

Changes in Vegetation of Permanent Wetland; Goblej Wetland

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ABSTRACT

Wetlands are most productive ecosystem. They provide habitat for flora and fauna. Wetlands play important role in hydrological cycle, nutrition cycle, Carbon sequestration, water quality and groundwater recharge. Vegetation plays very significant role in maintenance of ecosystem. Present study reports seasonal changes in permanent wetland. This will be helpful for restoration of such wetland.

Keywords : Vegetation, Wetland, Hydrological Cycle, Nutrition Cycle, Carbon Sequestration, Water Quality, Groundwater Recharge, Hydrology, Geography, Atmosphere

I. INTRODUCTION

Wetlands with a share of 0.0001% among the worldwide water incorporate bogs, swamps, marshes and similar zones and are a critical and fundamental part of the environment. A wide assortment of wetlands exists over the mainland as a result of provincial and nearby contrasts in hydrology, vegetation, water, science, soils, geography, atmosphere and different variables. At the world's surface, crisp water shapes the habitat of a substantial number of animal categories. These oceanic living beings and the environment they live in, speak to a significant part of the world's organic assorted variety. There is, by all accounts, no widespread understanding about characterizing wetlands as likewise to which degree a land can be viewed as a wetland. A general definition is that wetlands are the regions on the landscape where land and water meet, which for the most part lie in dejection or along waterways, lakes and beach front waters where they are exposed to intermittent flooding.

One of the principal broadly utilized wetland classification frameworks concocted by Cowardin et al., 1979 sorted the wetlands primarily into marine (beach front wetlands), estuarine (counting deltas, tidal bogs, and mangrove swamps), lacustrine (lakes), riverine (along waterways and streams), and palustrine ('marshy'– bogs, bogs and lowlands). The categorization depended on the hydrological, natural and geographical attributes of wetland. Ramsar Convention on Wetlands, which is a global treaty signed in 1971 for national activity and universal participation for the protection and shrewd utilization of wetlands and their assets, characterizes wetlands (Article 1.1) as "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres". There are by and large 1052 destinations in Europe; 289 locales in Asia; 359 destinations in Africa; 175 locales in South America; 211 sites in North America; and 79 destinations in Oceania area which have been recognized as Ramsar sites or wetlands of

International significance (Ramsar Secretariat, 2013). The wetlands are characterized as 'lands transitional among earthbound and oceanic eco-frameworks where the water table is more often than not at or close to the surface or the land is secured by shallow water (Wetlands are lands transitional among earthbound and sea-going systems where the water table is generally at or close to the surface or the land is secured by shallow water (Cowardin et al., 1979). They are dominated by water and have novel flora and fauna t variety, which usually experience times scheduled characteristic changes from hydric to mesic sorts. Wetlands are subsequently assessed in various ways with spatial and temporal relations. Detailed status of wetlands of the world though (Cowardin et al., 1979) gave a reasonable thought on the characterization of the wetlands and deep-water habitats.

According to the Ramsar Convention definition, the vast majority of the regular water bodies, (e.g., streams, lakes, seaside tidal ponds, mangroves, peat land, coral reefs) and man-made wetlands, (for example, lakes, ranch lakes, flooded fields, holy forests, salt skillet, stores, rock pits, sewage homesteads and waterways) in India establish the wetland environment. Out of all, just 26 wetlands have been assigned as the Ramsar Sites (Ramsar, 2013). Numerous other noteworthy wetlands performing significant service, are as yet being overlooked in general approach process. This prompts biological system risk against numerous freshwater wetlands. Numerous wetlands are as of now degraded and lost because of urbanization, populace development, and increased economic activities.

Threats to wetland ecosystem:

Mitigation activity should be evolved for sustainable development of wetlands such as building gabion structure to control flow of solid waste, construction of banks to decrease loss of soil, removal of weeds,

checking flow of sewage etc. The various local, state, private programs are needed to support the national policies of wetland so as to conserve and maintain use of natural resources. The modern technologies such as GIS are essentially required for conservation of wetlands of the whole country. (Acharya and adak, 2009).

