



## IMPACT OF INDUSTRIALIZATION ON FLORAL DIVERSITY OF THE PROPOSED ASH-DYKE AREA OF DHANRAS VILLAGE, NTPC, KORBA (C.G.)

### Botany

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### ABSTRACT

The present paper deals with the study based on floral survey of the land proposed for Ash dyke area by National Thermal Power Corporation Ltd, Korba to acquire 496.273 hectare land including 244.849 hectare forest land nearby lake Dhanras in Bilaspur district of Madhya Pradesh (Now Chhattisgarh). According to Forest Conservation Act 1980, the forest clearance is strictly prohibited without studying the flora and fauna of that area to know their status. NTPC had applied for the forest clearance of 244.849 hectare revenue forest area under the provision of Forest Conservation Act 1980. The main objective of study was to find out the rare and endangered flora and fauna of the proposed area. We observed and identified 340 plants species. These plant species were collected during different seasons. After collection of these species, they were preserved and kept in the SFRI Jabalpur (MP) herbarium for record. It was noticed that regeneration status of tree species were very poor. Other species occasionally present in this category are belonging to Shrub groups. We have recorded 9 families of monocotyledons with 47 genera and 78 species from study area. As far as dicotyledons are concerned 59 families with 172 genera and 236 species were recorded.

### KEYWORDS

Floral Diversity, Industrialization, Ash Dyke, Korba, Chhattisgarh.

### Introduction

The present paper deals with the study based on floral survey of the land proposed for Ash dyke area by National Thermal Power Corporation Ltd, Korba to acquire 496.273 hectare land including 244.849 hectare forest land nearby village Dhanras in Bilaspur district of Madhya Pradesh (Now Chhattisgarh). According to Forest Conservation Act 1980, the forest clearance is strictly prohibited without studying the flora of that area to know their status. NTPC had applied for the forest clearance of 244.849 hectare revenue forest area under the provision of Forest Conservation Act 1980. In the process, the forest department has asked NTPC to submit a detailed report of floristic survey of the area proposed for the clearance with the special reference to find out rare and endangered species of flora (if any) in the affected site. The main objective of study was to find out the rare and endangered flora of the proposed area.

**Study Area:** The study area lies between longitude 82° -40 and 82°-38' and 22°-30' and 22° to 28° latitude. The proposed site is located near Dhanras Village at Korba Super Thermal Plant situated on the West Bank of river Hasdeo Besin. Samples were collected in all the four seasons like summer, rainy, Spring and Winter season. Daily maximum temperature recorded 23.9° to 39.2°, minimum temperature 17.4° C 25° C, annual rainfall is recorded at 115 8.25 mm. forest type as per the classification (Champion and Seth 1968). Two types of forest has been seen that is Northern Tropical Dry Deciduous forest and Northern Tropical Moist Deciduous forest. Sal is the dominant species

### Methodology :-

The study area which is proposed for Ash dyke by NTPC was intensively explored by a team of scientists of SFRI, Jabalpur. Within demarcated boundaries, the entire affected area was divided into 55X50M wide strips and copper strips. For assessment of tree vegetation in the area, a quadrat of 40X40M was laid down. For sampling a quadrat of 10X10 and for herbs quadrat of 1X1 was laid down.

Field survey was carried out during all seasons of the year. Floristic diversity specimen of all plants species existed in the study area. Standard of the method has been followed for collection and preparation of herbarium (Jain & Rao 1977) These specimens were arranged according to Bentham & Hooker and kept in the state Forest Research Institute Jabalpur. Collected plant species were also categorized according to their habits such as trees, climbers, shrubs, herbs, grasses, semi parasite, and epiphytes etc.

### Observation and Discussion:-

The Chhattisgarh state of the India is the richest for flora with variation of physical and cultural features. Officially, the word development in India's backward and neglected regions has always meant two things pumping crores of rupees for creating the basic infrastructure like roads, dams, power projects, water supply, pipelines and modern educational and Healthcare facilities (Ruffie Josh 2000). Moreover the forest of this kind are also subjected to encroachment and damages by

local villagers for their livelihood and fuel. All these factors have caused cumulative adverse effects on the health of the forest

During the survey it was found that the local communities living nearby area were totally dependent on non timber forest produces for their livelihood and fuels. After land diversion there will be adverse impact on dependency of local communities on adjoining forest area and they have to move for another livelihood options.

