

Study of biodiversity of Saranda forest in Jharkhand, India

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Abstract : Saranda Forest is one of the most important forest of Jharkhand. It is known as “the land of seven hundred Hills” and has a very rich biodiversity. The vegetation is dominated by “SAL” hence also called “SAL FOREST”. The present study was conducted to assess the biodiversity of Saranda vegetation with much emphasis on quantitative estimation. Altogether 270 plant species (61 Tree, 88 Shrubs and 121 Herbs) were recorded Random Quadrat sampling was done. The forest is dominated by Sal trees constituting > 80% of vegetation. Saranda is known for 100% natural regeneration of Sal trees from seeds. Shannon –weaver’s Index was calculated. This indicated that in Saranda Forest tree species has a good species diversity, however the community is homogenous.

(Keywords : Saranda, Sal, Biodiversity)

Introduction

Saranda forest is a tropical moist deciduous forest, dominated by “SAL” (i.e. *Shorea robusta*). Hence also called “Sal forest” “It is comprised of 700 hills so also designated as “Land of 700 Hills”. “SAL” is one of the dominant tree species in tropical moist and dry deciduous forest in India. (Champion and Seth 1968). However, it is severely ill treated by the population living on fringes of forest because they use them for their livelihood. Thus it is on the verge of becoming threatened ecosystem (Sagar and Singh 2004) and is changing into dry, deciduous shrub, dry savannah and dry grass land (Champion and Srth, 1968, Singh and Singh, 1989), “SAL forest” has been studied extensively (Gupta & Shukla 1991, Singh et al, 1995; Uma Shankar et al, 1998; Pandey and Shukla, 1999; Uma Shankar 2001; Kushwaha and Nandy 2012) However there are very scanty reports on “Sal Forest” from

biodiversity point of view (H.S Lal and P.K Mishra, 2021) Therefore, the presents study is an attempt to observe the species richness and species evenness the two components of biodiversity in the most important “Sal forest “ of Saranda in Jharkhand.

Description of study Area:-

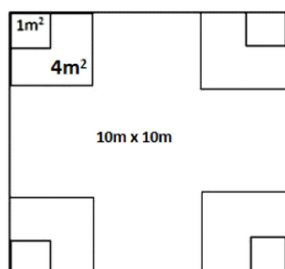
Saranda forest is a dense forest in the hilly region of West Singhbhum, East Singhbhum and Saraikela district in the Indian state of Jharkhand. The area used to be the private hunting reserve of the Singh Deofamily, the royal family of Saraikela. The forest covers an area of 820 Km². The word "Saranda" has been derived from the word "SERENGDA" Which literally means "700 hills in local language". It is located at the elevation of 550m (1800 ft) and the languages spoken are Hindi, HO, and santhali. "HO" people in habitat the area, which is dotted with iron ore mining towns including Gua, Chiria, kiriburu and Noamundi. The Perennial Rivers "Karo" and "Koina" pass through these forest areas supporting a diverse flora and fauna resources. However, 70 to 80% of forest were destroyed due to tree harvesting thereby making the site ecologically critical zone.

The area was also disturbed for multiple reasons, but problems have subsided in recent year and it has turned out to be a major ("Ecotourist hub").

Methodology:-

The stratified random sampling method was adopted for phyto- sociological survey in

the study area. A total of 100 Plots of 0.1h each were randomly laid sampling all the life forms i.e. trees, shrubs and herbs using species area curve method (Mishra, 1968, Mueller - Dombios and Ellenberg 1974) ensuring maximum representation of vegetation types. Accordingly 10m X 10m quadrat size was selected for tree, inside which 4 quadrats of 2mX2m at each corner were laid for shrubs analysis and 1 x 1 m for herb species.



Designing of sampling plot/ Quadrats

The girth (at breast height) of each individual tree was recorded at 1.37m above the tree base. All individuals with gbh > 30cm were considered as tree, < 30cm as shrubs and < 10cm as herbs.