Wetlands of Kerala and found out that wetlands of Kerala are under extreme pressures for agriculture, aquaculturing due to increasing population. Studies have concluded that undesirable changes are taking place in geological, physical, chemical and biological environments of wetlands of Kerala. Causes of threats to wetlands are man-made (wetlands mining, dams construction, use of pesticides & weedicides, discharge of sewage) as well as natural (eutrophication, storm damage, erosion and other biotic interferences except anthropogenic, KokkalK. *etal.* 2008)

Analytical studies on threats to wetland ecosystems and their solutions in the framework of the Ramsar convention. The study concluded that major threat to human welfare is wetland loss and degradation reduces ability of wetland to provide services. In industrialized area, due to losses that have already occurred; the public awareness is increasing and policies are being introduced. They illustrated that the areas which have low population density, the losses are not high but the risk of future loss remains high as there is high tendency of exploitation of natural resources for needs and since it moves towards economic development. The study also provided some solutions to contribute to the conservation at the present level such as- establishing programs for monitoring change in ecological characters, publishing information from inventions. (Daryadel and Talaei 2014)

Study on threats to wetland with special reference to detergent pollution – methods of conservation. The wetlands are polluted by many substances. Among all, usually the detergents mainly Linear Alkyl Benzene Sulphonate changes the physio-chemical properties of water which in turn, affect the organisms living in it. The review shows that detergent pollution is major threat to fishery of the country because changes in physiochemical factors of water lead to change in physiology of fishes. Introduction of detergents results in increasing pH, alkalinity and decreases free CO₂ and oxygen content. As oxygen decreases, the consumption efficiency of fishes decreases; hence, the metabolic processes are affected and productivity decreases. Since, fishes are the key unit and important component of wetland; the use of fertilizers, pesticides especially detergents should be avoided or reduced in the areas which are closure to the wetlands. (Anand Bibin G. *etal.*, 2010)

Vegetation gives indication of wetland status. There is urgent need to document vegetation of such prestigious ecosystem.

II. METHODS AND MATERIAL

The field survey was an important part of the study. To collect the data for floristic diversity visits were conducted from 2017 to August 2019. Preliminary survey was undertaken throughout the wetland to identify the area in rich in diversity. These identified areas were paid more attention by conducting frequent field trips. The duration of each study tour ranged between 5-10 days. During monsoon regular field visits were made to collect the ephemerals plants as well as the effort was made to collect the plants in different seasons.

The plant species were listed and plant specimens were also collected for herbaria preparation. This was

useful for identifying plants specimens from the flora. During field work, photographs were taken. The collected plant specimens were carefully pressed.

Herbarium: Collected specimen was tied in to plastic bags with little bit formaldehyde. Treated specimens were pressed in newspaper. Papers were changed for drying specimen. After drying specimen they have been treated with 4 percent ethanol and mercuric chloride. Specimens were mounted on herbarium sheet and labelling is done. Herbarium sheet has been submitted to Gujarat university herbarium.

III. RESULTS AND DISCUSSION

1. Analysis of Vegetation

Study reveals 139 species belongs to 104 genera, 3 varieties. Out of 139 106 species falls under dicotyledonous and 31 Species falls under monocotyledon. Study also report two pteridophyte species.

