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## PLANT DIVERSITY OF WESTERN CHITWAN FLORISTIC APPROACH

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### Abstract

This paper identifies and documents the plant biodiversity of western Chitwan, Nepal.

Specifically, our attention was focussed on the plants of forests, grasslands and common lands based on our “Reciprocal Relation of Population and Environment Study Project” conducted during January-April 1996. This species-diversity of trees, shrubs and herbaceous flora was recorded from 117, 117, and 1049 sampling quadrats of  $10 \times 10$ ,  $3 \times 3$  and  $1 \times 1$  m<sup>2</sup>, respectively. The flora of our study plots contains 236 species that belong to 191 genera and 66 families. Of 236 species of plants, 119, 113, 59, 35 and 119 species were recorded from Tikauli forest, National Park forest, forests along the Narayani river, grasslands of National Park and common lands of the western Chitwan, respectively. Dicotyledons represent 184 (77.97%) species of the total flora species followed by monocotyledons (46 spp., 19.49%) and ferns (6 spp., 2.54%), respectively. The five largest families are Leguminosae (38 spp.), Poaceae (27 spp.), Asteraceae (22 spp.), Rubiaceae (10 spp.), and Scrophulariaceae (9 spp.). *Hedyotis*, *Grewia* and *Lindernia*, each with 4 spp., are the most speciose genera in the flora.

### Keywords

biodiversity; flora; species-list

### Introduction

In the Chitwan district of Nepal, there is a high flow of migrants from the neighboring hill districts of Nepal. The increasing population of this district is largely dependent on natural plant resources to provide resources such as fuel, fodder and timber. As a result of high pressure on the forests and common lands, a number of changes have occurred including deforestation and the conversion of natural habitats into man-engineered habitats such as cultivated fields, lawns, school grounds, road ways, canal ways, etc. Nepal's poor economic condition (42% below poverty line) and low literacy rate (39.6%) combined with the lack of environmental education and awareness, result in humans being a factor responsible for the reduction of biological resources and natural ecosystems. In due course, it will be no wonder to find some of the plant species already depleted, others dangerously near depletion from the area, and vast invasion of new weeds in both natural and man-made habitats. We do not have an exact account of the plant species present in this district. Under this circumstances it is important to understand what plant species are prevalent the Chitwan district and make aware the authorities and communities so that they can protect and preserve plant biodiversity and diversified habitats.

Plant species play a vital role in maintaining the ecological balance of nature, therefore systematic floristic inventory and ecological studies are of vital importance. Previous research on the flora of agricultural fields (Gupta et al, 1977; Dangol and Gurung, 1988; Dangol, 1990a and 1990b) and forest and grasslands in the Chitwan district (Lehmkuhl 1994; Dangol et al, 1995; Joshi and Jha, 1995). Keeping in mind the importance of ecological study to understanding the reciprocal relations between environment and population, we have gathered information on plant species, their population and cover values and other physiographic data from research plots in western Chitwan. In this paper, we present an inventory of plant species and analyze the floristic diversity in relation to different habitats of our research plots.

## Study Area

The portion of the Chitwan district under study lies in the southernmost part of the Narayani zone in central Nepal. It extends between  $83^{\circ}55'$  –  $85^{\circ}37'$  E longitude and  $27^{\circ}21'$  –  $27^{\circ}46'$  N latitude covering an area of about  $2510\text{ km}^2$  that is nearly 30% of the Narayani zone. Makawanpur district in the east, Nawalparasi and Tanahun districts in the west, Gorkha district in the north and the Someshwor range (Churia hill) in the south surround this district. The Mahabharat range and the Churia hills surround the entire land of this district, which is called Bhitri Madhesh (Dun Valley or Inner Terai). This district enjoys a subtropical climate with fertile soils suitable for growing a variety of plants including crops.

## Materials and Methods

In order to assess the floristic inventory of plants present in this area, 265 research (quadrat) plots representing forests (117), grasslands (10) and common lands (138) in the different locations in the district were identified (Map 1). The forests of present study are Tikauli jungle (Block A), Royal Chitwan National Park (Block B), and forests along the Narayani River (Block C). Block A is situated in the southern east boundary of the study site and extends between the East-West Highway in the north and the Rapti River in the south. Block B is the southern boundary of the study area. It expands between the Jarneli post in the east to the confluence of the Reu khola and the Rapti River in the west. Block C includes the forests that expand along the south edge of the Narayani River, from the East-West Highway to the confluence of the Narayani arid Rapti Rivers is the northwest boundary of the study area. This block includes Nagarban (4 sample plots); Jhanjhaneban (7 plots); Gobreni (also called Majhuwa) ban (5 plots); and Kalaban (5 plots) were selected. The grassland plots were located between the Dhruba post and Sukhibar post of the Royal Chitwan National Park (Block B). The common lands refer to the lands used for common purposes of the residents of the western Chitwan. These represent different land use categories such as plantation areas, flood affected areas, common grazing lands, Baradavar/Tikauli grazing and grass cutting areas, School grounds and airport areas, Pokhari (ponds) and Ghole (marshy land) areas, roadways, and canal ways.

For the present study, three types of sampling units (quadrats) were used: (a);  $10 \times 10\text{ m}^2$  for trees and woody climbers, (b)  $3 \times 3\text{ m}^2$  for shrubs and saplings of the trees, and (c)  $1 \times 1\text{ m}^2$  for herbs and seedlings of trees and shrubs. Five  $1\text{ m}^2$  quadrats were positioned in each of the largest quadrat ( $10 \times 10\text{ m}^2$ ) in forests and grasslands and three  $1\text{ m}^2$  quadrats in each  $10 \times 10\text{ m}^2$  or  $1 \times 25\text{ m}^2$  sampling plot in the common lands. The sampling plot  $1 \times 25\text{ m}^2$  was determined for the canal ways and roadways. The plot size was  $10 \times 10\text{ m}^2$ . Frequencies of sampling quadrats in the particular study areas are given below (Table 1). Detail procedure for making sampling plots has been described by Chhetri (1996), and Richter and Chhetri (1997).