For qualitative identification plants were preserved as herbarium from all sites and identified by using books like Hen's flora, Flora of India etc. Net surfing and DESK research were also taken into account. The Quantitative analysis of tree species was done by calculating the following Phyto- sociological parameters:- (Curtis & McIntosh, 1950)

Frequency

Frequency (%) =

$$\frac{\text{No. of sampling units in which the species occurred}}{\text{Total No. of sampling units studied}} \times 100$$

Density =

$$\frac{\text{Total No. of individuals of the species in all the sampling units}}{\text{Total No. of sampling units studied}}$$

Abundance =

$$\frac{\text{Total No. of individuals of the species in all the sampling units}}{\text{No. of sampling units in which the species occurred}}$$

Biodiversity Index was, calculated by using formula:-

$$H = -\sum [(n_i/N) \ln(n_i/N)]$$

Calculation of Frequency class of Vegetation

The normal species occurrence ratio given by Raunkiaer is $A > B > C > D < E$ and stated that if frequency is matched with Raunkiaer normal frequency diagram (J-shaped), it means that the particular plant community is homogenous. Our result indicates homogenous community in nature.

Frequency Percentage	Class
0-20	A
21-40	B
41-60	C
61-80	D
81-100	E

Observations and Results:

Altogether 270 plant species (61 Tree, 88 Shrubs, 121 Herbs) were recorded. SAL (*Shorea robusta*) was the most important tree in the area. It is a deciduous tree and sheds its leaves in early summer. The Sal is a slow growing tree with an average of 160 years of maximum [life span (Champion and Seth 1960)]. The forest undergrowth was generally evergreen due to growth of trees like *Mangifera indica*, *Madhuca indica*, *Ficus glomerata*, *Alstonia*, *Ficus benghalensis*, *Ficus religiosa*, *Psidium*, *Artocarpus*, *Armossa rohitulea*, *Carmathus tinctorium*, *Schleichera oleosa* etc. The predominant species was *Butea frondosa* either in pure stand or mixed with *Diospyros*, *Madhuca*, *Shorea*, *Phyllanthus* etc. that form undergrowth especially towards the fringes.

Quantative analysis and diversity index of Tree species

Sl.No.	Name of species	Family	Relative frequency (RF)	Relative density (RD)	Relative B. area (RBA)	Importance Value Index (IVI)	Diversity index
1.	<i>Adina cordifolia</i> (Roxb.) Hook. f.	Rubiaceae	2.49	0.66	0.19	3.34	-0.05
2.	<i>Aegle marmelos</i> (L.) Corrêa	Rutaceae	1.6	0.29	0.07	1.97	-0.033
3.	<i>Ailanthus altissima</i>	Simaroubaceae	2.22	0.44	0.15	2.82	-0.044
4.	<i>Ailanthus excelsa</i> Roxb.	Simaroubaceae	1.78	0.38	0.02	2.18	-0.036
5.	<i>Alangium salviifolium</i> (L.f.) Wangerin	Comaceae	1.6	0.5	0.17	2.27	-0.037
6.	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	2.31	0.59	0.38	3.28	-0.049
7.	<i>Annona reticulata</i> L.	Annonaceae	0.36	0.07	0.02	0.45	-0.01
8.	<i>Annona squamosa</i> L.	Annonaceae	0.71	0.12	0.12	0.95	-0.018
9.	<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Guillem. & Perr.	Combretaceae	6.04	2.6	2.2	11.2	-0.123
10.	<i>Bauhinia racemosa</i>	Fabaceae	0.18	0.06	0.15	0.39	-0.009
11.	<i>Bauhinia semla</i> Wunderlin	Fabaceae	0.89	0.27	0.11	1.26	-0.023
12.	<i>Bauhinia vahlii</i> Wight & Arn.	Fabaceae	2.22	0.37	0.16	2.75	-0.043
13.	<i>Bauhinia variegata</i> L.	Fabaceae	2.2	0.41	0.22	2.02	-0.047
14.	<i>Bombax ceiba</i> L.	Malvaceae	1.6	0.37	0.04	2.01	-0.034
15.	<i>Borassus flabellifer</i> L.	Borassaceae	0.29	0.28	0.08	1.1	-0.01
16.	<i>Boswellia serrata</i> Roxb. Ex Colebr.	Burseraceae	0.8	0.18	0.08	1.06	-0.02
17.	<i>Bridelia retusa</i> (L.) A.Juss.	Phyllanthaceae	0.89	0.22	0.04	1.15	-0.021
18.	<i>Buchanania lanzan</i> Spreng.	Fabaceae	6.4	2.96	0.29	9.65	-0.111
19.	<i>Bursera serrata</i>	Burseraceae	0.27	0.1	0.03	0.4	-0.009
20.	<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	0.53	0.18	0.04	0.75	-0.015
21.	<i>Carica papaya</i>	Caricaceae	1	0.22	0.12	0.11	-0.024
22.	<i>Cedrus deodara</i>	Pinaceae	0.11	0.21	0.12	0.11	-0.031
23.	<i>Careya arborea</i>	Lecythidaceae	0.18	0.12	1.07	1.25	-0.025
24.	<i>Cassia fistula</i> L.	Fabaceae	2.62	1.56	0.28	6.01	-0.024
25.	<i>Cleistanthus collinus</i> (Roxb.) Benth. ex Hook.f.	Phyllanthaceae	2.84	0.91	0.21	4.09	-0.059
26.	<i>Dalbergia sissoo</i> DC.	Fabaceae	0.27	0.07	0.02	0.36	-0.008
27.	<i>Dillenia pentagyna</i> Roxb.	Dilleniaceae	0.53	0.18	0.06	0.77	-0.015
28.	<i>Diospyros melanoxylon</i> Roxb.	Ebenaceae	3.47	1.18	0.29	4.94	-0.068
29.	<i>Emblica officinalis</i> Gaertn.	Phyllanthaceae	2.67	0.46	0.06	3.19	-0.048
30.	<i>Erythrina indica</i> Lam.	Fabaceae	0.71	0.15	0.09	0.95	-0.018

