

Biodiversity Assessment and Biomass Estimation of Anjneri Hill

Project ReGreen Nation

MARCH 2024

Annual report submitted to
Raah Foundation



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Back cover image: Anjneri site in winter season

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Biodiversity Assessment and Biomass Estimation of Anjneri Hill

1. Introduction

Ecological assessment is a crucial step for land management practices. Along with assessing environmental abiotic factors such as soil and water, biodiversity monitoring is also important to understand biological community in a habitat in order to check possible effects of changes due to proposed land development or management projects. Biodiversity assessment studies including flora and fauna can provide insights on the species presence, habitat use and suggest recommendations on effective use of an area (Niemelä 2000, Bajarú et al. 2020).

Raah Foundation approached Bombay Natural History Society (BNHS) for biodiversity assessment and biomass estimation of plantation of an ongoing ecological restoration project in Nashik, Maharashtra. The project aims to work towards restoration in the catchments of Godavari River in Nashik area through a series of plantation of native flora in upcoming years. The work includes biomass calculation of the plantation and inventorying key fauna in the study area. BNHS team undertook the monsoon season survey for multiple taxa such as plants, insects, herpetofauna, birds and mammals at different time periods during 30th August to 9th October 2023 at selected study sites.

Biomass Estimation of plantation

Biomass estimation pertains to the assessment of the quantity of living or organic matter within a particular geographical area, whether it be a forest, grassland, or wetland. Accurate determination of plant biomass is of paramount importance in ecological studies, particularly concerning the carbon cycle, ecosystem dynamics, and the implications of climate change on our natural environment (Santoro & Cartus, 2018). It is pivotal to recognize that plants play a pivotal role in sequestering atmospheric carbon dioxide through the process of photosynthesis, thus rendering them crucial contributors to mitigating the effects of climate change. Precise biomass estimates are invaluable in quantifying the carbon stored within diverse plant ecosystems, ranging from forests to grasslands, and provide invaluable insights for initiatives aimed at preserving and restoring carbon-sequestering ecosystems. Furthermore, biomass estimation assumes a pivotal role in monitoring changes in vegetation over time, identifying regions of significant conservation value, and informing decision-making processes related to land use and management (Heryati et al., 2011; Vorster et al., 2020).

Present report summarizes the multi-taxa observations taken during the survey at Anjneri hill along with estimations of biomass of the recent plantation.

1.1 Objective

- i. To record seasonal variation in species and prepare inventories of flora and fauna.
- ii. To estimate biomass of the plantation.



Fig. 1 Lush green site of Anjneri hill showing plantation pits and natural vegetation in monsoon



Fig. 2 Seasonal transformation of Anjneri hill during winter

2. Methodology

2.1 Study area

Anjneri hill, also known as Gadhwa dongar, is situated on south-west side around 24km away from Nashik city. The study site is a hillock present at an elevation of 810m above sea level. This site is closer to Trimbakeshwar from where the river Godavari originates and thereby it is closer to the Western Ghats. Although predominantly the habitat is of grassland type, there are many trees present at the base in the valley of the hill. Seasonal transformations of vegetation were seen during wet and dry seasons (Fig. 1 & 2).

2.2 Sampling

Seasonal variation and species inventory

Species inventory of flora and fauna was prepared by following the transects of 1km as shown in the map (Fig. 3). Opportunistic observations were also added to the final list. Seasonal variation was recorded by comparing species count across three seasons. Plant species which could not be identified on the field were identified using literature (Almeida 1996-2009). Birds and insects were mainly observed in daytime owing to their activity period in the morning 0730 to 1100hrs. Insects were surveyed considering all microhabitats i.e. on vegetation, and along water bodies. Nocturnal species of birds and insects were surveyed during evening 0530 to 0830hrs. Unidentified birds and insects were identified using relevant literature (Grimmett et al. 2011, Kehimkar 2016, Subramanian 2009).

Amphibians and reptiles, together called as herpetofauna, are mainly active during dark hours hence their surveys were carried out from 1900hrs to 0200hrs of the following day. Species were searched beneath rocks, barks, in culverts, streams, and rock cuttings. Extensive visual encounter surveys were also carried out along road nearby the study site. Few species were partially handled, identified, photographed, and subsequently released at the same location as where they were found. Identification of the species was based on visual observations, photographs, the use of field guides (Whitaker and Captain 2008, Daniel 2002) and literature on herpeto-fauna of British India (Smith 1931, Smith 1935, Smith 1943).

Presence of different mammals was also noted either by direct sighting or by indirect signs such as pugmarks, scraping marks and droppings using the relevant reference (Menon 2014).

Biomass estimation

To determine the biomass, the quadrat method was employed. The research effort involved the establishment of a total of 24 quadrats in the Anjneri site as shown in the map (Fig. 4). Specifically, two percent of the total number of planted saplings was sampled by laying quadrats of having size 7 pits by 3 pits plots. Additionally, the GPS coordinates of these quadrats were recorded to ensure precise location data. To distinguish the quadrats from the

surrounding saplings, ribbons were affixed to the four corner plants of each quadrat, demarcating their boundaries.

Calculations for both above-ground and below-ground biomass estimations of tree saplings were executed using allometric equations, as delineated in relevant academic sources (Chaturvedi & Raghubanshi, 2012; Yuen et al., 2016). These equations, informed by scientific research, serve as fundamental tools for accurately quantifying biomass in plant populations, and their utilization is imperative for the precision and rigor of the biomass estimation process in the study. We also noted essential parameters such as sapling height, bole diameter, and other pertinent characteristics, were measured directly in the field using measuring tape.

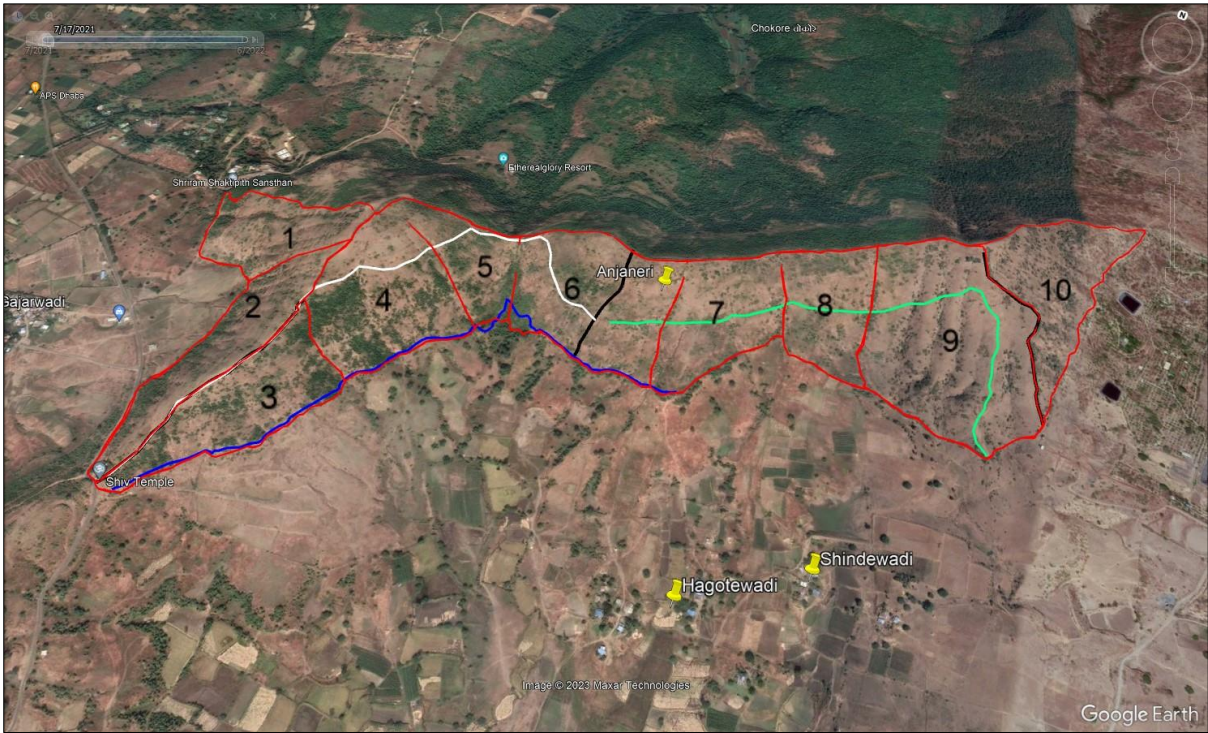


Fig. 3 Transects (blue, green & white) at Anjaneri hill for biodiversity documentation

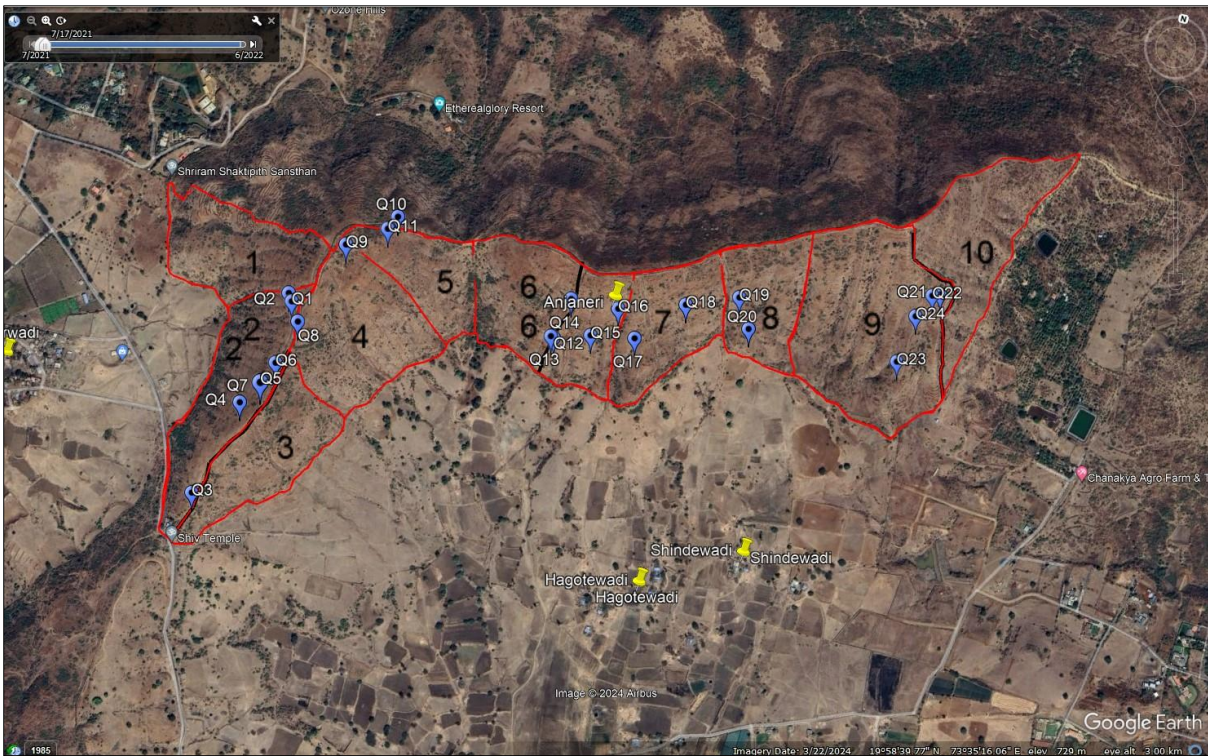


Fig. 4 Quadrats used for biomass assessments

3 Results

Taxa wise checklists of fauna and flora are given in following text under respective headings. Status provided by the global authority International Union for the Conservation of Nature (IUCN) in their Red List of Threatened Species, relevant remarks (native/introduced species) and protection provided by Indian law under the schedules of The Wild Life (Protection) Amendment Act, 2022 are also mentioned where applicable.

3.1 Flora

3.1.1 Species inventory

A total of 121 species belonging to 35 families were recorded across three seasons. Details of their habit, origin are given in the Annexure 1.

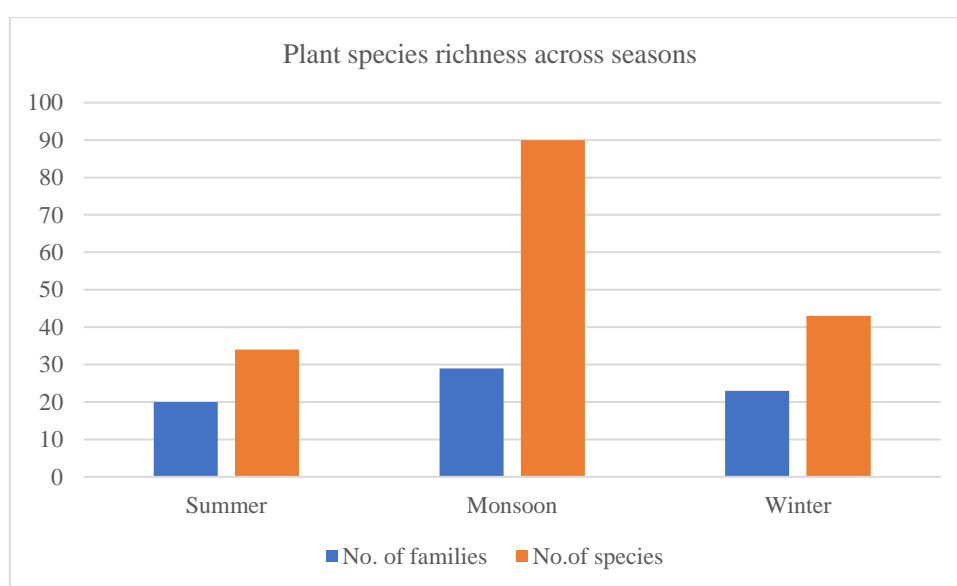


Fig. 5 Plant species richness across seasons at Anjneri

Majority of plant species at Anjneri are characteristics of grasslands and scrub forest. Out of total 121 species, almost 50% of the plants are herbs (n=54) followed by grasses (n=27). Some of these are annual that complete their breeding or flowering in monsoon in the suitable conditions. As mentioned earlier, trees were present at this site, generally at the base in the valleys or few on slopes. An individual of Banyan tree (*Ficus benghalensis*) was seen at the top near the boundary of zones nine and ten. *Ficus* spp. are usually known as flagship species as they support variety of other life forms like insects, parasites, birds etc.