Table 1: Details of Floral Species Found at Goblej

Sr. No	Family	No of Genus	No of species	var.
1	Acanthaceae	4	7	
2	Amaranthaceae	3	4	
3	Asclepiadaceae	3	4	
4	Asteraceae	6	8	
5	Caesalpiaceae	6	6	
6	Capparaceae	3	4	
7	Chenopodiaceae	1	1	
8	Convolvulaceae	5	6	1
9	Cucurbitaceae	4	3	1
10	Cyperaceae	3	6	
11	Elatinaceae	1	2	
12	Euphorbiaceae	4	5	
13	Fabaceae	9	16	1
14	Gentianaceae	1	2	

15	Hydrocharitaceae	2	3	
16	Lamiaceae	2	2	
17	Lemnaceae	1	1	
18	Lentibulariaceae	1	1	
19	Lythraceae	1	2	
19	Malvaceae	2	5	
20	Marsileaceae	1	1	
21	Meliaceae	1	1	
22	Menispermaceae	2	2	
23	Mimosaceae	1	2	
24	Molluginaceae	1	1	
25	Moraceae	1	3	
26	Najadaceae	1	1	
27	Nymphaceae	1	1	
28	Onagraceae	1	1	
29	Poaceae	13	18	
30	Pontederiaceae	1	1	
31	Potamogetonaceae	1	2	
32	Rhamnaceae	1	2	
33	Rubiaceae	1	1	
34	Rutaceae	1	1	
35	Salvadoraceae	1	3	
36	Sapotaceae	1		1
37	Scrophulariaceae	1	1	
38	Solanaceae	2	3	
39	Sterculiaceae	1	1	
40	Tiliaceae	1	3	
41	Typhaceae	1	1	
42	Ulmaceae	1	1	
43	Verbenaceae	1	2	
44	Vitaceae	1	1	
45	Zygophyllaceae	3	3	
		104	145	4

1.1 Habitat:

Study represents about 14 tree species, 25 shrub species, 85 herb species, 15 climbers, 10 aquatic herbs.

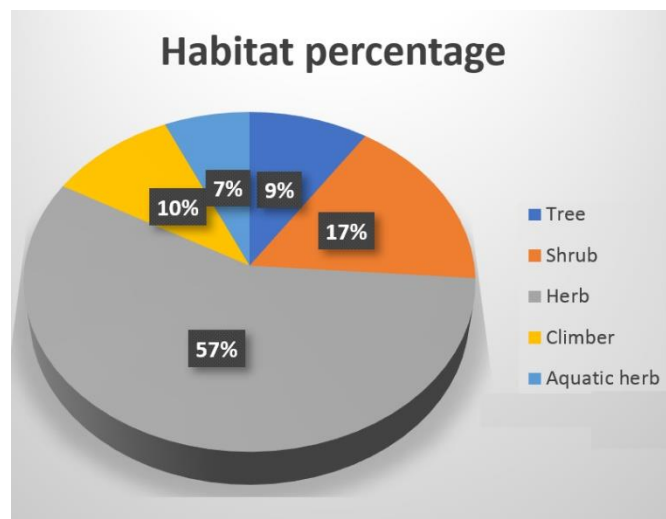


Figure 1. Habitat Composition in Goblej in Percentage

2. Wetland vegetation

Wetland vegetation is divided in to following three categories i.e Upland wetland species, Facultative wetland species, and obligatory wetland species.

Upland wetland species: Achyranthesaspera L., Alternantherasessilis (L.) R. Br. ex DC. Aristida hystrix L.f., Chenopodiumalbum L., Indigofera linifolia (L.f.) Retz., Merremiagangetica (L.) Cufod., Abutilonindicum (L.) Sw., Flueggea leucopyrus Willd., Maeruaoblongifolia (Forsk.) A.Rich., Peristrophepaniculata (Forssk.) Brummitt, Senna occidentalis (L.) Link, Ziziphus nummularia (Burm.f.) Wight & Arn., Balanites aegyptiaca (L.) Delile , Holopteleaintegrifolia (Roxb.) Planch., Pithecellobiumdulce (Roxb.) Benth., Vachellialeucophloea (Roxb.) Rashmi Sharma, Vachellia nilotica (L.) P.J.H. Hurter & Mabb., Tamarindusindica L. Vachellialeucophloea (Roxb.) Maslin, Seigler&Ebinge, Ficus virens Aiton,

Facultative wetland species: Ipomoea carnea Jacq. var. fistulosa (Michaux ex Choix) Austin etc., Typha domingensis Pers. Etc.