SLNo.	Name of species	Family	Relative frequency (RF)	Relative density (RD)	Relative B. area (RBA)	Importance Value Index (IVI)	Diversity index
31.	<i>Ficus racemosa</i> L.	Moraceae	0.44	0.12	0.09	0.65	-0.013
32.	<i>Ficus semicordata</i> Buch.-Ham. ex Sm.	Moraceae	0.71	0.15	0.06	0.92	-0.018
33.	<i>Helicteres isora</i> L.	Malvaceae	0.44	0.13	1.07	1.64	-0.029
34.	<i>Holarrhena pubescens</i> Wall.ex G.D	Apocynaceae	2.93	0.62	0.09	3.65	-0.054
35.	<i>Indigofera pulchella</i> Roxb.	Fabaceae	0.62	0.1	0.04	0.77	-0.015
36.	<i>Lagerstroemia parviflora</i> Roxb.	Lythraceae	3.82	1.64	0.56	6.02	-0.078
37.	<i>Madhuca latifolia</i> (Roxb.)J.F.Macbr.	Sapotaceae	4.71	2.32	2.94	9.97	-0.113
38.	<i>Mallotus philippensis</i> (Lam.)Müll.Arg.	Euphorbiaceae	0.44	0.12	0.07	0.64	-0.013
39.	<i>Mangifera indica</i> L.	Anacardiaceae	1.07	0.25	0.2	1.52	-0.027
40.	<i>Michelia champaca</i> L.	Magnoliaceae	0.53	0.09	0.02	0.64	-0.013
41.	<i>Miliusa velutina</i> (A.DC.)Hook.f. & Thomson	Annonaceae	0.71	0.18	1.07	1.96	-0.033
42.	<i>Mitragyna parvifolia</i> (Roxb.)Korth.	Rubiaceae	0.44	0.12	0.02	0.58	-0.012
43.	<i>Morinda tinctoria</i> Roxb.	Rubiaceae	0.44	0.15	0.02	0.61	-0.013
44.	<i>Plumeria rubra</i> L.	Apocynaceae	0.09	0.03	0.15	0.27	-0.006
45.	<i>Pterocarpus marsupium</i> Roxb.	Fabaceae	1.78	0.52	0.07	2.37	-0.038
46.	<i>Radermachera xylocarpa</i> (Roxb.) Roxb. ex K.Schum.	Bignoniaceae	1.6	0.37	0.19	2.16	-0.035
47.	<i>Schleichera oleosa</i> (Lour.)	Sapindaceae	3.11	0.63	0.35	4.1	-0.059
48.	<i>Semecarpus anacardium</i> L.f.	Anacardiaceae	0.71	0.12	0.12	0.95	-0.018
49.	<i>Shorea robusta</i> Gaertn.	Dipterocarpace	7.11	69.18	84.66	160.95	-0.334
50.	<i>Spondias pinnata</i>	Anacardiaceae	0.71	0.22	0.15	1.08	-0.02
51.	<i>Sterculia villosa</i>	Sterculiaceae	0.18	0.03	1.07	1.27	-0.023
52.	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	3.91	1.11	0.62	5.63	-0.075
53.	<i>Tamarindus indica</i> L.	Fabaceae	1.07	0.27	0.04	1.38	-0.025
54.	<i>Tectona grandis</i> L.f.	Lamiaceae	0.98	0.28	0.07	1.33	-0.024
55.	<i>Terminalia chebula</i>	Fabaceae	0.44	0.19	0.07	0.71	-0.014
56.	<i>Terminalia arjuna</i> (Roxb. exDC.) Wight & Arn.	Fabaceae	2.67	0.86	0.22	3.74	-0.055
57.	<i>Terminalia bellirica</i> (Gaertn.)Roxb.	Fabaceae	1.33	0.32	0.2	1.86	-0.031
58.	<i>Terminalia tomentosa</i> Wight	Fabaceae	4.89	2.92	2.28	10.09	-0.114
59.	<i>Trewia nudiflora</i>	Euphorbiaceae	0.18	0.18	1.07	1.42	-0.025
60.	<i>Trichilia connaroides</i> (Wight & Arn.) Benth.	Meliaceae	1.96	0.52	0.33	2.8	-0.044
61.	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	0.18	0.18	0.01	0.37	-0.008
			100	100	100	300	-2.431