As clearly seen in the figure no. 5, highest number of plants were recorded in monsoon (n=90) in which majority species are grasses, followed by winter (n=43). Out of the total species, almost 90% (n=109) plants were native. Grasses like *Heteropogon contortus*, *Sehima nervosum*, *Themda quadrivalvis*, *Borthicloa*, *Cymbopogon martini* and herbs like *Blainvella*, *Indigofera*, *Trichodesma* sp., are typically found in open grasslands. Trees like *Terminalia crenulata*, *Butea* sp, *Bauhinia* sp, *Grewia tiliifolia* are scattered at slopes in the undulating valleys. Grasses and annual herbs started drying after monsoon (mid-October) onwards.

3.1.2 Biomass Estimation

The above-ground and below-ground biomass estimations of tree saplings were calculated for monsoon and winter season in all zones where plantation was done. The data collected in the winter season is given in the Annexure 2.

In monsoon (September 2023), data collected in total 16 quadrats regarding the above ground biomass of 207 saplings was 168.65 grams, with a corresponding below-ground biomass of 63.78 grams. The biomass estimation of the plantation in monsoon season corresponds to the total above-ground biomass 168.65 grams, and below-ground biomass of 63.78 grams.

In winter (January 2024), data collected in total 24 quadrats regarding the above and below ground biomass of total 426 sapling provides valuable insight into the biomass distribution within this valuable plantation. Estimating biomass in all zones of Anjaneri, from Zone 1 to Zone 9, is crucial for understanding the ecosystem's productivity and carbon storage capacity. In winter season, the total biomass across all zones was found to be 92.18 grams. This value represents the combined weight of all plant matter in the area, including above-ground 70.99 grams and below-ground biomass 21.18 grams. Such data is essential for ecosystem management, conservation efforts, and understanding the impacts of climate change on plant communities.

3.2 Insects

A total of 30 insect species belonging to 15 families and seven different orders were recorded across three seasons (Annexure 3).

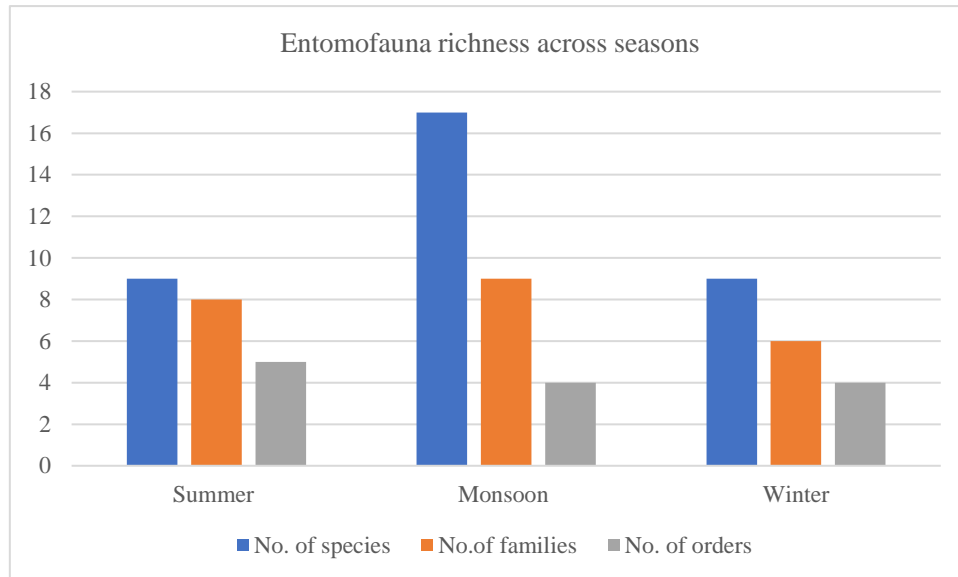


Fig. 6 Insect species richness across seasons at Anjneri

Highest number of species ($n=17$) were seen in monsoon season followed by equal number of species in summer and winter ($n=9$) but belonging to different orders but more number of families were seen in monsoon and summer ($n=9$ & 8 , respectively). Certain insects like Cicadas were only seen in summer season. Highest number of recorded species belonged to order Lepidoptera (moths and butterflies). Although the habitat of Anjneri is open grassland, we did not detect any skippers among butterflies. Among the interesting observations, we recorded four caterpillars of different stages of a swallowtail butterfly *Papilio demoleus* (Lime Butterfly) on the sapling of *Limonia acidissima* Kavath in zone number 2 in monsoon season. It is a commonly found butterfly species mainly completing its life-cycle on plants of family Rutaceae. Another interesting observation was of Harvester ants (*Pheidole* sp.), also known as fortress ants due to their characteristic layered structure of nest generally built on slopes.

None of the species are included under any schedule of the Wild Life (Protection) Amendment Act, 2022. The species were identified to species level wherever possible barring some groups like ants, grasshoppers of which field identification is not possible in most of the cases. Out of identified species, none of the species are included under threatened categories as per IUCN Red List.

3.3 Herpetofauna

A total of five species of amphibians belonging to three families and nine reptiles belonging to five families were found across three seasons (Annexure 4).

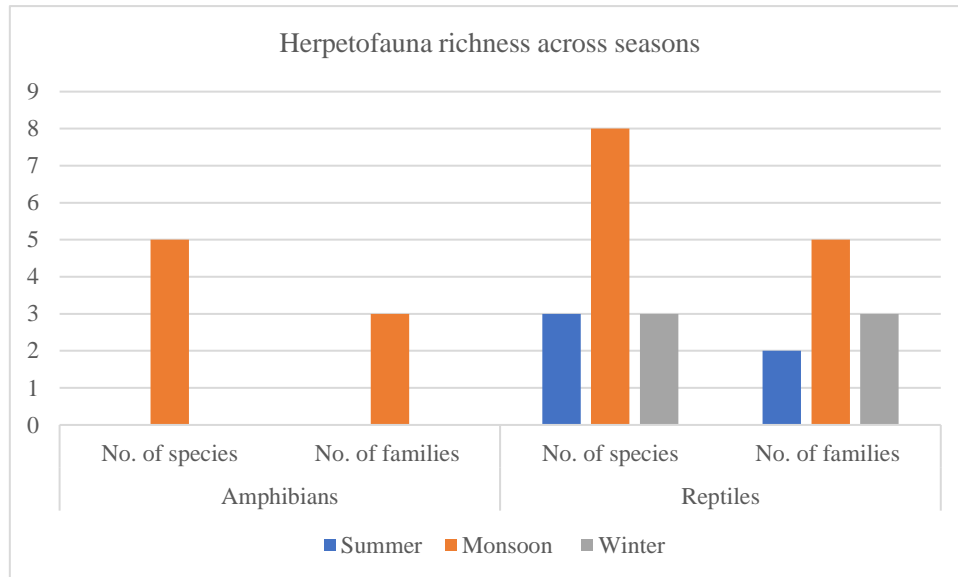


Fig. 7 Amphibian and reptile species richness across seasons at Anjneri

We did not record any amphibians in summer as well as winter season at Anjneri. Among reptiles, only Murray's House Gecko (*Hemidactylus cf. murrayi*) was found throughout all seasons. It is interesting to note that all the four species of snakes were spotted only in monsoon and one individual of Deccan Fan-throated Lizard (*Sarada deccanensis*) was seen in only summer season which is its breeding season. Overall, high species count and abundance was seen in the monsoon season. In case of reptiles, a higher number of species were seen in monsoon (n=8) than winter and summer (n=3 each).

As the life cycle of amphibians is dependent on freshwater, all five species were only found in monsoon in high numbers (n=10+). Among snakes, Checkered Keelback Snake, Rat Snake and Russell's Viper are protected under schedule I and Common Wolf Snake is protected under schedule II of The Wild Life (Protection) Amendment Act, 2022.

3.4 Avifauna

We recorded a total of 48 species of birds belonging to 28 families across three seasons in the study area (Annexure 5).

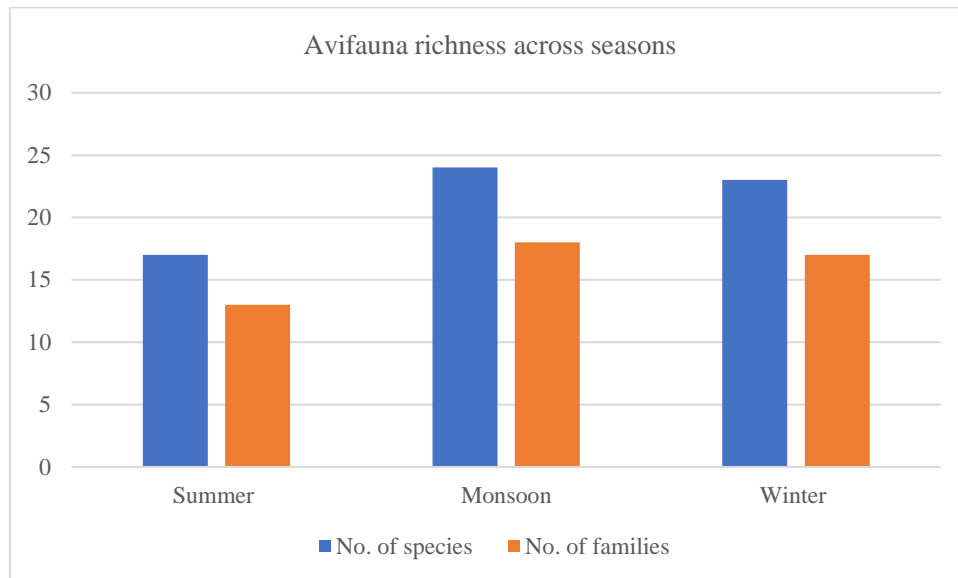


Fig. 8 Bird species richness across seasons at Anjneri

A higher number of species were observed in monsoon (n=24) and winter (n=23) season as compared to summer (n=17). Although the species richness is similar in monsoon and winter season, the composition varied in these two seasons. Out of the total 48 species, seven species are migratory and rest are resident. Out of these seven migratory species, migration of Jacobin Cuckoo is iconic meaning that although population in southern India is resident, the birds originating from eastern Africa arrive in Peninsular India at the start of monsoon hence the species is called as harbinger of monsoon or rain. The species was seen only during monsoon surveys. It is a brood parasitic bird which means it lays eggs in other bird's nests. Rest of the six species were mainly seen in the winter.

Among Bunting, we recorded a pair of Crested Bunting in monsoon whereas Grey-necked Bunting was found in winter. Both species are hill specialists often found in open rocky, grassy areas. They mainly feed on grass seeds, grains and occasionally on small insects. We also recorded Common Kestrel in which is a predatory bird, again inhabiting open grassy habitats.

Among other interesting observations, we recorded two individuals of Indian Vulture or Long-billed Vulture hovering above the study area in winter. The large rocky cliffs nearby the Anjneri reserve are perfect habitat for vultures and other raptors. The species is categorised as 'Critically Endangered (CR)' according to the Red List of International Union for Conservation of Nature (IUCN) due to severe population decline during 2000s.

4 Discussion

As observed throughout the year, our recordings indicate that the flora and fauna community of Anjneri hill is slightly different from other sites as it mainly closer to the Western Ghats and may be because the other side of the hill i.e. the one towards Chakore village is forested and not so open. Naturally occurring tree species are found at the base of this hill while the slopes were covered with grasses and shrubs e.g. *Euphorbia* spp. An increase in the biomass values was observed owing to increase in winter compared to monsoon as sampling efforts i.e number of quadrats sampled were more in the winter to accommodate the two percent sampling size. Also, some of the plots were seen burned in the fireline hence new adjacent quadrats were sampled. We suggest plantation of native plants over exotic varieties like Guava and Sitaphal. Priority must be given to trees naturally thriving in the area. Owing to the fact that the natural dominant elements are herbs and grasses (> 50%), care must be taken that plantations can alter the vegetation composition and thereby the ecosystem of the area. We discourage plantation of evergreen trees like Kaju (*Anacardium occidentale*) and Phanas (*Artocarpus heterophyllus*) as both naturally occur in high rainfall areas with high relative humidity, especially considering the hot dry conditions of the study site and irrigation challenges.

As a general trend, we saw higher number of specie and abundance in the monsoon season due to favourable climatic conditions across all faunal taxa. Life stages of butterfly caterpillars were witnessed on some of the saplings like Kavath which is good indication of adaptation to vegetation by local fauna. An interesting observation among herpetofauna was of Roux's Forest Lizard which is mainly a forest-dwelling species. We had seen one individual of this species in summer at this site only and not at any other study sites. This might be due to there is a good vegetation cover on the other side of the hill that is why we are able to see an overlap between forest-dwelling species and the ones inhabiting open areas, as evident by the presence of Crested Bunting and Grey-necked Bunting, a typical hill species. Sighting of Indian Vulture or Long-billed Vulture in the area is seems promising that its habitat is still intact and the area is used by the birds for foraging. It is a 'Critically Endangered (CR)' species according to the Red List of International Union for Conservation of Nature (IUCN).



Indian Vulture
Gyps indicus

ABSTRACT
Indian Vulture *Gyps indicus* has most recently been assessed for *The IUCN Red List of Threatened Species* in 2021. *Gyps indicus* is listed as Critically Endangered under criteria A2abce+4abce.

