Agrawal, A; Ostrom, E (2001) Collective action, property rights and decentralization in resource use in India and Nepal. *Political Society* 29: 485–514.

Agrawal, B (2009) Gender and forest conservation: the impact of women's participation in community forest governance. *Ecological Economics 68:* 2785–2799.

Belbase, N (1999) *National implementation of the convention on biological diversity, policy and legislative requirement*. IUCN, Kathmandu, Nepal.

Bhandari, R K (2006) *Floristic study of Dovan village development committee, Palpa district.* M. Sc. Dissertation, Central Department of Botany, Tribhuvan University, Kirtipur, Kathmandu, Nepal.

Bhattarai, N K (1997) Role of Women in the use and conservation of biodiversity; studies in the Nepal Himalaya. *Banko Jankari* **7**: 3–8.

BPP (1995) *Biodiversity profile of the Terai/Siwalik physiographic zones.* Biodiversity Profile Project Publication Number 12. Department of National Park and Wildlife Conservation, Kathmandu Nepal.

Bridson, D; Forman, L (1989) *The Herbarium handbook*. Royal Botanic Garden. Kew, UK (3rd edition).

haudhary, R P (1998) *Biodiversity in Nepal: status and conservation*. Tecpress, Bangkok, Thailand.

Glowka, L; Burhenne-Guilmin, F; Sygne, H (1994) *A guide to the convention on biological diversity*. IUCN Gland, Switzerland.

Gubhaju, M R (2009) *Non-Timber Forest Products (NTFPs) in community forests of Dovan, Palpa: diversity, population status and patterns of utilization*. M. Sc. Dissertation, Central Department of Botany, Tribhuvan University, Kirtipur, Kathmandu, Nepal.

Gurung, P (2013) *Role of participation of women in community forest management: a case study of dharapani women community forest, Bharatpokhari VDC, Kaski, Nepal.* M. Sc. Dissertation, Prithivi Narayan Campus, Pokhara, Nepal.

Mahato, R B (2006) *Diversity, use and coservation of plants in Palpa district, Nepal*. PhD. Thesis, Central Department of Botany, Tribhuvan University, Kirtipur, Kathmandu, Nepal.

Malla, S B; Rajbhandari, S B; Shrestha, T B; Adhikari, P M; Shakya, P R (eds) (1986). *Flora of Kathmandu valley*. Government of Nepal. Ministry of Forests and Soil Conservation, Kathmandu, Nepal.

Maren, I E ; Bhattarai, K R ; Chaudhary, R P (2013) Forest ecosystem services and biodiversity in contrasting Himalayan forest management systems. *Environmental Conservation* 41(1): 73–83.

MoFSC (2014) *Nepal biodiversity strategy and action plan 2014–2020*. Government of Nepal, Ministry of Forests and Soil Conservation, Kathmandu, Nepal.

Polunin, O; Stainton, J D A (1984) *Flowers of the Himalaya*. Oxford University Press, New Delhi, India.

Press, J R; Shrestha, K K; Sutton, D A (2000) *Annotated checklist of flowering plants of Nepal*. Natural History Museum, London, UK and Central Department of Botany, Tribhuvan University. Kathmandu, Nepal.

Shakya, P R; Adhikari, M K; Rajbhandari, K R; Chaudhary, R P; Shrestha, K K (1997) *Flora of Nepal*. Presented at International Seminar-Cum-Workshop on Flora of Nepal, Kathmandu, Nepal.

Shrestha, K K; Tiwari, N N; Rajbhandary, S; Shrestha, S; Upreti, Y; Poudel, R C (2003) *Non-timber forest products (NTFPs) in the critical bottlenecks and corridors of Terai Arc Landscape-Nepal: Documentation, utilization, trade and people livelihood.* A Project Report Submitted to WWF Nepal programme by Ethnobotanical Society of Nepal (ESON), Kathmandu, Nepal.

Shrestha, B B (2005) Fuel wood consumption, management and regeneration of two community forest in central Nepal. *Himalayan Journal of Science* 3(5): 75–80.

Shrestha, K (1998) *Dictionary of Nepalese plant names*. Mandala Book Point, Kathmandu, Nepal.