List of Shrubs species

Sl.No.	Name of species	Family
1.	Abelmoschus moschatus Medik.	Malvaceae
2.	Acacia nilotica (L.) Delile	Fabaceae
3.	Acacia pinnata Link (sapling)	Fabaceae
4.	Achyranthes aspera L.	Amaranthaceae
5.	Adhatoda vasica Nees	Acanthaceae
6.	Adina cordifolia (Roxb.)	Rubiaceae
7.	Ailanthus excelsa Roxb.	Simaroubaceae
8.	Alangium salviifolium	Cornaceae
9.	Alstonia scholaris (L.) R.Br. (sapling)	Apocynaceae
10.	Amaranthus spinosus L.	Amaranthaceae
11.	Anogeissus latifolia (Roxb. ex DC.) Wall. ex Guillem. & Perr. (sapling)	Combretaceae
12.	Argemone mexicana L.	Papaveraceae
13.	Barleria cristata L.	Acanthaceae
14.	Barleria prionitis L.	Acanthaceae
15.	Bauhinia vahlii Wight & Arn. (sapling)	Fabaceae
16.	Baugainvillea spectabilis	Nyctaginaceae
17.	Bidens pilosa L.	Asteraceae
18.	Bixa orellana L.	Bixaceae
19.	Bombax ceiba L. (sapling)	Malvaceae
20.	Buchanania lanzan Spreng. (sapling)	Anacardiaceae
21.	Butea monosperma (Lam.)	Fabaceae
	Taub. (sapling)	
22.	Butea superba Roxb.	Fabaceae
23.	Caesalpinia pulcherrima (L.) Sw.	Fabaceae
24.	Calotropis procera (Aiton) Dryand.	Apocynaceae
25.	Calotropis gigantea (L.) Dryand.	Apocynaceae
26.	Carissa carandas	Apocynaceae
27.	Casaria tomentosa Roxb.	Salicaceae
28.	Cassia occidentalis	Fabaceae
29.	Cassia alata L.	Fabaceae
30.	Cassia fistula L. (sapling)	Fabaceae
31.	Cassia sophera L.	Fabaceae
32.	Cipadessa baccifera	Meliaceae
33.	Cleistanthus collinus (Roxb.) Benth. ex H.	Phyllanthaceae
34.	Clerodendrum indicum (L.) Kuntze	Lamiaceae
35.	Clerodendrum infortunatum L.	Lamiaceae
36.	Colebrookea oppositifolia	Lamiaceae
37.	Cordia dichotoma G.Forst.	Boraginaceae
38.	Crotalaria albida Roth	Fabaceae
39.	Croton oblongifolius Delile	Euphorbiaceae
40.	Datura metel L.	Solanaceae
41.	Desmodium pulchellum (L.) Benth.	Fabaceae
42.	Desmodium gangeticum (L.) DC.	Fabaceae
43.	Diospyros melanoxylon Roxb. (sapling)	Ebenaceae
44.	Embllica officinalis Gaertn.	Phyllanthaceae