THE RED LIST ASSESSMENT ⓘ
▶ BirdLife International. 2021. *Gyps indicus*. *The IUCN Red List of Threatened Species* 2021: e.T22729731A204672586.

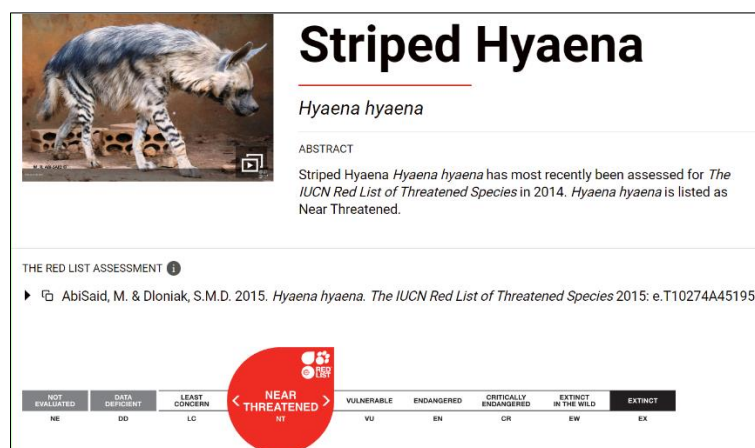
NOT EVALUATED | DATA DEFICIENT | LEAST CONCERN | NEAR THREATENED | VULNERABLE | ENDANGERED | **CRITICALLY ENDANGERED (CR)** | EXTINCT IN THE WILD | EXTINCT

NE | DD | LC | NT | VU | EN | EW | EX

Presence of mammals

Among mammals, we found droppings of Black-naped Hare (*Lepus nigricollis*) in the monsoon which is protected under schedule II of WPA, 2022. An exciting observation was recorded of the Striped Hyena (*Hyaena hyaena*) in the winter. It is the only hyena species found in India. We recorded an active den of an individual near zone 4 and 5 where a local saw an adult individual of hyena during survey that quickly vanished into its den. Locals are aware of the animal and fortunately there is no conflict between them. A decomposing remains of a domestic chicken was found near the den. Hyenas are usually scavengers feeding on the carcasses and remains of dead animals and hence regarded as 'cleaners of the environment'. Presence of the animal indicates that it is surviving well in the habitat and it should be protected with high priority as the population of this species is declining due to habitat loss owing to land conversion. Hyenas mainly reside I rocky areas near grasslands and open scrublands. This species is categorised as 'Near Threatened' (NT) according to the Red List of International Union for Conservation of Nature (IUCN) with around 10,000 individuals surviving in the wild in India.

Also, we learnt from local people that Wild Boars (*Sus scrofa cristatus*) cause damage to the saplings by digging in the soil. There was notable digging activity near the base of bamboo saplings. The species *Sus scrofa* is protected under schedule II.



Striped Hyena
Hyaena hyaena

ABSTRACT
Striped Hyena *Hyaena hyaena* has most recently been assessed for *The IUCN Red List of Threatened Species* in 2014. *Hyaena hyaena* is listed as Near Threatened.

THE RED LIST ASSESSMENT ⓘ
► AbiSaid, M. & Dloniak, S.M.D. 2015. *Hyaena hyaena*. *The IUCN Red List of Threatened Species* 2015: e.T10274A451950.

NOT EVALUATED	DATA DEFICIENT	LEAST CONCERN	NEAR THREATENED NT	VULNERABLE	ENDANGERED	CRITICALLY ENDANGERED	EXTINCT IN THE WILD	EXTINCT
NE	DD	LC		VU	EN	CR	EW	EX

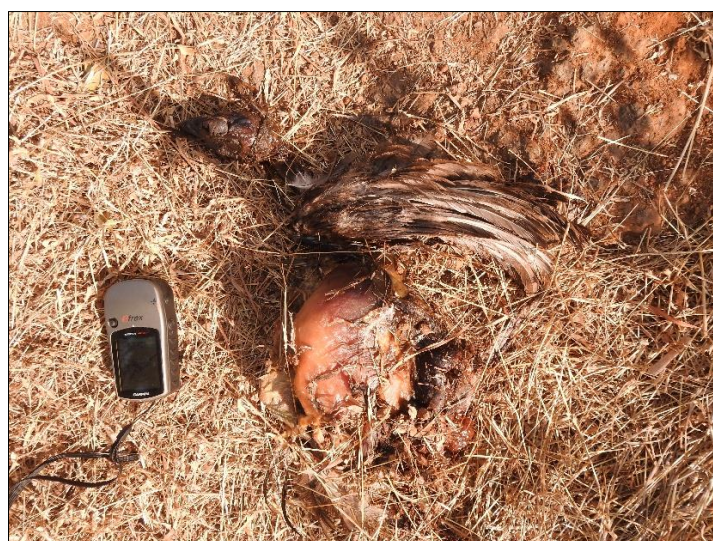


Fig. 9 Remains of domestic chicken near Hyena den

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Annexures

Annexure 1 Checklist of plants recorded across seasons

Sr. no.	Family	Botanical Name	Habit	IUCN status	Status	Summer	Monsoon	Winter
1	Acanthaceae	<i>Rostellularia procumbens</i>	Herb	NE	Native	-	+	-
2	Acanthaceae	<i>Rungia</i> sp.	Herb	--	Native	+	-	-
3	Amaranthaceae	<i>Amaranthus viridis</i>	Herb	NE	Native	+	-	-
4	Amaranthaceae	<i>Alternanthera paronychioides</i>	Herb	NE	Introduced	-	+	+
5	Apiaceae	<i>Pimpinella adscendens</i>	Herb	NE	Native	-	+	-
6	Apocynaceae	<i>Calotropis gigantea</i>	Shrub	NE	Native	+	-	-
7	Apocynaceae	<i>Carissa carandas</i>	Shrub	NE	Native	+	+	+
8	Apocynaceae	<i>Cryptolepis buchananii</i>	Shrub	NE	Native	-	+	+
9	Arecaceae	<i>Phoenix sylvestris</i>	Tree	NE	Native	+	-	-
10	Asparagaceae	<i>Agave americana</i>	Shrub	LC	Introduced	+	+	+
11	Asparagaceae	<i>Asparagus racemosus</i>	Climber	NE	Native	-	+	+
12	Asteraceae	<i>Acmella oleraceae</i>	herb	NE	Native	-	-	+
13	Asteraceae	<i>Ageratum conyzoides</i>	Herb	NE	Introduced	-	+	-
14	Asteraceae	<i>Bidens biternata</i>	Herb	NE	Native	-	+	-
15	Asteraceae	<i>Blainvillea acmella</i>	Herb	NE	Native	-	+	-
16	Asteraceae	<i>Blumea</i> sp.	Herb	NE	Native	-	-	+
17	Asteraceae	<i>Emilia sonchifolia</i>	Herb	NE	Native	-	+	-
18	Asteraceae	<i>Guizotia abyssinica</i>	Herb	NE	Native	-	-	+
19	Asteraceae	<i>Launaea</i> sp.	Herb	--	Native	+	-	-
20	Asteraceae	<i>Nanothamnus sericeus</i>	Herb	NE	Native	+	-	-
21	Asteraceae	<i>Parthenium hysterophorous</i>	Herb	NE	Introduced	-	-	+
22	Asteraceae	<i>Phyllocephalum scabridum</i>	Herb	NE	Native	-	+	-
23	Asteraceae	<i>Senecio bombayensis</i>	Herb	NE	Native	-	+	-
24	Asteraceae	<i>Tridax procumbens</i>	Herb	NE	Native	+	+	+
25	Asteraceae	<i>Vernonia</i> sp.	Herb	-	Native	+	-	-
26	Balsaminaceae	<i>Impatiens balsamina</i>	Herb	NE	Native	-	+	-
27	Boraginaceae	<i>Cordia</i> sp.	Tree	-	Native	+	-	-
28	Boraginaceae	<i>Trichodesma inaequale</i>	Herb	NE	Native	-	+	+
29	Capparidaceae	<i>Capparis zeylanica</i>	Shrub	NE	Native	-	-	+
30	Casuarinaceae	<i>Casuarina equisetifolia</i>	Tree	LC	Introduced	+	-	-
31	Celastraceae	<i>Celastrus paniculatus</i>	Shrub	NE	Native	-	+	+
32	Celastraceae	<i>Maytenus</i> sp.	Shrub	--	Native	-	+	+
33	Colchicaceae	<i>Gloriosa superba</i>	Climber	LC	Native	-	+	+

Sr. no.	Family	Botanical Name	Habit	IUCN status	Status	Summer	Monsoon	Winter
34	Combretaceae	<i>Terminalia bellirica</i>	Tree	LC	Native	+	+	+
35	Combretaceae	<i>Terminalia chebula</i>	Tree	LC	Native	+	-	-
36	Convolvulaceae	<i>Argyreia</i> sp.	Twinner	--	Native	+	-	-
37	Convolvulaceae	<i>Evolvulus alsinoides</i>	Herb	LC	Native	+	+	+
38	Convolvulaceae	<i>Ipomoea carnea</i>	Shrub	NE	Native	+	-	-
39	Convolvulaceae	<i>Ipomoea eriocarpa</i>	Herb	NE	Native	-	+	-
40	Convolvulaceae	<i>Ipomoea triloba</i>	Herb	NE	Introduced	-	+	-
41	Convolvulaceae	<i>Rivea hypocrateriformis</i>	Climber	LC	Native	-	+	-
42	Euphorbiaceae	<i>Euphorbia antiquorum</i>	Shrub	LC	Native	-	-	+
43	Euphorbiaceae	<i>Euphorbia neriifolia</i>	Shrub	LC	Native	-	+	-
44	Euphorbiaceae	<i>Mallotus philippensis</i>	Tree	LC	Native	-	+	+
45	Fabaceae	<i>Acacia auriculiformis</i>	Tree	LC	Introduced	-	-	+
46	Fabaceae	<i>Alysicarpus</i> sp.	Herb	--	Native	-	+	+
47	Fabaceae	<i>Bauhinia racemosa</i>	Tree	NE	Native	+	+	+
48	Fabaceae	<i>Bauhinia variegata</i>	Tree	NE	Native	-	-	+
49	Fabaceae	<i>Butea monosperma</i>	Tree	LC	Native	+	-	-
50	Fabaceae	<i>Cassia fistula</i>	Tree	NE	Native	-	-	+
51	Fabaceae	<i>Chamaecrista kleinii</i>	Herb	NE	Native	-	+	-
52	Fabaceae	<i>Chamaecrista mimosoides</i>	Herb	LC	Native	-	+	-
53	Fabaceae	<i>Crotalaria filipes</i>	Herb	NE	Native	-	+	-
54	Fabaceae	<i>Crotalaria hebecarpa</i>	Herb	NE	Native	-	+	-
55	Fabaceae	<i>Crotalaria</i> sp.	Herb	--	Native	-	+	-
56	Fabaceae	<i>Crotalaria triquetra</i>	Herb	NE	Native	-	+	-
57	Fabaceae	<i>Dalbergia sissoo</i>	Tree	LC	Native	+	-	-
58	Fabaceae	<i>Desmodium</i> sp.	Herb	--	Native	+	-	-
59	Fabaceae	<i>Gliricidia sepium</i>	Tree	--	Introduced	+	+	+
60	Fabaceae	<i>Indigofera cordifolia</i>	Herb	NE	Native	-	+	+
61	Fabaceae	<i>Indigofera linifolia</i>	Herb	NE	Native	-	+	+
62	Fabaceae	<i>Indigofera trifoliata</i>	Herb	NE	Native	-	+	+
63	Fabaceae	<i>Pongamia pinnata</i>	Tree	LC	Native	-	+	+
64	Fabaceae	<i>Smithia bigemina</i>	Herb	NE	Native	-	-	-
65	Fabaceae	<i>Vachellia nilotica</i>	Tree	LC	Native	-	+	-
66	Fabaceae	<i>Vigna vexillata</i>	Herb	NE	Native	-	+	-
67	Fabaceae	<i>Zornia diphylla</i>	Herb	NE	Native	-	+	-
68	Gentianaceae	<i>Canscora</i> sp.	Herb	--	Native	-	+	-
69	Lamiaceae	<i>Hyptis suaveolens</i>	Herb	NE	Native	+	-	+
70	Lamiaceae	<i>Plectranthus mollis</i>	Herb	NE	Native	-	+	-
71	Lamiaceae	<i>Pogostemon benghalensis</i>	Herb	LC	Native	+	-	-