Shrestha, T B; Joshi, R M (1996) *Rare, endemic and endangered plants of Nepal*. WWF Nepal Program, Kathmandu, Nepal.

Stainton, J D A (1972) *Forest of Nepal*. The Camelot Press Ltd., London and Southampton, UK.

Staiton, A (1988) *Flowers of the Himalaya:* a supplement, Oxford University Press, India.

Upadhyay, B (2005) Women and natural resource management. Illustrations from India and Nepal. *Natural Resource FORUM 29*(3): 224–232.

APPENDIX 1

List of plant species found in two community forests and deposition of herbarium specimens in KATH (National Herbarium, Godawari), TUCH (TU, Central Department of Botany, Kirtipur) and TMC (Tribhuvan Multiple Campus, Tansen).

S.N.	Family	Scientific name	Local name	Collection number	Habit	JM	WM	KATH	TUCH	TMC
1.	Acanthaceae	*Asystasia macrocarpa* Nees		DPM188070	S	+	-	+	+	+
2.	Acanthaceae	*Barleria cristata* L.	Bande kuro	DPM286070	S	+	+	+	+	-
3.	Acanthaceae	*Dicliptera bupleuroides* Nees	Ghode jhar	DPM46070	H	+	+	+	+	+
4.	Acanthaceae	*Justicia adhatoda* L.	Asuro	NC	S	+	-	-	-	-
5.	Acanthaceae	*Justicia procumbens* L.	Phuli jhar	DPM139070	H	+	+	+	+	+
6.	Acanthaceae	*Strobilanthes angustifrons* C. B. Clarke		DPM287070	H	-	+	+	+	+
7.	Acoraceae	*Acorus calamus* L.	Bojho	NC	H	+	-	-	-	-
8.	Cornaceae	*Alangium chinense* (Lour.) Harms	Bhalu paile	DPM366070	T	+	+	+	+	+
9.	Amaranthaceae	*Achyranthes aspera* L.	Apamarga	DPP342070	H	+	-	+	+	+
10.	Amaranthaceae	*Achyranthes bidentata* Blume	Datiwan	NC	H	+	+	-	-	-
11.	Anacardiaceae	*Choerospondias axillaris* (Roxb.) B.L. Burtt & A.W. Hill	Lapsi	NC	T	+	-	-	-	-
12.	Anacardiaceae	*Mangifera indica* L.	Aanp	NC	T	+	+	-	-	-
13.	Anacardiaceae	*Rhus javananica* L.	Bhakimlo	NC	T	+	+	-	-	-
14.	Anacardiaceae	*Spondias pinnata* (L. f.) Kurz	Amaro	NC	T	+	+	-	-	-
15.	Apiaceae	*Centella asiatica* (L.) Urb.	Tapre jhar	DPM213070	H	+	+	-	+	+
16.	Apocynaceae	*Calotropis gigantea* (L.) Dryand.	Aank	NC	S	+	+	-	-	-
17.	Apocynaceae	*Ceropegia pubescens* Wall.	Ban simi	DPP146070	C	+	+	+	+	+