Sl.No.	Name of species	Family
45.	Eupatorium odoratum L.	Asteraceae
46.	Ficus glomerata Roxb.	Moraceae
47.	Flemingia macrophylla	Fabaceae
48.	Flemingia chappar Benth.	Fabaceae
49.	Gmelina arborea Roxb. (sapling)	Lamiaceae
50.	Helicteres isora L. (sapling)	Malvaceae
	Heteropogon androphilus (Stapf)	
51.	Roberty	Poaceae
52.	Holarrhena pubescens Wall. ex G.Don (sapling)	Apocynaceae
53.	Hyptis suaveolens (L.) Poit.	Lamiaceae
54.	Ichnocarpus frutescens (L.) W.T.Aiton	Apocynaceae
55.	Lagerstroemia parviflora	Lythraceae
56.	Lantana camara L.	Verbenaceae
57.	Lantana indica Roxb.	Verbenaceae
58.	Leea asiatica	Vitaceae
59.	Leonotis nepetifolia (L.) R.Br.	Lamiaceae
	Madhuca latifolia (Roxb.)	
60.	J.F.Macbr. (sapling)	Sapotaceae
61.	Mangifera indica L. (sapling)	Anacardiaceae
	Miliusa tomentosa (Roxb.) J.Sinclair (sapling)	
62.		Annonaceae
63.	Mirabilis jalapa L.	Nyctaginaceae
64.	Morus alba L.	Moraceae
65.	Nyctanthes arbor-tristis L.	Oleaceae
66.	Parthenium hysterophorus L.	Asteraceae
	Phoenix sylvestris (L.)Roxb. (sapling)	
67.		Aracaceae
68.	Potentilla indica L.	Rosaceae
69.	Rauvolfia tetraphylla L.	Apocynaceae
	Schleichera oleosa (Lour.) Merr. (sapling)	
70.		Sapindaceae
71.	Shorea robusta Gaertn.(sapling)	Dipterocarpaceae
72.	Sida cordifolia L.	Malvaceae
	Solanum xanthocarpum Schrad. & H. Wendl.	
73.		Solanaceae
74.	Syzygium cumini (L.) Skeels	Myrtaceae
75.	Tectona grandis L.f. (sapling)	Lamiaceae
76.	Tephrosia purpurea (L.)Pers.	Fabaceae
	Terminalia tomentosa Wight & Arn. (sapling)	
77.		Combretaceae
	Terminalia arjuna (Roxb. ex DC.) Wight & Arn. (sapling)	
78.		Combretaceae
79.	Thespesia lampas (Cav.) Dalzell	Malvaceae
80.	Trema orientalis (L.) Blume	Cannabaceae
81.	Trewia nudiflora L. (sapling)	Euphorbiaceae
82.	Triumfetta rhomboidea Jacq.	Malvaceae
83.	Urena lobata L.	Malvaceae
84.	Watsonia distans L.	Iridaceae
85.	Woodfordia fruticosa (L.) Kurz	Lythraceae
86.	Xanthium strumarium L.	Asteraceae
87.	Ziziphus mauritiana Lam.	Rhamnaceae
88.	Ziziphus oenopolia (L.)	Rhamnaceae

List of Herbs species

Sl.No.	Name of species	Family
1	Abrus precatorius L.	Fabaceae
2	Abutilon indicum L.	Malvaceae
3	Acalypha indica L.	Euphorbiaceae
4	Acorus calamus L.	Acoraceae
5	Adiantum lanceolatum (Lab ill.) Poir.	Lindsaeaceae
6	Aeginetia indica L.	Orobanchaceae
7	Ageratum conyzoides (L.) L.	Asteraceae
8	Alternanthera philoxeroides (Mart.) Griseb.	Amaranthaceae
9	Alternanthera sessilis (L.) R.Br. ex DC.	Amaranthaceae
10	Alternanthera tenella Colla	Amaranthaceae
11	Amaranthus spinosus L.	Amaranthaceae
12	Amaranthus viridis L.	Amaranthaceae
13	Ammannia baccifera L.	Lythraceae
14	Ampelocissus latifolia (Roxb.) Planch.	Vitaceae
15	Andrographis paniculata (Burm.f.) Nees	Acanthaceae
16	Asparagus racemosus Willd.	Asparagaceae
17	Bacopa monnieri (L.) Wettst.	Plantaginaceae
18	Balsamina impatiens	Balsaminaceae
19	Basella alba L.	Basellaceae
20	Basella rubra L.	Basellaceae
21	Bidens pilosa L.	Asteraceae
22	Biophytum sensitivum (L.) DC.	Oxalidaceae
23	Blechnum orientale L.	Blechnaceae
24	Boerhavia diffusa L.	Nyctaginaceae
25	Boerhavia repens L.	Nyctaginaceae
26	Cajanus scarabaeoides	Fabaceae
27	Canna indica L.	Cannaceae
28	Cassia tora L.	Fabaceae
29	Catharanthus roseus (L.) G. Don	Apocynaceae
30	Celastrus paniculatus Willd.	Celastraceae
31	Celosia argentea L.	Amaranthaceae
32	Centella asiatica (L.) Urb.	Apiaceae