Sr. no.	Family	Botanical Name	Habit	IUCN status	Status	Summer	Monsoon	Winter
72	Lamiaceae	<i>Tectona grandis</i>	Tree	EN	Native	+	+	+
73	Linaceae	<i>Linum mysorense</i>	Herb	NE	Native	-	+	-
74	Lythraceae	<i>Ammannia multiflora</i>	Herb	LC	Native	-	+	-
75	Lythraceae	<i>Rotala densiflora</i>	Herb	NE	Native	-	+	-
76	Lythraceae	<i>Woodfordia fruticosa</i>	Shrub	LC	Native	+	+	+
77	Malvaceae	<i>Azanza lampas</i>	Shrub	NE	Native	-	+	+
78	Malvaceae	<i>Grewia tiliifolia</i>	Tree	NE	Native	-	+	+
79	Menispermaceae	<i>Tinospora sinensis</i>	Climber	NE	Native	-	+	+
80	Moraceae	<i>Ficus benghalensis</i>	Tree	LC	Native	+	+	+
81	Oleaceae	<i>Jasminum malabaricum</i>	shrub	NE	Native	-	-	+
82	Orobanchaceae	<i>Buchnera hispida</i>	Herb	NE	Native	-	+	-
83	Orobanchaceae	<i>Parasopbia delphiniifoli</i>	Herb	NE	Native	-	+	-
84	Orobanchaceae	<i>Rhamphicarpa longiflora</i>	Herb	NE	Native	-	+	-
85	Oxalidaceae	<i>Oxalis corniculata</i>	Herb	--	Native	+	-	-
86	Papaveraceae	<i>Argemone mexicana</i>	Herb	--	Introduced	+	-	+
87	Pteridaceae	<i>Aleuritopteris formosana</i>	Fern	LC	Native	+	-	-
88	Poaceae	<i>Apluda mutica</i>	Grass	NE	Native	-	+	-
89	Poaceae	<i>Aristida stocksii</i>	Grass	NE	Native	-	+	-
90	Poaceae	<i>Arthraxon lanceolatus</i>	Grass	NE	Native	-	+	-
91	Poaceae	<i>Arthraxon lancifolius</i>	Grass	NE	Native	-	+	-
92	Poaceae	<i>Arundinella pumila</i>	Grass	NE	Native	-	+	-
93	Poaceae	<i>Bothriochloa insculpta</i>	Grass	NE	Native	-	+	-
94	Poaceae	<i>Capillipedium assimile</i>	Grass	NE	Native	-	+	-
95	Poaceae	<i>Cenchrus americanus</i>	Grass	NE	Introduced	-	+	-
96	Poaceae	<i>Chloris virgata</i>	Grass	NE	Introduced	-	+	-
97	Poaceae	<i>Cymbopogon martini</i>	Grass	NE	Native	-	+	-
98	Poaceae	<i>Dactyloctenium aegyptium</i>	Grass	NE	Native	-	+	-
99	Poaceae	<i>Dimeria stapfiana</i>	Grass	NE	Native	-	+	-
100	Poaceae	<i>Eleusine indica</i>	Grass	LC	Native	-	+	-
101	Poaceae	<i>Eragrostis nutans</i>	Grass	NE	Native	-	+	-
102	Poaceae	<i>Eragrostis tenuifolia</i>	Grass	NE	Native	-	+	-
103	Poaceae	<i>Eragrostis unioloides</i>	Grass	LC	Native	-	+	-
104	Poaceae	<i>Heteropogon contortus</i>	Grass	NE	Native	-	+	-
105	Poaceae	<i>Ischaemum barbatum</i>	Grass	NE	Native	-	+	-
106	Poaceae	<i>Ischaemum ciliare</i>	Grass	NE	Native	-	+	-
107	Poaceae	<i>Ischaemum diplopogon</i>	Grass	NE	Native	-	+	-

Sr. no.	Family	Botanical Name	Habit	IUCN status	Status	Summer	Monsoon	Winter
108	Poaceae	<i>Ischaemum impressum</i>	Grass	NE	Native	-	+	-
109	Poaceae	<i>Microchloa indica</i>	Grass	NE	Native	-	+	-
110	Poaceae	<i>Pseudanthistiria umbellata</i>	Grass	NE	Native	-	+	-
111	Poaceae	<i>Sehima nervosa</i>	Grass	NE	Native	-	+	-
112	Poaceae	<i>Sporobolus diandrus</i>	Grass	NE	Native	-	+	-
113	Poaceae	<i>Themeda quadrivalvis</i>	Grass	NE	Native	-	+	-
114	Poaceae	<i>Tripogon jacquemontii</i>	Grass	NE	Native	-	+	-
115	Rubiaceae	<i>Oldenlandia sp.</i>	Herb	--	Native	-	+	-
116	Rubiaceae	<i>Spermacoce hispida</i>	Herb	NE	Native	-	+	-
117	Sapotaceae	<i>Madhuca longifolia var. latifolia</i>	Tree	LC	Native	+	-	-
118	Solanaceae	<i>Nicandra physalodes</i>	Herb	NE	Native	-	-	+
119	Solanaceae	<i>Solanum sp.</i>	Herb	NE	Native	-	-	+
120	Verbenaceae	<i>Lantana camara</i>	Shrub	NE	Introduced	+	+	+
121	Vitaceae	<i>Causonis trifolia</i>	Shrub	NE	Native	-	+	+

IUCN status: LC (least concern), EN (Endangered), NE (not evaluated),
'-' (status not assigned to unidentified taxon), '+' – presence, '-' – absence

Annexure 2 Biomass estimation of saplings in winter season

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
1	Sitaphal	<i>Annona squamosa</i>	0.04	0.01	0.05	19.9741385,73 .5920102	1
2	Amba	<i>Mangifera indica</i>	0.07	0.02	0.09	19.9740417,73 .5920348	1
3	Arjun	<i>Terminalia arjuna</i>	0.37	0.1	0.47	19.974008,73. 5920115	1
4	Sitaphal	<i>Annona squamosa</i>	0.08	0.02	0.1	19.9740042,73 .5920125	1
5	Jambhul	<i>Syzygium cumini</i>	0.12	0.03	0.15	19.9740024,73 .5920082	1
6	Sitaphal	<i>Annona squamosa</i>	0.05	0.01	0.07	19.9740344,73 .5920912	1
7	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.09	0.02	0.12	19.9816068,73 .5805485	1
8	Vad	<i>Ficus benghalensis</i>	0.06	0.02	0.07	19.9740245,73 .5919916	1
9	Pandhra kuda	<i>Holarrhena pubescens</i>	0.1	0.03	0.13	19.9740081,73 .5919769	1
10	Arjun	<i>Terminalia arjuna</i>	0.4	0.1	0.5	19.9739953,73 .5919808	1
11	Amba	<i>Mangifera indica</i>	0.12	0.03	0.15	19.9742698,73 .5919113	1
12	Bhend	<i>Thespesia populnea</i>	0.24	0.06	0.31	19.9743091,73 .5919254	1
13	Arjun	<i>Terminalia arjuna</i>	0.35	0.09	0.44	19.9742984,73 .5918915	1
14	Amba	<i>Mangifera indica</i>	0.08	0.02	0.1	19.9742972,73 .5918905	1
15	Jambhul	<i>Syzygium cumini</i>	0.15	0.04	0.19	19.9742822,73 .5918703	1
16	Amba	<i>Mangifera indica</i>	0.07	0.02	0.09	19.9742629,73 .5918365	1
17	Amba	<i>Mangifera indica</i>	0.12	0.03	0.15	19.9742348,73 .5918113	1
18	Arjun	<i>Terminalia arjuna</i>	0.34	0.09	0.43	19.9742142,73 .5916855	1
19	Amba	<i>Mangifera indica</i>	0.14	0.04	0.17	19.9742297,73 .591701	1

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
20	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.11	0.03	0.14	19.9742512,73 .5917325	1
21	Amba	<i>Mangifera indica</i>	0.14	0.04	0.17	19.9742571,73 .59173	1
22	Sitaphal	<i>Annona squamosa</i>	0.03	0.01	0.04	19.9741721,73 .5917678	1
23	Amba	<i>Mangifera indica</i>	0.12	0.03	0.15	19.9742136,73 .5918589	1
24	Karanj	<i>Pongamia pinnata</i>	0.2	0.05	0.26	19.9742373,73 .5918964	1
25	Amba	<i>Mangifera indica</i>	0.24	0.06	0.3	19.9743515,73 .5918219	1
26	Arjun	<i>Terminalia arjuna</i>	0.41	0.11	0.52	19.9743472,73 .5918096	1
27	Arjun	<i>Terminalia arjuna</i>	0.4	0.1	0.5	19.9743472,73 .5918097	1
28	Pandhra kuda	<i>Holarrhena pubescens</i>	0.14	0.04	0.17	19.9743623,73 .5918549	1
29	Amba	<i>Mangifera indica</i>	0.16	0.04	0.2	19.9744353,73 .5919641	1
30	Karanj	<i>Pongamia pinnata</i>	0.3	0.08	0.37	19.9724859,73 .5917856	2
31	Amba	<i>Mangifera indica</i>	0.24	0.06	0.31	19.9725075,73 .5915712	2
32	Amba	<i>Mangifera indica</i>	0.27	0.07	0.33	19.9725935,73 .5916134	2
33	Amba	<i>Mangifera indica</i>	0.2	0.05	0.26	19.9726026,73 .5918057	2
34	Pandhra kuda	<i>Holarrhena pubescens</i>	0.1	0.03	0.13	19.9726178,73 .5917666	2
35	Sag	<i>Tectona grandis</i>	0.05	0.01	0.07	19.9726805,73 .5917409	2
36	Amba	<i>Mangifera indica</i>	0.29	0.07	0.36	19.9727144,73 .5918274	2
37	Bahava	<i>Cassia fistula</i>	0.47	0.12	0.6	19.9727322,73 .5917669	2
38	Sag	<i>Tectona grandis</i>	0.03	0.01	0.04	19.9726663,73 .5917698	2
39	Pandhra kuda	<i>Holarrhena pubescens</i>	0.09	0.02	0.11	19.9726033,73 .5918529	2

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
40	Amba	<i>Mangifera indica</i>	0.27	0.07	0.33	19.9725823,73 .5918558	2
41	Amba	<i>Mangifera indica</i>	0.27	0.07	0.34	19.9726917,73 .5919242	2
42	Amba	<i>Mangifera indica</i>	0.18	0.05	0.23	19.9724708,73 .5918432	2
43	Vaval	<i>Holoptelea integrifolia</i>	0.11	0.03	0.14	19.9727018,73 .5916551	2
44	Amba	<i>Mangifera indica</i>	0.1	0.03	0.13	19.9726408,73 .5916506	2
45	Mallotus	<i>Mallotus philippensis</i>	0.22	0.06	0.27	19.972534,73. 5918496	2
46	Amba	<i>Mangifera indica</i>	0.24	0.06	0.31	19.9726817,73 .5918131	2
47	Amba	<i>Mangifera indica</i>	0.29	0.07	0.36	19.9727543,73 .5917627	2
48	Amba	<i>Mangifera indica</i>	0.33	0.08	0.41	19.9720892,73 .5914669	2
49	Shisam	<i>Dalbergia sissoo</i>	0.06	0.02	0.07	19.9721001,73 .5914883	2
50	Kavat	<i>Limonia acidissima</i>	0.25	0.06	0.31	19.9721016,73 .5914906	2
51	Shivan	<i>Gmelina arborea</i>	0.1	0.03	0.12	19.9720896,73 .5914703	2
52	Unidentified	*	0.13	0.03	0.17	19.9720891,73 .5914634	2
53	Sag	<i>Tectona grandis</i>	0.06	0.02	0.07	19.9720054,73 .591433	2
54	Amba	<i>Mangifera indica</i>	0.29	0.08	0.37	19.9718945,73 .5914359	2
55	Dhaman	<i>Grewia tiliifolia</i>	0.1	0.02	0.12	19.9718573,73 .591562	2
56	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.04	0.01	0.05	19.9719744,73 .5914731	2
57	Pandhra kuda	<i>Holarrhena pubescens</i>	0.07	0.02	0.09	19.9719746,73 .5914588	2
58	Amba	<i>Mangifera indica</i>	0.35	0.09	0.44	19.9719946,73 .5914535	2
59	Peru	<i>Psidium guajava</i>	0.13	0.03	0.17	19.9720316,73 .5914702	2

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
60	Peru	<i>Psidium guajava</i>	0.11	0.03	0.13	19.9720321,73 .5914524	2
61	Phanas	<i>Artocarpus heterophyllus</i>	0.27	0.07	0.35	19.9720382,73 .5914565	2
62	Amba	<i>Mangifera indica</i>	0.11	0.03	0.14	19.9720406,73 .5914576	2
63	Nimbu	<i>Citrus limon</i>	0.09	0.02	0.12	19.9720443,73 .5914555	2
64	Amba	<i>Mangifera indica</i>	0.09	0.02	0.11	19.9720407,73 .5914535	2
65	Amba	<i>Mangifera indica</i>	0.05	0.01	0.06	19.9720395,73 .5914576	2
66	Pandhra kuda	<i>Holarrhena pubescens</i>	0.14	0.04	0.17	19.972041,73. 5914619	2
67	Pandhra kuda	<i>Holarrhena pubescens</i>	0.07	0.02	0.09	19.9720377,73 .5914584	2
68	Amba	<i>Mangifera indica</i>	0.33	0.08	0.41	19.9720412,73 .5914649	2
69	Pandhra kuda	<i>Holarrhena pubescens</i>	0.16	0.04	0.2	19.970205,73. 5909358	2
70	Karanj	<i>Pongamia pinnata</i>	0.17	0.04	0.21	19.9703049,73 .5908715	2
71	Amba	<i>Mangifera indica</i>	0.05	0.01	0.07	19.9703293,73 .590863	2
72	Kaju	<i>Anacardium occidentale</i>	0.11	0.03	0.13	19.9703628,73 .5909003	2
73	Sitaphal	<i>Annona squamosa</i>	0.08	0.02	0.1	19.970534,73. 590914	2
74	Vad	<i>Ficus benghalensis</i>	0.05	0.01	0.06	19.9705472,73 .590912	2
75	Amba	<i>Mangifera indica</i>	0.06	0.01	0.07	19.9705411,73 .5908996	2
76	Kaju	<i>Anacardium occidentale</i>	0.04	0.01	0.05	19.9702844,73 .5908137	2
77	Shivan	<i>Gmelina arborea</i>	0.25	0.07	0.32	19.9703419,73 .5908461	2
78	Karanj	<i>Pongamia pinnata</i>	0.37	0.1	0.46	19.9703195,73 .5908416	2
79	Amba	<i>Mangifera indica</i>	0.06	0.02	0.08	19.9703206,73 .5908398	2

