

CHAPTER - VII

ANALYSIS OF THE FLORA

The Rasik Beel complex is an aggregate of five different wetlands formed by a common water flow of the River Raidak. It is a good house for numerous species of local and migratory birds and is now projected as a tourist's destination and as a bird reserve. The flora and the vegetation structure of Rasik Beel Complex area was not known. So, an attempt was initiated in 2007 to record the flora of this area that has enough potential for conservation as Ransar Site.

7.1. Recorded Flora

After the comprehensive floristic survey, it is noted that the wetland complex is bestowed with immensely rich flora. A total of 614 species of vascular plants has been recorded from the intensive survey in the area since the year 2007. Of these, angiosperms are represented by 581 species under 397 genera belonging to 124 families. In addition, 3 species of 3 genera from 3 families of gymnosperms and 30 species of fern and fern allies covering 25 genera belonging to 17 families have been recorded from the Rasik Beel wetland complex during the present exploration. The reason for sustenance of enormous richness in floral diversity within the area is basically due to the perennial nature of water body and about 1/3rd area of the Beel remains undisturbed as conservation practices are imposed for that area. However, the remaining 2/3rd area is open for fishing and related activities. The species composition is changes there regularly for this. This, in turn, always keeps the inter-specific relationship disturbed. The area receives annual precipitation of 200 – 400 cm, the major amount of which is received mainly during the monsoon months. However, little amount of rain is received almost in all other months. This type of distribution of precipitation maintains a very good water relation for the plants and the vegetation and that is the main reason for the occurrence of rich marginal flora.

The analysis of the flora revealed that there are numerous tropical, subtropical and even temperate elements those are common with the East Himalayan region. The beels, nallahas, other low-laying areas, scrubs, forests etc provided an enormous variety of habitats and that is reflected in the richness of the flora.

The detailed analysis of the total angiosperm flora of the Wetland complex and its surrounding area revealed that the distribution and variation in dicots have much dominance over the monocots.

An analysis of the flora of Rasik Beel further revealed the existence of numerous important plant species which are directly or indirectly beneficial for the human sustenance. Many of the species have been recorded for having varied potential as food, medicines, etc. for humanity, besides an extraordinary rich repository of various plant resources including the large number of valuable and durable timber-yielding trees.

Quite a good number of algae are also found growing in and around the beel area and the species of *Spirogyra sp.*, *Chara sp.*, *Nitela sp.*, *Oedogonium sp.*, *Anabaena sp.*, *Nostoc sp.* etc. are dominating in the study area.

7.2. Numerical Distribution of Taxa

The present floristic work on Rasik Beel Wetland deals with the recorded 124 Angiospermic families, out of which 96 are dicotyledonous and the remaining 28 are monocotyledonous; 428 species under 300 genera are recorded from 96 dicotyledons families and 153 species belonging to 97 genera in 28 monocot families. Only 3 species of gymnosperm belonging to 3 genera under 3

families and a total of 30 species of ferns and fern-allies were recorded under 25 genera belonging to 17 families (Table 7.1).

Table 7.1. Numerical representation of different floristic elements in Rasik Beel area

Plant Group	Representation					
	Family		Genus		Species	
	No.	%	No.	%	No.	%
Dicotyledons	96	66.7	300	70.6	428	69.7
Monocotyledons	28	19.4	97	22.8	153	24.9
Gymnosperms	3	2.1	3	0.7	3	0.4
Pteridophyta	17	11.8	25	5.9	30	4.9
TOTAL	144	100	425	100	614	99.9

The Tables 7.2 to 7.5 provided accounts of family-wise numerical distribution of Taxa recorded from the Rasik Beel Wetland Complex.

Table 7.2. Alphabetically family-wise numerical representation of Angiospermic taxa: A. Dicotyledons for the flora of Rasik Beel

Name of the plants	Genera	Species
Acanthaceae	13	20
Amaranthaceae	9	16
Anacardiaceae	2	2
Annonaceae	4	5
Apiaceae	4	4
Apocynaceae	10	10
Araliaceae	1	1
Aristolochiaceae	1	2
Asteraceae	26	29
Balsaminaceae	1	2
Bignoniaceae	2	2
Bixaceae	1	1
Boraginaceae	2	2
Brassicaceae	3	4
Cactaceae	1	1
Campanulaceae	1	1
Cannabaceae	1	1
Capparaceae	2	2
Caricaceae	1	1
Caryophyllaceae	3	5
Celastraceae	1	1
Ceratophyllaceae	1	1
Chloranthaceae	1	1
Cleomaceae	1	3
Clusiaceae	1	1
Combretaceae	2	5

Table contd.

Name of the plants	Genera	Species
Convolvulaceae	6	10
Cornaceae	1	1
Crassulaceae	1	1
Cucurbitaceae	9	10
Dilleniaceae	2	3
Dipterocarpaceae	1	1
Droseraceae	1	1
Ebenaceae	1	1
Elaeocarpaceae	1	1
Elatinaceae	1	1
Euphorbiaceae	6	10
Fabaceae	25	38
Hydroleaceae	1	1
Hypericaceae	1	1
Icacinaceae	1	1
Lamiaceae	12	16
Lauraceae	2	6
Lecythidaceae	2	2
Lentibulariaceae	1	3
Linderniaceae	2	7
Lythraceae	6	10
Magnoliaceae	1	2
Malvaceae	14	20
Melastomataceae	2	2
Meliaceae	5	6
Menispermaceae	4	5
Menyanthaceae	1	2
Molluginaceae	1	2
Moraceae	4	11
Moringaceae	1	1
Myrtaceae	4	5
Nyctaginaceae	4	5
Nymphaeaceae	1	3
Oleaceae	1	2
Onagraceae	1	3
Oxalidaceae	2	3
Papaveraceae	2	2
Passifloraceae	1	1
Phrymaceae	1	1
Phyllanthaceae	3	7
Piperaceae	2	6
Plantaginaceae	2	2

Table contd.

Name of the plants	Genera	Species
Plumbaginaceae	1	1
Polygalaceae	1	1
Polygonaceae	3	10
Portulacaceae	1	1
Primulaceae	2	2
Proteaceae	1	1
Putranjivaceae	1	1
Ranunculaceae	2	2
Rhamnaceae	3	4
Rosaceae	1	1
Rubiaceae	10	12
Rutaceae	6	7
Salicaceae	1	1
Sapindaceae	1	1
Sapotaceae	1	1
Scrophulariaceae	1	1
Simaroubaceae	1	1
Solanaceae	6	11
Tamaricaceae	1	1
Theaceae	1	1
Ulmaceae	1	2
Urticaceae	6	8
Verbenaceae	4	4
Violaceae	1	1
Vitaceae	4	7
Total	296	422

Table 7.3. Family-wise numerical representation of Angiospermic taxa: B. Monocotyledons for the flora of Rasik Beel

Name of the plants	Genera	Species
Alismataceae	2	3
Amaryllidaceae	1	1
Aponogetonaceae	1	3
Araceae	13	15
Arecaceae	5	5
Asparagaceae	1	1
Burmanniaceae	1	1
Cannaceae	1	1
Commelinaceae	6	13
Costaceae	1	1
Cyperaceae	9	29
Dioscoreaceae	1	4
Eriocaulaceae	1	2

Table contd.

Name of the plants	Genera	Species
Hydrocharitaceae	6	7
Hypoxidaceae	2	2
Juncaceae	1	1
Marantaceae	1	1
Musaceae	1	2
Orchidaceae	6	7
Poaceae	28	40
Pontederiaceae	2	3
Potamogetonaceae	1	3
Smilacaceae	1	2
Typhaceae	1	1
Xyridaceae	1	1
Zingiberaceae	4	5
Total	98	154

Table 7.4. Family-wise numerical representation of Pinophyta for the flora of Rasik Beel

Family	Genera	Species
Araucariaceae	1	1
Cupressaceae	1	1
Cycadaceae	1	1
Total	3	3

Table 7.5. Family-wise numerical representation of Pteridophytes recorded for the flora of Rasik Beel

Family	Genus	Species
Adiantaceae	2	2
Aspleniaceae	1	1
Azollaceae	1	1
Blechnaceae	1	1
Davalliaceae	1	1
Dryopteridaceae	3	3
Gleicheniaceae	1	1
Marsileaceae	1	1
Ophioglossaceae	1	1
Polypodiaceae	3	3
Pteridaceae	3	4
Salviniaceae	1	3
Schizaeaceae	1	2
Selaginellaceae	1	1
Tectariaceae	1	1
Thelypteridaceae	1	1
Woodsiaceae	2	3
Total	25	30

7.3. High Representation

Most comprehensive floristic work for the Indian subcontinent was published by Sir J.D. Hooker (1872 – 1897) in his *The Flora of British India*. Recently *The Flora of Eastern Himalaya*, Parts I - III by Hara (1966, 1971) and Ohashi (1975), and *The Flora of Bhutan*, vols. 1 – 3, by Grierson and Long (1983, 1984, 1987, 1991, 1999, 2000), Noltie (1994, 2000) and Pears and Cribb (2002) also presented a monumental work on this region. The first flora, i.e. *The Flora of British India* covers the plants collected from Indian subcontinent, Eastern Himalaya to Pakistan, Bangladesh, Myanmar, Malaysia, etc. *The Flora of Eastern Himalaya* has engrossed the plant collection from the hilly parts of North Bengal, Sikkim, Eastern Nepal and Bhutan regions in the Eastern Himalaya covering an altitudinal range of 300 m to 4400 m. *Flora of Bhutan* covered the *Terai* and *Duars* of North Bengal. In case of Dicotyledonous flora, In *Flora of Eastern Himalaya* (FEH), the family Fabaceae is represented with highest number of species, which is followed by Asteraceae, Lamiaceae, Rubiaceae etc. The *Flora of Bhutan* (FB) recorded Asteraceae as the most represented and is followed by Fabaceae, Rubiaceae, Lamiaceae etc. The present survey recorded 38 species for the Fabaceae and then followed by Asteraceae, Acanthaceae, Malvaceae etc. A comparative account of top 10 families in these three works are given in the Table 7.6.