List of Herbs species

Sl.No.	Name of species	Family
33	<i>Chenopodium album</i> L.	Chenopodiaceae
34	<i>Cleome diandra</i> Burch.	Cleomaceae
35	<i>Cleome gynandra</i> L.	Cleomaceae
36	<i>Cleome ruidosperma</i> DC.	Cleomaceae
37	<i>Cleome viscosa</i> L.	Cleomaceae
38	<i>Clitoria ternatea</i> L.	Fabaceae
39	<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae
40	<i>Colocasia esculenta</i> (L.) Schott	Araceae
41	<i>Commelina benghalensis</i> L.	Commelinaceae
42	<i>Commelina erecta</i> L.	Commelinaceae
43	<i>Costus speciosus</i> (J.Koenig) Sm.	Costaceae
44	<i>Crotalaria albida</i> Roth	Fabaceae
45	<i>Croton bonplandianus</i> Baill.	Euphorbiaceae
46	<i>Curculigo orchioidea</i> Gaertn.	Hypoxidaceae
47	<i>Curcuma amada</i> Roxb.	Zingiberaceae
48	<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae
49	<i>Cyanotis cristata</i> (L.) D. Don	Commelinaceae
50	<i>Cymbopogon citratus</i> (DC.) Stapf	Poaceae
51	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae
52	<i>Cyperus rotundus</i> L.	Cyperaceae
53	<i>Dactyloctenium aegyptium</i>	Fabaceae
54	<i>Desmodium triflorum</i> (L.) DC.	Fabaceae
55	<i>Dioscorea alata</i>	Dioscoreaceae
56	<i>Dioscorea oppositifolia</i>	Dioscoreaceae
57	<i>Dioscorea bulbifera</i> L.	Dioscoreaceae
58	<i>Dioscorea pentaphylla</i> L.	Dioscoreaceae
59	<i>Eclipta alba</i> (L.) Hassk.	Asteraceae
60	<i>Eclipta prostrata</i> (L.) L.	Asteraceae
61	<i>Elephantopus scaber</i> L.	Compositae
62	<i>Emilia sonchifolia</i> (L.) DC. ex DC.	Compositae
63	<i>Eriocaulon cinereum</i> R.Br.	Eriocaulaceae
64	<i>Eulaliopsis binata</i> (Retz.) C.E. Hubb.	Poaceae