18.	Apocynaceae	*Cryptolepis dubia* (Burm.f.) M.R. Almeida		NC	C	-	+	-	-	-
19.	Apocynaceae	*Ichnocarpus frutescens* (L.) W.T. Aiton	Dudhe lahara	DPM313070	C	+	+	+	+	+
20.	Apocynaceae	*Plumeria rubra* L.	Golaichi	NC	T	-	+	-	-	-
21.	Apocynaceae	*Rauvolfia serpentina* (L.) Benth. ex Kurz	Sarpaghandha	DPM243070	H	+	-	+	-	-
22.	Araceae	*Arisaema concinnum* Schott	Kalo bikh	DPP76070	H	+	+	+	+	+
23.	Araceae	*Arisaema tortuosum* (Wall.) Schott	Sarpako makai	NC	H	+	+	-	-	-
24.	Asparagaceae	*Agave cantula* Roxb.	Ketuki		H	+	-	-	-	-
25.	Asparagaceae	*Asparagus racemosus* Willd.	kurilo	NC	H	+	-	-	-	-
26.	Asparagaceae	*Disporum cantoniense* (Lour.) Merr.		PS120070	H	-	+	+	+	+
27.	Compositae	*Adenostemma lavenia* (L.) Kuntze		DPP199070	H	-	+	+	+	-
28.	Compositae	*Ageratina adenophora* (Spreng.) R.M. King & H. Rob.	Banmara	NC	H	+	+	-	-	-
29.	Compositae	*Ageratum conyzoides* L.	Gandhe jhar	NC	H	+	+	-	-	-
30.	Compositae	*Ageratum houstonianum* Mill.	Gandhe jhar	DPM344070	H	+	+	+	+	+
31.	Compositae	*Anaphalis* sp.	Kairo jhar	DPM367070	H	+	-	+	-	-
32.	Compositae	*Artemisia indica* Willd.	Titepai	DPP310070	H	+	+	+	+	+
33.	Compositae	*Bidens pilosa* L.	Kuro	DPM256070	H	+	+	+	+	-
34.	Compositae	*Chromolaena odorata* (L.) R.M.King & H.Rob.	Aaule banmara	DPM292070	H	+	-	+	+	+
35.	Compositae	*Conyza japonica* (Thunb.) Less. ex Less	Rampati	DPP21070	H	-	+	+	+	+

36.	Compositae	*Cyanthillium cinereum* (L.) H.Rob.	Jurjure jhar	DPP200070	H	-	+	+	+	+
37.	Compositae	*Eclipta prostrata* (L.) L.	Bhringraj	DPM205070	H	+	+	+	+	+
38.	Compositae	*Elephantopus scaber* L.	Bhuti jhar	DPP26070	H	-	+	+	+	+
39.	Compositae	*Emilia sonchifolia* (L.) DC. ex DC.	Toriphul	DPP179070	H	-	+	+	+	+
40.	Compositae	*Erigeron acer* var. *multicaulis* (Wall. ex DC.) C.B. Clarke	Salaha jhar	DPP98070	H	-	+	+	-	-
41.	Compositae	*Galinsoga parviflora* Cav.	Chitlange jhar	NC	H	+	+	-	-	-
42.	Compositae	*Guizotia abyssinica* (L. f.) Cass.	Jushe til	DPP167070	H	-	+	+	+	+
43.	Compositae	*Inula cappa* (Buch.-Ham. ex D. Don) DC.	Gaitihare	DPM405070	S	+	-	+	+	+
44.	Compositae	*Pentanema indicum* (L.) Ling		DPP100070	H	+	-	+	-	-
45.	Compositae	*Sigesbeckia orientalis* L.	Dudhe jhar	DPM383070	H	-	+	+	+	+
46.	Compositae	*Sonchus asper* (L.) Hill.	Dudhe	DPP159070	H	+	+	+	+	-
47.	Compositae	*Synedrella nodiflora* (L.) Gaertn.	Bare jhar	DPM343070	H	-	+	+	+	+
48.	Berberidaceae	*Berberis asiatica* Roxb. ex DC.	Chutro	NC	S	+	-	-	-	-
49.	Boraginaceae	*Cordia dichotoma* G. Frost.		DPP72070	T	+	+	+	+	+
50.	Boraginaceae	*Cynoglossum zeylanicum* (Vahl) Brand	Kanike kuro	DPM195070	H	+	+	+	+	+
51.	Brassicaceae	*Rorippa benghalensis* (DC.) H. Hara	Ban tori	DPM259070	H	-	+	+	-	-
52.	Burseraceae	*Garuga pinnata* Roxb.	Dabdabe	NC	T	+	+	-	-	-
53.	Caryophyllaceae	*Drymaria cordata* subsp. *diandra* (Blume) J.A.Duke	Abijalo	DPM333070	H	+	+	+	-	-
54.	Commelinaceae	*Commelina suffruticosa* Blume	Kane jhar	DPP236070	H	+	+	+	+	-