Table 7.6. Comparative study of top 10 dicot Families after the survey of Rasik Beel flora

Name of the plants	FEH		FB		Rasik Beel	
	Genera	Species	Genera	Species	Genera	Species
Fabaceae	71	184	85	277	25	38
Asteraceae	70	166	126	370	26	29
Acanthaceae	19	46	27	83	13	20
Malvaceae	8	18	12	34	14	20
Amaranthaceae	9	16	11	21	9	16
Lamiaceae	39	88	43	117	12	16
Rubiaceae	31	66	55	153	10	12
Moraceae	6	15	7	52	4	11
Solanaceae	7	25	22	50	6	11
Apocynaceae	12	13	22	45	10	10

In case of Monocotyledonous flora, in the *Flora of Eastern Himalaya* (FEH), Orchidaceae is highest represented, which is followed by Poaceae, Cyperaceae, Araceae and Commelinaceae. In *Flora of Bhutan* (FB), Orchidaceae is the largest family and that is followed by Poaceae, Cyperaceae, Araceae and Commelinaceae. In the present survey recorded highest number of 40 species for Poaceae and is followed by Cyperaceae, Araceae, Commelinaceae and then Orchidaceae. A comparison of top 5 families in these three works are given in the Table 7.7.

Table 7.7. Comparative study of top five monocot families after the survey of Rasik Beel flora

Name of the plants	FEH		FB		Rasik Beel	
	Genera	Species	Genera	Species	Genera	Species
Poaceae	78	183	125	381	28	40
Cyperaceae	10	114	73	181	9	29
Araceae	14	37	17	44	13	15
Comelinaceae	9	16	11	31	6	13
Orchidaceae	61	188	132	579	6	7

The present work in Rasik Beel complex, the Poaceae appeared as the largest with 28 genera and 40 species and it is followed by Fabaceae, Asteraceae, Cyperaceae, Acanthaceae, Malvaceae, Amaranthaceae, Lamiaceae, Araceae and Commelinaceae and is presented in Table 7.8 with further details.

The Flora of British India recorded the plants collected from the entire Indian subcontinent, including Eastern Himalaya to Pakistan, Bangladesh, Nepal, Bhutan, Myanmar, Malaysia, etc. *The Flora of Eastern Himalaya* has engrossed the plant collection from the hilly parts of North Bengal, Sikkim, Eastern Nepal and Bhutan regions in the Eastern Himalaya covering an altitudinal range from 300 m to 4400 m. *Flora of Bhutan* also covered the *Terai* and *Duars* of North Bengal. But, the present survey is restricted to a small area of the Rasik Beel Complex. So, the number of families, genera, species and their highest relative position also varied. A comparative account of top ten families in these four works are given in the Table 7.9.

Table 7.8. Top ten families in the flora of Rasik Beel complex

Name of the plants	Genera	Species
Poaceae	28	40
Fabaceae	25	38
Asteraceae	26	29
Cyperaceae	9	29
Acanthaceae	13	20
Malvaceae	14	20
Amaranthaceae	9	16
Lamiaceae	12	16
Araceae	13	15
Commelinaceae	6	13

Table 7.9. Comparison of top ten families of Rasik Beel complex with three monumental publications

SN	FBI	FEH	FB	Rasik Beel
1	Orchidaceae	Orchidaceae	Orchidaceae	Poaceae
2	Asteraceae	Fabaceae	Poaceae	Fabaceae
3	Poaceae	Poaceae	Cyperaceae	Asteraceae
4	Rosaceae	Asteraceae	Asteraceae	Cyperaceae
5	Cyperaceae	Cyperaceae	Fabaceae	Acanthaceae
6	Geraniaceae	Rosaceae	Scrophulariaceae	Malvaceae
7	Ericaceae	Scrophulariaceae	Rosaceae	Amaranthaceae
8	Liliaceae	Lamiaceae	Rubiaceae	Lamiaceae
9	Lamiaceae	Ranunculaceae	Lamiaceae	Araceae
10	Apiaceae	Urticaceae	Ranunculaceae	Commelinaceae

The study area is comparatively too small and is housing only 614 species of vascular plants as has been recorded through the intensive survey since the year 2007. Of these, angiosperms are represented by 581 species under 397 genera belonging to 124 families. In addition, 3 species of 3 genera from 3 families of gymnosperms and 30 species of fern and fern allies covering 25 genera covering 17 families have been recorded from the Rasik Beel wetland complex. The largest genus is

Ficus of Moraceae with 7 species and is followed by *Cassia* of Fabaceae, *Solanum* of Solanaceae, *Persicaria* of Polygonaceae, *Cyperus* of Cyperaceae etc. are all with 6 species. The best represented 10 genera in the Rasik Beel flora has been presented in Table 7.10.

Table 7.10. The highest represented ten genera in Rasik Beel flora

Genus	Family	No. of Species
<i>Ficus</i>	Moraceae	7
<i>Cassia</i>	Fabaceae	6
<i>Solanum</i>	Solanaceae	6
<i>Persicaria</i>	Polygonaceae	6
<i>Cyperus</i>	Cyperaceae	6
<i>Desmodium</i>	Fabaceae	5
<i>Ipomoea</i>	Convolvulaceae	5
<i>Lindernia</i>	Scrophulariaceae	5
<i>Piper</i>	Piperaceae	5
<i>Commelina</i>	Commelinaceae	4

7.4. Rare and threatened plants of Rasik Beel Wetland

The Rasik Beel is one of the important conservatories for rare and threatened species of plants in the area. During the study, some of the threatened species of India, under Red Data Books of Indian Plants (Nayar and Shastri, 1987, 1988, 1990) has also been recorded. These plants seems to be widely distributed inside the Beel complex. The rarity of or threat to a majority of those could be due to several natural causes, but it could also be due to severe anthropogenic factors like habitat destruction through timber extraction, grazing, fishing, tourisms etc. Unskilled and unscientific harvest of large number of species by local plant-traders for several identical purposes are attributing directly or indirectly in the population structure or even the loss of species from their natural habitat.

The knowledge of plants being used in medicine is high in the Indian Himalayan region. There are major gaps in the knowledge of biological resources and the means by which biological diversity is being maintained (Heywood and Baste, 1995). It is interesting to note that all the recorded plants are till date not recognized under any threat category of IUCN except a few are recorded either as 'Least Concern' or as 'Lower Risk'. two species, *Shorea robusta* and *Toona ciliata* has been recognized as 'Lower Risk/ Least Concern' under ver 2.3 in the Red List of IUCN [<http://www.iucnredlist.org/>], Indian Red Data Book [Nayar and Sastry, 1987, 1988] and Red List of Botanical Survey of India [http://bsi.gov.in/content/259_1_InventorisationofEndangeredPlantSpecies.aspx].

7.5. Exotic Elements

In the Himalayas and its foothill region is rich with a total of 190 invasive alien species under 112 genera, belonging to 47 families (Chandra Sekar, 2012). Out of 190 invasive alien species, dicotyledons flora is represented by 40 families, 95 genera and 170 species and monocotyledons by 7 families, 17 genera and 20 species. Scattered research work on the exotic and alien species of India has been carried out by Maheswari, 1962; Matthew, 1969; Maiti and Guha Bakshi, 1984; Das, 1984; Das and Chanda, 1986; Das *et al*, 1984; Khuroo *et al*, 2007a, 2008, 2010, 2012; Negi and Hajra, 2007; Singh *et al*, 2010. Nayar (1977) has discussed the changing pattern of vegetation due to some exotic and invasive species. Liu *et al* (2005, 2006, 2008) has worked in detail on the exotics in China that has also included the Himalayan region. A preliminary list of exotic and introduce plants of India has been compiled by Pandey (2000) and Reddy (2008). Out of the

614 species of recorded flora, 95 species has been recognized as exotics. Out of these 54 has been naturalized (Fig. 7.1). The taxonomic distribution of these exotic plants are given bellow:

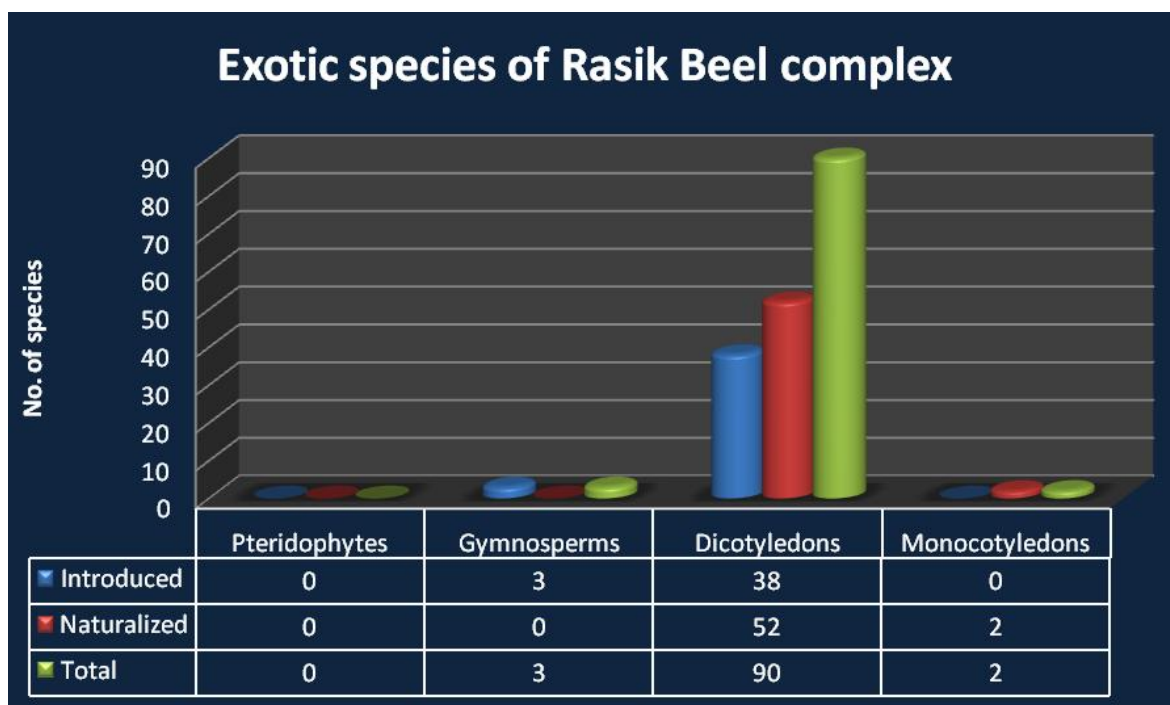


Fig. 7.1. Graphical presentation of Exotic elements in the flora of Rasik Beel complex

Out of 95 exotic species, 24 species came from Tropical America, 14 from South America, 12 from Brazil and Mexico and only 6 species are of Asian origin. List of recorded exotic species is given in Table 7.11.

Table 7.11. List of Exotic-alien species of Rasik Beel Complex

Plants	Family	Status
<i>Agave angustifolia</i>	Central America	Naturalized
<i>Ageratum conyzoides</i>	South America	Naturalized
<i>Ageratum houstonianum</i>	Mexico	Naturalized
<i>Alamanda cathartica</i>	South America	Naturalized
<i>Alternanthera paronychioides</i>	Brazil	Naturalized
<i>Alcea rosea</i>	China	Naturalized
<i>Anacardium occidentale</i>	Brazil	Cultivated
<i>Annona reticulata</i>	West Indies	Cultivated
<i>Annona squamosa</i>	Tropical America, West Indies	Cultivated
<i>Argemone mexicana</i>	Mexico	Naturalized
<i>Barleria lupulina</i>	Madagascar	Naturalized
<i>Bougainvillia glabra</i>	Brazil	Cultivated
<i>Bougainvillia spectabilis</i>	Brazil	Cultivated
<i>Bidens pilosa</i>	America	Naturalized
<i>Bixa orellana</i>	Tropical America	Cultivated

Table contd.

Plants	Family	Status
<i>Caesalpinia pulcherima</i>	Tropical America	Cultivated
<i>Cajanus cajan</i>	Africa	Semi-naturalized
<i>Capsicum annum</i>	South America	Semi-naturalized
<i>Carica papaya</i>	Central America	Semi-naturalized
<i>Senna alata</i>	South America	Naturalized
<i>Senna tora</i>	Tropical America	Naturalized
<i>Cassia javanica</i> subsp. <i>nodosa</i>	Sumatra, Java	Semi-naturalized
<i>Catharanthus roseus</i>	West Indies, Madagascar	Naturalized
<i>Chenopodium ambrosioides</i>	Mexico	Naturalized
<i>Chromolaena odorata</i>	Jamaica	Naturalized
<i>Cinnamomum verum</i>	Sri Lanka	Cultivated
<i>Cissampelos pareira</i>	Neo-tropical	Naturalized
<i>Cleome rutidospermum</i>	West Africa	Naturalized
<i>Clitoria ternatea</i>	Tropical America	Semi-naturalized
<i>Corchorus aestuans</i>	Tropical America	Naturalized
<i>Crassocephalum crepidioides</i>	Tropical America	Naturalized
<i>Croton bonplandianum</i>	Paraguay	Naturalized
<i>Datura metel</i>	Tropical America	Naturalized
<i>Delonix regia</i>	Madagascar	Semi-naturalized
<i>Digitaria ciliaris</i>	Tropical America	Naturalized
<i>Eclipta prostrata</i>	South America	Naturalized
<i>Eichhornia crassipes</i>	Tropical America	Naturalized
<i>Emilia sonchifolia</i>	Africa, Asia	Naturalized
<i>Eragrostis tenella</i>	Africa, Asia	Naturalized
<i>Erigeron canadensis</i>	North America	Naturalized
<i>Euphorbia hirta</i>	Tropical America	Naturalized
<i>Evolvulus nummularius</i>	West Indies	Naturalized
<i>Fumaria indica</i>	North temperate region	Naturalized
<i>Galinsoga parviflora</i>	Tropical America	Naturalized
<i>Gnaphalium purpurium</i>	Tropical America	Naturalized
<i>Gravelia robusta</i>	Australia	Cultivated
<i>Hibiscus rosa-sinensis</i>	China	Cultivated
<i>Hibiscus sabdariffa</i>	America	Semi-naturalized
<i>Hyptis suaveolens</i>	South America	Naturalized
<i>Ipomoea carnea</i> ssp. <i>fistulosa</i>	South America	Naturalized
<i>Ipomoea quamoclit</i>	Tropical America	Naturalized
<i>Jatropha curcas</i>	Tropical America	Naturalized
<i>Lagerstroemia indica</i>	China	Cultivated
<i>Lantana camara</i>	West Indies, Jamaica	Naturalized
<i>Lippia javanica</i>	Tropical America	Naturalized

Table contd.

Plants	Family	Status
<i>Litchi chinensis</i>	China	Semi-naturalized
<i>Malva viscosa penduliflora</i>	Mexico	Cultivated
<i>Manilkara zapota</i>	Central America	Cultivated
<i>Mecardonia procumbens</i>	Tropical America	Naturalized
<i>Mikania micrantha</i>	Tropical America	Naturalized
<i>Mimosa invisa</i>	Tropical America	Naturalized
<i>Mimosa pudica</i>	Brazil	Naturalized
<i>Mirabilis jalapa</i>	Tropical America	Semi-naturalized
<i>Nicotiana glauca</i>	Tropical America	Naturalized
<i>Oxalis corniculata</i>	South Europe, North America	Naturalized
<i>Oxalis latifolia</i>	Brazil	Naturalized
<i>Parthenium hysterophorus</i>	West Indies, Central & North America	Naturalized
<i>Peperomia pellucida</i>	Central America	Naturalized
<i>Persicaria hydropiper</i>	Temperate region	Naturalized
<i>Petunia violacea</i>	South America	Cultivated
<i>Physalis minima</i>	South America	Naturalized
<i>Portulaca oleracea</i>	Europe, North Africa	Naturalized
<i>Psidium guajava</i>	Tropical South America	Semi-naturalized
<i>Punica granata</i>	Afghanistan, Baluchistan, Iran	Cultivated
<i>Pupalia lappacea</i>	Afro-Asia	Naturalized
<i>Ricinus communis</i>	Africa	Naturalized
<i>Scoparia dulcis</i>	South America	Naturalized
<i>Senna occidentalis</i>	South America	Naturalized
<i>Senna sophera</i>	America	Naturalized
<i>Sida cordata</i>	Tropical America	Naturalized
<i>Solanum pimpenillifolium</i>	Tropical America	Naturalized
<i>Solanum sysimbrifolium</i>	Brazil	Naturalized
<i>Spathodea campanulata</i>	Tropical Africa	Semi-naturalized
<i>Stachytarpheta indica</i>	South America	Naturalized
<i>Stellaria media</i>	Europe	Naturalized
<i>Synedrella nodiflora</i>	Tropical America	Naturalized
<i>Tagetes patula</i>	Mexico	Semi-naturalized
<i>Tamarindus indica</i>	Tropical Africa	Naturalized
<i>Tridax procumbens</i>	South America	Naturalized
<i>Vicia sativa</i>	West Africa, Europe	Naturalized
<i>Wedelia calendulacea</i>	Austro-Asia	Naturalized
<i>Xanthium strumarium</i>	South America	Naturalized

No exotic Pteridophyte has been recognized in the Rasik Beel flora, but 3 species of Gymnosperms has been detected as exotic elements. Only 2 monocotyledons species found there as naturalized exotic elements (Fig. 7.1).