List of Herbs species

Sl.No.	Name of species	Family
65	<i>Euphorbia hirta</i> L.	Euphorbiaceae
66	<i>Euphorbia thymifolia</i> L.	Euphorbiaceae
67	<i>Evolvulus alsinoides</i> (L.) L.	Convolvulaceae
68	<i>Evolvulus nummularius</i> (L.) L.	Convolvulaceae
69	<i>Gomphrena serrata</i> L.	Amaranthaceae
70	<i>Hedyotis corymbosa</i>	Rubiaceae
71	<i>Heliotropium indicum</i> L.	Boraginaceae
72	<i>Hydrangia macrophylla</i> L.	Hydrangiaceae
73	<i>Hemidesmus indicus</i> (L.) R.Br. ex Schult.	Apocynaceae
74	<i>Heteropogon contortus</i>	Poaceae
75	<i>Heteropogon leptocladus</i> (Hack.) Roberty	Poaceae
76	<i>Hygrophila auriculata</i> (Schumach.) Heine	Acanthaceae
77	<i>Ipomoea aquatica</i> Forssk.	Convolvulaceae
78	<i>Ipomoea quadrangularis</i> Bojer ex Choisy	Convolvulaceae
79	<i>Jatropha curcas</i> L.	Euphorbiaceae
80	<i>Lathyrus sativus</i> L.	Fabaceae
81	<i>Leucas aspera</i> (Willd.) Link	Lamiaceae
82	<i>Lindenbergia indica</i> Vatke	Plantaginaceae
83	<i>Lindernia ciliate</i>	Scrophulariaceae
84	<i>Ludwigia octovalvis</i> (Jacq.) P.H. Raven	Onagraceae
85	<i>Martynia annua</i> L.	Martyniaceae
86	<i>Mazus pumilus</i>	Scrophulariaceae
87	<i>Melochia corchorifolia</i> L.	Malvaceae
88	<i>Mentha arvensis</i> L.	Lamiaceae
89	<i>Mimosa pudica</i> L.	Fabaceae
90	<i>Momordica dioica</i> Roxb. ex Willd.	Cucurbitaceae
91	<i>Mucuna pruriens</i> (L.) DC.	Fabaceae
92	<i>Oldenlandia corymbosa</i> L.	Rubiaceae
93	<i>Oplismenus burmannii</i>	Asteraceae
94	<i>Oxalis corniculata</i> L.	Oxalidaceae
95	<i>Oxalis latifolia</i> Kunth	Oxalidaceae
96	<i>Pennisetum pedicellatum</i> Trin.	Poaceae

List of Herbs species

Sl.No.	Name of species	Family
97	Phyllanthus amarus L.	Phyllanthaceae
98	Phyllanthus virgatus G.Forst.	Phyllanthaceae
99	Physalis angulata L.	Solanaceae
100	Piper umbellatum L.	Piperaceae
101	Pterocarpus marsupium	Fabaceae
102	Rauvolfia serpentina (L.)Benth. ex Kurz	Apocynaceae
103	Ruellia tuberosa	Acanthaceae
104	Rungia parviflora Nees	Acanthaceae
105	Saccharum spontaneum L.	Poaceae
106	Scoparia dulcis L.	Plantaginaceae
107	Sida cordifolia L.	Malvaceae
108	Smithia conferta	Poaceae
109	Solanum nigrum L.	Solanaceae
110	Sonchus arvensis L.	Compositae
111	Sonchus oleraceus (L.) L.	Asteraceae
112	Sphaeranthus indicus L.	Asteraceae
113	Synedrella nodiflora (L.)Gaertn.	Compositae
114	Thysanolaena sps	Poaceae
115	Tridax procumbens (L.) L.	Compositae
116	Uraria lagopoides	Fabaceae
117	Uraria picta (Jacq.) DC.	Fabaceae
118	Vernonia aspera (Roxb.)Buch.-Ham.	Asteraceae
119	Vernonia cinerea (L.) Less.	Compositae
120	Vetiveria zizanioides (L.)Nash	Poaceae
121	Wedelia chinensis (Osbeck)Merr.	Asteraceae

Conclusion

1. Biodiversity is key to life on earth. Growth of vegetation in the forest of Saranda is highly vibrant. This vibrancy is attributed to rich chlorophyll present in plants. The chlorophyll converts sun energy using water and CO₂ through the process of photosynthesis.
2. The forest is dominated by Sal trees constituting > 80% of vegetation. Saranda is known for 100% natural regeneration of sal trees from seeds. No. of trees observed here is 61, Shrubs 88 and Herbs 121. Dominant trees in the area include Sal (*Shorea robusta*), Sagwan (*Tectona grandis*), Asan,

(*Terminalia elliptica*) etc. Kala shishum (*Dalbergai latifolia*) and Beeja Sal (*Pterocarpus marsupiam*) are few in number only. Shrubs mainly include *Achyranthus aspera*, *Adhatoda vasica*, *Amaranthus viridis* etc. *Ageratum conyzoides* and *Leonotis nepetifolia* are important herbs here and are abundantly available along road sides. Giant lianas such as *Bauhinia sp*

(*Siyali patta*) is abundantly available in the forest used for making pattals and is one of the important source of income for villagers. Implementing well planned and structured Biodiversity is key to survival of this unique Sal dominant forest ecosystem.

Pl see annexure for list of flora of the area.

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