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
80	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.05	0.01	0.07	19.9703088,73 .5908374	2
81	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.05	0.01	0.06	19.9702841,73 .590798	2
82	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.06	0.02	0.08	19.9703834,73 .5908341	2
83	Kavat	<i>Limonia acidissima</i>	0.15	0.04	0.19	19.9725988,73 .591778	3
84	Amba	<i>Mangifera indica</i>	0.29	0.07	0.36	19.9726665,73 .5919251	3
85	Kaju	<i>Anacardium</i> <i>occidentale</i>	0.03	0.01	0.04	19.9728395,73 .5918533	3
86	Pandhra kuda	<i>Holarrhena pubescens</i>	0.09	0.02	0.11	19.972586,73. 5919835	3
87	Pandhra kuda	<i>Holarrhena pubescens</i>	0.09	0.02	0.11	19.9727607,73 .5919094	3
88	Nandruk	<i>Ficus macrocarpa</i>	0.11	0.03	0.14	19.9727447,73 .5919105	3
89	Pandhra kuda	<i>Holarrhena pubescens</i>	0.03	0.01	0.04	19.9726479,73 .5919228	3
90	Amba	<i>Mangifera indica</i>	0.08	0.02	0.1	19.9726167,73 .5919221	3
91	Palash	<i>Butea monosperma</i>	0.07	0.02	0.09	19.9729603,73 .5919031	3
92	Pandhra kuda	<i>Holarrhena pubescens</i>	0.03	0.01	0.04	19.972543,73. 5918318	3
93	Kavat	<i>Limonia acidissima</i>	0.15	0.04	0.19	19.9725977,73 .5919143	3
94	Nimbu	<i>Citrus limon</i>	0.12	0.03	0.15	19.9725838,73 .591917	3
95	Bhend	<i>Thespesia populnea</i>	0.18	0.05	0.23	19.9725879,73 .5919093	3
96	Dhaman	<i>Grewia tiliifolia</i>	0.1	0.02	0.12	19.9725958,73 .5919157	3
97	Shisam	<i>Dalbergia sissoo</i>	0.15	0.04	0.18	19.9725998,73 .5919228	3
98	Kavat	<i>Limonia acidissima</i>	0.27	0.07	0.34	19.9725919,73 .5919295	3
99	Amba	<i>Mangifera indica</i>	0.12	0.03	0.15	19.9725885,73 .5919254	3

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
100	Amba	<i>Mangifera indica</i>	0.06	0.02	0.08	19.9729733,73 .591972	3
101	Shisam	<i>Dalbergia sissoo</i>	0.12	0.03	0.15	19.9729629,73 .5919744	3
102	Arjun	<i>Terminalia arjuna</i>	0.27	0.07	0.34	19.97296,73.5 919719	3
103	Jambhul	<i>Syzygium cumini</i>	0.27	0.07	0.34	19.9729448,73 .5919763	3
104	Jambhul	<i>Syzygium cumini</i>	0.21	0.06	0.27	19.9729275,73 .591972	3
105	Jambhul	<i>Syzygium cumini</i>	0.31	0.08	0.39	19.9729163,73 .5919747	3
106	Shisam	<i>Dalbergia sissoo</i>	0.06	0.02	0.07	19.9729084,73 .5919739	3
107	Jambhul	<i>Syzygium cumini</i>	0.31	0.08	0.39	19.9729058,73 .5919716	3
108	Sag	<i>Tectona grandis</i>	0.06	0.02	0.08	19.9729058,73 .5919707	3
109	Yankhal	<i>Maytenus emarginata</i>	0.11	0.03	0.13	19.9729061,73 .5919708	3
110	Jambhul	<i>Syzygium cumini</i>	0.34	0.09	0.42	19.9729061,73 .5919717	3
111	Amba	<i>Mangifera indica</i>	0.07	0.02	0.09	19.9729054,73 .5919697	3
112	Shisam	<i>Dalbergia sissoo</i>	0.07	0.02	0.09	19.9729001,73 .5919701	3
113	Shisam	<i>Dalbergia sissoo</i>	0.17	0.04	0.21	19.9728977,73 .5919834	3
114	Amba	<i>Mangifera indica</i>	0.1	0.03	0.13	19.9728982,73 .5919881	3
115	Shisam	<i>Dalbergia sissoo</i>	0.17	0.04	0.21	19.9729023,73 .5919895	3
116	Arjun	<i>Terminalia arjuna</i>	0.27	0.07	0.34	19.9729033,73 .5919934	3
117	Shisam	<i>Dalbergia sissoo</i>	0.06	0.02	0.07	19.9729079,73 .5919998	3
118	Amba	<i>Mangifera indica</i>	0.18	0.05	0.23	19.9753866,73 .5927973	4
119	Nimbu	<i>Citrus limon</i>	0.14	0.04	0.18	19.9754244,73 .5928718	4

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
120	Nimbu	<i>Citrus limon</i>	0.12	0.03	0.15	19.9755002,73 .593006	4
121	Nimbu	<i>Citrus limon</i>	0.22	0.06	0.28	19.975504,73. 5930018	4
122	Neem	<i>Azadirachta indica</i>	0.16	0.04	0.2	19.9754679,73 .5932931	4
123	Nimbu	<i>Citrus limon</i>	0.12	0.03	0.15	19.9755356,73 .5929211	4
124	Kavat	<i>Limonia acidissima</i>	0.09	0.02	0.12	19.9738113,73 .5922207	4
125	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.05	0.01	0.07	19.9738131,73 .5922207	4
126	Kavat	<i>Limonia acidissima</i>	0.19	0.05	0.24	19.9738164,73 .5922214	4
127	Kavat	<i>Limonia acidissima</i>	0.05	0.01	0.06	19.973831,73. 5922249	4
128	Chinch	<i>Tamarindus indica</i>	0.12	0.03	0.15	19.9738307,73 .592225	4
129	Pimpal	<i>Ficus religiosa</i>	0.15	0.04	0.19	19.9738287,73 .5922253	4
130	Bel	<i>Aegle marmelos</i>	0.04	0.01	0.05	19.9738222,73 .5922286	4
131	Vaval	<i>Holoptelea integrifolia</i>	0.2	0.05	0.26	19.9738213,73 .5922223	4
132	Bhend	<i>Thespesia populnea</i>	0.22	0.06	0.28	19.9738298,73 .5922278	4
133	Varas	<i>Heterophragma</i> <i>quadriloculare</i>	0.12	0.03	0.15	19.9738383,73 .5922246	4
134	Amba	<i>Mangifera indica</i>	0.45	0.12	0.57	19.9738198,73 .59233	4
135	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.03	0.01	0.04	19.9738282,73 .5923019	4
136	Peru	<i>Psidium guajava</i>	0.21	0.05	0.27	19.9758737,73 .5934647	5
137	Karanj	<i>Pongamia pinnata</i>	0.29	0.07	0.36	19.9758532,73 .5934718	5
138	Pandhra kuda	<i>Holarrhena pubescens</i>	0.1	0.03	0.13	19.9758914,73 .5935135	5
139	Sitaphal	<i>Annona squamosa</i>	0.16	0.04	0.21	19.975883,73. 5935675	5

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
140	Pandhra kuda	<i>Holarrhena pubescens</i>	0.1	0.03	0.13	19.9758658,73 .5935912	5
141	Sag	<i>Tectona grandis</i>	0.05	0.01	0.07	19.9758473,73 .5935915	5
142	Phanas	<i>Artocarpus heterophyllus</i>	0.41	0.11	0.52	19.9758508,73 .593589	5
143	Yankhal	<i>Maytenus emarginata</i>	0.11	0.03	0.13	19.9758478,73 .5935878,	5
144	Sitaphal	<i>Annona squamosa</i>	0.08	0.02	0.1	19.9758501,73 .5935763	5
145	Amba	<i>Mangifera indica</i>	0.14	0.04	0.18	19.9758515,73 .5935751	5
146	Pandhra kuda	<i>Holarrhena pubescens</i>	0.1	0.03	0.13	19.9758491,73 .593573	5
147	Phanas	<i>Artocarpus heterophyllus</i>	0.27	0.07	0.35	19.9758489,73 .593572	5
148	Shivan	<i>Gmelina arborea</i>	0.03	0.01	0.04	19.9758454,73 .5935714	5
149	Sitaphal	<i>Annona squamosa</i>	0.1	0.03	0.13	19.9758413,73 .5935688	5
150	Pandhra kuda	<i>Holarrhena pubescens</i>	0.09	0.02	0.11	19.9758422,73 .5935687	5
151	Yankhal	<i>Maytenus emarginata</i>	0.42	0.11	0.53	19.9758417,73 .5935687	5
152	Neem	<i>Azadirachta indica</i>	0.51	0.13	0.65	19.9758406,73 .5935688	5
153	Neem	<i>Azadirachta indica</i>	0.57	0.15	0.72	19.9761417,73 .5935711	5
154	Peru	<i>Psidium guajava</i>	0.11	0.03	0.13	19.9761165,73 .5936029	5
155	Amba	<i>Mangifera indica</i>	0.11	0.03	0.13	19.9761237,73 .5936326	5
156	Arjun	<i>Terminalia arjuna</i>	0.22	0.06	0.28	19.9761234,73 .5936505	5
157	Sitaphal	<i>Annona squamosa</i>	0.14	0.04	0.18	19.9761279,73 .5936493	5
158	Arjun	<i>Terminalia arjuna</i>	0.36	0.09	0.45	19.9761267,73 .5936497	5
159	Neem	<i>Azadirachta indica</i>	0.32	0.08	0.41	19.976084,73. 5934691	5

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
160	Peru	<i>Psidium guajava</i>	0.21	0.05	0.27	19.9761053,73 .5934951	5
161	Kaju	<i>Anacardium occidentale</i>	0.08	0.02	0.1	19.9761283,73 .5935116	5
162	Amba	<i>Mangifera indica</i>	0.06	0.02	0.08	19.9761053,73 .5935277	5
163	Pandhra kuda	<i>Holarrhena pubescens</i>	0.16	0.04	0.2	19.9761284,73 .5935576	5
164	Bahava	<i>Cassia fistula</i>	0.22	0.06	0.28	19.9763503,73 .5934055	5
165	Kaju	<i>Anacardium occidentale</i>	0.11	0.03	0.13	19.9763467,73 .5934343	5
166	Kaju	<i>Anacardium occidentale</i>	0.16	0.04	0.2	19.9761334,73 .5936688	5
167	Pandhra kuda	<i>Holarrhena pubescens</i>	0.17	0.04	0.21	19.9762013,73 .5933515	5
168	Sitaphal	<i>Annona squamosa</i>	0.16	0.04	0.21	19.9761316,73 .5936269,	5
169	Kaju	<i>Anacardium occidentale</i>	0.13	0.03	0.16	19.9760793,73 .5936045	5
170	Pangara	<i>Erythrina variegata</i>	0.25	0.07	0.32	19.9760717,73 .5936324	5
171	Arjun	<i>Terminalia arjuna</i>	0.48	0.12	0.61	19.9760934,73 .5938139	5
172	Amba	<i>Mangifera indica</i>	0.06	0.02	0.08	19.9761037,73 .5937869	5
173	Amba	<i>Mangifera indica</i>	0.16	0.04	0.21	19.9761072,73 .5937894	5
174	Pandhra kuda	<i>Holarrhena pubescens</i>	0.1	0.03	0.13	19.9761073,73 .5937701	5
175	Modhal	<i>Lannea coromandelica</i>	0.05	0.14	0.2	19.9755401,73 .5972345	6
176	Bakul	<i>Mimusops elengii</i>	0.08	0.02	0.11	19.9754157,73 .5969501	6
177	Modhal	<i>Lannea coromandelica</i>	0.1	0.26	0.36	19.9753868,73 .59706	6
178	Karanj	<i>Pongamia pinnata</i>	0.28	0.07	0.35	19.9754904,73 .5970428	6
179	Modhal	<i>Lannea coromandelica</i>	0.13	0.34	0.47	19.975505,73. 5970746	6

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
180	Phanas	<i>Artocarpus heterophyllus</i>	0.05	0.01	0.07	19.9754766,73 .5970602	6
181	Modhal	<i>Lannea coromandelica</i>	0.14	0.37	0.51	19.9754964,73 .5970743	6
182	Karanj	<i>Pongamia pinnata</i>	0.26	0.07	0.33	19.9755028,73 .5970595	6
183	Karanj	<i>Pongamia pinnata</i>	0.07	0.02	0.09	19.9755073,73 .597056	6
184	Arjun	<i>Terminalia arjuna</i>	0.05	0.01	0.07	19.9754537,73 .5970817	6
185	Shisam	<i>Dalbergia sissoo</i>	0.1	0.03	0.12	19.9754563,73 .5970852	6
186	Shivan	<i>Gmelina arborea</i>	0.32	0.08	0.41	19.9754509,73 .5970788	6
187	Arjun	<i>Terminalia arjuna</i>	0.27	0.07	0.34	19.975438,73. 5970775	6
188	Phanas	<i>Artocarpus heterophyllus</i>	0.22	0.06	0.28	19.9754382,73 .5970788	6
189	Phanas	<i>Artocarpus heterophyllus</i>	0.55	0.14	0.69	19.9754293,73 .596926	6
190	Bakul	<i>Mimusops elengii</i>	0.19	0.05	0.24	19.9754157,73 .5969502	6
191	Bakul	<i>Mimusops elengii</i>	0.1	0.03	0.13	19.9754402,73 .5970352	6
192	Shisam	<i>Dalbergia sissoo</i>	0.12	0.03	0.15	19.9754531,73 .5970308	6
193	Modhal	<i>Lannea coromandelica</i>	0.04	0.11	0.16	19.9754579,73 .5970466	6
194	Bahava	<i>Cassia fistula</i>	0.06	0.01	0.07	19.9747929,73 .5970218	6
195	Arjun	<i>Terminalia arjuna</i>	0.24	0.06	0.3	19.974791,73. 5970173	6
196	Amba	<i>Mangifera indica</i>	0.14	0.04	0.17	19.9747948,73 .5970183	6
197	Shisam	<i>Dalbergia sissoo</i>	0.06	0.02	0.07	19.974797,73. 5970179	6
198	Bahava	<i>Cassia fistula</i>	0.07	0.02	0.08	19.9748414,73 .5970764	6
199	Pimpal	<i>Ficus religiosa</i>	0.1	0.03	0.12	19.9749114,73 .5970577	6