## Plant identification

The plant specimens were identified with the help of illustrated manuals and flora books. The identification was further conformed matching with the herbarium specimens in National Herbarium and Plant Laboratories of the Department of Plant Resources, Godawari. Some specimens are identified by local names only. All the voucher specimens collected during the present study are housed in the Herbarium of the Department of Agricultural Botany, Institute of Agriculture and Animal Science, Rampur, Chitwan, Nepal.

## Result and Discussion

### Species-diversity

Our species-list enumerates 236 plant species belonging to 66 families and 191 genera (Appendix I). This indicates the richness of the floristic diversity within the research plots. These species comprise 184 Dicotyledons (77.97%), 46 Monocotyledons (19.49%) and 6 fern and their allies (2.54%) (Table 2) The Leguminosae (34 spp.), Poaceae (26 spp.) and Asteraceae (21 spp.) are the most prevalent families in floristic composition (Table 3), in terms of numbers of species and genera. Those families are followed by the Acanthaceae, Labiate, Rubiaceae Scrophulariaceae, Euphorbiaceae, Cyperaceae and Verbenaceae. The rest of the families contain less than 5 species.

The genera with more than 2 species are listed in Table 4. *Hedyotis*, *Grewia* and *Lindernia* (4 spp. each) are the largest genera, followed by *Cassia*, *Crotalaria*, *Desmodium*, *Dioscorea*, and *Terminalia*, each represented by 3 species.

The frequency distribution of species per genus, genera per family and species per family is given in Figure 1. One hundred and sixty (83.77%) genera contain 1 species each, followed by 23 genera with 2 species each. Similarly, 29 families have 1 species each, 15 with 2 species each and 11 with 3 species each. Eleven (16.66%) families include species ranged from 4–38, representing 61.02% of the flora. Two families contain the highest number of genera (23 spp each). The majority of the families (35 spp., 53%) each represents a single species followed by 16 families with 2 species each.

### Common and unique species

An analysis of the composition of flora in respect to the study plots shows that Tikauli forest and the National Park forest share the highest number (69 spp.) of common species, whereas grassland (BL) and forest C have the least common species (Table 5). The above data indicate that the forests of the National Park and Tikauli are floristically more similar to each other than other blocks. Block A contributes the highest unique species (99 species) and the least unique species by the GL (only 15 species). The common land plants common to the Forest A, Forest B, Forest C, and GL amount to 49, 36, 31, and 21, respectively. The occurrence of a higher number of common land plants in the Tikauli forest indicates a higher anthropogenic impact on the environment of this forest. The species common in these two blocks (A and CL) include *Cassia tora*, *Echinochloa colona*, *Eleusine indica*, *Euphorbia hirta*, *Evolvulus nummularius*, *Hedyotis corymbosa*, *Hedyoia diffusa*, *Hyptis suaveolens*, *Ludwigia perennis*, *Polygonum plebeium*, *Rotala indica*, *Scoparia dublcis*, *Setaria pallid-fusca*, *Vicia terasperma* and *Xanthium strumarium*. The species mentioned above were also reported from highly disturbed part of Tikauli forest (located in the eastern side of the East-West Highway), rice fields, summer and winter crop fields (Dangol et al., 1995; Dangol et al., 1986 and 1988; Dangol, 1990a, 1990b, and 1991; Dangol and Baral, 1986; Gupta et al., 1977).

## Major taxa in different blocks

The top families in terms of the occurrence of the number of species are depicted in Table 6. In Blocks A and B, the top most rank of the families is occupied by the Leguminosae followed by Poaceae in Block A and Asteraceae in Block B. The Poaceae is the largest family in Block C and Block CL, whereas the Asteraceae is the top family in Block GL. These largest families account for 52.10%, 49.55%, 55.93%, 57.14%, and 50.42% of the total flora in Block A, B, C, GL and CL respectively. These data indicates that the majority of the species (i.e. 50 or more than 50% of the flora) is contributed by top five families.

### Trees of the forests

*Shorea robusta* and *Terminalia alata* are the major trees found in the Tikauli forest. It is interesting to note that the *S. robusta* trees are higher in the exterior part compared with middle and interior parts of the Tikauli forest. This is possibly because they share their habitat with other tree species like *Cleistocalyx operculatus*, *T. alata*, and Lahare pipal. Also, it may be due to the ease of felling trees in this area compared to the exterior and middle parts where forest guards are more likely to be patrolling. In the exterior part of the National Park forest, *Trewia nudiflora* and *Bombax ceiba* are the major components of the forest forming the *Trewia-Bombax* tree community. *S. robusta* and *C. operculatus* are the two major trees in the interior plots and are accompanied by *Dillenia pentagyna*, and *Lagerstroemia parviflora*. The species such as *T. nudiflora*, *B. ceiba*, *Litsea monopetala*, and *Mallotus philippensis* showed a decreasing pattern of plant population from exterior to interior sites in the National Park. In the forests along the Narayani river, *Dalbergia sissoo* is the main tree in the study plots, except in Kalaban, which is a natural forest on an island in the Narayani river. Other trees recorded in Kalaban only are *B. ceiba*, *T. nudiflora*, and *Ehretia laevis*.

### Shrubs and saplings of the forests

Among the six shrubs, the most common species are *Clerodendrum viscosum*, *Pogostemon benghalensis*, *Colebrookea oppositifolia*, *Eupatorium odoratum*, *Grewia sapida*, *Helicteres isora* and *Callicarpa macrophylla*. are found to be higher in the exterior plots of the Block A. In the National Park forest (Block B), *G. sapida* and *H. isora* prefer the interior habitats whereas *C. macrophylla*, *C. viscosum*, and *P. benghalensis* are abundant in the exterior plots of the forest. However the major shrubs in the forest along the Narayani river are comprised of *P. benghalensis*, *C. oppositifolia*, *C. viscosum*, *Melastoma malabathricum*, *Murraya koenigii*, and *Coffea benghalensis*. is one of the successful plants in the sissoo plantation areas. It has also been reported as a weed found in pineapple orchards in Rampur (Dangol and Baral, 1986). The saplings of *S. robusta* were recorded from Block A and Block B, but found less abundantly in the interior plots of Block A. The saplings of *S. robusta* tree were found five times more in the interior parts compared to the exterior part of Block B. The saplings of *Swida oblonga*, *C. operculatus* and *T. alata* were In an Increasing order from the exterior to the middle to interior Block A. Some saplings of trees such as *D. sissoo*, *Myrsine* sp. (Damaikath), *Premna integrifolia*, etc. were also observed in Block C.