Obligatory wetland species:Hydrilla verticillata (L.f.) Royle.,Najas marina L.,Nymphaea pubescens Willd., PotamogetonnodosusPoir.,Potamogetonpectinatus L.,UtriculariainflexastellarisL.f., Vallisnerianatans (Lour.) Hara.,Eichhorniacrassipes (Mart.) Solms.,

3. Vegetation strata in wetland: vegetation is divided in three layers i.e Upper layer, Middle layer, Ground layer.

Upper layer:*Holopteleaintegrifolia* (Roxb.) Planch., *Balanites aegyptiaca* (L.) Delile ,*Prosopisjuliflora* (Sw.) DC., *Tamarindusindica* L., *Vachellialeucophloea* (Roxb.) Rashmi Sharma., *Vachellia nilotica* (L.) P.J.H. Hurter &Mabb., *Vachellialeucophloea* (Roxb.) Maslin, Seigler&Ebinge. Etc.

Middle layer: *Capparisdecidua* (Forssk.) Edg., *Cocculushirsutus* (L.) Diels., *Cyrtiatrifolia*(L.) Domin.,*Cadaba fruticosa* (L.) Druce.,*Flueggea leucopyrus* Willd.,

Kirganelia reticulata (Poir.) Baill., *Pergulariadaemia* (Forsk)., *Ipomoea carnea* Jacq. var. *fistulosa* (Michaux ex Choix) Austin etc.

Ground layer:*Achyranthesaspera*L., *Aeschynomeneindica* L., *Alternantherasessilis* (L.) R. Br. ex DC., *Alternanthera polygonoides* (L.) R.Br. ex Sweet, *Alysicarpusbupleurifolius* (L.) DC., *Alysicarpusheyneanus* Wt. &Arn., ., *Blepharis maderaspatensis* (L.) B.Heyne ex Roth, *Blumeamollis* (D. Don) Merr., *Blumea lacera* (Burm.f.) DC., *Convolvulus microphyllus* Sieber ex Spreng., *Desmodium triflorum* (L.) DC. Etc.

4. Seasonal changes in wetland:

Monsoon impacts on vegetation of wetland. In monsoon vegetation Some species appears as water level goes down *glinusspp. polygonum plebium, hygrophylla*

Sr. no	Botanical name	Family	Monsoon	Winter	Summer
1	<i>Abutilon indicum</i> (L.) Sw.	Malvaceae	✓	✓	
2	<i>Achyranthesaspera</i> L.	Amaranthaceae	✓	✓	
3	<i>Aeschynomeneindica</i> L.	Fabaceae	✓		
4	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	Amaranthaceae	✓	✓	
5	<i>Alternanthera polygonoides</i> (L.) R.Br. ex Sweet	Amaranthaceae	✓	✓	
6	<i>Alysicarpusbupleurifolius</i> (L.) DC.	Fabaceae	✓		
7	<i>Alysicarpusheyneanus</i> Wt. &Arn.	Fabaceae	✓		
8	<i>Alysicarpusvaginalis</i> (L.) DC.	Fabaceae	✓		
9	<i>Ammanniabaccifera</i> L.	Lythraceae	✓	✓	
10	<i>Ammannia multiflora</i> Roxb.	Lythraceae	✓	✓	
11	<i>Aristida spp</i>	Poaceae	✓		
12	<i>Aristida hystrix</i> L.f.	Poaceae	✓		
13	<i>Azadirachtaindica</i> Juss.	Meliaceae	✓	✓	✓
14	<i>Azollaspp</i>	Salviniaceae	✓	✓	✓