7.6. Flowering calendar

Flowering calendar of the temperate flora of Darjeeling Hills (1500 – 2400 m) was previously prepared by Das and Chanda (1987) and for the Sambalpur District flora by Panda *et al* (1992). The flowering seasons of species in Terai and Duars flora is little known till date. The flowering seasons of majority of the floristic elements of Rasik Beel complex has been recorded during the survey work and has been presented in the Table 7.12.

Table 7.12. Flowering Calendar of Rasik Beel Flora [1 – 12 denotes the months of the year]

Plants	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Abrus pulchellus</i>												
<i>Acacia catechu</i>												
<i>Acacia pennata</i>												
<i>Achyranthes aspera</i>												
<i>Achyranthes bidentata</i>												
<i>Adenanthera pavonina</i>												
<i>Aegle marmelos</i>												
<i>Aerides multiflora</i>												
<i>Aerva sanguinolenta</i>												
<i>Aeschynomene aspera</i>												
<i>Aeschynomene indica</i>												
<i>Ageratum conyzoides</i>												
<i>Ageratum houstonianum</i>												
<i>Albizia chinensis</i>												
<i>Alpinia calcarata</i>												
<i>Alpinia nigra</i>												
<i>Alstonia scholaris</i>												
<i>Alternanthera paronychioides</i>												
<i>Alternanthera philoxeroides</i>												
<i>Alternanthera sessilis</i>												
<i>Amaranthus blitum</i>												
<i>Amaranthus spinosus</i>												
<i>Amaranthus viridis</i>												
<i>Amischotolype hookeri</i>												
<i>Ammannia baccifera</i>												
<i>Ardisia solanacea</i>												
<i>Areca catechu</i>												
<i>Argyreia roxburghii</i>												
<i>Artabotrys hexapetalus</i>												
<i>Artocarpus heterophyllus</i>												
<i>Artocarpus lacucha</i>												
<i>Axonopus compressus</i>												
<i>Balakata baccata</i>												
<i>Barleria cristata</i>												
<i>Barleria lupulina</i>												

Table contd.

Plants	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Barleria strigosa</i>												
<i>Bauhinia purpurea</i>												
<i>Bauhinia variegata</i>												
<i>Bidens pilosa</i>												
<i>Biophytum sensitivum</i>												
<i>Blumea lacera</i>												
<i>Bolboschoenus maritimus</i>												
<i>Bombax ceiba</i>												
<i>Bougainvillea spectabilis</i>												
<i>Bridelia retusa</i>												
<i>Bryophyllum pinnatum</i>												
<i>Buddleja asiatica</i>												
<i>Burmannia coelestis</i>												
<i>Butea monosperma</i>												
<i>Caesalpinia cucullata</i>												
<i>Calamus tenuis</i>												
<i>Callicarpa arborea</i>												
<i>Calotropis gigantea</i>												
<i>Cannabis sativa</i>												
<i>Capparis zeylanica</i>												
<i>Cardamine hirsuta</i>												
<i>Careya arborea</i>												
<i>Cassia fistula</i>												
<i>Catharanthus roseus</i>												
<i>Centella asiatica</i>												
<i>Cheilocostus speciosus</i>												
<i>Chenopodium album</i>												
<i>Chrysopogon aciculatus</i>												
<i>Cinnamomum tamala</i>												
<i>Cinnamomum verum</i>												
<i>Citrus limon</i>												
<i>Clerodendrum indicum</i>												
<i>Clerodendrum infortunatum</i>												
<i>Clerodendrum japonicum</i>												
<i>Coffea benghalensis</i>												
<i>Colocasia esculenta</i>												
<i>Combretum decandrum</i>												
<i>Commelina benghalensis</i>												
<i>Commelina diffusa</i>												
<i>Commelina suffruticosa</i>												
<i>Crateva religiosa</i>												
<i>Crinum amoenum</i>												
<i>Crotalaria alata</i>												
<i>Crotalaria pallida</i>												
<i>Cuphea procumbens</i>												

Table contd.

Plants	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Curculigo orchoides</i>												
<i>Cyanotis axillaris</i>												
<i>Cyanotis cristata</i>												
<i>Cyanthillium cinereum</i>												
<i>Cynodon dactylon</i>												
<i>Cynoglossum lanceolatum</i>												
<i>Cyperus compressus</i>												
<i>Cyperus haspan</i>												
<i>Cyperus rotundus</i>												
<i>Cyperus stoloniferus</i>												
<i>Dalbergia sissoo</i>												
<i>Datura metel</i>												
<i>Datura stramonium</i>												
<i>Deeringia amaranthoides</i>												
<i>Dendrobium aphyllum</i>												
<i>Dendrocide sinuata</i>												
<i>Dentella repens</i>												
<i>Desmodium laxiflorum</i>												
<i>Desmodium triflorum</i>												
<i>Dicliptera bupleuroides</i>												
<i>Dillenia pentagyna</i>												
<i>Dioscorea bulbifera</i>												
<i>Dioscorea hamiltonii</i>												
<i>Dioscorea pentaphylla</i>												
<i>Dioscorea prazeri</i>												
<i>Diospyros malabarica</i>												
<i>Drosera burmannii</i>												
<i>Drymaria cordata</i>												
<i>Duchesnea indica</i>												
<i>Duranta erecta</i>												
<i>Dysphania ambrosioides</i>												
<i>Echinochloa crus-galli</i>												
<i>Eichhornia crassipes</i>												
<i>Eleocharis atropurpurea</i>												
<i>Eleusine indica</i>												
<i>Enydra fluctuans</i>												
<i>Eranthemum griffithii</i>												
<i>Eranthemum splendens</i>												
<i>Eryngium foetidum</i>												
<i>Euphorbia hirta</i>												
<i>Evolvulus nummularius</i>												
<i>Ficus benghalensis</i>												
<i>Ficus religiosa</i>												
<i>Fimbristylis aestivalis</i>												
<i>Fimbristylis complanata</i>												

Table contd.

Plants	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Floscopa scandens</i>												
<i>Flueggea virosa</i>												
<i>Glinus oppositifolius</i>												
<i>Globba multiflora</i>												
<i>Gmelina arborea</i>												
<i>Heliotropium indicum</i>												
<i>Holarrhena pubescens</i>												
<i>Hoya parasitica</i>												
<i>Hydrocotyle sibthorpioides</i>												
<i>Hygrophila phlomoides</i>												
<i>Hygrophila polysperma</i>												
<i>Hypericum japonicum</i>												
<i>Ichnocarpus frutescens</i>												
<i>Impatiens balsamina</i>												
<i>Impatiens trilobata</i>												
<i>Ipomoea aquatica</i>												
<i>Ipomoea hederifolia</i>												
<i>Ixora thwaitesii</i>												
<i>Jasminum caudatum</i>												
<i>Jasminum dispersum</i>												
<i>Jasminum sambac</i>												
<i>Justicia adhatoda</i>												
<i>Kyllinga nemoralis</i>												
<i>Lagerstroemia speciosa</i>												
<i>Lannea coromandelica</i>												
<i>Lasia spinosa</i>												
<i>Leea aequata</i>												
<i>Leea asiatica</i>												
<i>Leea macrophylla</i>												
<i>Lepidagathis incurva</i>												
<i>Leucas zeylanica</i>												
<i>Limnophila heterophylla</i>												
<i>Limnophila sessiliflora</i>												
<i>Lindernia ciliata</i>												
<i>Lindernia crustacea</i>												
<i>Lindernia parviflora</i>												
<i>Lippia alba</i>												
<i>Litchi chinensis</i>												
<i>Litsea glutinosa</i>												
<i>Litsea monopetala</i>												
<i>Ludwigia adscendens</i>												
<i>Ludwigia octovalvis</i>												
<i>Ludwigia perennis</i>												
<i>Maesa indica</i>												
<i>Mallotus philippensis</i>												
<i>Mangifera indica</i>												
<i>Manilkara zapota</i>												
<i>Marsdenia tinctoria</i>												
<i>Mazus pumilus</i>												
<i>Melastoma malabathricum</i>												
<i>Melochia corchorifolia</i>												
<i>Merremia hirta</i>												

Table contd.