### Herbaceous flora and seedlings of the forests

*S. robusta* seedlings occur as one of the dominant species in the Block A and Block B. The chance of *S. robusta* seedlings growing into a tee is less in Block A because the habitats are frequently disturbed by human activities such as grazing animals, collecting fuel-wood, and forest firing. *C. viscosum* seedlings are also recorded in Block A. Tall grasses are the major species in the ground flora of the forest and grasslands. The three species dominating the grasslands are *Imperata cylindrica*, *Saccharum spontaneum*, *Saccharum benghalense* and *Themeda arundinacea*. *Blumeopsis flava* is one of the dominant herbs in Block A, whereas

*Rungia parviflora*, *Oxalis corniculata*, *Ageratum houstonianum*), *Commelina benghalensis* and *Blumea* spp (Mulapate) are the major species in Block C.

### Herbaceous flora of the common lands

In the study area, grasses are the major species that constitute the plant communities in the common lands. Among grasses, *I. cylindrica* is a major species in plantation areas, common grazing areas, Pokhari/Ghole areas and canal ways. It prefers mostly plantation areas with less disturbance but poor soils. It has also been reported as one of the dominant weeds in pineapple orchards in Chitwan. (Dangol and Baral, 1986) *S. spontaneum* is the most important species of the floodplain areas. Other common grass species in the common lands include *Cynodon dactylon* and *Chrysopogon aciculatus*, the latter can tolerate very adverse situations like frequent trampling or cutting because it is prostrate in its vegetative stage. Also, its fruits are dispersed very easily by agents such as man, sheep, etc. The most frequently recorded dicot species are *Desmodium triflorum*, *R. parviflora*, *O. corniculata* and *Evolulus nummularius*. They are prostrate in habit, protecting them from grazing and cutting. The other dicot species represented less frequently include *Medicago lupulina*, *Launaea aspleniiifolia*, *Lippia nodiflora*, *Rotala indica*, *Hydrocotyle sibthorpioides*, *Centella asiatica* and *A. houstonianum*. Among them, *A. houstonianum* is claimed by farmers to be a poisonous to their livestock. In the habitats, which are frequently disturbed by nature i.e., floods or human activities like firing, grazing, felling, or construction, perennial species tend to replace the annuals. For example, in the floodplain areas, we observed only a few annuals, but many strong perennial plants like *S. spontaneum* (which sends long runners) and *Equisetum debile* (with deep rhizomes and roots to draw water and minerals from deep zone of soil).

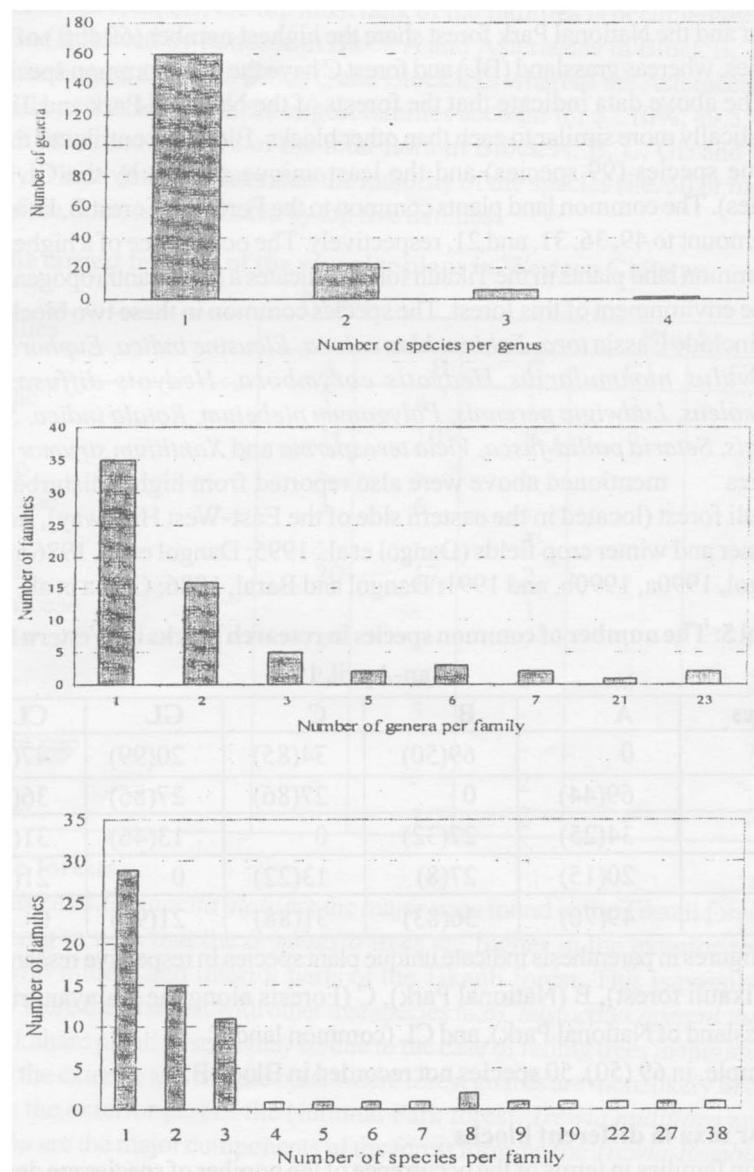
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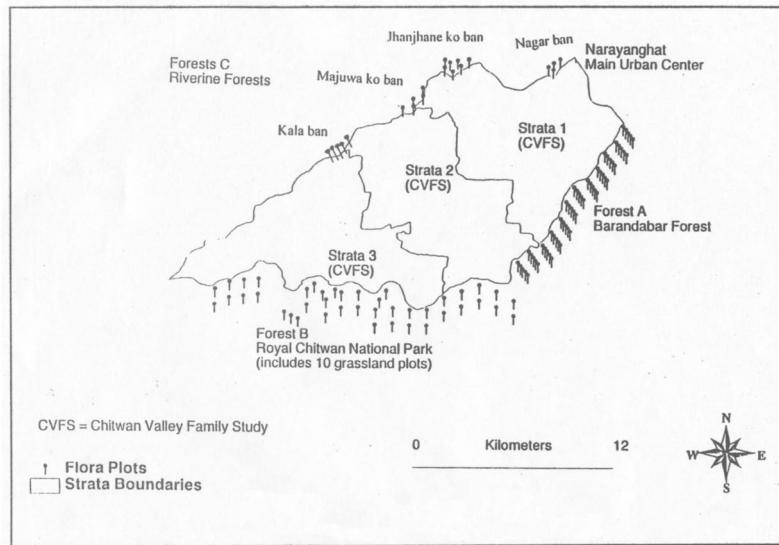
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**Figure 1.**