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
200	Modhal	<i>Lannea coromandelica</i>	0.09	0.23	0.32	19.9748324,73 .5968748	6
201	Jambhul	<i>Syzygium cumini</i>	0.12	0.03	0.15	19.9750703,73 .5970167	6
202	Sag	<i>Tectona grandis</i>	0.05	0.01	0.07	19.9750377,73 .5970359	6
203	Khair	<i>Acacia catechu</i>	0.1	0.03	0.13	19.9749807,73 .5969849	6
204	Jambhul	<i>Syzygium cumini</i>	0.18	0.05	0.23	19.9749731,73 .5969911	6
205	Amba	<i>Mangifera indica</i>	0.18	0.05	0.23	19.974897,73. 597047	6
206	Apta	<i>Bauhinia racemosa</i>	0.29	0.08	0.37	19.9748775,73 .5970664	6
207	Pandhra kuda	<i>Holarrhena pubescens</i>	0.07	0.02	0.09	19.9748663,73 .5970673	6
208	Kavat	<i>Limonia acidissima</i>	0.19	0.05	0.24	19.9748608,73 .59706	6
209	Bahava	<i>Cassia fistula</i>	0.12	0.03	0.15	19.9748521,73 .5970618	6
210	Modhal	<i>Lannea coromandelica</i>	0.1	0.26	0.36	19.9748503,73 .5970616	6
211	Vad	<i>Ficus benghalensis</i>	0.08	0.02	0.1	19.9748527,73 .5970616	6
212	Pimpal	<i>Ficus religiosa</i>	0.08	0.02	0.1	19.974845,73. 5970636	6
213	Jambhul	<i>Syzygium cumini</i>	0.06	0.02	0.08	19.9748499,73 .5970643	6
214	Pandhra kuda	<i>Holarrhena pubescens</i>	0.12	0.03	0.15	19.9748507,73 .5970606	6
215	Jambhul	<i>Syzygium cumini</i>	0.26	0.07	0.32	19.9748543,73 .5970632	6
216	Palash	<i>Butea monosperma</i>	0.04	0.01	0.05	19.9748592,73 .5970634	6
217	Sag	<i>Tectona grandis</i>	0.03	0.01	0.04	19.9748646,73 .5970637	6
218	Dhaman	<i>Grewia tiliifolia</i>	0.2	0.05	0.26	19.9749999,73 .5977834	6
219	Kaju	<i>Anacardium occidentale</i>	0.08	0.02	0.1	19.9749873,73 .5977803	6

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
220	Amba	<i>Mangifera indica</i>	0.2	0.05	0.26	19.9749137,73 .5976189	6
221	Jambhul	<i>Syzygium cumini</i>	0.18	0.05	0.23	19.9749631,73 .5977374	6
222	Kaju	<i>Anacardium occidentale</i>	0.15	0.04	0.18	19.9749921,73 .5977259	6
223	Kaju	<i>Anacardium occidentale</i>	0.08	0.02	0.1	19.9749917,73 .5976626	6
224	Amba	<i>Mangifera indica</i>	0.18	0.05	0.23	19.9749798,73 .5976993	6
225	Kaju	<i>Anacardium occidentale</i>	0.11	0.03	0.14	19.9749808,73 .5977129	6
226	Amba	<i>Mangifera indica</i>	0.2	0.05	0.26	19.9749794,73 .5977087	6
227	Kaju	<i>Anacardium occidentale</i>	0.18	0.05	0.23	19.9749899,73 .5977109	6
228	Amba	<i>Mangifera indica</i>	0.11	0.03	0.14	19.9749982,73 .5977027	6
229	Dhaman	<i>Grewia tiliifolia</i>	0.3	0.08	0.38	19.9750063,73 .5976947	6
230	Amba	<i>Mangifera indica</i>	0.43	0.11	0.55	19.975007,73. 5976948	6
231	Kaju	<i>Anacardium occidentale</i>	0.12	0.03	0.15	19.9750111,73 .5976931	6
232	Jambhul	<i>Syzygium cumini</i>	0.18	0.05	0.23	19.9750863,73 .5978354	6
233	Bahava	<i>Cassia fistula</i>	0.14	0.04	0.18	19.9748813,73 .5976169	6
234	Amba	<i>Mangifera indica</i>	0.18	0.05	0.22	19.9749014,73 .5976903	6
235	Amba	<i>Mangifera indica</i>	0.12	0.03	0.15	19.974898,73. 5976953	6
236	Arjun	<i>Terminalia arjuna</i>	0.36	0.09	0.45	19.9749202,73 .5977186	6
237	Amba	<i>Mangifera indica</i>	0.07	0.02	0.09	19.974949,73. 5977178	6
238	Bahava	<i>Cassia fistula</i>	0.12	0.03	0.15	19.9747757,73 .5970831	6
239	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.15	0.04	0.19	19.9747756,73 .5970838	6

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
240	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.19	0.05	0.24	19.974744,73. 5970688	6
241	Amba	<i>Mangifera indica</i>	0.13	0.03	0.16	19.9747581,73 .5970022	6
242	Vaval	<i>Holoptelea integrifolia</i>	0.27	0.07	0.34	19.9747627,73 .5968668	6
243	Sitaphal	<i>Annona squamosa</i>	0.1	0.03	0.12	19.974715,73. 5968531	6
244	Sag	<i>Tectona grandis</i>	0.09	0.02	0.11	19.9747214,73 .5968434	6
245	Jambhul	<i>Syzygium cumini</i>	0.29	0.07	0.36	19.9747259,73 .5968334	6
246	Amba	<i>Mangifera indica</i>	0.18	0.05	0.23	19.9747316,73 .596838	6
247	Pandhra kuda	<i>Holarrhena pubescens</i>	0.28	0.07	0.35	19.9747294,73 .59684	6
248	Bahava	<i>Cassia fistula</i>	0.13	0.03	0.16	19.9747341,73 .5968305	6
249	Pandhra kuda	<i>Holarrhena pubescens</i>	0.16	0.04	0.2	19.9747341,73 .5968305	6
250	Dhaman	<i>Grewia tiliifolia</i>	0.18	0.05	0.23	19.9747374,73 .5968358	6
251	Arjun	<i>Terminalia arjuna</i>	0.2	0.05	0.25	19.974748,73. 5968538	6
252	Amba	<i>Mangifera indica</i>	0.08	0.02	0.1	19.9747472,73 .5968768	6
253	Bahava	<i>Cassia fistula</i>	0.27	0.07	0.34	19.9747418,73 .5968796	6
254	Vad	<i>Ficus benghalensis</i>	0.18	0.05	0.23	19.9747428,73 .5968882	6
255	Hirda	<i>Terminalia chebula</i>	0.15	0.04	0.19	19.9747436,73 .5968939	6
256	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.15	0.04	0.19	19.9747451,73 .5969007	6
257	Arjun	<i>Terminalia arjuna</i>	0.16	0.04	0.2	19.9747177,73 .59701	6
258	Bahava	<i>Cassia fistula</i>	0.16	0.04	0.2	19.9747049,73 .5969749	6
259	Neem	<i>Azadirachta indica</i>	0.16	0.04	0.2	19.9760123,73 .5994483	7

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
260	Apta	<i>Bauhinia racemosa</i>	0.21	0.06	0.27	19.9760281,73 .5994582	7
261	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.05	0.01	0.07	19.9760695,73 .5994608	7
262	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.04	0.01	0.05	19.9760703,73 .5994526	7
263	Modhal	<i>Lannea coromandelica</i>	0.18	0.46	0.63	19.9761643,73 .5994345	7
264	Vad	<i>Ficus benghalensis</i>	0.09	0.02	0.12	19.9761184,73 .5993718	7
265	Neem	<i>Azadirachta indica</i>	0.38	0.1	0.48	19.9761282,73 .5994115	7
266	Apta	<i>Bauhinia racemosa</i>	0.32	0.08	0.4	19.9761223,73 .5994125	7
267	Vad	<i>Ficus benghalensis</i>	0.08	0.02	0.1	19.9761186,73 .5994282	7
268	Sitaphal	<i>Annona squamosa</i>	0.02	0.01	0.03	19.9761168,73 .5994281	7
269	Shivan	<i>Gmelina arborea</i>	0.33	0.09	0.41	19.9761012,73 .5994295	7
270	Chinch	<i>Tamarindus indica</i>	0.21	0.05	0.26	19.9760907,73 .5994385	7
271	Khair	<i>Acacia catechu</i>	0.28	0.07	0.35	19.9760554,73 .5994473	7
272	Arjun	<i>Terminalia arjuna</i>	0.05	0.01	0.07	19.9760562,73 .5994518	7
273	Khair	<i>Acacia catechu</i>	0.14	0.04	0.17	19.9760482,73 .5994531	7
274	Modhal	<i>Lannea coromandelica</i>	0.05	0.14	0.2	19.976056,73. 5994502	7
275	Vad	<i>Ficus benghalensis</i>	0.06	0.02	0.08	19.976056,73. 5994471	7
276	Khair	<i>Acacia catechu</i>	0.38	0.1	0.48	19.9760528,73 .5994475	7
277	Neem	<i>Azadirachta indica</i>	0.22	0.06	0.27	19.9760503,73 .5994483	7
278	Neem	<i>Azadirachta indica</i>	0.06	0.02	0.08	19.9760515,73 .599447	7
279	Modhal	<i>Lannea coromandelica</i>	0.12	0.31	0.44	19.9760521,73 .5994464	7

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
280	Apta	<i>Bauhinia racemosa</i>	0.18	0.05	0.22	19.9760534,73 .5994467	7
281	Vad	<i>Ficus benghalensis</i>	0.08	0.02	0.1	19.9760523,73 .5994438	7
282	Neem	<i>Azadirachta indica</i>	0.15	0.04	0.19	19.9760554,73 .5994453	7
283	Arjun	<i>Terminalia arjuna</i>	0.11	0.03	0.13	19.975603,73. 598177	7
284	Neem	<i>Azadirachta indica</i>	0.11	0.03	0.14	19.9756524,73 .5983969	7
285	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.08	0.02	0.1	19.9755091,73 .5983536	7
286	Neem	<i>Azadirachta indica</i>	0.27	0.07	0.34	19.9756418,73 .5983862	7
287	Pandhra kuda	<i>Holarrhena pubescens</i>	0.07	0.02	0.09	19.9756322,73 .5983741	7
288	Kaju	<i>Anacardium</i> <i>occidentale</i>	0.08	0.02	0.1	19.9756254,73 .5983663	7
289	Bahava	<i>Cassia fistula</i>	0.11	0.03	0.14	19.9756344,73 .598378	7
290	Bahava	<i>Cassia fistula</i>	0.04	0.01	0.06	19.9756348,73 .5983802	7
291	Modhal	<i>Lannea coromandelica</i>	0.15	0.4	0.55	19.975743,73. 5983584	7
292	Nimbu	<i>Citrus limon</i>	0.16	0.04	0.21	19.9756044,73 .5983888	7
293	Pandhra kuda	<i>Holarrhena pubescens</i>	0.07	0.02	0.09	19.975625,73. 5982624	7
294	Kaju	<i>Anacardium</i> <i>occidentale</i>	0.08	0.02	0.1	19.9756624,73 .5982602	7
295	Yankhal	<i>Maytenus emarginata</i>	0.11	0.03	0.13	19.9756543,73 .5982717	7
296	Pandhra kuda	<i>Holarrhena pubescens</i>	0.09	0.02	0.11	19.9756698,73 .5983062	7
297	Yankhal	<i>Maytenus emarginata</i>	0.03	0.01	0.03	19.9756699,73 .5982971	7
298	Varas	<i>Heterophragma</i> <i>quadrioculare</i>	0.22	0.06	0.28	19.9756738,73 .5983047	7
299	Kavat	<i>Limonia acidissima</i>	0.31	0.08	0.39	19.9756777,73 .59831	7

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
300	Bahava	<i>Cassia fistula</i>	0.06	0.01	0.07	19.9756741,73 .5983349	7
301	Arjun	<i>Terminalia arjuna</i>	0.03	0.01	0.03	19.9756835,73 .5983435	7
302	Pandhra kuda	<i>Holarrhena pubescens</i>	0.05	0.01	0.07	19.975686,73. 5983448	7
303	Shisam	<i>Dalbergia sissoo</i>	0.03	0.01	0.04	19.9756916,73 .5983485	7
304	Pandhra kuda	<i>Holarrhena pubescens</i>	0.03	0.01	0.04	19.9756886,73 .598345	7
305	Pandhra kuda	<i>Holarrhena pubescens</i>	0.17	0.04	0.22	19.9751304,73 .5986346	7
306	Bahava	<i>Cassia fistula</i>	0.26	0.07	0.32	19.9751506,73 .5986597	7
307	Hirda	<i>Terminalia chebula</i>	0.31	0.08	0.39	19.9751751,73 .5986612	7
308	Pandhra kuda	<i>Holarrhena pubescens</i>	0.15	0.04	0.18	19.9751863,73 .5986572	7
309	Yankhal	<i>Maytenus emarginata</i>	0.2	0.05	0.25	19.9752053,73 .5986523	7
310	Kumbh	<i>Careya arborea</i>	0.2	0.05	0.25	19.9752157,73 .5986547	7
311	Pandhra kuda	<i>Holarrhena pubescens</i>	0.16	0.04	0.2	19.9752209,73 .5986542	7
312	Nandruk	<i>Ficus macrocarpa</i>	0.22	0.06	0.28	19.9752176,73 .5986511	7
313	Kumbh	<i>Careya arborea</i>	0.18	0.05	0.23	19.9752117,73 .5986538	7
314	Pandhra kuda	<i>Holarrhena pubescens</i>	0.04	0.01	0.06	19.9752069,73 .5986538	7
315	Pangara	<i>Erythrina variegata</i>	0.23	0.06	0.29	19.9751995,73 .5986619	7
316	Bahava	<i>Cassia fistula</i>	0.13	0.03	0.16	19.9751924,73 .5986617	7
317	Nandruk	<i>Ficus macrocarpa</i>	0.26	0.07	0.33	19.9751929,73 .5986611	7
318	Aasan	<i>Bridelia retusa</i>	0.34	0.09	0.43	19.9759109,73 .6008042	8
319	Aasan	<i>Bridelia retusa</i>	0.11	0.03	0.14	19.9760788,73 .6008861	8