Plants	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Merremia vitifolia</i>												
<i>Meyna spinosa</i>												
<i>Mimosa invisa</i>												
<i>Mimosa pudica</i>												
<i>Monochoria hastata</i>												
<i>Monochoria vaginalis</i>												
<i>Morinda angustifolia</i>												
<i>Morus indica</i>												
<i>Murdannia nudiflora</i>												
<i>Naravelia zeylanica</i>												
<i>Natsiatum herpeticum</i>												
<i>Nelsonia canescens</i>												
<i>Neolamarckia cadamba</i>												
<i>Nicotiana plumbaginifolia</i>												
<i>Nyctanthes arbor-tristis</i>												
<i>Nymphoides hydrophylla</i>												
<i>Nymphoides indica</i>												
<i>Oenanthe javanica</i>												
<i>Oldenlandia corymbosa</i>												
<i>Oplismenus burmanni</i>												
<i>Oplismenus compositus</i>												
<i>Oroxylum indicum</i>												
<i>Osbeckia nepalensis</i>												
<i>Oxalis corniculata</i>												
<i>Oxalis debilis</i> var. <i>corymbosa</i>												
<i>Oxalis latifolia</i>												
<i>Papilionanthe teres</i>												
<i>Persicaria barbata</i>												
<i>Persicaria chinensis</i>												
<i>Persicaria hydropiper</i>												
<i>Persicaria orientalis</i>												
<i>Persicaria strigosa</i>												
<i>Phaulopsis imbricata</i>												
<i>Phlogacanthus thyrsoiflorus</i>												
<i>Phyla nodiflora</i>												
<i>Phyllanthus emblica</i>												
<i>Phyllanthus reticulatus</i>												
<i>Phyllanthus urinaria</i>												
<i>Physalis divaricata</i>												
<i>Pilea cordifolia</i>												
<i>Piper longum</i>												
<i>Piper nigrum</i>												
<i>Piper sylvaticum</i>												
<i>Pistia stratiotes</i>												
<i>Pogostemon amaranthoides</i>												
<i>Polycarpon prostratum</i>												
<i>Polygala chinensis</i>												
<i>Polygonum plebeium</i>												
<i>Polygonum pubescens</i>												
<i>Potamogeton distinctus</i>												
<i>Potamogeton octandrus</i>												
<i>Pouzolzia hirta</i>												

Table contd.

Plants	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Pouzolzia zeylanica</i>												
<i>Pterospermum acerifolium</i>												
<i>Pueraria phaseoloides</i>												
<i>Pueraria sikkimensis</i>												
<i>Ranunculus sceleratus</i>												
<i>Rauvolfia tetraphylla</i>												
<i>Richardia scabra</i>												
<i>Ricinus communis</i>												
<i>Rotala rotundifolia</i>												
<i>Rothea serrata</i>												
<i>Rumex dentatus</i>												
<i>Rumex maritimus</i>												
<i>Rungia pectinata</i>												
<i>Saccharum spontaneum</i>												
<i>Salomonina ciliata</i>												
<i>Sauropus compressus</i>												
<i>Schoenoplectiella articulata</i>												
<i>Schoenoplectiella juncooides</i>												
<i>Scoparia dulcis</i>												
<i>Senna occidentalis</i>												
<i>Senna tora</i>												
<i>Sida acuta</i>												
<i>Sida cordata</i>												
<i>Sida cordifolia</i>												
<i>Sida rhombifolia</i>												
<i>Smilax ovalifolia</i>												
<i>Smilax perfoliata</i>												
<i>Solanum aculeatissimum</i>												
<i>Solanum americanum</i>												
<i>Solanum indicum</i>												
<i>Solanum pimpinellifolium</i>												
<i>Solanum sisymbriifolium</i>												
<i>Solanum torvum</i>												
<i>Sonchus arvensis</i>												
<i>Spathodea campanulata</i>												
<i>Spermacoce alata</i>												
<i>Sphaeranthus indicus</i>												
<i>Spilanthes acmella</i>												
<i>Stellaria media</i>												
<i>Stellaria uliginosa</i>												
<i>Stellaria wallichiana</i>												
<i>Stephania glabra</i>												
<i>Stephania japonica</i>												
<i>Sterculia villosa</i>												
<i>Synedrella nodiflora</i>												
<i>Syzygium cumini</i>												
<i>Syzygium formosum</i>												
<i>Tabernaemontana divaricata</i>												
<i>Tagetes erecta</i>												
<i>Tectona grandis</i>												
<i>Terminalia bellirica</i>												
<i>Tetracera sarmentosa</i>												

Table contd.

Plants	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Tetrastigma bracteolatum</i>												
<i>Tetrastigma campylocarpum</i>												
<i>Tetrastigma serrulatum</i>												
<i>Thunbergia fragrans</i>												
<i>Thunbergia grandiflora</i>												
<i>Tinospora sinensis</i>												
<i>Toona ciliata</i>												
<i>Trapa natans</i>												
<i>Trema orientalis</i>												
<i>Trema tomentosa</i>												
<i>Tridax procumbens</i>												
<i>Triumfetta rhomboidea</i>												
<i>Tylophora indica</i>												
<i>Typha elephantina</i>												
<i>Urena lobata</i>												
<i>Utricularia aurea</i>												
<i>Utricularia bifida</i>												
<i>Utricularia hirta</i>												
<i>Uvaria hamiltonii</i>												
<i>Vallisneria natans</i>												
<i>Vitex negundo</i>												
<i>Wahlenbergia marginata</i>												
<i>Wrightia arborea</i>												
<i>Xanthium strumarium</i>												
<i>Youngia japonica</i>												
<i>Ziziphus jujuba</i>												
<i>Ziziphus rugosa</i>												

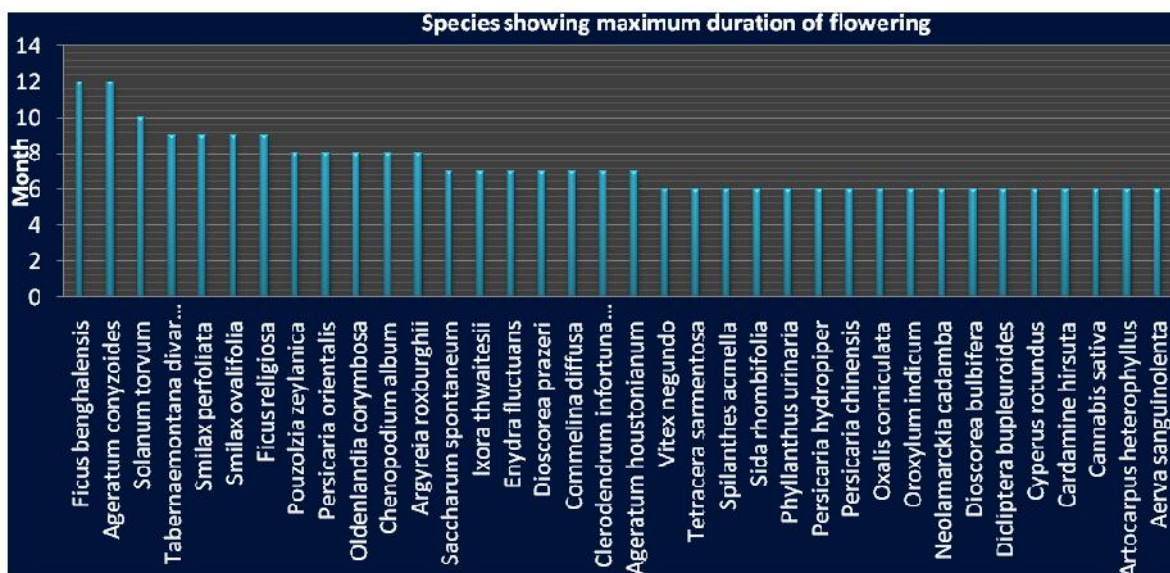


Fig. 7.2. Species showing maximum duration of flowering

Ficus benghalensis, *Ageratum conyzoides*, *Solanum torvum*, *Tabernaemontana divaricata*, *Smilax perfoliata*, *Smilax ovalifolia*, *Ficus religiosa*, *Pouzolzia zeylanica*, *Persicaria orientalis*, *Oldenlandia corymbosa*, *Chenopodium album*, *Argyreia roxburghii*, *Saccharum spontaneum* etc are blooming for the longest duration of the year (Fig. 7.2).

April, May, June and later October and November may be called as nature's flower festival of Rasik Beel flora, because maximum flowering species (10% of the total studied flowering species in each month) found to bloom during these two periods every year. March appears to be the resting month, as very less number species go for flowering (Fig. 7.3).