**Map 1.**  
Flora Plots Locations in Western Chitwan, Nepal

**Table 1**

Size and number of quadrats studied in different research sites in west Chitwan, Nepal.

Research Site	Quadrat Size		
	<b>10 × 10m<sup>2</sup></b>	<b>3 × 3m<sup>2</sup></b>	<b>1 × 1m<sup>2</sup></b>
Tikauli forest	62	62	310
National Park forest	34	34	170
National Park grassland	10	-	50
Forest along Naryani river	21	21	105
Common lands	138	-	414
<b>Total</b>	<b>265</b>	<b>117</b>	<b>1049</b>

**Table 2**

Summary of the composition of the vascular plant of western Chitwan

Texa	Families	Genera	Species
Ferns and fern allies	5	6	6
Dicotyledons	51	147	184
Monocotyledons	10	38	46
<b>Total</b>	<b>66</b>	<b>191</b>	<b>236</b>

**Table 3**

Families with the largest number of genera and species in the vascular of western Chitwan

Families	Genera	Species
Leguminosae	23	38
Poaceae	23	27
Asteraceae	21	23
Acanthaceae	7	8
Labiatae	7	7
Rubiaceae	6	10
Scrophulariaceae	6	9
Euphorbiaceae	6	8
Cyperaceae	5	6
Verbenaceae	5	5

**Table 4**

Genera with the largest number of species in the vascular plant of Western Chitwan

Genera	Species
Hedyotis (Rubiaceae)	4
Lindernia (Scrophulariaceae)	4
Cassia (Leguminosae)	3
Crotalaria (Leguminosae)	3
Desmodium (Leguminosae)	3
Dioscorea (Dioscoreaceae)	3
Grewia (Tiliaceae)	3
Terminalia (Combretaceae)	3
Acacia (Leguminosae)	2
Ageratum (Asteraceae)	2
Bauhinia (Leguminosae)	2
Commelina (Commelinaceae)	2
Cyperus (Cyperaceae)	2
Dalbergia (Leguminosae)	2
Digitaria (Poaceae)	2
Eragrostis (Poaceae)	2
Euphorbia (Euphorbiaceae)	2
Flemingia (Leguminosae)	2
Justicia (Acanthaceae)	2
Leea (Leeaceae)	2
Litsea (Lauraceae)	2
Myrsine (Myrsinaceae)	2
Paspalum (Poaceae)	2
Phyllanthus (Euphorbiaceae)	2
Polygonum (Polygonaceae)	2
Rotala (Lythraceae)	2
Solanum (Solanaceae)	2
Uraria (Leguminosae)	2
Vicia (Leguminosae)	2
Xeromphis (Rubiaceae)	2
Zizyphus (Rhamnaceae)	2

The number of common species in research blocks in Western Chitwan, Jan-April, 1996

**Table 5**

Sites	A	B	C	GL	CL
<b>A</b>	0	69(50)	34(85)	20(99)	47(70)
<b>B</b>	69(44)	0	27(86)	27(86)	36(77)
<b>C</b>	34(25)	27(32)	0	13(46)	31(28)
<b>GL</b>	20(15)	27(8)	13(22)	0	21(14)
<b>CL</b>	49(70)	36(83)	31(88)	21(98)	0

The figures in parenthesis indicate unique plant species in respective research blocks A (Tikauli forest), B (National Park), C (Forests along the Narayani river), GL (Grassland of National Park), and CL (common land). Example, in **69** (50), 50 species not recorded in Block B.

**Table 6**

The largest families of the vascular plants in Western Chitwan, Nepal.

Top Families	Blocks				
	A	B	C	GL	CL
Acanthaceae	3	4	3	3	4
Asteraceae	11	10	8	9	14
Cyperaceae	-	-	-	-	6
Euphorbiaceae	3	6	-	-	4
Labiatae	-	-	3	-	-
Leguminosae	20	17	2	-	-
Menispermaceae	-	-	3	-	-
Myrsinaceae	3	-	-	-	-
Poaceae	16	10	9	6	23
Rubiaceae	6	5	-	-	4
Scrophulariaceae	-	-	-	2	7
Solanaceae	-	-	2	-	-
Verbenaceae	-	4	2	-	-

## Appendix I

Species-list of the plants of western Chitwan, Nepal, January-April, 1996 Blocks: A (Tikauli forest), B (National Park), C (Forests along the Narayani river), GL (Grassland of National Park), and CL (common land). (x= presence in a particular research block)