The primary objectives of the present study is to list out the variety of plant species existing within the study area and to find the rare and endangered species. Total 340 plants species have been listed from the study area. Out of the total listed species, 8 species are belonging to algae; 7 species to fungi; 9 species to bryophytes; 2 species to epiphytes; 2 species to semi parasites; 8 species to under shrubs; 13 species to shrubs; 20 species to climbers; 152 species to herbs; 38 species to grasses; 6 species to small trees; and 5 species to medium tree.

Majority of 314 species are belonging to Angiosperm. However, remaining 26 species are categorized as lower plant groups in the Angiospermic plants. 78 species belonging to monocotyledons. However, in dicotyledons, 236 species have been recorded in the area. We observed 10 dominant families among Angiosperm group are found to be listed (List)

Fabaceae has been found to be a largest family in the area, dominating by 44 species of 23 genera.

Poaceae is the second largest family contributed by 38 species of 28 genera. Many plants were found to have medicinal value which were used by local people.

### Conclusion:

Due to heavy pressure of biotic interference, the area have been found to be severely degraded. The density of the trees was found to be very poor. Amongst all noticed species, Shorea Robusta & Buchanania Lanzan were found to be dominating species.

Protected areas are adversely impacted by industrialization and large number of people displaced by Ash dyke has altered demographic structure of the area the local ecosystem which took years for taking proper shape.

**Future Scope:** Since the industrialization has converted a forest land into degraded forest, the modern concept of sustainable development must be taken into consideration for the sake of stability and improvement along with environment and people.