Monthwise flowering percentage of Rasik Beel flora

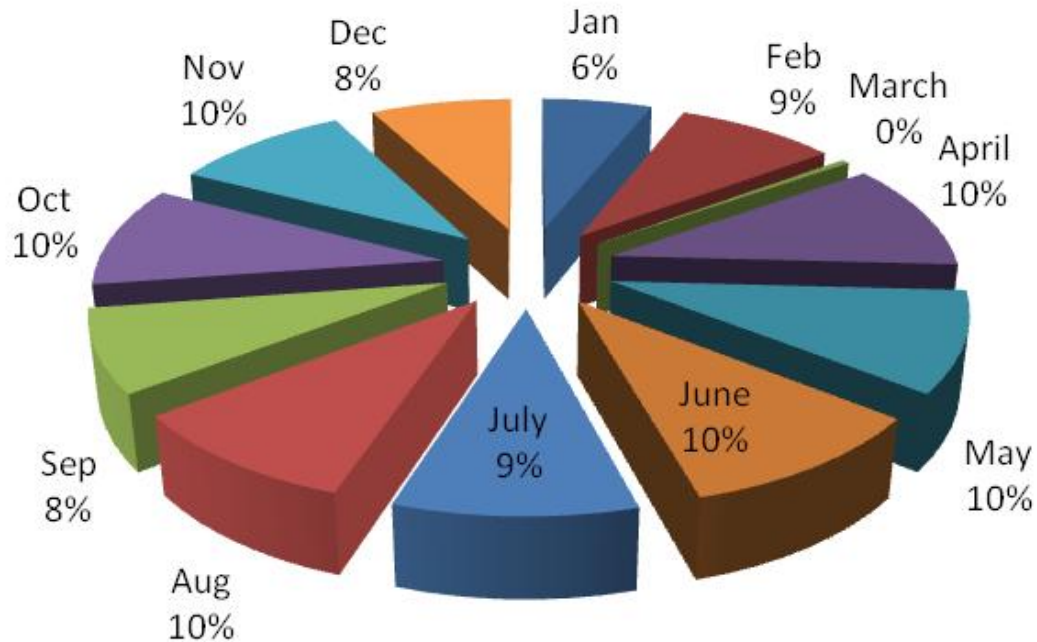


Fig. 7.3. Yearly flowering distribution of Rasik Beel flora

7.8. Anthropogenic activities

A large part of the Beel area is allowed free for fishing. The villagers are cultivating commercially important exotic fishes in that part of the Beel. If this practice is continued for few more years, then the local species of fishes will be vanished from the Beel very soon. Through their regular fishing activities they are disturbing the local and migratory aquatic birds and damaging the free-floating and other aquatic vegetation. The population of Aquatic rotifers, Mollusca, Zoo planktons and phytoplanktons are also being seriously affected by them due to fishery related activities. At the same time, the basic stock of food for the Beel-birds, both native and migratory, are being affected.

Poor knowledge of NTFP collection by local villagers is also the cause of damage of diversity and food crisis for aquatic birds. Ecotourism is seriously disturbing the local floral and faunal communities and also the overall environment of the area.

7.9. Ex-situ conservation and wetland management system

There is no any facility for the *ex-situ* conservation of plants in the study area except for some widely cultivated ornamentals in the garden and that is only for beautification. On the other hand, *ex-situ* conservation for animals is gradually increasing there through the creation of new tanks and enclosures for keeping Leopards, Deers, Pythons, Peacocks, Ghorials, Tortoises, Gooses etc. But, it appears more as a Zoo devoted to tourism than a centre with conservation activities. Plantation forest area is also increasing and the species under use for the purpose are mainly *Salix tetrasperma*, *Lagerstroemia hirsuta*, *Terminalia arjuna*, *Terminalia bellirica*, *Syzygium cumini*, *Putranjiva*

roxburghii, *Cassia javanica* ssp. *nodosa*, *Delonix regia*, *Lagerstroemia indica*, *Litchi chinensis*, *Spathodea campanulata* etc. in the surrounding parts of the Beel. It appears that for a conservatory devoted mainly for the bird conservation enough thought need to be given for the further selection of species for plantation. Plants provide food, shelter and suitable structures for nesting round the year for larger number of bird species, local as well as migratory, may be properly recognized and should be used for plantations.

7.10. Ornamental Plants in Park and Garden

There is a park and one associated garden [‘Sishu Udyan’] in the Rasik Beel area developed for beautification and tourism. Also road-side areas and conservatory sites are beautified with plants. As much 70 ornamental species has been recorded from such areas (Fig. 7.4). Those are all common ornamentals used widely for beautification or as garden-plants and has no role in conservation activities. However, some of these produce edible fruits and of medicinal importance. These are of different habit groups like trees, shrubs, climbers and herbs. All the recorded ornamentals are enumerated below:

Acalypha hispida [Amaranthaceae]; V.N. – *Morog Phul*; *Rajib & AP Das 0585*, dtd. 25.07.2007.

Use: Garden shrub with attractive leaves and flowers.

Adenanthera pavonina [Fabaceae: Mimosoidae]; V.N. – *Kuch Chandan*; *Rajib & AP Das 0315*, dtd. 10. 02. 2007.

Use: Planted in Garden as a beautiful tree.

Aerva sanguinolenta [Amaranthaceae]; V.N. – *Lopang*; *Rajib & AP Das 0093*, dtd. 07. 02. 2007.

Use: Garden fence plants.

Alcea rosea [Malvaceae]; Common Name: *Holi-hock*; *Rajib & AP Das 0165*, dtd. 08. 02. 2007.

Uses: Cultivated as an ornamental plant.

Alstonia scholaris [Apocynaceae]; V.N. – *Chhatim*; *Rajib & AP Das 0372*, dtd. 21. 07. 2007.

Use: Planted in Garden and conservation sectors.

Areca catechu [Arecaceae]; V.N. – *Supari*; *Rajib & AP Das 0089*, dtd. 06. 02. 2007.

Use: Planted in Garden fence.

Artabotrys hexapetalus [Annonaceae]; V.N. – *Kaath Champa*; *Rajib & AP Das 0533*, dtd. 23.07.2007.

Use: Planted as garden plant.

Artemisia indica [Asteraceae]; V.N. – *Naag Nisinda*; *Rajib & AP Das 0497*, dtd. 23. 07. 2007.

Use: Garden plants and also used in medicinally.

Artocarpus lacucha [Moraceae]; V.N. – *Daoa*; *Rajib & AP Das 0719*, dtd. 14. 02. 2008.

Uses: Planted in garden for its valuable wood. Fruits edible and leaves are used as fodder.

Bambusa vulgaris [Poaceae]; V.N. – *Halud Bansh*; *Rajib & AP Das 0678*, dtd. 14. 02. 2008.

Use: Planted in Garden margin.

Barleria cristata [Acanthaceae]; V.N. – *Jati*; *Rajib & AP Das 0669*, dtd. 13. 02. 2008.

Use: Planted in garden for its beautiful flowers.

Barleria lupulina [Acanthaceae]; V.N. – *Halud Ful*; *Rajib & AP Das 0621*, dtd. 11. 02. 2008.

Use: Planted in garden for its beautiful flowers.

- Barleria strigosa*** [Acanthaceae]; V.N. – *Neel Jati*; Rajib & AP Das 0536, dtd. 23. 07. 2007.
Use: Planted in garden for its beautiful flowers.
- Bauhinia purpurea*** [Fabaceae]; V.N. – *Rakta Kanchan*; Rajib & AP Das 0325, dtd. 21. 07. 2007.
Use: Planted in garden for its beautiful flowers.
- Bauhinia variegata*** [Fabaceae]; V.N. – *Kanchan*; Rajib & AP Das 0311, dtd. 10. 02. 2007.
Use: Planted in garden for its beautiful foliage and flowers.
- Bougainvillea glabra*** [Nyctaginaceae]; V.N. – *Bagan Bilas*; Rajib & AP Das 0051, dtd. 05. 02. 2007.
Use: Planted in garden and park.
- Bougainvillea spectabilis*** [Nyctaginaceae]; V.N. – *Bagan Bilas*; Rajib & AP Das 0048, dtd. 05. 02. 2007.
Use: Planted in garden and park.
- Bryophyllum pinnatum*** [Crassulaceae]; V.N. – *Pathorkuchi*; Rajib & AP Das 0223, dtd. 09. 02. 2007.
Use: Grown in gardens for its beautiful succulent leaves and flowers.
- Caesalpinia pulcherrima*** [Fabaceae: Caesalpinioideae]; V.N. – *Krishnachura*; Rajib & AP Das 0103, dtd. 07. 02. 2007.
Use: Planted in garden for its beautiful flowers.
- Callistemon lanceolatus*** [Myrtaceae]; V.N. – *Bottle Brush*; Rajib & AP Das 0269, dtd. 10. 02. 2007.
Use: Planted in garden for its beautiful flowers.
- Calotropis gigantea*** [Apocynaceae: Asclepiadoideae]; V.N. – *Akanda*; Rajib & AP Das 0410, dtd. 22. 07. 2007.
Use: Planted in garden side, leaves also used as medicinally.
- Camellia japonica*** [Theaceae]; V.N. – *Camelia*; Rajib & AP Das 0060, dtd. 07. 02. 2007.
Use: Planted in garden for its beautiful flowers.
- Carica papaya*** [Caricaceae]; V.N. – *Pnepe*; Rajib & AP Das 0096, dtd. 07. 02. 2007.
Use: Cultivated in garden for its edible fruits.
- Caryota urens*** [Arecaceae]; V.N. – *Paam*; Rajib & AP Das 0088, dtd. 06. 02. 2007.
Use: Planted in forest margin.
- Cassia fistula*** [Fabaceae: Caesalpinioideae]; V.N. – *Bandar Lathi*; Rajib & AP Das 0142, dtd. 07. 02. 2007.
Use: Deciduous ornamental small tree with beautiful foliage and flowers.
- Cassia javanica ssp. nodosa*** [Fabaceae: Caesalpinioideae]; V.N. – *Balaram Chura*; Rajib & AP Das 0122, dtd. 07. 02. 2007.
Use: Ornamental flowering tree.
- Cereus repandus*** [Cactaceae]; V.N. – *Sij Kanta*; Rajib & AP Das 0020, dtd. 05. 02. 2007.
Use: Cultivated as ornamental plant.
- Catharanthus roseus*** [Apocynaceae]; V.N. – *Nayantara*; Rajib & AP Das 0388, dtd. 21. 07. 2007.
Use: Plant is grown in gardens.
- Cinnamomum tamala*** [Lauraceae]; V.N. – *Tejpata*; Rajib & AP Das 0540, dtd. 23. 07. 2007.
Use: Cultivated in garden as spice tree.