15	Balanites aegyptiaca (L.) Delile	Zygophyllaceae	✓	✓	✓
16	BergiaammanoidesHeyne ex Roth	ELATINACEAE	✓		
17	Bergiaodorata Edgew	ELATINACEAE	✓		
18	Blepharismaderaspatensis (L.) B.Heyne ex Roth	Acanthaceae	✓		
19	Blumeaeriantha DC.	Asteraceae		✓	✓
20	Blumeamollis (D. Don) Merr.	Asteraceae		✓	✓
21	Blumea lacera (Burm.f.) DC.	Asteraceae		✓	✓
22	Cadaba fruticosa (L.) Druce	Capparaceae	✓	✓	✓
23	Calotropis <u>procera</u> (Ait.) R. Br.	Asclepiadaceae	✓	✓	✓
24	Calotropis <u>gigantea</u> (L.) Dryand.	Asclepiadaceae	✓	✓	✓
25	Canavalia <u>gladiata</u> (Jacq.) DC.	Fabaceae	✓		
26	Capparis <u>decidua</u> (Forssk.) Edg.	Capparaceae	✓	✓	✓
27	Cassia tora L.	Caesalpiniaceae	✓		
28	Charaspp	Characeae	✓	✓	✓
29	Chenopodium <u>album</u> L.	Chenopodiaceae	✓		
30	Chloris <u>barbata</u> Sw.	Poaceae	✓		
31	Cocciniagrandis (L.) Voigt.	Cucurbitaceae	✓		
32	Cocculushirsutus (L.) Diels	Menispermaceae	✓	✓	
33	Convolvulus microphyllus Sieber ex Spreng.	Convolvulaceae	✓		
34	Corchorus <u>aestuans</u> L.	Tiliaceae	✓		
35	Corchorus <u>fascicularis</u> Lamk.	Tiliaceae	✓		
36	Corchorus <u>olitorins</u> L.	Tiliaceae	✓		
37	Cressa <u>retica</u> L.	Convolvulaceae		✓	
38	Cyanthillium cinereum (L.) H.Rob.	Asteraceae	✓	✓	
39	Cynodondactylon (L.) Pers.	Poaceae	✓		
40	Cyperus <u>difformis</u> L.	Cyperaceae	✓		
41	Cyperus <u>rotundus</u> L.	Cyperaceae	✓	✓	
42	Cyratiatrifolia (L.) Domin	Vitaceae	✓		
43	Dactyloctenium <u>aegypticum</u> (L.) Willd.	Poaceae	✓		
44	Dentellarepens (L.) J.R. Frost & G. Frost.	Rubiaceae	✓		

45	Desmodium triflorum (L.) DC.	Fabaceae	✓		
46	Desmostachya <u>bipinnata</u> (L.) Stapf in Dyer	Poaceae	✓	✓	
47	Dichanthium <u>mannulatum</u> (Forssk.) Stapf	Poaceae	✓	✓	
48	Echinochloa <u>colona</u> (L.) Link	Poaceae	✓		
49	Eclipta <u>prostrata</u> (L.) L.	Asteraceae	✓		
50	Eichhornia <u>crassipes</u> (Mart.) Solms.	Pontederiaceae	✓	✓	✓
51	Enichostema <u>hyssopifolium</u> (Willd.) Verdoon.	Gentianaceae	✓	✓	
52	Enicostemma <u>axillare</u> (Lam.) Raynal	Gentianaceae	✓	✓	
53	Eragrostis <u>stenella</u> (L.) P. Beauv. ex Roem. &Schult.	Poaceae	✓		
54	Eragrostis <u>amabilis</u> (L.) Wight & Arn.	Poaceae	✓		
55	Eragrostis <u>ciliaris</u> (L.) R.Br.	Poaceae	✓		
56	Euphorbia <u>thymifolia</u> L.	Euphorbiaceae	✓		
57	Evolvulus <u>nummularis</u> (L.) L.	Convolvulaceae	✓	✓	
58	Ficus <u>benghalensis</u> L.	Moraceae	✓	✓	✓
59	Ficus <u>virens</u> Dryand	Moraceae	✓	✓	✓
60	Flueggea <u>leucopyrus</u> Willd.	Euphorbiaceae	✓	✓	✓
61	Glinus <u>lotoides</u> L.	Molluginaceae		✓	
62	Holoptelea <u>integrifolia</u> (Roxb.) Planch.	Ulmaceae	✓	✓	✓
63	Hydrilla <u>verticillata</u> (L.f.) Royle	Hydrocharitaceae	✓	✓	✓
64	Hygrophila <u>auriculata</u> (Schum.) Heine	Acanthaceae	✓		
65	Hygrophila <u>serpyllum</u> T. Anderson	Acanthaceae		✓	
66	Indigofera <u>cordifolia</u>	Fabaceae	✓		
67	Indigofera <u>linifolia</u> Retz.	Fabaceae	✓		
68	Indigofera <u>linnaei</u> Ali.	Fabaceae	✓		
69	Indigofera <u>trita</u> L.f. subsp. <u>trita</u> var. Maffei (Chiov.) Ali	Fabaceae	✓		