55.	Convolvulaceae	*Argyreia hookeri* C.B. Clarke	Suntiki	DPM393070	C	+	-	+	+	+
56.	Convolvulaceae	*Cuscuta reflexa* Roxb.	Akash beli	NC	C	+	+	-	-	-
57.	Convolvulaceae	*Evolvulus alsinoides* (L.) L.		DPP308070	H	-	+	+	-	-
58.	Convolvulaceae	*Ipomoea quamoclit* L.	Jayanti lahara	DPM304070	C	+	-	+	+	+
59.	Convolvulaceae	*Porana* sp.		DPM101070	C	+	-	+	+	-
60.	Cucurbitaceae	*Herpetospermum pedunculosum* (Ser.) C.B. Clarke	Kurkure kakro	DPM56070	C	+	-	-	+	-
61.	Cucurbitaceae	*Mukia maderaspatana* (L.) M. Roem.	Bankakri	DPM363070	C	+	+	+	+	+
62.	Cucurbitaceae	*Solena amplexicaulis* (Lam.) Gandhi	Golkakri	DPP43070	C	+	+	-	+	-
63.	Cucurbitaceae	*Trichosanthes tricuspidata* Lour.	Indrayani	NC	C	+	-	-	-	-
64.	Cyperaceae	*Cyperus rotundus* L.	Mothe	DPP125070	H	+	+	+	+	+
65.	Cyperaceae	*Kyllinga brevifolia* Rottb.	Mothe	DPP132070	H	+	+	+	+	+
66.	Cyperaceae	*Mariscus cyperoides* (Roxb.) A. Dietr.		DPM317070	H	-	+	+	+	-
67.	Dioscoreaceae	*Dioscorea deltoidea* Wall. ex Griseb.	Bhyakur	DPP198070	C	+	+	+	+	+
68.	Ebenaceae	*Diospyros malabarica* (Desr.) Kostel.	Khalluk	NC	T	+	+	-	-	-
69.	Euphorbiaceae	*Euphorbia hirta* L.	Aakhle jhar	DPP206070	H	+	+	+	+	+
70.	Euphorbiaceae	*Euphorbia prostrata* Aiton	Kanike ghans	DPP209070	H	-	+	+	-	-
71.	Euphorbiaceae	*Jatropha curcas* L.	Sajiwan	NC	T	+	+	-	-	-
72.	Euphorbiaceae	*Mallotus philippensis* (Lam.) Muell.	Rohini	NC	T	+	-	-	-	-

73.	Euphorbiaceae	*Ricinus communis* L.	Arandi	NC	S	+	+	-	-	-
74.	Euphorbiaceae	*Sapium insigne* (Royle) Benth. & Hook.f.	Khirro	NC	T	+	+	-	-	-
75.	Leguminosae	*Abrus precatorius* L.	Rati gedi	DPM355070	C	+	-	+	+	+
76.	Leguminosae	*Aeschynomene indica* L.		DPM362070	H	+	-	+	+	-
77.	Leguminosae	*Albizia lebbeck* (L.) Benth.	Borek	NC	T	+	+	-	-	-
78.	Leguminosae	*Alysicarpus rugosus* (Willd.) DC.	Madhuphul	DPP172070	H	-	+	+	+	+
79.	Leguminosae	*Bauhinia variegata* L.	Koiralo	DPM301070	T	+	+	-	+	-
80.	Leguminosae	*Cassia floribunda* Collad.	Dhulo chakaudi	DPP201070	S	+	+	+	+	+
81.	Leguminosae	*Chamaecrista mimosoides* (L.) Greene		NC	H	+	-	-	-	-
82.	Leguminosae	*Crotalaria albida* Roth.	Bhedephul	DPM212070	H	+	-	+	+	+
83.	Leguminosae	*Dalbergia sissoo* Roxb. ex DC.	sissoo	NC	T	+	-	-	-	-
84.	Leguminosae	*Desmodium confertum* DC.	Bhatmas jhar	DPM284070	S	+	-	+	+	+
85.	Leguminosae	*Desmodium elegans* DC.	Bakhare ghans	DPM281070	S	+	+	+	+	+
86.	Leguminosae	*Desmodium heterocarpon* (L.) DC.	Shakino	DPM302070	S	+	-	+	-	-
87.	Leguminosae	*Desmodium microphyllum* (Thunb.) DC.	Mirye jhar	DPP25070	H	+	+	+	+	-
88.	Leguminosae	*Desmodium* sp.		DPM395070	H	+	-	+	+	-
89.	Leguminosae	*Erythrina stricta* Roxb.	Phaledo	NC	T	+	+	-	-	-
90.	Leguminosae	*Flemingia chappar* Benth.	Bhatte	DPP6070	H	-	+	+	+	-