**PLANT SPECIES COLLECTED FROM THE AREA AND KEPT PRESERVED IN THE HERBARIUM ARE LISTED AS UNDER :-**

	<b>ALGAE</b>		
1	Anabena Sp	29	Corchorus fascicularis. Lamk.
2	Chara Sp	30	Grewia asiatica L.
3	Coleochaete pulvinata	31	Grewia hirsuta. Vahl.
4	Nostoc commune	32	Grewia tiliifolia
5	Oedogonium sp.		<b>13. MALPIGHIACEAE</b>
6	Oscillatoria chloronia	33	Hiptage benghalensis (L)Kurtz.
7	Spirogyra sp.		<b>14. OXALIDACEAE</b>
8	Volvox tertius	34	Biophytum reinwardtii (Zucc) Klotz.
	<b>FUNGI</b>	35	Biophytum sensitivum L.D.C.
1	Agricus sp.	36	Oxalis latifolia.Kuntz.
2	Geastrum sp.		<b>15. RUTACEAE</b>
3	Lycoperdon gemmatum	37	AEGAL marmelos L.
4	Lycoperdon pusillum		<b>16. BURSERACEAE</b>
5	Microporus xanthopus	38	Boswellia serrata.Roxb.
6	Polyporus arclarius	39	Garuga pinnata.Roxb
7	Polyporus versicolor		<b>17. MELIACEAE</b>
	<b>BRYOPHYTA</b>	40	Azadiracta indica.A.Juss.
1	Anthoceros fusiformis	41	Chloroxylon surentenia D.C.
2	Funaria hygrometrica	42	Soymida febrifuga A.Juss.
3	Marchantia polymorpha		<b>18. CELASTRACEAE</b>
4	Marchantia sp	43	Elaeodendron roxburgii.Wight & Arm.
5	Porella sp		<b>19. RHAMNACEAE</b>
6	Polytrichum piliferum	44	Ventilago calyculata.Tulsan in Ann.
7	Riccia sp	45	Zizyphus mauritiana Lamk.
8	Riccia fluitans	46	Zizyphus rotundifolia L.
9	Riccia natans		<b>20. VITIDIACEAE</b>
	<b>PTERIDOPHYTA</b>	47	Vitis linnei.Roxb.
1	Adiantum philippense		<b>21. SAPINDACEAE</b>
2	Ophioglossum sp	49	Schleichera oleora Lour.
	<b>DICOTYLEDONES ANGIOSPERMS</b>		<b>22 ANACARDIACEAE</b>
	<b>1. DILLENIACEAE</b>	50	Anacardium occidentale.L.
1	Dillenia pentagyna Roxb. Hooker	51	Buchnania Lanzas Spreng.
	<b>2. ANNONACEAE</b>	52	Lannea coromandelica(Houtt)Merrill.
2	Annona squamosa. L.	53	Mangifera indica L.
3	Miliusa tomentosa. Roxb.	54	Semicarpus anacardium.L.F.
	<b>3. MENISPERMACEAE</b>		<b>23 MORINGACEAE</b>
4	Cissampelos pareira. L.	55	Moringa olifera Lamk.
5	Cocculus hirsutus.L.Diels		<b>FABACEAE 24 PAPILIONACEAE</b>
	<b>4. PAPAVERACEAE</b>	56	Abrus precatorious.L.
6	Argimone maxicana. L.	57	Aeschynomene indica.L.
	<b>5. FLACOURTIACEAE</b>	58	Alysicarpus monolifer(L)D.C.
7	Casearia graveolens Wild.	59	Alysicarpus indica L.
	Flacourtia indica(Burm.f) Merr.	60	alysicarpus rogosus Dc.Hooker.
	<b>6. POLYGALACEAE</b>	61	Atlosia scarbaeoides. L.Benth
8	Polygala erioptera.DC.	62	Beutea monosperma (Lamk)Taub.
	<b>7. DIPTEROCARPACEAE</b>	63	Crotalaria Hirsuta willd.
9	Shorea robusta Roxb.ex.C.F.Gaertn.	64	Crotalaria Juncea.L.
	<b>8. CARYOPHYLLACEAE</b>	65	crotalaria sericea. Retz.
10	Polycarpaea corymbosa.L.	66	Dalbergia paniculata. Roxb.
	<b>9. MALVACEAE</b>	67	Dalbergia sissoo Roxb.Hort.
11	Abelmoschus manihot.L	68	Desmodium gangeticum L.DC.
12	Gossypium herbaceum L.	69	Desmodium latifolium.Dc.
13	Malvastrum coromandelianum(L)	70	Desmodium SP.
14	Pavonia procumbent (W & A) Walp.	71	Desmodium spirale.Dc.
15	Pavonia zelylanica L.	72	Desmodium triflorum L.Dc.
16	Sida acuta L. Burm.	73	Flemingia macrophylla.Willd.
17	Sida cordifolia L.	74	Indigofera astragalina Dc.
18	Sida sp.	75	Indigofera cordifolia.Heyne ex.Roth.
19	Triumfetta rhomboidea Jacq.	76	Indigofera latifolium L.
20	Urena lobata L.	77	Indigofera pentaphylla.Retz.
	<b>10. BOMBACACEAE</b>	78	Melilotus alba Derr in Lam.
21	Bombax malabaricum D.C	79	Mucuna Prurita Hook.Bot.Misc.
	<b>11. STERCULIACEAE</b>	80	Ougeinia Oojeinensis(Roxb)Houchrout.
22	Bytteneria herbacea Roxb.	81	Smithia conferta.Sm.in Rees.
23	Helicteres isora L	82	Vicia hirsuta.L.S.
24	Melochia corchorifolia L.	83	Zornia gibbosa.Span.
25	Pterospermum acerifolium. Wild.		<b>25. CAESALPINIACEAE</b>
26	Sterculia urens. Roxb.	84	Bauhinia purpurea. L.
	<b>12. Tilliaceae</b>	85	Bauhinia retusa.Kuntz.
27	Corchorus aestuans.L.	86	Bahuinia variegata.L.
28	Corchorus capsularis.L.	87	Cassia absus L.
		88	Cassia tora.L.

