Flora of community managed forests of Palpa district, western Nepal

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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 comitities. 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). Community 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 71 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 unidentified 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.

| 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.

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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 angustiflorus 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 javanifera L.                     | Bhakimlo         | NC                | T     | +  | +  | -    | -    | -   |
| 14.  | Anacardiaceae   | Spondias pinnata (L. f.) Kurz          | Amaro            | NC                | T     | +  | +  | -    | -    | -   |
| 15.  | Apiceae         | 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     | +  | +  | +    | +    | +   |
| No. | Family       | Scientific Name                  | Locality  | Collection No. | Indicator 1 | Indicator 2 | Indicator 3 | Indicator 4 | Indicator 5 | Indicator 6 |
|-----|--------------|----------------------------------|-----------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 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 | Sarpaghanha | DPM243070 | H           | +           | -           | +           | -           | -           |
| 22  | Araceae      | Arisaema concinnum Schott        | Kalo bikh | DPP76070      | H           | +           | +           | +           | +           |
| 23  | Araceae      | Arisaema tortuosum (Wall.) Schott | Sarpakomai | NC            | H           | +           | +           | -           | -           |
| 24  | Asparagaceae | Agave cantula Roxb.              | Ketuki    | H              | +           | -           | -           | -           | -           |
| 25  | Asparagaceae | Asparagus racemosus Wild.        | 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           | -           | +           | +           |

**Notes:** Please note that the table represents the biodiversity data of various plant species, including their scientific names, family, localities, collections, and indicators. The indicators likely refer to specific characteristics or measurements relevant to the study. The table is structured to allow for easy comparison and analysis of the data across different species and localities.
| No. | Family          | Genus and Species                                | Location | Collection | Habitat |
|-----|----------------|-------------------------------------------------|----------|------------|---------|
| 36  | Compositae     | Cyanthillium cinerum (L.) H. Rob.                | Jurjule jhar | DPP200070 | H       |
| 37  | Compositae     | Eriophorum prostratum (L.) L.                    | Bhuri jhar | DPP167070 | H       |
| 38  | Compositae     | Elephantopus scaber L.                           | Toriphul  | DPP8070    | H       |
| 39  | Compositae     | Emilia sonchifolia (L.) DC.                      | Chitang Jhar | DPP170070 | H       |
| 40  | Compositae     | Emilia sonchifolia var. multicaulis (Wall. ex DC.) C.B. Clarke | Gaithare  | DPP167070 | NC      |
| 41  | Compositae     | Emilia sonchifolia (L.) DC.                      | Chitang Jhar | DPP170070 | H       |
| 42  | Compositae     | Erigeron acer var. multicaulis (Walt. ex DC.) C.B. Clarke | Chitang Jhar | DPP170070 | NC      |
| 43  | Compositae     | Galinsoga parviflora Cav.                        | Chitang Jhar | DPP170070 | H       |
| 44  | Compositae     | Galinsoga parviflora Cav.                        | Chitang Jhar | DPP170070 | H       |
| 45  | Compositae     | Inula cappa (Buch.-Ham. ex. D. Don.) DC.         | Gaithare  | DPP167070 | S       |
| 46  | Compositae     | Pentanema indicum (L.) Ling.                     | Thu  | DPP140070 | H       |
| 47  | Compositae     | Pentanema indicum (L.) Ling.                     | Thu  | DPP140070 | H       |
| 48  | Compositae     | Pentanema indicum (L.) Ling.                     | Thu  | DPP140070 | H       |
| 49  | Compositae     | Pentanema indicum (L.) Ling.                     | Thu  | DPP140070 | H       |
| 50  | Compositae     | Sigesbeckia orientalis L.                        | Dabha Jhar | DPP150070 | H       |
| 51  | Compositae     | Sigesbeckia orientalis L.                        | Dabha Jhar | DPP150070 | H       |
| 52  | Compositae     | Sonchus asper (L.) Hill.                         | Bare Jhar | DPP150070 | H       |
| 53  | Compositae     | Synedrella nodiflora (L.) Gaertn.                | Chitro   | DPP150070 | NC      |
| 54  | Compositae     | Synedrella nodiflora (L.) Gaertn.                | Chitro   | DPP150070 | NC      |