91.	Leguminosae	*Flemingia strobilifera* (L.) W.T. Aiton	Sangle jhar	DPP7070	H	+	+	+	+	+
92.	Leguminosae	*Indigofera linifolia* (L.f.) Retz.		DPM321070	H	+	-	+	+	+
93.	Leguminosae	*Mimosa pudica* L.	Lajawati jhar	DPP13070	H	+	+	+	+	+
94.	Leguminosae	*Mimosa rubicaulis* Lam.	Arali	DPM305070	S	+	-	+	+	-
95.	Leguminosae	*Phaseolus* sp.	Basnte	DPM354070	C	+	-	+	+	+
96.	Leguminosae	*Senna tora* (L.) Roxb.	Chakaudi	DPM297070	S	+	-	+	+	-
97.	Leguminosae	*Stylosanthes hamata* (L.) Taub.	Stylo	DPP223070	S	-	+	+	+	+
98.	Leguminosae	*Tamarindus indica* L.	Imili	DPP20070	T	+	-	+	-	-
99.	Leguminosae	*Castanopsis indica* (Roxb. ex Lindl.) A.DC.	Katus	NC	T	+	+	-	-	-
100.	Hypoxidaceae	*Curculigo orchioides* Gaertn.	Seldhoti	DPM12070	H	+	-	-	+	+
101.	Juglandaceae	*Engelhardia spicata* Lesch. ex Blume	Mauwa	NC	T	+	+	-	-	-
102.	Lamiaceae	*Callicarpa macrophylla* Vahl	Dhahi chamale	DPM357070	S	+	+	+	+	+
103.	Lamiaceae	*Clerodendrum infortunatum* L.	Chuti	DPM356070	S	+	+	+	+	+
104.	Lamiaceae	*Colebrookea oppositifolia* Sm.	Khasreti	DPM392070	S	+	+	+	+	+
105.	Lamiaceae	*Geniosporum coloratum* (D. Don) Kuntze	Ban bawari	DPM351070	H	+	-	+	+	-
106.	Lamiaceae	*Perilla frutescens* (L.) Britton	Jhuse til	DPP165070	H	-	+	+	+	+
107.	Lamiaceae	*Plectranthus coetsa* Buch.-Ham.ex D. Don	Ghyu silam	DPM273070	H	+	-	+	+	+
108.	Lamiaceae	*Plectranthus mollis* (Aiton.) Spreng.	Ban silam	DPP185070	H	+	-	+	+	-
109.	Lamiaceae	*Pogostemon* sp.	Rudhilo	DPM311070	H	+	-	+	+	+

110.	Lamiaceae	*Premna barbata* Wall. ex Schauer	Gidari	NC	T	+	-	-	-	-
111.	Lamiaceae	*Scutellaria discolor* Colebr.	Dampate	DPM337070	H	+	-	+	-	-
112.	Lamiaceae	*Scutellaria repens* Buch.-Ham. ex D. Don	Charpate	DPP178070	H	+	-	+	+	+
113.	Lamiaceae	*Teucrium quadrifarium* Buch.-Ham. ex D. Don	Kalo rudhilo	DPM364070	H	+	-	+	-	-
114.	Lamiaceae	*Teucrium royleanum* Wall. ex Benth.		DPM373070	H	+	-	+	+	-
115.	Lamiaceae	*Teucrium viscidum* Blume		DPM376070	H	+	-	+	+	+
116.	Lamiaceae	*Vitex negundo* L.	Simali, Sewali	DPM49070	S	+	+	+	+	+
117.	Lauraceae	*Cinnamomum tamala* (Buch.-Ham.) Nees & Eberm.	Tejpat	NC	T	+	+	-	-	-
118.	Lauraceae	*Litsea monopetala* (Roxb.) Pers.	Kutmero	NC	T	+	+	-	-	-
119.	Linaceae	*Reinwardtia indica* Dumort.	Payullee	NC	H	+	-	-	-	-
120.	Linderniaceae	*Lindernia ruellioides* (Colsm.) Pennell	Kankare	DPP134070	H	-	+	+	+	-
121.	Lythraceae	*Woodfordia fruticosa* (L.) Kurz	Dhayaro	NC	S	+	-	-	-	-
122.	Malvaceae	*Abelmoschus manihot* (L.) Medik.	Ban kapas	DPP153070	S	+	-	+	-	-
123.	Malvaceae	*Bombax ceiba* L.	Simal	NC	T	+	-	-	-	-
124.	Malvaceae	*Gossypium hirsutum* L.	Kapas	DPM414070	S	+	-	+	-	-
125.	Malvaceae	*Grewia optiva* J.R. Drumm. ex Benth.	Phosra	DPM334070	T	+	+	+	-	-
126.	Malvaceae	*Sida acuta* Burm. f.	Ballu	DPP145070	S	+	+	+	+	+
127.	Malvaceae	*Sida rhombifolia* L.	Sano chiliya	DPM323070	S	-	+	+	+	+