Family names	Botanical names	Local names				A	B	C	GL	CL
Acanthaceae	<i>Barleria cristata</i> L.	Kuro	x	x					x	
Acanthaceae	<i>Hemigraphis hirta</i> (Vahl) T. Anders.		x	x						
Acanthaceae	<i>Hygrophila polysperma</i> (Roxb.) T. Anders.								x	
Acanthaceae	<i>Justicia quinqueangularis</i> Koenig ex Roxb.								x	
Acanthaceae	<i>Justicia</i> sp.	Bisaune jhar	x							
Acanthaceae	<i>Lepidagathis incurva</i> Buch.-Ham ex D. Don	Bankuro	x							
Acanthaceae	<i>Nelsonia canescens</i> (Lam.) Spreng.		x							
Acanthaceae	<i>Rungia parviflora</i> (Retz.) Nees	Saraudi	x	x	x				x	
Amaranthaceae	<i>Achyranthes aspera</i> L.	Daiwan	x	x	x				x	
Amaranthaceae	<i>Alternanthera sessilis</i> (L.) DC.	Bhringi jhar							x	
Anacardiaceae	<i>Buchanania latifolia</i> Roxb.	Bhalayo	x							
Apiaceae	<i>Centella asiatica</i> (L.) Urb.	Ghodtare	x	x	x				x	
Apiaceae	<i>Hydrocotyle sibthorpioides</i> Lam.	Sano ghodtare	x	x	x				x	
Apiaceae	<i>Oenanthe javanica</i> (Blume) DC.		x						x	
Apocynaceae	<i>Holarthaea pubescens</i> (Buch.-Ham.) Wall. ex G. Don	Dudhkhiro	x	x						
Apocynaceae	<i>Trachelospermum laevidum</i> (D. Don) K. Schum.	Salikal		x						
Apocynaceae	<i>Vallaris solanacea</i> (Roth) Kunze	Dudhe lahara	x	x						
Araceae	<i>Pistia stratiotes</i> L.	Bankovi							x	
Arecales	<i>Phoenix humilis</i> Royle ex Baccari.	Dhotipate/Thakal	x	x						
Asclepiadaceae	<i>Calotropis gigantea</i> (L.) Dryand	Aank							x	
Asclepiadaceae	<i>Gongronema nepalense</i> (Wall.) Deene								x	
Aspidiaceae	<i>Tectaria macrodonta</i> (Fee) C. Chr.	Kali neuro	x							
Aspidiaceae	<i>Thelypteris auriculata</i> (J. Smith) Iwatsuki	Bishkoche	x	x	x	x			x	
Asteraceae	<i>Ageratum conyzoides</i> L.	Gandhe (Seto)		x					x	
Asteraceae	<i>Ageratum houstonianum</i> Mill.	Gandhe (Nilo)	x	x	x	x			x	
Asteraceae	<i>Artemisia dubia</i> Wall. ex Besser	Titerpati							x	

Family names	Botanical names	Local names			A	B	C	GL	CL
Asteraceae	<i>Bidens pilosa</i> L.	Kalo kuro						x	x
Asteraceae	<i>Blumea laciniata</i> DC.	Thulo mulapate	x	x	x	x	x	x	x
Asteraceae	<i>Blumea</i> sp.	Thulo mulapate							
Asteraceae	<i>Blumeopsis flava</i> (DC.) Gagnep.	Toriganda	x	x					
Asteraceae	<i>Caesulia axillaris</i> Roxb.	Thuk jhar					x		
Asteraceae	<i>Cirsium arvense</i> (L.) Scop.	Gainda kande	x	x			x		
Asteraceae	<i>Conyza leucantha</i> (D. Don) Ludlow & Raven	Mulapate		x					
Asteraceae	<i>Eclipta prostrata</i> (L.) L.	Bhingraj	x	x			x		
Asteraceae	<i>Elephantopus scaber</i> L.	Thinko	x	x					
Asteraceae	<i>Emilia sonchifolia</i> (L.) DC.	Mulapate					x		
Asteraceae	<i>Eupatorium odoratum</i> L.	Bannara	x	x					
Asteraceae	<i>Gnaphalium purpureum</i> L.	Boki jhar					x		
Asteraceae	<i>Inula rubricaulis</i> (DC.) C. B. Clarke.	Kan pate	x	x					
Asteraceae	<i>Ixeris polyccephala</i> Cass.	Dudhe jhar		x			x		
Asteraceae	<i>Launaea asplenifolia</i> (Willd.) Hook. f.	Sano mulapate	x	x	x	x	x		
Asteraceae	<i>Spilanthes uliginosa</i> Swarts	Marethi					x		
Asteraceae	<i>Synedrella nodiflora</i> Gaertn.	Pahenle jhar		x					
Asteraceae	<i>Tridax procumbens</i> L.	Putai jhar					x		
Asteraceae	<i>Vernonia cinerea</i> (L.) Less.	Jhurihure	x	x	x	x	x		
Asteraceae	<i>Xanthium strumarium</i> L.	Bhende kuro	x				x		
Barringtoniaceae	<i>Careya arborea</i> Roxb.	Kumbhi	x						
Bombacaceae	<i>Bombax ceiba</i> L.	Simal		x	x	x			
Boraginaceae	<i>Heliotropium striosum</i> Willd.	Hanthi sunde					x		
Boraginaceae	<i>Trichodesma indicum</i> (L.) R. Br.	Gerguj			x				
Burseraceae	<i>Garuga pinnata</i> Roxb.	Dababde	x	x					
Campanulaceae	<i>Campanula pallida</i> Wall.	Ghante jhar				x			
Chenopodiaceae	<i>Chenopodium album</i> L.	Beth					x		
Combretaceae	<i>Terminalia alata</i> Heyne ex Roth	Saj	x	x					
Combretaceae	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Barro	x	x					