**Legend:**
- H: Forest
- S: Shrubs
- T: Terrestrial
- NC: Not collected
| Page | Taxonomic Family | Species Name | Author(s) | Genotype Code | Other Notes |
|------|-----------------|--------------|-----------|---------------|-------------|
| 55.  | Convolvulaceae   | Argyrea hookeri | C.B. Clarke | Suntiki DPM393070 | C + |
| 56.  | Convolvulaceae   | Argyrea hookeri | C.B. Clarke | Suntiki DPM393070 | C + |
| 57.  | Convolvulaceae   | Cuscuta reflexa | Roxb. | Akash beli DPP308070 | C + + |
| 58.  | Convolvulaceae   | Cuscuta reflexa | Roxb. | Jayanti lahara DPM304070 | C + |
| 59.  | Convolvulaceae   | Evolvulus alsinoides | L. | DPP308070 H | - + |
| 60.  | Convolvulaceae   | Ipomoea quamoclit | L. | DPM304070 | - + |
| 61.  | Convolvulaceae   | Porana sp. | C.B. Clarke | DPM308070 H | - |
| 62.  | Cucurbitaceae    | Herpetospermum pedunculosum | (Ser.) C.B. Clarke | Kurkure kakro DPM56070 | C + |
| 63.  | Cucurbitaceae    | Mukia maderaspatana | (L.M.) | Bankakri DPM363070 | C + |
| 64.  | Cucurbitaceae    | Solena amplexicaulis | (Lam.) | Gokakri DPP43070 | C + |
| 65.  | Cucurbitaceae    | Trichosanthus rotundus | L. | Indrayani DPP125070 | H + |
| 66.  | Cucurbitaceae    | Trichosanthus rotundus | L. | Methe DPP132070 | H + |
| 67.  | Cucurbitaceae    | Trichosanthus rotundus | L. | DPP1317070 | H |
| 68.  | Cyperaceae       | Cyperus rotundus | L. | Mothe | + + + + |
| 69.  | Cyperaceae       | Solena amplexicaulis | (Lam.) | Mothe | + + + + |
| 70.  | Cyperaceae       | Solena amplexicaulis | (Lam.) | DPP198070 C | + + + + |
| 71.  | Cyperaceae       | Solena amplexicaulis | (Lam.) | DPP196070 C | + + |
| 72.  | Cyperaceae       | Solena amplexicaulis | (Lam.) | DPP206070 H | + + |

**Notes:**
- C: Cultivated
- NC: Naturalized
- H: Herbaceous
- T: Tree
| No. | Family          | Species                     | Subspecies           | Arandi | Khirro | Rati gedi | Borek | Mathupul | DPM212070 | DPM284070 | DPM302070 | DPM281070 | DPM280170 | DPM362070 | DPM355070 | DPM362070 | DPM362070 | DPM362070 | DPM362070 | DPM362070 | DPM362070 | DPM362070 | DPM362070 | DPM362070 | DPM362070 | DPM362070 | DPM362070 | DPM362070 | DPM362070 |
|-----|----------------|----------------------------|----------------------|--------|--------|----------|--------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 73  | Euphorbiaceae  | Ricinus communis (Royle) Benth. | Arandi               | NC     | NC     | C        | T      | H        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 74  | Euphorbiaceae  | Sapium insigne (Royle) Benth. |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 75  | Leguminosae    | Abrus precatorius L.         |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 76  | Leguminosae    | Aeschynomene indica L.       |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 77  | Leguminosae    | Alpinia officinarum (L.) Willd. |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 78  | Leguminosae    | Aviszus rugosus (Willd.) DC.  |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 79  | Leguminosae    | Bakeriana elongata L.        |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 80  | Leguminosae    | Cassia fistula (L.) Willd.    |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 81  | Leguminosae    | Chamaecrista mimosoides (L.) Greene |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 82  | Leguminosae    | Chamaecrista mimosoides (L.) Greene |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 83  | Leguminosae    | Chamaecrista mimosoides (L.) Greene |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 84  | Leguminosae    | Chamaecrista mimosoides (L.) Greene |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 85  | Leguminosae    | Chamaecrista mimosoides (L.) Greene |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 86  | Leguminosae    | Chamaecrista mimosoides (L.) Greene |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 87  | Leguminosae    | Chamaecrista mimosoides (L.) Greene |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 88  | Leguminosae    | Chamaecrista mimosoides (L.) Greene |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 89  | Leguminosae    | Chamaecrista mimosoides (L.) Greene |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 90  | Leguminosae    | Chamaecrista mimosoides (L.) Greene |          | +      | +      | +        | +      | +        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |

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| Specimen | Genus      | Species | Location | Season | Notes |
|----------|------------|---------|----------|--------|-------|
| DPP7076  | Flemingia  | strobilifera | L. | Jhar | + + + + + |
| DPP13076 | Indigofera | linifolia  | L.f. | DPM321070 | H + + |
| DPP130760 | Mimosa      | pudica    | Lam.  | Lajawati jhar | + + + + + |
| DPP354070 | Phaseolus  | sp.      | Basnite | Arali | C + + + + |
| DPP222070 | Senna      | tora     | L. Roxb. | Chakaudi | + + + + + |
| DPP352070 | Stylosanthes | hamata  | (L.) Taub. | Sandle | + + + |
| DPP20070 | Tamarindus | indica  | L. | Imili | T + |
| DPP13070 | Castanospermum | indica | L. | Katus | + + + + + |
| DPP12070 | Curculigo | orchioides | Gaertn. | Seldhoti | + + + + + |
| DPP357070 | Engelhardia | spicata | Lech. ex Lindl. | Mauwa | + + + + + |
| DPP356070 | Callicarpa | macrophylla | Vahl | Dhahi | + + + + + |
| DPP351070 | Clerodendrum | infortunatum | L. | Chudi | + + + |
| DPP392070 | Colebrookea | oppositifolia | Sm. | Khasreti | + + + + + |
| DPP354070 | Colebrookea | coloratum | D. Don | Jhuse til | + + + |
| DPP351070 | Colebrookea | coetsa | Buch.-Ham. ex D. Don | Ban bavari | + + + + + |
| DPP185070 | Plectranthus | sp. | Buch.-Ham. ex D. Don | Ghryu silam | + + + |
| DPP311070 | Pogostemon | sp. | Spreng. | Rudhilo | + + + + + |