128.	Malvaceae	*Triumfetta rhomboides* Jacq.	Dalle kuro	DPM204070	H	-	+	+	+	+
129.	Malvaceae	*Urena lobata* L.	Nalu kuro	DPM203070	H	+	+	+	+	+
130.	Melastomataceae	*Melastoma malabathricum* L.	Angeri	DPM397070	S	+	+	+	+	+
131.	Melastomataceae	*Osbeckia nepalensis* Hook. f.	Seto chulsi	DPM359070	S	-	+	+	+	+
132.	Melastomataceae	*Osbeckia nutans* Wall. ex C.B. Clarke	Chulsi	DPM381070	S	+	-	+	+	+
133.	Meliaceae	*Cipadessa baccifera* (Roth) Miq.	Chaulani	DPM207070	S	+	-	+	+	+
134.	Meliaceae	*Melia azedarach* L.	Bakaino	DPM14070	T	+	+	+	+	-
135.	Meliaceae	*Toona ciliata* M. Roem.	Tuni	NC	T	+	+	-	-	-
136.	Menispermaceae	*Cissampelos pareira* L.	Badalpate	DPM232070	C	+	+	+	+	+
137.	Menispermaceae	*Stephania elegans* Hook. f. & Thomson	Gano gurjo	DPM234070	C	+	+	+	+	+
138.	Moraceae	*Artocarpus lakoocha* Wall. ex Roxb.	Badahar	NC	T	+	-	-	-	-
139.	Moraceae	*Ficus benghalensis* L.	Bar	NC	T	+	+	-	-	-
140.	Moraceae	*Ficus glaberrima* Blume	Pakuri	NC	T	+	+	-	-	-
141.	Moraceae	*Ficus racemosa* L.	Dumri	NC	T	+	-	-	-	-
142.	Moraceae	*Ficus religiosa* L.	Pipal	NC	T	+	+	-	-	-
143.	Moraceae	*Ficus sarmentosa* Buch.-Ham. ex Sm.	Berulo	DPP9070	C	+	-	-	+	-
144.	Moraceae	*Ficus semicordata* Buch.-Ham. ex Sm.	Khaniya	NC	T	+	+	-	-	-
145.	Moraceae	*Morus serrata* Roxb.	Kimbu	NC	T	+	+	-	-	-
146.	Myrtaceae	*Eucalyptus alba* Reinw. ex Blume	Masala	NC	T	+	+	-	-	-
147.	Myrtaceae	*Syzgium cumini* (L.) Skeels	Jamun	NC	T	+	+	-	-	-
148.	Oleaceae	*Fraxinus floribunda* Wall.	Lakuri	DPM248070	T	+	+	+	+	+