Family names	Botanical names	Local names			A	B	C	GL	CL
Combretaceae	<i>Terminalia chebula</i> Retz.	Harr-o		x					
Commelinaceae	<i>Commelinina benghalensis</i> L.	Bankane/Jangali kane	x	x	x	x	x		
Commelinaceae	<i>Commelinina sp.</i>	Jangali kane					x		
Convolvulaceae	<i>Evolvulus nummularius</i> (L.) L.	Badampate jhar	x				x		
Cordiaceae	<i>Ehretia laevis</i> Roxb.	Dhaturung	x	x	x				
Cornaceae	<i>Swida oblonga</i> (Wall.) Soják	Latitath	x	x					
Cucurbitaceae	<i>Momordica charantia</i> L.	Ban'kareli	x						
Cucurbitaceae	<i>Solena heterophylla</i> Lour.	Golkankari	x	x					
Cyperaceae	<i>Cyperus iria</i> L.	Chhate mothe					x		
Cyperaceae	<i>Cyperus</i> sp.	Mothe	x	x	x	x	x	x	
Cyperaceae	<i>Eleocharis pellucida</i> Presl	Jwane jhar					x		
Cyperaceae	<i>Kyllinga brevifolia</i> Rottb.	Dalle mothe					x		
Cyperaceae	<i>Pycrus flavidus</i> (Retz.) T. Koyama	Chiure mothe					x		
Cyperaceae	<i>Schoenoplectus juncoides</i> (Roxb.) Palla	Suire jhar					x		
Dilleniaceae	<i>Dillenia pentagyna</i> Roxb.	Tantari	x	x					
Dioscoreaceae	<i>Dioscorea bulbifera</i> L.	Ban tarul	x	x					
Dioscoreaceae	<i>Dioscorea deltoidea</i> Wall. ex Griseb.	Ban tarul	x	x	x				
Dioscoreaceae	<i>Dioscorea hamiltonii</i> Hook. f.	Ban tarul	x						
Dipterocarpaceae	<i>Shorea robusta</i> Gaertn.	Sal	x	x					
Equisetaceae	<i>Equisetum debile</i> Roxb. ex Vaucher	Hadjorni/Aankhle jhar	x	x	x	x	x		
Euphorbiaceae	<i>Antidesma acidum</i> Retz.	Archal	x	x					
Euphorbiaceae	<i>Bridelia retusa</i> (L.) Spreng.	Gayo/Lahare gayo		x					
Euphorbiaceae	<i>Euphorbia hirta</i> L.	Dudne jhar	x				x		
Euphorbiaceae	<i>Euphorbia parviflora</i> L.	Sando dudne jhar					x		
Euphorbiaceae	<i>Mallotus philippensis</i> (Lam.) Muell -Arg.	Sindure				x			
Euphorbiaceae	<i>Phyllanthus emblica</i> L.	Amala			x				
Euphorbiaceae	<i>Phyllanthus urinaria</i> L.	Bhuiamala	x	x			x		
Euphorbiaceae	<i>Trewia nudiflora</i> L.	Vellar		x	x	x	x		
Gentianaceae	<i>Canscora decussata</i> (Roxb.) Schult & Schult.f.	Seto phule jhar	x						

Family names	Botanical names	Local names			A	B	C	GL	CL
Labiateae	<i>Acrocephalus indicus</i> (Burm. f.) Kunze	Lerui jhangi (D)	x						
Labiateae	<i>Colerocea oppositifolia</i> Sm.	Dhurseli	x	x					
Labiateae	<i>Hyptis suaveolens</i> (L.) Poit.	Jangali silam	x			x			
Labiateae	<i>Leucas plukenetii</i> (Roth) Spreng.	Gumpate				x			
Labiateae	<i>Ocimum basilicum</i> L.	Babari	x			x			
Labiateae	<i>Pogostemon benghalensis</i> (Burm.f.) Kunze	Rudilo	x	x		x			
Labiateae	<i>Rhabdosia ternifolia</i> (D. Don) Harai	Bhimsenpati jhar	x						
Lauraceae	<i>Litsea chartacea</i> (Wall. ex Nees) Hook. f.		x						
Lauraceae	<i>Litsea monopetala</i> (Roxb.) Pers.	Kumiro	x	x	x	x			
Leeaceae	<i>Leea crispia</i> van Royen ex L.	Guite Padiin/Paddari	x	x					
Leeaceae	<i>Leea macrophylla</i> Roxb. ex Hornem.	Galeini	x	x					
Leguminosae	<i>Acacia catechu</i> (L.f.) Willd.	Khayer	x						
Leguminosae	<i>Acacia pennata</i> (L.) Willd.	Ararkanda	x	x					
Leguminosae	<i>Atylosia scarabaeoides</i> (L.) Benth.	Bangahat	x						
Leguminosae	<i>Bauhinia malabarica</i> Roxb.	Amili	x						
Leguminosae	<i>Bauhinia vahlii</i> Wight & Arn.	Bhorla	x						
Leguminosae	<i>Butea monosperma</i> (Lam.) Kunze	Palans	x						
Leguminosae	<i>Caesalpinia bonduc</i> (L.) Roxb.	Bhaise kanda	x						
Leguminosae	<i>Cassia fistula</i> L.	Rajbirikhya	x						
Leguminosae	<i>Cassia occidentalis</i> L.	Bhaise tapre				x			
Leguminosae	<i>Cassia tora</i> L.	Tapre jhar	x			x			
Leguminosae	<i>Codariocalyx motorius</i> (Houttyn) Ohashi		x						
Leguminosae	<i>Crotalaria prostrata</i> Rottb. ex Willd	Chhinchhine bajra	x		x	x			
Leguminosae	<i>Crotalaria sessiliflora</i> L.	Chhinchhine bajra	x						
Leguminosae	<i>Crotalaria sessiliflora</i> Roxb.	Boksi ghanger	x	x					
Leguminosae	<i>Crotalaria sp.</i>	Chhippi				x			
Leguminosae	<i>Dalbergia latifolia</i> Roxb.	Satisal	x	x					
Leguminosae	<i>Dalbergia sissoo</i> Roxb ex DC.	Sisau		x					
Leguminosae	<i>Derris</i> sp.	Derri		x					