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
320	Amba	<i>Mangifera indica</i>	0.12	0.03	0.15	19.9760199,73 .6007628	8
321	Karanj	<i>Pongamia pinnata</i>	0.55	0.14	0.7	19.9759304,73 .600706	8
322	Mahua	<i>Madhuca longifolia</i> var. <i>latifolia</i>	0.11	0.03	0.14	19.9759515,73 .6010927	8
323	Aasan	<i>Bridelia retusa</i>	0.29	0.07	0.36	19.9760142,73 .6010569	8
324	Pandhra kuda	<i>Holarrhena pubescens</i>	0.09	0.02	0.11	19.9759121,73 .6009047	8
325	Kaju	<i>Anacardium occidentale</i>	0.08	0.02	0.1	19.9759663,73 .6007382	8
326	Aasan	<i>Bridelia retusa</i>	0.14	0.04	0.18	19.9759664,73 .6007565	8
327	Amba	<i>Mangifera indica</i>	0.08	0.02	0.1	19.9759674,73 .6007634	8
328	Pandhra kuda	<i>Holarrhena pubescens</i>	0.09	0.02	0.11	19.9759819,73 .6007623	8
329	Kaju	<i>Anacardium occidentale</i>	0.08	0.02	0.1	19.975978,73. 6007647	8
330	Amba	<i>Mangifera indica</i>	0.06	0.02	0.08	19.975978,73. 6007655	8
331	Neem	<i>Azadirachta indica</i>	0.14	0.04	0.17	19.9759758,73 .6007694	8
332	Amba	<i>Mangifera indica</i>	0.09	0.02	0.11	19.9759704,73 .6007715	8
333	Pandhra kuda	<i>Holarrhena pubescens</i>	0.03	0.01	0.04	19.9759696,73 .6007734	8
334	Pandhra kuda	<i>Holarrhena pubescens</i>	0.07	0.02	0.09	19.9759691,73 .6007766	8
335	Pandhra kuda	<i>Holarrhena pubescens</i>	0.07	0.02	0.09	19.9759724,73 .6007824	8
336	Amba	<i>Mangifera indica</i>	0.29	0.07	0.36	19.9759702,73 .6007859	8
337	Karanj	<i>Pongamia pinnata</i>	0.42	0.11	0.53	19.9764168,73 .6004439	8
338	Neem	<i>Azadirachta indica</i>	0.2	0.05	0.25	19.9764385,73 .600388	8
339	Amba	<i>Mangifera indica</i>	0.16	0.04	0.21	19.9765969,73 .6003617	8

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
340	Amba	<i>Mangifera indica</i>	0.34	0.09	0.43	19.9767396,73 .600615	8
341	Sag	<i>Tectona grandis</i>	0.08	0.02	0.11	19.9766203,73 .600582	8
342	Neem	<i>Azadirachta indica</i>	0.34	0.09	0.42	19.9765524,73 .6005351	8
343	Bahava	<i>Cassia fistula</i>	0.11	0.03	0.13	19.9766745,73 .6004245	8
344	Amba	<i>Mangifera indica</i>	0.34	0.09	0.43	19.9765936,73 .6003559	8
345	Amba	<i>Mangifera indica</i>	0.16	0.04	0.21	19.9765994,73 .6004483	8
346	Amba	<i>Mangifera indica</i>	0.16	0.04	0.21	19.9765777,73 .6004542	8
347	Karanj	<i>Pongamia pinnata</i>	0.54	0.14	0.68	19.9765787,73 .600457	8
348	Sag	<i>Tectona grandis</i>	0.09	0.02	0.12	19.9765736,73 .600456	8
349	Amba	<i>Mangifera indica</i>	0.15	0.04	0.19	19.9765732,73 .6004532	8
350	Nimbu	<i>Citrus limon</i>	0.16	0.04	0.2	19.9765732,73 .6004493	8
351	Pangara	<i>Erythrina variegata</i>	0.11	0.03	0.14	19.9765516,73 .6004459	8
352	Vad	<i>Ficus benghalensis</i>	0.08	0.02	0.1	19.9760599,73 .6038706	9
353	Arjun	<i>Terminalia arjuna</i>	0.13	0.03	0.17	19.9759692,73 .6038623	9
354	Bahava	<i>Cassia fistula</i>	0.14	0.04	0.18	19.9759895,73 .6039088	9
355	Mallotus	<i>Mallotus philippensis</i>	0.22	0.06	0.27	19.9759728,73 .6038932	9
356	Shisam	<i>Dalbergia sissoo</i>	0.15	0.04	0.18	19.9759551,73 .6038906	9
357	Pandhra kuda	<i>Holarrhena pubescens</i>	0.02	0	0.02	19.9759502,73 .6038813	9
358	Arjun	<i>Terminalia arjuna</i>	0.19	0.05	0.24	19.9759405,73 .6038572	9
359	Varas	<i>Heterophragma quadriloculare</i>	0.04	0.01	0.05	19.9759511,73 .6038572	9

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
360	Shisam	<i>Dalbergia sissoo</i>	0.19	0.05	0.25	19.9759595,73 .6038554	9
361	Shisam	<i>Dalbergia sissoo</i>	0.49	0.13	0.61	19.9759601,73 .6038519	9
362	Kumbh	<i>Careya arborea</i>	0.06	0.02	0.08	19.9759642,73 .6038519	9
363	Sawar	<i>Ceiba pentandra</i>	0.11	0.03	0.14	19.9759627,73 .6038605	9
364	Katesawar	<i>Bombax ceiba</i>	0.19	0.05	0.23	19.9759628,73 .6038632	9
365	Amba	<i>Mangifera indica</i>	0.31	0.08	0.39	19.9759601,73 .603867	9
366	Bahava	<i>Cassia fistula</i>	0.11	0.03	0.14	19.9759576,73 .6038658	9
367	Aasan	<i>Bridelia retusa</i>	0.14	0.04	0.18	19.9759563,73 .6038691	9
368	Kumbh	<i>Careya arborea</i>	0.05	0.01	0.06	19.9769607,73 .6039592	9
369	Arjun	<i>Terminalia arjuna</i>	0.21	0.06	0.27	19.976897,73. 6038881	9
370	Amba	<i>Mangifera indica</i>	0.41	0.11	0.51	19.9768426,73 .6039926	9
371	Pandhra kuda	<i>Holarrhena pubescens</i>	0.02	0	0.02	19.9767683,73 .6039383	9
372	Arjun	<i>Terminalia arjuna</i>	0.21	0.06	0.27	19.976764,73. 603991	9
373	Arjun	<i>Terminalia arjuna</i>	0.13	0.03	0.17	19.9772988,73 .6038511	9
374	Kahandol	<i>Sterculia urens</i>	0.08	0.02	0.1	19.9606551,73 .614144	9
375	Pandhra kuda	<i>Holarrhena pubescens</i>	0.02	0	0.02	19.9767554,73 .6040032	9
376	Pandhra kuda	<i>Holarrhena pubescens</i>	0.02	0	0.02	19.9766176,73 .6038714	9
377	Pandhra kuda	<i>Holarrhena pubescens</i>	0.04	0.01	0.05	19.9766288,73 .603875	9
378	Apta	<i>Bauhinia racemosa</i>	0.05	0.01	0.07	19.9766398,73 .6038757	9
379	Shisam	<i>Dalbergia sissoo</i>	0.1	0.03	0.12	19.9766473,73 .6038696	9

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
380	Palash	<i>Butea monosperma</i>	0.08	0.02	0.09	19.9766562,73 .6038699	9
381	Shisam	<i>Dalbergia sissoo</i>	0.09	0.02	0.11	19.9766638,73 .6038663	9
382	Arjun	<i>Terminalia arjuna</i>	0.11	0.03	0.13	19.9766647,73 .6038663	9
383	Pandhra kuda	<i>Holarrhena pubescens</i>	0.09	0.02	0.11	19.9766823,73 .6038548	9
384	Kumbh	<i>Careya arborea</i>	0.12	0.03	0.15	19.9766871,73 .6038529	9
385	Pandhra kuda	<i>Holarrhena pubescens</i>	0.03	0.01	0.04	19.9766917,73 .6038528	9
386	Shisam	<i>Dalbergia sissoo</i>	0.29	0.08	0.37	19.9774059,73 .6041563	9
387	Yankhal	<i>Maytenus emarginata</i>	0.15	0.04	0.19	19.9774234,73 .6040669	9
388	Kala umber	<i>Ficus hispida</i>	0.11	0.03	0.14	19.9773953,73 .6040794	9
389	Shisam	<i>Dalbergia sissoo</i>	0.24	0.06	0.31	19.9773789,73 .6040806	9
390	Pandhra kuda	<i>Holarrhena pubescens</i>	0.07	0.02	0.09	19.9773587,73 .604096	9
391	Shisam	<i>Dalbergia sissoo</i>	0.15	0.04	0.18	19.9773516,73 .604112	9
392	Amba	<i>Mangifera indica</i>	0.27	0.07	0.34	19.9773521,73 .6041206	9
393	Varas	<i>Heterophragma quadriloculare</i>	0.16	0.04	0.21	19.9773372,73 .604132	9
394	Shisam	<i>Dalbergia sissoo</i>	0.21	0.06	0.27	19.9773391,73 .6041386	9
395	Amba	<i>Mangifera indica</i>	0.41	0.11	0.51	19.9773453,73 .604139	9
396	Pandhra kuda	<i>Holarrhena pubescens</i>	0.11	0.03	0.14	19.9773517,73 .6041366	9
397	Apta	<i>Bauhinia racemosa</i>	0.27	0.07	0.34	19.9773534,73 .6041357	9
398	Shisam	<i>Dalbergia sissoo</i>	0.19	0.05	0.25	19.9773593,73 .6041331	9
399	Amba	<i>Mangifera indica</i>	0.49	0.13	0.62	19.9773659,73 .6041325	9

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
400	Amba	<i>Mangifera indica</i>	0.45	0.12	0.57	19.977371,73.6041386	9
401	Shisam	<i>Dalbergia sissoo</i>	0.31	0.08	0.39	19.977372,73.6041443	9
402	Pandhra kuda	<i>Holarrhena pubescens</i>	0.05	0.01	0.07	19.9773718,73.6041467	9
403	Bahava	<i>Cassia fistula</i>	0.2	0.05	0.25	19.9773699,73.6041486	9
404	Amba	<i>Mangifera indica</i>	0.37	0.1	0.46	19.9773658,73.6041559	9
405	Pandhra kuda	<i>Holarrhena pubescens</i>	0.09	0.02	0.12	19.9773571,73.6041655	9
406	Shisam	<i>Dalbergia sissoo</i>	0.25	0.07	0.32	19.9773535,73.6041796	9
407	Bahava	<i>Cassia fistula</i>	0.26	0.07	0.33	19.9773552,73.6041789	9
408	Amba	<i>Mangifera indica</i>	0.33	0.08	0.41	19.9773598,73.6041818	9
409	Bahava	<i>Cassia fistula</i>	0.22	0.06	0.28	19.9773633,73.6041891	9
410	Amba	<i>Mangifera indica</i>	0.31	0.08	0.39	19.9774678,73.6043036	9
411	Shisam	<i>Dalbergia sissoo</i>	0.29	0.08	0.37	19.9774593,73.6043086	9
412	Bahava	<i>Cassia fistula</i>	0.15	0.04	0.19	19.9774547,73.6043059	9
413	Karanj	<i>Pongamia pinnata</i>	0.3	0.08	0.37	19.9774526,73.6043127	9
414	Kumbh	<i>Careya arborea</i>	0.3	0.08	0.38	19.977448,73.6043235	9
415	Pandhra kuda	<i>Holarrhena pubescens</i>	0.07	0.02	0.09	19.97744,73.6043238	9
416	Shisam	<i>Dalbergia sissoo</i>	0.27	0.07	0.34	19.9774175,73.6043288	9
417	Pandhra kuda	<i>Holarrhena pubescens</i>	0.04	0.01	0.05	19.9774087,73.6043283	9
418	Bahava	<i>Cassia fistula</i>	0.08	0.02	0.11	19.9774028,73.604328	9
419	Arjun	<i>Terminalia arjuna</i>	0.21	0.06	0.27	19.9774015,73.6043271	9