149.	Oxalidaceae	*Oxalis corniculata* L.	Chari amilo	DPM353070	H	+	+	+	-	-
150.	Pentaphylaceae	*Eurya acuminata* DC.	Sano jingane	DPP186070	S	+	-	+	+	+
151.	Phyllanthaceae	*Antidesma acidum* Retz.	Amili	DPP66070	T	+	+	+	+	+
152.	Phyllanthaceae	*Phyllanthus emblica* L.	Amala	NC	T	+	+	-	-	-
153.	Phyllanthaceae	*Phyllanthus reticulatus* Poir.	Sikani	DPM384070	C	+	+	+	+	+
154.	Phyllanthaceae	*Phyllanthus urinaria* L.	Bhui amala	NC	H	+	+	-	-	-
155.	Pinaceae	*Pinus roxburghi* Sarg.	Salla	NC	T	+	+	-	-	-
156.	Piperaceae	*Piper longum* L.	Pipla	DPM306070	C	+	-	+	+	+
157.	Plantaginaceae	*Lindenbergia grandiflora* (Buch.-Ham. ex D. Don) Benth.	Bhede phul	DPP174070	H	+	+	+	+	+
158.	Plantaginaceae	*Plantago asiatica* subsp. *erosa* (Wall.) Z.Yu Li	Ishabgol	DPP31070	H	-	+	+	-	-
159.	Poaceae	*Aristida adscensionis* L.		DPM277070	H	+	+	+	-	-
160.	Poaceae	*Arundinella setosa* Trin.	Katara	NC	H	+	-	-	-	-
161.	Poaceae	*Brachiaria* sp.	Banso	NC	H	+	+	-	-	-
162.	Poaceae	*Chrysopogon aciculatus* (Retz.) Trin.		DPP127070	H	-	+	+	+	+
163.	Poaceae	*Chrysopogon fulvus* (Spreng.) Chiov.		DPM372070	H	-	+	+	+	-
164.	Poaceae	*Cymbopogon pendulus* (Nees. ex Steud) W.Watson		DPM331070	H	-	+	+	-	-
165.	Poaceae	*Cynodon dactylon* (L.) Pers.	Dubo	NC	H	+	+	-	-	-
166.	Poaceae	*Cyrtococcum patens* var. *latifolium* (Honda) Ohwl		DPP151070	H	+	+	+	+	+
167.	Poaceae	*Dendrocalamus hamiltonii* Nees & Arn. ex Munro	Bans	NC	H	+	-	-	-	-

168.	Poaceae	*Echinochloa colona* (L.) Link.		DPP1070	H	+	-	+	-	-
169.	Poaceae	*Imperata cylindrica* (L.) Raeusch.	Siru	NC	H	+	+	-	-	-
170.	Poaceae	*Microstegium ciliatum* (Trin) A. Camus		DPM361070	H	+	-	+	-	-
171.	Poaceae	*Oplismenus compositus* (L.) P. Beauv.		DPM280070	H	-	+	+	+	+
172.	Poaceae	*Pogonatherum crinitum* (Thunb.) Kunth	Musi khari	DPM332070	H	+	+	+	+	+
173.	Poaceae	*Setaria plicata* (Lam.) T. Cook		DPM264070	H	-	+	+	+	+
174.	Poaceae	*Sporobolus fertilis* (Steud.) Clayton		DPP156070	H	+	+	+	-	-
175.	Poaceae	*Themeda villosa* (Lam.) A. Camus		DPM282070	H	+	+	+	+	+
176.	Poaceae	*Thysanolaena latifolia* (Roxb. ex hornem.) Honda	Amriso	NC	H	+	+	-	-	-
177.	Polygonaceae	*Persicaria hydropiper* (L.) Delarbre	Pirre	DPP128070	H	+	+	+	+	-
178.	Polygonaceae	*Persicaria poiretii* (Meisn.) K.L. Wilson	Seto pirre	DPP130070	H	+	+	+	+	+
179.	Primulaceae	*Maesa chisia* Buch.-Ham. ex D. Don	Bilauni	DPM221070	S	+	+	+	+	+
180.	Ranunculaceae	*Clematis acuminata* DC.	Ransag	DPM346070	C	+	+	+	+	+
181.	Ranunculaceae	*Ranunculus* sp.	Samphu jhar	DPP17070	H	+	+	+	+	+
182.	Rhamnaceae	*Ziziphus mauritiana* Lam.	Bayar	DPP228070	T	+	+	+	+	-
183.	Rosaceae	*Agremonia pilosa* var. *nepalensis* (D. Don) Nakai	Ganthe jhar	DPP166070	H	+	+	+	-	-