*Sample jhar:
Flemingia strobilifera (L.) W.T. Aiton
Indigofera linifolia (L.f.) Retz.
Mimosa pudica Lam.
Phaseolus sp.
Senna tora (L.) Roxb.
Stylosanthes hamata (L.) Taub.
Tamarindus indica L.
Curculigo orchioides Gaertn.
Engelhardia spicata Lech. ex Lindl.
Callicarpa macrophylla Vahl
Clerodendrum infortunatum L.
Colebrookea oppositifolia Sm.
Colebrookea coloratum D. Don
Colebrookea coetsa Buch.-Ham. ex D. Don
Plectranthus sp.
Pogostemon sp.*
| No. | Family       | Species                          | Author(s)                      | Note |
|-----|--------------|----------------------------------|--------------------------------|------|
| 110. | Lamiaceae    | Premna barbata Wall. ex Schauer | Gidari DPM37070 NC            |      |
| 111. | Lamiaceae    | Scutellaria discolor Collbr.    | Dampate DPP178070 H           |      |
| 112. | Lamiaceae    | Scutellaria regens Buch.-Ham. ex D. Don | Charpate DPM364070 H |      |
| 113. | Lamiaceae    | Teucrium quadranarium Wall. ex Ham. ex D. Don | Kalo rudhilo DPM49070 H |      |
| 114. | Lamiaceae    | Teucrium scordium L. Benth.     | -                              |      |
| 115. | Lamiaceae    | Teucrium viscidum Blume         | Simli, Sewali DPM257070 NC    |      |
| 116. | Lamiaceae    | Vitex negundo L. Benth.         | Gidari DPP137070 H           |      |
| 117. | Lamiaceae    | Cinnamonum tamala (Buch.-Ham. ex Nees & Eberm.) | DPM268070 H |      |
| 118. | Lauraceae    | Litsea monopetala (Roxb.)      | Tepat DPM14070 NC            |      |
| 119. | Lauraceae    | Rehvaria indica Dumort.         | Payullee DPP145070 H         |      |
| 120. | Lauraceae    | Lindernia reticulata (Crem.)    | Kankare DPP157070 S          |      |
| 121. | Lythraceae   | Woodfordia fruticosa (L.) Kurz | Dhyarlo DPP145070 S          |      |
| 122. | Malvaceae    | Abelmoschus manihot (L.) Medik. | Ban kapas DPP158070 S        |      |
| 123. | Malvaceae    | Gossypium hirsutum L. Benth.    | Simal DPM434070 T            |      |
| 124. | Malvaceae    | Bombax ceiba L. J. Drumm. ex Benth. | Kapas DPP149070 S  |      |
| 125. | Malvaceae    | Grewia optiva J.R. Drumm. ex Benth. | Sano chilaya DPM402070 S |      |
| 126. | Malvaceae    | Sida acuta Burm. f.             | Ballu DPP193070 S            |      |
| 127. | Malvaceae    | Sida rhombifolia L.             | DPM303070 S                  |      |
| No. | Family                | Species                                      | Collector | Code     | Status | Notes  |
|-----|-----------------------|----------------------------------------------|-----------|----------|--------|--------|
| 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      | +      |
| No. | Family          | Species                          | Collection Site   | Code    | Length | Width | Height | Flowers | Fruits | Leaves | Notes     |
|-----|----------------|----------------------------------|-------------------|--------|--------|-------|--------|---------|--------|--------|-----------|
| 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.         | Bhu amala         | NC      | H      | +     | +      | -       | -      | -      |           |
| 155 | Pinaceae       | Pinus roxburghii Sarg.          | Salia             | NC      | T      | +     | +      | -       | -      | -      |           |
| 156 | Piperaceae     | Piper longum L.                 | Pipla             | DPM306070 | C      | +     | -      | +       | +      | +      |           |
| 157 | Plantaginaceae | Lindenbergia grandiflora       | Bhede phul        | DPP174070 | H      | +     | +      | +       | +      | +      |           |
| 158 | Plantaginaceae | Plantago asiatica subsp. erosa | 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      | +     | -     | -       | -      | -      |           |
| No. | Family         | Species and Synonyms                                                                 | Collection No. | Core | Core | Core | Core | Core |
|-----|----------------|--------------------------------------------------------------------------------------|----------------|------|------|------|------|------|
| 168 | Poaceae        | *Echinochloa colona* (L.) Link.                                                       | DPP1070        | H    | +    | -    | +    | -    |
| 169 | Poaceae        | *Imperata cylindrica* (L.) Rauesch.                                                   | 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     | 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         | H    | +    | +    | -    | -    |
| 177 | Polygonaceae   | *Persicaria hydropiper* (L.) Delarbre                                                 | DPP128070      | H    | +    | +    | +    | -    |
| 178 | Polygonaceae   | *Persicaria poireti* (Meisn.) K.L. Wilson                                            | DPP130070      | H    | +    | +    | +    | +    |
| 179 | Primulaceae    | *Maesa chisia* Buch.-Ham. ex D. Don                                                   | DPP221070      | S    | +    | +    | +    | +    |
| 180 | Convulcaceae   | *Clematis acuminata* DC.                                                              | DPP346070      | C    | +    | +    | +    | +    |
| 181 | Ranunculaceae  | *Ranunculus* sp.                                                                     | DPP17070       | H    | +    | +    | +    | +    |
| 182 | Rhamnaceae     | *Ziziphus mauritiana* Lam.                                                            | DPP228070      | T    | +    | +    | +    | -    |
| 183 | Rosaceae       | *Agremonia pilosa* var. nepalensis* (D. Don) Nakai                                   | DPP166070      | H    | +    | +    | -    | -    |
| No. | Family       | Species Name                                      | Location     | Code      | Habit  | B | C | T | S |
|-----|--------------|--------------------------------------------------|--------------|-----------|--------|---|---|---|---|
| 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 | Rosaceae     | *Hedyotis scandens* Roxb.                        | Pani lahara  | DPP45070  | C      | + | + | - | + |
| 188 | Rubiaceae    | *Mussaenda macrophylla* Wall.                    | Dhubini      | 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.                  | Kadi patta   | 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   | *Diplonema 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        | H      | + | + | + | + |
| No. | Family       | Species                                      | Location            | Code    | JM | WM | NC | Total |
|-----|--------------|----------------------------------------------|---------------------|--------|----|----|----|-------|
| 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, Ghti 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.                           | Puren ji 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