- Cinnamomum verum*** [Lauraceae]; V.N. – *Darchini*; *Rajib & AP Das 0412*, dtd. 11. 02. 2008.
Use: Cultivated in garden as spice tree.
- Citrus maxima*** [Rutaceae]; V.N. – *Jambura*; *Rajib & AP Das 0600*, dtd. 26. 07. 2007.
Use: Cultivated garden for its testy fruits.
- Cocos nucifera*** [Arecaceae]; V.N. – *Narkel*; *Rajib & AP Das 0090*, dtd. 07. 02. 2007.
Use: Cultivated garden plants for its fruits.
- Clitoria ternatea*** [Fabaceae: Faboidae]; V.N. – *Nilkantha*; *Rajib & AP Das 0239*, dtd. 09. 02. 2007.
Use: Cultivated for its flower.
- Crinum amoenum*** [Amarylidaceae]; V.N. – *Akashi*; *Rajib & AP Das 0170*, dtd. 08. 02. 2007.
Use: Plants are grown for gardening purposes.
- Duranta erecta*** [Verbenaceae]; V.N. – *Duranta*; *Rajib & AP Das 0488*, dtd. 23.7.2007.
Use: Cultivated for garden fencing.
- Ficus elastica*** [Moraceae]; V.N. – *Rober Bot*; *Rajib & AP Das 0597*, dtd. 25. 07. 2007.
Uses: Planted as ornamental garden tree.
- Hibiscus mutabilis*** [Malvaceae]; V.N. – *Sthal Padma*; *Rajib & AP Das 0487*, dtd. 23. 07. 2007.
Uses: Cultivated as ornamental plants.
- Hibiscus rosa-sinensis*** [Malvaceae]; V.N. – *Rakta Jaba*; *Rajib & AP Das 0080*, dtd. 06. 02. 2007.
Uses: Cultivate in gardens for its beautiful flowers.
- Holarrhena pubescens*** [Apocynaceae]; V.N. – *Kurchi*; *Rajib & AP Das 0459*, dtd. 23. 07. 2007.
Uses: Cultivate in gardens for its beautiful flowers.
- Impatiens balsamina*** [Balsaminaceae]; V.N. – *Dopati*; *Rajib & AP Das 0620*, dtd. 11. 02. 2008.
Use: Ornamental garden annual.
- Impatiens trilobata*** [Balsaminaceae]; V.N. – *Dopati*; *Rajib & AP Das 0554*, dtd. 24. 07. 2007.
Use: Ornamental garden annual.
- Ixora acuminata*** [Rubiaceae]; V.N. – *Rangan*; *Rajib & AP Das 0478*, dtd. 23. 07. 2007.
Use: Grown in gardens for its beautiful flowers.
- Jasminum dispersum*** [Oleaceae]; V.N. – *Juin*; *Rajib & AP Das 0614*, dtd. 11.02.2008.
Use: Grown in gardens for its beautiful flowers.
- Jasminum sambac*** [Oleaceae]; V.N. – *Beli*; *Rajib & AP Das 0480*, dtd. 23.07.2007.
Use: Grown in gardens for its aromatic and beautiful flowers.
- Jatropha curcas*** [Euphorbiaceae]; V.N. – *Varenda, Sada Varenda*; *Rajib & AP Das 0722*, dtd. 14.02.2008.
Use: Grown along the fences for its beautiful foliage.
- Justicia adhatoda*** [Acanthaceae]; V.N. – *Basak*; *Rajib & AP Das 0542*, dtd. 23.07.2007.
Use: Grown along the fences for its beautiful foliage and flowers.
- Justicia gendarussa*** [Acanthaceae]; V.N. – *Kalakasunda*; *Rajib & AP Das 0651*, dtd. 12.02.2008.
Use: Grown along the fences for its beautiful foliage and flowers.
- Litchi chinensis*** [Sapindaceae]; V.N. – *Lichu*; *Rajib & AP Das 0313*, dtd. 10.02.2007.
Use: Cultivated in garden for its testy fruits.

Magnolia grandiflora [Magnoliaceae]; V.N. – *Kathali Champa*; Rajib & AP Das 0123, dtd. 07.02.2007.

Use: Planted in garden for its elegant foliage and flowers.

Magnolia champaca [Magnoliaceae]; V.N. – *Swarna Champa*; Rajib & AP Das 0187, dtd. 09.02.2007.

Use: This species is widely cultivated as an ornamental and for timber.

Malvaviscus arboreus var. *penduliflorus* [Malvaceae]; V.N. – *Lanka Jaba*; Rajib & AP Das 0329, dtd. 21.07.2007.

Uses: Ornamental plants. Grown in gardens for its beautiful flowers.

Mangifera indica [Anacardiaceae]; V.N. – *Aam*; Rajib & AP Das 0334, dtd. 21.07.2007.

Uses: This species is widely cultivated for timber and its tasty fruits.

Mesua ferrea [Clusiaceae]; V.N. – *Nageswar*; Rajib & AP Das 0065, dtd. 07.02.2007.

Uses: Cultivated for beautiful flowers.

Mirabilis jalapa [Nyctaginaceae]; V.N. – *Sandhya Malatai*; Rajib & AP Das 0034, dtd. 05.02.2007.

Use: Grown in gardens for its beautiful flowers.

Moringa oleifera [Moringaceae]; V.N. – *Sajna*; Rajib & AP Das 0171, dtd. 08.02.2007.

Use: Ornamental gared plants.

Morus australis [Moraceae]; V.N. – *Tnut*; Rajib & AP Das 0128, dtd. 07. 02. 2007.

Uses: Ornamental plants.

Murraya paniculata [Rutaceae]; V.N. – *Kamini*; Rajib & AP Das 0642, dtd. 12.02.2008.

Use: Garden plants.

Neolamarckia cadamba [Rubiaceae]; V.N. – *Kadam*; Rajib & AP Das 0587, dtd. 25.07. 2007.

Use: Ornamental tree. Timber also very valuable.

Nyctanthes arbor-tristis [Nyctaginaceae]; V.N. – *Shiuli*; Rajib & AP Das 0047, dtd.05.02. 2007.

Use: Cultivated for its flowers.

Nymphaea nouchali [Nymphaeaceae]; V.N. – *Neel Shaluk*; Rajib & AP Das 0336, dtd. 21.07.2007.

Use: Cultivated in park-side pond.

Nymphaea pubescens [Nymphaeaceae]; V.N. – *Shaluk*; Rajib & AP Das 0402, dtd. 22. 07. 2007.

Use: Cultivated in park-side pond.

Nymphaea rubra [Nymphaeaceae]; V.N. – *Lal Shaluk*; Rajib & AP Das 0251, dtd. 10. 02. 2007.

Use: Cultivated in park-side pond.

Ocimum basilicum [Lamiaceae]; V.N. – *Sada Tulsi*; Rajib & AP Das 0321, dtd. 21. 07. 2007.

Use: Garden aromatic herb.

Ocimum tenuiflorum [Lamiaceae]; V.N. – *Kalo Tulsi*; Rajib & AP Das 0560, dtd. 24. 07. 2007.

Use: Garden plants.

Phyllanthus emblica [Phyllanthaceae]; V.N. – *Amlaki*; Rajib & AP Das 0490, dtd. 23. 07. 2007.

Use: Cultivated garden plants for its fruits.

Piper longum [Piperaceae]; V.N. – *Pipla*; Rajib & AP Das 0206, dtd. 09. 02. 2007.

Use: Ornamental plants.

Piper nigrum [Piperaceae]; V.N. – *Golmarich*; Rajib & AP Das 0262, dtd. 10. 02. 2007.

Use: Ornamental plants.

Polyalthia longifolia [Annonaceae]; V.N. – *Debdaru*; Rajib & AP Das 0440, dtd. 22. 07. 2007.

Uses: This species is widely cultivated as an ornamental and for timber.

Psidium guajava [Myrtaceae]; V.N. – *Peyara*; Rajib & AP Das 0258, dtd. 10. 02. 2007.

Use: Cultivated garden plants.

Roystonea regia [Arecaceae]; V.N. – *Narkel Paam*; Rajib & AP Das 0092, dtd. 07. 02. 2007.

Use: Ornamental garden palm.