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Leguminosae	<i>Desmodium gangeticum</i> (L.) DC.	Bhattamasejhar	x	x					
Leguminosae	<i>Desmodium oojeinense</i> (Roxb.) Ohashi	Sandan	x						
Leguminosae	<i>Desmodium</i> sp.	Sal jhabra	x	x					
Leguminosae	<i>Desmodium triflorum</i> (L.) DC.	Chariamilki mausi	x	x	x	x			
Leguminosae	<i>Flemmingia macrophylla</i> (Willd.) Merr.	Bhattamasi/Tinpaté ghansx	x	x					
Leguminosae	<i>Flemmingia strobilifera</i> (L.) Ait.	Bhatmas jhar	x						
Leguminosae	<i>Indigofera pulchella</i> Roxb.	Sagino	x						
Leguminosae	<i>Lens culinaris</i> Medik.	Musuro			x				
Leguminosae	<i>Medicago lupulina</i> L.	Jhuppe pyauli	x						
Leguminosae	<i>Milletia extensa</i> (Benth.) Baker	Gaujo	x	x					
Leguminosae	<i>Mimosa pudica</i> L.	Lajabati			x				
Leguminosae	<i>Phaseolus mungo</i> L.	Ban masyang	x	x					
Leguminosae	<i>Phyllodium pulchellum</i> (L.) Desv	Kanni jhangi	x						
Leguminosae	<i>Smithia ciliata</i> Royle	Lajane jhar			x				
Leguminosae	<i>Spatholobus parviflorus</i> (Roxb.) Kunze	Madane/Debre lahara	x	x					
Leguminosae	<i>Tadehagi triquetrum</i> (L.) Ohasi	Jhunka lahabra	x						
Leguminosae	<i>Utraria lagopodioides</i> (L.) Desv.		x						
Leguminosae	<i>Utraria lagopus</i> DC.	Nilo tanki	x						
Leguminosae	<i>Vicia angustifolia</i> L.	Kudikosa			x				
Leguminosae	<i>Vicia tetrasperma</i> Moench.	Aankura	x		x				
Liliaceae	<i>Asparagus racemosus</i> Willd.	kurilo	x						
Liliaceae	<i>Chlorophytum nepalense</i> (Lindl.) Baker	Pyije	x						
Liliaceae	<i>Smilax ovalifolia</i> Roxb. ex Don	Kukur daino	x	x					
Lythraceae	<i>Lagerstroemia parviflora</i> Roxb.	Boddairo	x	x					
Lythraceae	<i>Rotala indica</i> (Willd.) Koehne	Belauti jhar	x		x				
Lythraceae	<i>Rotala rotundifolia</i> (Buch -Ham. ex Roxb.) Koehne	Amhapate jhar							x
Malvaceae	<i>Sida rhombifolia</i> L.	Balu	x	x					
Malvaceae	<i>Urena lobata</i> L.	Balu/Chhipi	x	x	x				
Marsileaceae	<i>Marsilea crenata</i> Presl	Charpate jhar						x	

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Melastomataceae	<i>Melastoma melathricum</i> L.	Angeri		x					
Meliaceae	<i>Melia azedarach</i> L.	Bakkaino		x			x		x
Menispermaceae	<i>Cissampelos pareira</i> L.	Baulpate	x	x	x				
Menispermaceae	<i>Stephania elegans</i> Hook. f. & Thoms.	Baulpate		x	x	x			x
Menispermaceae	<i>Tinospora sinensis</i> (Lour.) Merr.	Guddargano			x				
Myrsinaceae	<i>Maesa chisua</i> Buch.-Ham ex D. Don	Bilane	x	x					
Myrsinaceae	<i>Myrsine semiseriata</i> Wall.	Kalikath (Karatua)	x		x				
Myrsinaceae	<i>Myrsine</i> sp.	Damai kath	x	x	x				
Myrtaceae	<i>Cleistocalyx operculatus</i> (Roxb.) Merr. & Perry	Kyamun	x	x	x				
Myrtaceae	<i>Syzygium cumini</i> (L.) Skeels	Jamun	x	x			x		x
Onagraceae	<i>Ludwigia perennis</i> L.	Lwang jhar	x				x		x
Ophioglossaceae	<i>Ophioglossum petiolatum</i> Hook.	Jibres sag	x	x					
Oxalidaceae	<i>Oxalis corniculata</i> L.	Chariamili	x	x	x		x		x
Piperaceae	<i>Piper longum</i> L.	Pipla	x				x		
Poaceae	<i>Axonopus compressus</i> (Swartz) Beauvois	Makai banso/Thulo bano							x
Poaceae	<i>Brachiaria</i> spp.	Banso	x	x	x		x		x
Poaceae	<i>Chrysopogon aciculatus</i> (Retz.) Trin.	Kuro ghans	x		x		x		x
Poaceae	<i>Cynodon dactylon</i> (L.) Pers.	Dubo	x	x	x		x		x
Poaceae	<i>Desmostachya bipinnata</i> (L.) Stapf	Kush	x	x	x		x		x
Poaceae	<i>Dichanthium annulatum</i> (Forssk.) Stapf	Jhusse ankhe jhar					x		
Poaceae	<i>Digitaria ciliaris</i> (Retz.) Koeler	Chitre banso	x		x				
Poaceae	<i>Digitaria</i> spp.	Chitre banso					x		
Poaceae	<i>Echinochloa colona</i> (L.) Link	Sama ghans	x				x		x
Poaceae	<i>Eleusine indica</i> (L.) Gaertn.	Kode jhar	x				x		
Poaceae	<i>Eragrostis tenella</i> (L.) Beauvois	Junge banso	x	x	x		x		x
Poaceae	<i>Eragrostis unioloides</i> (Retz.) Nees ex Steudel	Chiure banso	x	x	x		x		x
Poaceae	<i>Hemarthria compressa</i> (L.f.) R. Br.	Ghoole dubo	x	x	x		x		x
Poaceae	<i>Imperata cylindrica</i> (L.) Beauvois	Siru	x	x	x		x		x
Poaceae	<i>Ischaemum rugosum</i> Salisb.	Madilo							x