184.	Rosaceae	*Duchesnea indica* (Andrews) Focke	Bhui kaphal	DPP36070	H	-	+	+	+	-
185.	Rosaceae	*Pyrus pashia* Buch.-Ham. ex D. Don	Mayal	NC	T	+	+	-	-	-
186.	Rosaceae	*Rubus ellipticus* Sm.	Ainselu	DPP255070	S	+	-	+	+	-
187.	Rubiaceae	*Hedyotis scandens* Roxb.	Pani lahara	DPP45070	C	+	+	-	+	-
188.	Rubiaceae	*Mussaenda macrophylla* Wall.	Dhobini	DPP56070	H	+	+	+	+	-
189.	Rubiaceae	*Oldenlandia lineata* (Roxb.) Kuntze	Charpate jhar	DPM3070	H	-	+	+	+	-
190.	Rutaceae	*Boenninghausenia albiflora* (Hook.) Rchb. ex Meisn.	Uruse jhar	DPM293070	H	+	-	+	+	+
191.	Rutaceae	*Murraya koenigii* (L.) Spreng.	Kadipatta	NC	S	+	-	-	-	-
192.	Santalaceae	*Osyris lanceolata* Hochst. & Steud.	Nundhiki	DPM403070	T	+	+	-	+	-
193.	Santalaceae	*Viscum album* L.	Hadchur	NC	S	+	-	-	-	-
194.	Sapindaceae	*Sapindus mukorossi* Gaertn.	Ritha	NC	T	+	+	-	-	-
195.	Sapotaceae	*Diploknema butyracea* (Roxb.) H.J. Lam	Chiuri	NC	T	+	+	-	-	-
196.	Smilacaceae	*Smilax ovalifolia* Roxb. ex D. Don	Kukurdaino	NC	C	+	+	-	-	-
197.	Solanaceae	*Datura metal* L.	Daturo	NC	H	+	-	-	-	-
198.	Solanaceae	*Solanum aculeatissimum* Jacq.	Jangali bihi	DPP37070	H	+	+	+	+	-
199.	Solanaceae	*Solanum donianum* Walp.	Goyala	DPM215070	T	+	-	+	+	+
200.	Solanaceae	*Solanum indicum* L.	Kanthakari	DPM241070	H	+	-	+	+	-
201.	Solanaceae	*Solanum nigrum* L.	Kalo bihi	DPM23070	H	+	+	+	-	-
202.	Symplocaceae	*Symplocos paniculata* (Thunb.) Miq.		DPP147070	S	-	+	+	+	+

203.	Theaceae	*Schima wallichi* (DC.) Korth.	Chilaune	DPM420070	T	+	+	+	+	+
204.	Urticaceae	*Boehmeria platyphylla* D. Don	Chalne sisno	DPM226070	S	+	-	+	+	+
205.	Urticaceae	*Boehmeria ternifolia* D. Don	Kamle	DPM225070	S	+	+	+	+	+
206.	Urticaceae	*Debregeasia longifolia* (Burm. f.) Wedd.	Jaki, Ghiti Lahara	DPM93070	H	+	-	+	+	+
207.	Urticaceae	*Gonostegia hirta* (Blume ex Hassk.) Miq.	Pani lahara	DPP4070	H	-	+	+	+	+
208.	Urticaceae	*Pilea scripta* (Buch.-Ham. ex D. Don) Wedd.	Chiple	DPM22070	H	+	-	+	+	-
209.	Vitaceae	*Cissus javana* DC.	Junkiri lahara	DPP65070	C	-	+	+	+	+
210.	Vitaceae	*Leea asiatica* (L.) Ridsdale	Galeni	DPM325070	S	-	+	+	-	-
211.	Vitaceae	*Tetrastigma* sp.	Pureni lahara	DPM28070	C	+	+	-	+	-
212.	Xanthorrhoeaceae	*Aloe vera* (L.) Burm. f.	Ghuikumari	NC	H	+	+	-	-	-
213.	Zingiberaceae	*Cautleya spicata* (Sm.) Baker	Jangali beshar	DPM44070	H	+	-	+	+	-
	Total					176	143	141	124	88

Note: JM- Joint managed forest (Barangdi-Kohal CF), WM- Women managed forest (Bansa-Gopal CF), NC- Not collected