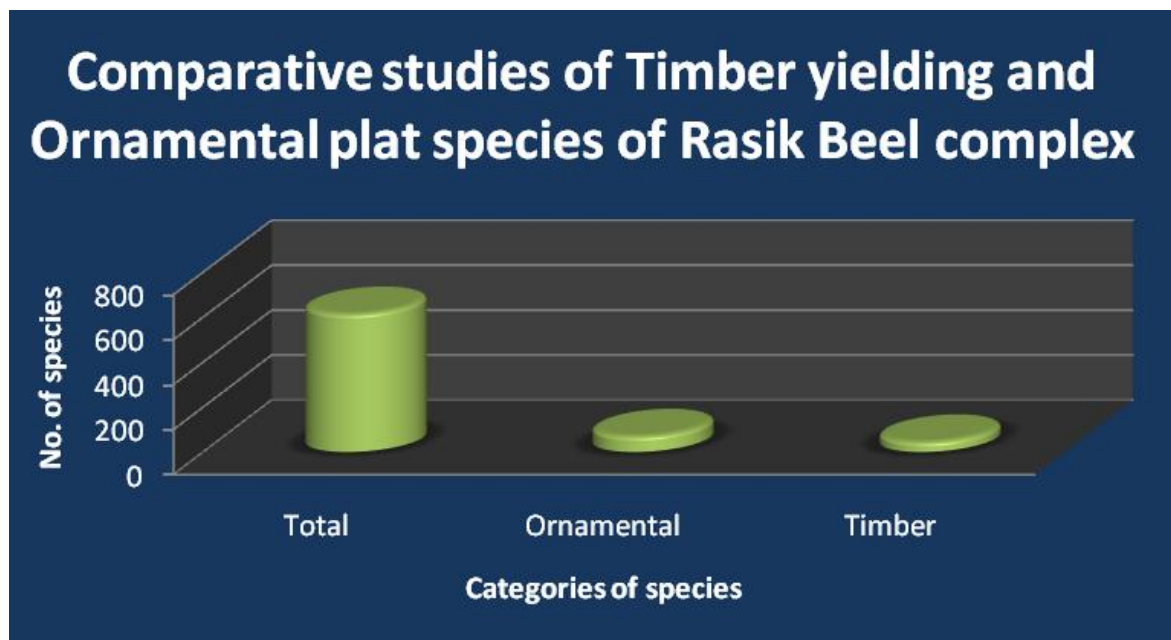


Fig.:7.4. Comparative study of Timber yielding and Ornamental and garden plants of Rasik Beel complex

7.11. Important Timber Yielding Plants of Rasik Beel Area

Altogether, 45 species of trees have been recorded from the surrounding forests areas of Rasik Beel complex those produce much valuable wood (Fig. 7.4). These plants are not a part of NTFPs, but their leaves, fruits and flowers are the main sources of NTFPs of the study area. The recorded timber yielding species are enumerated below:

Amoora rohituka [Meliaceae]; V.N. – *Rasune*; Rajib & AP Das 0532, dtd. 23. 07. 2007.

Aglaia spectabilis [Meliaceae]; V.N. – *Lali*; Rajib & AP Das 0498, dtd. 23. 07. 2007.

Artocarpus heterophyllus [Moraceae]; V.N. – *Kanthal*; Rajib & AP Das 0732, dtd. 14. 02. 2008.

Artocarpus lakoocha [Moraceae]; V.N. – *Dawa*; Rajib & AP Das 0719, dtd. 14. 02. 2008.

Barringtonia acutangula [Lecythydaceae]; V.N. – *Hijal*; Rajib & AP Das 0109, dtd. 07. 02. 2007.

Bischofia javanica [Phyllanthaceae]; V.N. – *Kainjal*; Rajib & AP Das 0265, dtd. 10. 02. 2007.

Bombax ceiba [Malvaceae]; V.N. – *Shimul*; Rajib & AP Das 0435, dtd. 22. 07. 2007.

- Callicarpa arborea* [Lamiaceae]; Rajib & AP Das 0295, dtd. 10. 02. 2007.
- Careya arborea* [Lecythidaceae]; V.N. – Kumbhi; Rajib & AP Das 0153, dtd. 08. 02. 2007.
- Cassia javanica* ssp. *nodosa* [Fabaceae: Caesalpinioideae]; V.N. – Balaram chura; Rajib & AP Das 0122, dtd. 07. 02. 2007.
- Senna siamea* [Fabaceae: Caesalpinioideae]; Rajib & AP Das 0127, dtd. 07. 02. 2007.
- Chukrasia tabularis* [Meliaceae]; V.N. – Chikrashi; Rajib & AP Das 0454, dtd. 22. 07. 2007.
- Cinnamomum bejolghota* [Lauraceae]; V.N. – Bon tejpata; Rajib & AP Das 0469, dtd. 23. 07. 2007.
- Dalbergia sissoo* [Fabaceae: Caesalpinioideae]; V.N. – Sishu; Rajib & AP Das 0151, dtd. 08. 02. 2007.
- Dillenia indica* [Dilleniaceae]; V.N. – Chalta; Rajib & AP Das 0666, dtd. 13. 02. 2008.
- Dillenia pentagyna* [Dilleniaceae]; V.N. – Tartari; Rajib & AP Das 0695, dtd. 14. 02. 2008.
- Diospyros malabarica* [Ebenaceae]; V.N. – Gaab; Specimen Cited: Rajib & AP Das 0222, dtd. 09. 02. 2007.
- Elaeocarpus floribundus* [Elaeocarpaceae]; V.N. – Jalpai; Rajib & AP Das 0085, dtd. 06. 02. 2007.
- Gmelina arborea* [Lamiaceae]; V.N. – Gamari; Rajib & AP Das 0524, dtd. 23. 07. 2007.
- Lagerstroemia hirsuta* [Lythraceae]; V.N. – Jarul; Rajib & AP Das 0512, dtd. 23. 07. 2007.
- Lagerstroemia parviflora* [Lythraceae]; V.N. – Sidha; Rajib & AP Das 0511, dtd. 23. 07. 2007.
- Lannea coromandelica* [Anacardiaceae]; V.N. – Jika; Rajib & AP Das 0364, dtd. 21. 07. 2007.
- Litsea glutinosa* [Lauraceae]; V.N. – Pipul; Rajib & AP Das 0618, dtd. 11. 02. 2008.
- Litsea monopetala* [Lauraceae]; V.N. – Bonkathal; Rajib & AP Das 0685, dtd. 14. 02. 2008.
- Mangifera indica* [Anacardiaceae]; V.N. – Aam; Rajib & AP Das 0334, dtd. 21. 07. 2007.
- Melia azedarach* [Meliaceae]; V.N. – Ghora nim; Rajib & AP Das 0243, dtd. 09. 02. 2007.
- Mesua ferrea* [Clusiaceae]; V.N. – Nageswar; Rajib & AP Das 0065, dtd. 07. 02. 2007.
- Magnolia champaca* [Magnoliaceae]; V.N. – Swarna champa; Rajib & AP Das 0187, dtd. 09. 02. 2007.
- Neolamarckia cadamba* [Rubiaceae]; V.N. – Kadam; Rajib & AP Das 0587, dtd. 25. 07. 2007.
- Oroxylum indicum* [Bignoniaceae]; V.N. – Taroyal phal; Rajib & AP Das 0299, dtd. 10. 02. 2007.
- Peltophorum pterocarpum* [Fabaceae: Caesalpinioideae]; V.N. – Radhachura; Rajib & AP Das 0149, dtd. 08. 02. 2007.
- Polyalthia longifolia* [Annonaceae]; V.N. – Debdaru; Rajib & AP Das 0440, dtd. 22. 07. 2007.
- Shorea robusta* [Dipterocarpaceae]; V.N. – Sal; Rajib & AP Das 0648, dtd. 12. 02. 2008.
- Sterculia villosa* [Malvaceae]; V.N. – Odal; Rajib & AP Das 0468, dtd. 23. 07. 2007.
- Swietenia macrophylla* [Meliaceae]; V.N. – Mehogini; Rajib & AP Das 0310, dtd. 10. 02. 2007.
- Swietenia mahagoni* [Meliaceae]; V.N. – Mehogini; Rajib & AP Das 0390, dtd. 21. 07. 2007.
- Syzygium cumini* [Myrtaceae]; V.N. – Kalojam; Rajib & AP Das 0174, dtd. 08. 02. 2007.
- Syzygium jambos* [Myrtaceae]; V.N. – Golap-jam; Rajib & AP Das 0252, dtd. 10. 02. 2007.

- Tamarindus indica* [Fabaceae: *Caesalpinioideae*]; V.N. – *Tentul*; *Rajib & AP Das 0244*, dtd. 09. 02. 2007.
- Tectona grandis* [Lamiaceae]; V.N. – *Segun*; *Rajib & AP Das 0682*, dtd. 14. 02. 2008.
- Terminalia arjuna* [Combretaceae]; V.N. – *Arjun*; *Rajib & AP Das 0541*, dtd. 23. 07. 2007.
- Terminalia bellirica* [Combretaceae]; V.N. – *Bahera*; *Rajib & AP Das 0602*, dtd. 26. 07. 2007.
- Terminalia myriocarpa* [Combretaceae]; V.N. – *Panisaaj*; *Rajib & AP Das 0586*, dtd. 25. 07. 2007.
- Toona ciliata* [Meliaceae]; V.N. – *Toon*; *Rajib & AP Das 0267*, dtd. 10. 02. 2007.
- Wrightia arborea* [Apocynaceae]; V.N. – *Khira*; *Rajib & AP Das 0273*, dtd. 10. 02. 2007.

Recently, *Salix tetrsperma* is also being introduced for its branching nature, which is quite suitable for the nesting by many birds. *Terminalia arjuna* also planted at the middle of the Island and parts of Baroan and Chhotojan Beel areas for the same reason.