89	Cassia occidentalis.L.		<b>39. SAPOTACEAE</b>
90	Cassia fistula.L.	148	Madhuca indica.J.E.Gmel
91	Hardwickia binata.Roxb.		<b>40. EBENACEAE</b>
92	Tamirandus indica.L.	149	Diospyros melanoxylon.Roxb
	<b>26. MIMOSACEAE</b>		<b>41. APOCYNACEAE</b>
93	Acacia catechu.Willd	150	Holarrhena antidysentrica.Wall.
94	Acacia ferruginea	151	Nerium indicasum.Mill
95	Acacia nilotica.L.	152	Icnocarpus frutescens(L)R.Br.
96	Albizia lebbek.(L)Benth in Hook.	153	Vallisneria spiralis.L.
97	Albizia procera.Roxb.Benth&Hooker.		<b>42. ASCLEPIADEACE</b>
98	Mimosa pudica.L.	154	Hemidesmus indicus(L) R.Br.
	<b>27. COMBRETACEAE</b>	155	Holostemma annulare.Roxb.K.Schum
99	Anogeissus latifolia Bedd.	156	Cryptolepis buchanani.Roemer & Schult
100	Anogeissus pendula.Edgew.	157	Pergularia daemia (Forsk)Chiov.
101	Terminalia arjuna.Roxb.ex.Dc.		<b>43. GENTIANACEAE</b>
102	Terminalia bellerica.Roxb..	158	Canscora diffusa(Vahl)R.Bar.
103	Terminalia tomentosa(Roxb.ex.DC)	159	Exacum pendunculatum.Forsk.
	<b>28. MYRTACEAE</b>	160	Exacum tetragonum.Roxb.
104	Syzygium cumini.L.		<b>44. BORAGINACEAE</b>
	<b>29. LECYTHIDACEAE</b>	161	Cynoglossum zeylanicum.Vahl.(Ex.Horn)
105	Careya arborea.Roxb.		<b>45. CONVULVULACEAE</b>
	<b>30. LYTHRACEAE</b>	162	Cuscuta reflexa.Roxb.
106	Lagestroemia parviflora.Roxb.	163	Evolvulus alsinoides(L).L.
107	Woofordia fructicosa.L.Kurtz in	164	Evolvulus nummularius(L).L.
	<b>31. ONAGRACEAE</b>	165	Ipomoea aquatica.Forsk.
108	Ludwigia perennis L.	166	Ipomoea pestrigridis.L.
	<b>32. PASSIFLORACEAE</b>	167	Ipomoea Sp.
109	Passiflora edulis.Sims	168	Merremia emerginata(Burm.f.)Halb.F.
	<b>33. CUCURBITACEAE</b>	169	Merremia Sp.
110	Melothria maderaspatana(L)	170	Rivea hypocrateriterimis(Desr)Choisy
111	Mukia madraspatana		<b>46. SOLONACEAE</b>
112	Trichosanthes cucumeriana.L	171	Solanum nigrum.L
	<b>34. APIACEAE</b>	172	Physalis minima.L.
113	Centella asiatica.L.(Urb)		<b>47. SCROPHULARICEAE</b>
	<b>35. RUBIACEAE</b>	173	Linderbergia murarid.Roxb
114	Adina cordifolia.Roxb.(Hook)F.	174	Linderbergia crustacea.L.F.V.Muell.
115	Borreria articularia(Linn).F	175	Scoparia dulies.L.