70	<i>Ipomoea aquatica</i> Forsk.	Convolvulaceae	✓	✓	✓
71	<i>Ipomoea carnea</i> Jacq. var. <i>fistulosa</i> (Michaux ex Choisy) Austin	Convolvulaceae	✓	✓	✓
72	<i>Ipomoea marginata</i> (Desr.) Verdc.	Convolvulaceae	✓		
73	<i>Ischaemum indicum</i> (Houtt.) Merr.	Poaceae	✓		
74	<i>Kirganelia reticulata</i> (Poir.) Baill.	Euphorbiaceae	✓	✓	✓
75	<i>Lemnagibba</i> L.	Lemnaceae		✓	
76	<i>Limonia acidissima</i> Groff	Rutaceae	✓	✓	✓
77	<i>linderniaspp</i>	Scrophulariaceae	✓		
78	<i>Ludwigiaperennis</i> L.	Onagraceae	✓	✓	✓
79	<i>Luffa acutangula</i> (L.) Roxb. var. <i>amara</i> (Roxb.) Clarke	Cucurbitaceae	✓		
80	<i>Madhuca longifolia</i> var. <i>latifolia</i> (Rox b.) A.Chev.	Sapotaceae	✓	✓	✓
81	<i>Maerua oblongifolia</i> (Forsk.) A.Rich.	Capparaceae	✓	✓	✓
82	<i>Marsilea</i> spp	Marsileaceae		✓	
83	<i>Melochiacorchorifolia</i> L.	Sterculiaceae	✓		
84	<i>Merremiagangetica</i> (L.) Cufod.	Convolvulaceae		✓	
85	<i>Momordica balsamina</i> L.	Cucurbitaceae	✓		
86	<i>Najas marina</i> L.	Najadaceae	✓	✓	✓
87	<i>Nymphaea pubescens</i> Willd.	Nymphaeaceae	✓	✓	✓
88	<i>Ocimumcanum</i> Sims.	Lamiaceae	✓		
89	<i>Panicum</i> spp	Poaceae	✓		
90	<i>Parthenium hysterophorus</i> L.	Asteraceae	✓		
91	<i>Paspalidiumflavidum</i> (Retz.) A. Camus	Poaceae	✓		
92	<i>Pentatropiscapensis</i> (L.f.) Bullock	Asclepiadaceae	✓	✓	
93	<i>Pergulariadaemia</i> (Forsk).	Asclepiadaceae	✓	✓	✓
94	<i>Peristrophepaniculata</i> (Forssk.) Brummitt	Acanthaceae	✓	✓	
95	<i>Phyla nodiflora</i> (L.) Greene	Verbenaceae	✓	✓	✓
96	<i>Phyllanthus erecta</i> (Medic.) Almeida	Euphorbiaceae	✓		