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Poaceae	<i>Leersia hexandra</i> Swartz	Karautre ghans						x	x
Poaceae	<i>Opismenus burmannii</i> (Retz.) Beauvois	Ote banso	x	x				x	x
Poaceae	<i>Paspalum distichum</i> L.	Mane banso	x						
Poaceae	<i>Paspalum scrobiculatum</i> L.	Mane banso	x	x				x	x
Poaceae	<i>Phragmites karka</i> (Retz.) Trin. ex Steudel	Masino narkat	x	x				x	x
Poaceae	<i>Pogonatherum crinitum</i> (Thunb.) Kunth	Khari banso						x	x
Poaceae	<i>Polygonum monspeliacum</i> (L.) Desf.	Puchhre jhar						x	
Poaceae	<i>Saccharum benghalense</i> Retz.	Baruwa	x	x					
Poaceae	<i>Saccharum spontaneum</i> L.	Kans	x	x	x	x		x	
Poaceae	<i>Setaria pallide-fusca</i> (Schumach.) Stapf & C. E. Hubbard	Jhusile banso	x					x	
Poaceae	<i>Sporobolus diander</i> (Retz.) Beauvois							x	
Poaceae	<i>Themeda arundinacea</i> (Roxb.) Ridley	Khadahi	x	x					
Polygalaceae	<i>Polygala</i> sp.							x	
Polygonaceae	<i>Polygonum barbatum</i> L.	Pire bikh			x			x	
Polygonaceae	<i>Polygonum plebeium</i> R. Br.	Suklu jhar	x					x	
Pontederiaceae	<i>Monochoria hastata</i> (L.) Solms	Jaluki						x	
Primulaceae	<i>Anagallis arvensis</i> L.	Krishnanil						x	
Primulaceae	<i>Androsace umbellata</i> (Lour.) Merr.	Chhate primula	x					x	
Rhamnaceae	<i>Ziziphus nummularia</i> (Burn. f.) Wight & Arn.	Deshi bayer	x	x					
Rhamnaceae	<i>Zizyphus mauritiana</i> Lam.	Bayer						x	
Rosaceae	<i>Fragaria indica</i> Andr.	Bhuin kafal	x						
Rosaceae	<i>Potentilla spinosa</i> L.	Jangali bajradanti						x	
Rubiaceae	<i>Anthocephalus chinensis</i> (Lam.) A. Rich.	Karam	x						
Rubiaceae	<i>Borreria articularis</i> (L.f.) F. N. Williams		x	x				x	
Rubiaceae	<i>Hedyotis corymbosa</i> (L.) Lam.		x					x	
Rubiaceae	<i>Hedyotis diffusa</i> Willd.		x					x	
Rubiaceae	<i>Hedyotis gracilis</i> Hook. f.							x	
Rubiaceae	<i>Hedyotis lineata</i> Roxb.		x						
Rubiaceae	<i>Mitrargyna parviflora</i> (Roxb.) Korth.	Kaini	x						

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Rubiaceae	<i>Xeromphis spinosa</i> (Thunb.) Keay	Mainkanda	x	x	x	x	x		
Rubiaceae	<i>Xeromphis uliginosa</i> (Retz.) Maheshwari	Pidar		x					
Rubiaceae	<i>Wendlandia puberula</i> DC.	kainyo	x						
Rutaceae	<i>Murraya koenigii</i> (L.) Spreng.	Asare	x	x	x	x	x		
Rutaceae	<i>Skimmia arborensis</i> T. Anderson ex Gamble	Asare	x	x					
Sapindaceae	<i>Schleichera oleosa</i> (Lour.) Oken	kusum	x	x					
Schizaeaceae	<i>Lygodium flexuosum</i> (L.) Sw.	parewapoti	x	x					
Scrophulariaceae	<i>Bacopa hamiltoniana</i> (Benth.) Wetst.		x						
Scrophulariaceae	<i>Lindernia amagalis</i> (Burm. f.) Pennell								
Scrophulariaceae	<i>Lindernia ciliata</i> (Closm.) Pennell	Karate jhar	x						
Scrophulariaceae	<i>Lindernia oppositifolia</i> (L.) Mukerjee		x						
Scrophulariaceae	<i>Lindernia sp.</i>		x						
Scrophulariaceae	<i>Mazus pumilus</i> (Burm. f.) van Steenis			x					
Scrophulariaceae	<i>Mecardonia procumbens</i> (Mill.) Small		x	x					
Scrophulariaceae	<i>Scoparia dulcis</i> L.	Chini jbar	x						
Scrophulariaceae	<i>Veronica anagallis-aquatica</i> L.	Dhape jhar		x					
Solanaceae	<i>Physalis divaricata</i> D. Don	Patpaté		x					
Solanaceae	<i>Solanum aculeatissimum</i> Jacq.	Kantakari	x						
Solanaceae	<i>Solanum surattense</i> Burm. f.	Kantakari	x	x	x	x			
Sterculiaceae	<i>Helicteres isora</i> L.	Simthi	x	x					
Sterculiaceae	<i>Melochia corchorifolia</i> L.	Bankuro							
Sterculiaceae	<i>Pterospermum acerifolium</i> (L.) Wild.	Singane	x						
Tamaricaceae	<i>Tamarix dioica</i> Roxb. ex Roth	Jheuwa							
Theaceae	<i>Schinia wallichii</i> (DC.) Korth	Chilaune	x						
Tiliaceae	<i>Grewia helicterifolia</i> Wall. ex G Don	Kharbuja	x	x					
Tiliaceae	<i>Grewia sapida</i> Roxb. ex DC.	Pharsa	x	x	x				
Tiliaceae	<i>Grewia subinaequialis</i> DC.	Dafer	x	x					
Tiliaceae	<i>Triumfetta rhomboides</i> Jacq.	Dalle kuro						x	
Typhaceae	<i>Typha angustifolia</i> L.	Pater	x	x	x	x	x	x	

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Urticaceae	<i>Gnostegia pentanera</i> (Roxb.) Miq.	Sim chiple jhar							x
Urticaceae	<i>Pouzolzia zeylanica</i> (L.) J. Bennett & R. Brown	Chiple jhar							x
Verbenaceae	<i>Callicarpa macrophylla</i> Vahl	Dhauchamla							
Verbenaceae	<i>Clerodendrum viscosum</i> Vent	Bhauthi	x	x	x	x			x
Verbenaceae	<i>Gmelina arborea</i> Roxb.	Khamari	x						
Verbenaceae	<i>Lippia nodiflora</i> (L.) Rich.	Bhuin okra	x	x	x	x			x
Verbenaceae	<i>Premna integrifolia</i> L.	Gindari	x						x
Vitaceae	<i>Cissus repens</i> Lam.	Charchare lahara	x	x					
Zingiberaceae	<i>Costus speciosus</i> (Koenig) Smith	Bet lauri	x						