116	Borreria stricta(Linn).F	176	Striga angustifolia(Don)Salid.
117	Borreria pusilla. Wall.Dc.	177	Striga Sp.
118	Gardenia latifolia. Ait.		<b>48. ACANTHACEAE</b>
119	Gardenia turgida.Roxb	178	Andrographis paniculata(Burm)F.Wall
120	Ixora parviflora. Vahl.	179	Barleria cristata.L.
121	Hydotis sp.	180	Eranthemum purpurascens.T.Ands
122	Myrtagyna parviflora.Korth	181	Hemigraphis latebrosa(Hey ex.Ro)Nees
123	Oldenlandia gracilis.Dc.	182	Hemiadelphus polyspermus.Nees
124	Oldenlandia sp.	183	Hygrophylia auriculata(Schum)Heins, Keoo
125	Xeromorphis spinosa(Thumb)Keay	184	Indeneesiella echioides Sreemadh
	<b>36. ASTERACEAE</b>	185	Lepidagathis cristate, willd
126	Acanthospermum hispidum.Dc	186	Peristrophe bicalyculata (Retz) Nees. wall.
127	Ageratum conyzoides.L.	187	Rungia repens L.Nees & walls
128	Ageratum houstonianum.Mill.	188	Justicia guinqueangularis.L.
129	Bidens biternata(Lorr).Merr &Shaft	189	Justicia procumbens. Linn.
130	Bidens pillosa.L.Auct		<b>49. VERAENACEAE</b>
131	Cyathocline purpurea.Kuntz	190	Clerodendrum serratum (L) Moon.cat
132	Elephantopus scaber.L.	191	Lentana camara. L.var.aculeata(L)M.
133	Emilia sochifolia L.Dc.	192	Tectona grandis L.F.
134	Gnaphalium Indicum.L.Auct.	193	Vitex nequendo.L.
135	Gnaphalium Sp.		<b>50. LAMIACEAE</b>
136	Lagascea mollis.Cav.	194	Anisochilus carnosus (L.F.) Wall
137	Launcea procumbens(Roxb)Ramayya	195	Colebrookea oppositifolia J.E. Smith.
138	Sphaeranthus indicus.L.	196	Hyptis suaveolens. L-
139	Tridax procumbens.L.	197	Leonotis nepetifolia L.R. Br.
140	Vernonia arborea.Buch.Ham.	198	Leucas aspera. L.
141	Vernonia cineria.L.Less	199	Orthosiphon rubicundus (D.Don) Benth
142	Vernonia divergens(Roxb)Edgew	200	Plectranthus mollis (Ait) spreng
143	Vicoa indica.L.Dc.		<b>51. NYCTAGINACEAE</b>
144	Xanthium indicum.Koeing	201	Boerhavia diffusa. L.
	<b>37. COMPANULACEAE</b>		<b>52. AMARANTHACEAE</b>
145	Companula wallichii.Babu	202	Achyranthes aspera. L.
146	Wahlenbergia marginata(Thumb)	203	Achyranthes bidentata. Blume
	<b>38. PLUMBAGINACEAE</b>	204	Alternanthera sesilis.(L)R.Br.ex.DC
147	Plumbago zeylanica.L.	205	Amaranthus aspera.L.