97	Phyllanthus <u>maderaspatensis</u> L.	Euphorbiaceae	✓	✓	
98	Physalis angulata L.	Solanaceae	✓		
99	Physalis <u>minima</u> L.	Solanaceae	✓		
100	Pithecellobium <u>dulce</u> (Roxb.) Benth.	Caesalpiaceae	✓	✓	✓
101	Plectranthuspp	Lamiaceae	✓		
102	PotamogetonnodosusPoir.	Potamogetonace	✓	✓	✓
103	Potamogetonpectinatus L.	Potamogetonace	✓	✓	✓
104	Prosopis <u>juliflora</u> (Sw.) DC.	Caesalpiaceae	✓	✓	✓
105	Rhynchosia <u>minima</u> (L.) DC.	Fabaceae	✓	✓	
106	Rungia <u>pectinata</u> (L.) Nees	Acanthaceae	✓	✓	
107	Salvadora <u>oleoides</u> Decne	Salvadoraceae	✓	✓	✓
108	Salvadora <u>persica</u> L.	Salvadoraceae	✓	✓	✓
109	Schoenoplectus <u>articulatus</u> (L.) Palla	Cyperaceae		✓	
110	Schoenoplectusjuncoides (Roth) Palla	Cyperaceae		✓	
111	Scirpuspp	Cyperaceae		✓	
112	Scirpus <u>tuberosus</u> Desf.	Cyperaceae	✓	✓	
113	Senna occidentalis (L.) Link	Caesalpiaceae	✓	✓	
114	Sesbaniabispinosa (Jacq.) Wight	Fabaceae	✓	✓	
115	Setaria <u>glauca</u> (L.) Beauv.	Poaceae	✓		
116	Setaria intermedia Roem. &Schult.	Poaceae	✓		
117	Sida alba L.	Malvaceae	✓	✓	
118	Sidacordifolia L.	Malvaceae	✓		
119	Sida acuta Burm.f.	Malvaceae	✓		
120	Sida cordata (Burm.f.) Borss. Waalk.	Malvaceae	✓		
121	Solanum diphyllum L.	Solanaceae	✓	✓	
122	Suaeda nudiflora Moq.	Amaranthaceae	✓	✓	✓
123	Tamarindus <u>indica</u> L.	Caesalpiaceae	✓	✓	✓
124	Tephrosia <u>purpurea</u> (L.) Pers.	Fabaceae	✓	✓	
125	Tephrosiaspp	Fabaceae	✓		

126	Tephrosia villosa (L.) Pers.	Fabaceae	✓		
127	Teramnuslabialis (L.f.) Spreng.	Fabaceae	✓	✓	
128	Tinospora cordifolia (Willd.) Miers	Menispermaceae	✓	✓	✓
129	Tribulus terrestris L.		✓	✓	
130	Trichosanthes cucumerina L.	Cucurbitaceae	✓		
131	Tridax procumbens (L.) L.	Asteraceae	✓		
132	Typha angustata Bory & Chaub. (Accepted name is Typha domingensis Pers.)	Typhaceae	✓		
133	Utricularia inflexa Steud.	Lentibulariaceae		✓	
134	Vachellia leucophloea (Roxb.) Rashmi Sharma	Caesalpinaceae	✓	✓	✓
135	Vachellia nilotica (L.) P.J.H. Hurter & Mabb.	Mimosaceae	✓	✓	✓
136	Vallisneria spiralis (L.) Hara	Hydrocharitaceae	✓	✓	✓
137	Xanthium strumarium L.	Asteraceae	✓	✓	
138	Ziziphus mauritiana Lamk.	Rhamnaceae	✓	✓	✓
139	Ziziphus nummularia (Burm.f.) Wight & Arn.	Rhamnaceae	✓	✓	✓

IV. CONCLUSION

Wetland vegetation is useful for selection of plant species for wetland restoration. Wetlands interact with birds, amphibians, insects, reptiles. The work will be helpful to students, teachers, who are interested in wetland research. Study will also be helpful for determining indicators for the wetland ecosystem. Study will also be helpful to understand wetland associates.

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