Sr. No.	Common Name	Botanical Name	Aboveground biomass (g)	Belowground Biomass (g)	Total Biomass	Co ordinates	Zone no.
420	Shisam	<i>Dalbergia sissoo</i>	0.34	0.09	0.43	19.9773985,73 .6043276	9
421	Amba	<i>Mangifera indica</i>	0.55	0.14	0.69	19.9771903,73 .6044907	9
422	Apta	<i>Bauhinia racemosa</i>	0.16	0.04	0.2	19.9772037,73 .6044661	9
423	Apta	<i>Bauhinia racemosa</i>	0.16	0.04	0.2	19.9772037,73 .6044661	9
424	Apta	<i>Bauhinia racemosa</i>	0.21	0.06	0.27	19.9771974,73 .6044354	9
425	Bahava	<i>Cassia fistula</i>	0.28	0.07	0.35	19.9773885,73 .6042958	9
426	Apta	<i>Bauhinia racemosa</i>	0.45	0.12	0.57	19.977334,73. 6043903	9
		Total	70.86	21.21	92.13		

‘*’ indicates unknown taxon

Annexure 3 Checklist of insects recorded across seasons

Sr. no.	Order	Family	Scientific Name	Common Name	IUCN status	Summer	Monsoon	Winter
1	Blattodea	--	--	Termite	--	+	-	-
2	Diptera	Muscidae	<i>Musca</i> sp.	Fly	--	+	+	-
3	Diptera	Syrphidae	--	Hover Fly	--	-	-	+
4	Hemiptera	Berytidae	--	Stilt Bug	--	+	-	-
5	Hemiptera	Cicadidae	<i>Platypleura</i> sp.	Cicada	--	+	-	-
6	Hemiptera	Reduviidae	--	Assassin Bug	--	+	-	-
7	Hemiptera	Scutelleridae	<i>Chrysocoris</i> sp.	Jewel Bug	--	+	-	-
8	Hymenoptera	Formicidae	<i>Pheidole</i> sp.	Harvester Ant	--	-	+	+
9	Lepidoptera	Geometridae	--	Geometer Moth	--	-	+	-
10	Lepidoptera	Lycaenidae	<i>Amblypodia anita</i>	Purple Leaf Blue	NE	-	-	+
11	Lepidoptera	Lycaenidae	<i>Cigaritis vulcanus</i>	Common Silverline	NE	-	+	-
12	Lepidoptera	Lycaenidae	<i>Chilades pandava</i>	Plains Cupid	NE	-	+	-
13	Lepidoptera	Lycaenidae	<i>Zizula hylax</i>	Tiny Grass Blue	LC	-	+	+
14	Lepidoptera	Nymphalidae	<i>Euploea core</i>	Common Crow	LC	-	+	-
15	Lepidoptera	Nymphalidae	<i>Hypolimnas misippus</i>	Danaid Eggfly	LC	-	+	-
16	Lepidoptera	Nymphalidae	<i>Junonia lemonias</i>	Lemon Pansy	NE	+	-	-
17	Lepidoptera	Nymphalidae	<i>Neptis hylas</i>	Common Sailor	NE	-	-	+
18	Lepidoptera	Nymphalidae	<i>Phalanta phalantha</i>	Common Leopard	LC	-	-	+
19	Lepidoptera	Nymphalidae	<i>Vanessa cardui</i>	Painted Lady	LC	-	+	-
20	Lepidoptera	Papilionidae	<i>Papilio demoleus</i>	Lime Butterfly	NE	-	+	-
21	Lepidoptera	Pieridae	<i>Belenois aurota</i>	Pioneer	LC	-	+	-
22	Lepidoptera	Pieridae	<i>Catopsilia pomona</i>	Common Emigrant	NE	-	+	-
23	Lepidoptera	Pieridae	<i>Eurema laeta</i>	Spotless Grass Yellow	NE	-	-	+
24	Lepidoptera	Pieridae	<i>Ixias marianne</i>	White Orange Tip	NE	-	+	-
25	Odonata	Libellulidae	<i>Crocothemis servilia</i>	Scarlet Skimmer	LC	-	-	+
26	Odonata	Libellulidae	<i>Orthetrum taeniolatum</i>	Small Skimmer	LC	-	-	+
27	Odonata	Libellulidae	<i>Pantala flavescens</i>	Wandering Glider	LC	+	+	-
28	Odonata	Libellulidae	<i>Rhyothemis variegata</i>	Common Picturewing	LC	+	-	-
29	Orthoptera	Acrididae	--	Short-horned Grasshopper	--	-	-	+
30	Orthoptera	Acrididae	<i>Cyrtacanthacris tatarica</i>	Brown-spotted Locust	NE	-	-	+

IUCN status: LC (least concern), NE (not evaluated), '--' (status not assigned to unidentified taxon),
 '+' – presence, '-' – absence

Annexure 4 Checklist of herpetofauna recorded across seasons

Sr. No.	Family	Species	Common Name	IUCN Status	WPI Schedule	Summer	Monsoon	Winter
Amphibians								
1	Bufonidae	<i>Duttaphrynus melanostictus</i>	Common Indian Toad	LC	--	-	+	-
2	Dicroglossidae	<i>Haplobatrachus tigerinus</i>	Indian Bull Frog	LC	Schedule II	-	+	-
3	Dicroglossidae	<i>Sphaerotheca breviceps</i>	Indian Burrowing Frog	LC	--	-	+	-
4	Dicroglossidae	<i>Minervarya</i> sp.	Common Indian Cricket Frog	NE	--	-	+	-
5	Rhachophoridae	<i>Polypedates maculatus</i>	Common Indian Tree Frog	LC	--	-	+	-
Reptiles								
1	Agamidae	<i>Calotes vultosus</i>	Common Garden Lizard	NE	--	-	+	+
2	Agamidae	<i>Monilesaurus rouxii</i>	Roux's Forest Lizard	LC	--	+	+	-
3	Agamidae	<i>Sarada deccanensis</i>	Deccan Fan-throated Lizard	LC	--	+	-	-
4	Colubridae	<i>Fowlea piscator</i>	Checkered Keelback Snake	LC	Schedule I	-	+	-
5	Colubridae	<i>Lycodon aulicus</i>	Common Wolf Snake	LC	Schedule II	-	+	-
6	Colubridae	<i>Ptyas mucosa</i>	Indian Rat Snake	LC	Schedule I	-	+	-
7	Gekkonidae	<i>Hemidactylus cf. murrayi</i>	Murray's House Gecko	NA	--	+	+	+
8	Scincidae	<i>Eutropis carinata</i>	Common Keeled Skink	LC	--	-	+	+
9	Viperidae	<i>Daboia russelii</i>	Russell's Viper	LC	Schedule I	-	+	-

IUCN status: LC (least concern), NE (not evaluated), '--' (status not assigned to unidentified taxon), '+' – presence, '-' – absence

Annexure 5 Checklist of avifauna recorded across seasons

Sr. no.	Family	Scientific name	Common Name	IUCN Status	WPA Status	Summer	Monsoon	Winter	Status
1	Accipitridae	<i>Gyps indicus</i>	Indian Vulture	CR	Schedule I	-	-	+	Resident
2	Accipitridae	<i>Milvus migrans</i>	Black Kite	LC	Schedule II	-	-	+	Resident
3	Accipitridae	<i>Pernis ptilorhynchus</i>	Oriental Honey-buzzard	LC	Schedule II	-	-	+	Resident
4	Acrocephalidae	<i>Acrocephalus dumetorum</i>	Blyth's Reed Warbler	LC	Schedule II	-	-	+	Migrant
5	Aegithinidae	<i>Aegithina tiphia</i>	Common Iora	LC	Schedule II	-	+	-	Resident
6	Alcedinidae	<i>Halcyon smyrnensis</i>	White-throated Kingfisher	LC	Schedule II	+	+	-	Resident
7	Apodidae	<i>Apus affinis</i>	Little Swift	LC	Schedule II	+	-	-	Resident
8	Apodidae	<i>Cypsiurus balasiensis</i>	Asian Palm-Swift	LC	Schedule II	+	-	-	Resident
9	Apodidae	<i>Tachymarptis melba</i>	Alpine Swift	LC	Schedule II	-	-	+	Resident
10	Ardeidae	<i>Bubulcus coromandus</i>	Eastern Cattle Egret	NA	Schedule II	-	+	-	Resident
11	Caprimulgidae	<i>Caprimulgus affinis</i>	Savanna Nightjar	LC	Schedule II	+	-	-	Resident
12	Caprimulgidae	<i>Caprimulgus indicus</i>	Jungle Nightjar	LC	Schedule II	+	-	-	Resident
13	Charadriidae	<i>Vanellus indicus</i>	Red-wattled Lapwing	LC	Schedule II	-	+	-	Resident
14	Cisticolidae	<i>Orthotomus sutorius</i>	Common Tailorbird	LC	Schedule II	-	+	-	Resident
15	Cisticolidae	<i>Cisticola juncidis</i>	Zitting Cisticola	LC	Schedule II	-	+	+	Resident
16	Cisticolidae	<i>Prinia inornata</i>	Plain Prinia	LC	Schedule II	-	+	-	Resident
17	Columbidae	<i>Columba livia</i>	Rock Dove	LC	Schedule II	+	-	-	Resident
18	Columbidae	<i>Spilopelia senegalensis</i>	Laughing Dove	LC	Schedule II	+	+	-	Resident
19	Corvidae	<i>Corvus macrorhynchos</i>	Large-billed Crow	LC	Schedule II	+	+	+	Resident
20	Cuculidae	<i>Centropus (sinensis) parroti</i>	Southern Coucal	LC	Schedule II	-	-	+	Resident
21	Cuculidae	<i>Clamator jacobinus</i>	Jacobin Cuckoo	LC	--	-	+	-	Migrant
22	Cuculidae	<i>Eudynamis scolopaceus</i>	Western Koel	LC	Schedule II	+	-	-	Resident
23	Cuculidae	<i>Hierococcyx varius</i>	Common Hawk-cuckoo	LC	Schedule II	-	+	-	Resident
24	Dicruridae	<i>Dicrurus leucophaeus</i>	Ashy Drongo	LC	Schedule II	-	-	+	Migrant
25	Emberizidae	<i>Emberiza buchanani</i>	Grey-necked Bunting	LC	Schedule II	-	-	+	Migrant
26	Emberizidae	<i>Emberiza lathami</i>	Crested Bunting	LC	Schedule II	-	+	-	Resident

Sr. no.	Family	Scientific name	Common Name	IUCN Status	WPA Status	Summer	Monsoon	Winter	Status
27	Estrildidae	<i>Amandava amandava</i>	Red Avadavat	LC	Schedule II	-	+	-	Resident
28	Estrildidae	<i>Lonchura punctulata</i>	Scaly-breasted Munia	LC	Schedule II	-	+	-	Resident
29	Falconidae	<i>Falco tinnunculus</i>	Common Kestrel	LC	Schedule II	-	+	+	Resident
30	Hirundinidae	<i>Cecropis daurica</i>	Red-rumped Swallow	LC	Schedule II	+	+	-	Resident
31	Hirundinidae	<i>Hirundo smithii</i>	Wire-tailed Swallow	LC	Schedule II	+	-	-	Resident
32	Hirundinidae	<i>Ptyonoprogne concolor</i>	Dusky Crag Martin	LC	Schedule II	-	+	+	Resident
33	Hirundinidae	<i>Ptyonoprogne rupestris</i>	Eurasian Crag Martin	LC	Schedule II	-	-	+	Migrant
34	Leiotrichidae	<i>Turdoides striata</i>	Jungle Babbler	LC	Schedule II	-	+	-	Resident
35	Megalaimidae	<i>Psilopogon haemacephalus</i>	Coppersmith Barbet	LC	Schedule II	+	-	-	Resident
36	Meropidae	<i>Merops orientalis</i>	Asian Green Bee-eater	LC	Schedule II	+	-	+	Resident
37	Motacillidae	<i>Anthus similis</i>	Long-billed Pipit	LC	Schedule II	-	-	+	Migrant
38	Motacillidae	<i>Motacilla flava</i>	Western Yellow Wagtail	LC	Schedule II	-	-	+	Migrant
39	Muscicapidae	<i>Saxicoloides fulicatus</i>	Indian Robin	LC	Schedule II	+	+	+	Resident
40	Nectariniidae	<i>Cinnyris asiaticus</i>	Purple Sunbird	LC	Schedule II	+	-	+	Resident
41	Nectariniidae	<i>Leptocoma zeylonica</i>	Purple-rumped Sunbird	LC	Schedule II	-	+	-	Resident
42	Passeridae	<i>Passer domesticus</i>	House Sparrow	LC	Schedule II	-	+	-	Resident
43	Phasianidae	<i>Francolinus pictus</i>	Painted Francolin	LC	Schedule II	-	-	+	Resident
44	Phasianidae	<i>Francolinus pondicerianus</i>	Grey Francolin	LC	Schedule II	-	+	+	Resident
45	Pycnonotidae	<i>Pycnonotus cafer</i>	Red-vented Bulbul	LC	Schedule II	-	+	+	Resident
46	Pycnonotidae	<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	LC	Schedule II	+	+	+	Resident
47	Sturnidae	<i>Acridotheres fuscus</i>	Jungle Myna	LC	Schedule II	+	-	-	Resident
48	Sylviidae	<i>Sylvia curruca</i>	Lesser whitethroat	LC	Schedule II	-	-	+	Migrant

IUCN status: LC (least concern), NE (not evaluated), ‘-’ (status not assigned to unidentified taxon), ‘+’ – presence, ‘-’ – absence

Photo-plates
Flora



Senecio bombayensis



Impatiens balsamina



Euphorbia antiquorum



Guizotia abyssinica

Insects



Swallowtail butterfly caterpillars on Kavath sapling



Geometer moth resting on Karvand plant



Brown-spotted Locust



Plain Tiger butterfly caterpillar on *Asclepias currasavica* (Halad-kunku) sapling

Herpetofauna



Common Indian Tree frog



Indian Wolf Snake

Birds



Crested Bunting (Male)



Common Kestrel (right) and Laughing Dove (left)



Indian Vulture



Grey-necked Bunting

Mammals



Droppings of Black-naped Hare



Active den of Striped Hyena



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