206	Amaranthus spinosus. L	262	Cyperus cyperinus (Retz) Valik.
207	Amaranthus tricolor. L.	263	Cyperus castaneus.Willd.
208	Celosia argentea. L.	264	Cyperus flavidus Retz.
209	Comphrena celosioides	265	Cyperus flabelliformis.L.
210	Digera alternifolia L.Aschers.	266	Cyperus globosus. All
	<b>53. POLYGONACEAE</b>	267	Cyperus haspan. L.
211	Polygonum pedunculare. Wall exuet.Fc.	268	Cyperus iris L.
	<b>54. LAURACEAE</b>	269	Cyperus pumilus.L.
212	Litsea glutinosa (Lour)C.B.Ro	270	Fimbristylis dichotoma (L) Vahl. Enum.
	<b>55. LORANTHACEAE</b>	271	Lipocarpa chinensis (Osbeck) Kern
213	Loranthus longiflorus Desr & Lamk.	272	Rhynchospora longisetis.vahl
214	Viscum nenalense spreng.	273	Rhynchoapora submerinata. Kuntz.
	<b>56. EUPHORBIACEAE</b>	274	Scirpus erectuspoirEl
215	Antidesma acidum. Retz	275	Scirpus squarrosus L.Mant.
216	Bridelia retusa.L. spreng.	276	Scirpus sp.
217	Claistanthus collinus (Benth)		<b>68 POACEAE</b>
218	Emblca Officialis Gaertn.	277	Alloteropsis cimicina (L) stap P.F1.
219	Euphorbia geniculata Orteg	278	Apluda mutica. L.
220	Euphorbia hirta	279	Aristida hystrix.L.
221	Euphorbia L.	280	Arthroxon ciliaris.P.Beauv.
222	Euphorbia paniculata. L.	281	Arundinella pumila (Hochst. ex. A.Rich)
223	Euphorbia prostrata nit.	282	Bothriochloa pertusa (L) A. Camus
224	Euphorbia sp.	283	Chloris virgata sw.F1.Ind.
225	Mallotus philippensis (Lam) Nuell.	284	Crysopogon aciculatus.L.
226	Phyllanthus simplei. Retz.	285	Cymbopogon martinii Ro>h.Wats.
227	Phyllanthus sp.	286	Cynodon dactylon (L) Pers. Syn.
228	Sesbastiania chamaeleo (L) Muell.	287	Dactyloctenium annulatum L.. (P) Beauv.
	<b>57 ULMACEAE</b>	288	Dendrocalamus st.rictus Roxb.
229	Holoptelea integrifolia (Roxb)	289	Dicanthium annulatum (For .k) stapf.
	<b>58 MORACEAE</b>	290	Digitaria adscendens (HBK) Hennis
230	Ficus benghalensis L. Hooker	291	Echinochloa colonum (L) Link Hort.
231	Ficus hispida.L.F.	292	Eleusine indica (L) Gaertn.
232	Ficus gibbosa king.	293	Elytrophorus articulatus.P.Beauv.
233	Ficus glomerata. Roxb.	294	Eragrostiella Olfaria (Vahl)Bor.
234	Ficus relidiosa L. Hooker.	295	Eragrostis coarctata - stap4.
235	Ficus semicordata.Buch.Ham.ex.J.E.smith.	296	Eragrostis diarrhena (Schult) steed.
236	Ficus sp.	297	Eragrostis gangetica. (Romb) steud.
	MONOCOTYLEDONES	298	Eragrostis tenui-folia(A.Rich)Hochst.ex.steud
	<b>59 ORCHIDACEAE</b>	299	Eragrostis tremula. L. Beay.
237	Vanda testacea (Lind)	300	Eragrostis unioidis Retz.
238	Vander roxburghii R.Dr.	301	Eragrostis sp.
	<b>60 ZINGIBERACEAE</b>	302	Heteropogon contortus P.Beauv.ex Roem.
239	Zingiber capitatum Roxb.	303	Hackelochloa granularis L..O.Ktze.
	<b>61 DIOSCORACEAE</b>	304	Melanocenchris monoica (Rottler)C.Fischer.
240	Dioscorea bulbifera. L.	305	Panicum antidotale.Retz.
241	Dioscorea oppositifolia. L.	306	Panicum brevifolium L.
242	Dioscorea puber. Bl.	307	Paspalielium flavidum.Retz.Acamus
243	Dioscorea Wightii. Hooker. F.	308	Pannisetum pedicellatum.Trin in Mem
244	Dioscorea sp.	309	Setaria sp.
	<b>62 LILIACEAE</b>	310	Setaria hesecarpa P.Beauv.
245	Asparagus racemosus Willd.	311	Setaria pellida Fus.
246	Aloe barbadensis Mill.	312	porobulus indicus L.R.Veauv.
247	Gloriosa superba L.	313	Thpmeda Guadrivalvis. L.O.
248	Iphigenia indica L.A.Gray.	314	Thysanolaena maxima.Ret?.
249	Chlorophytum arundinaceum Baker.		
	<b>63 SMILACACEAE</b>		
250	Smilax zeylanica L		
	<b>64 COMMELINACEAE</b>		
251	Commelina sp.		
252	Commelina sp.		
253	Commelina benghalensis. L.		
254	Commelina paludosa Bl. Enum.		
255	Commelina undulata R.Br.		
256	Cyanotic axillaris.D.Don.		
257	Cyanotis cristata L.		
258	Murdania semiteres Datz.		
	<b>65 ARECACEAE</b>		
259	Phoenix acaulis, Roxb.Ex Buch-Ham.		
	<b>66 ERIOCAULACEAE</b>		
260	Eriocaulon cinereum R.Br.Prodr.		
261	Eriocaulon quinquangulare.L.sp.		
	<b>67 CYPERACEAE</b>		

Table 2 : DISTRIBUTION OF SPECIES WITH THEIR HABIT

PLANTS	NO. OF PLANTS
Algae	8
Fungi	7
Bryophyta	9
Pteridophyte	2
Semiparasites	2
Herbs	152
Shrubs	13
Under Shrubs	8
Climbers	26
Grasses	38
Trees	62
Medium Trees	5
Small Trees	6
Epiphytes	2
<b>Total</b>	<b>340</b>

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