

Vegetation Analysis of Kanewal Wetland, Gujarat

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ABSTRACT

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Wetland provides various plant species. These plants are use as food, fodder, timber, it is use as medicine, provide shelter for birds, as well as water-birds, migratory birds, local animals and human. Kanewal Wetland is an Irrigation Reservoir. Vegetation of Kanewal is very rich in diversity. Study shows presence of Different species of Angiosperms and pteridophytes. Vegetation analysis were done for year 2018-2019 for every season. Families of species are classified in to monocot and dicot. Many plant species grown there which is very important medicinally as well.

Keywords : Wetland, Vegetation, Species, Food

I. INTRODUCTION

Wetlands are the most productive ecosystem of the earth (Ghermandi et al., 2008). Wetland ecosystem forms an important environment for aquatic, semi-aquatic and moisture loving floral and faunal associations. They act as bio filter, as they intake large amount of organic as well as inorganic nutrients from the eutrophic water bodies nutrients enriched pollutant through various dynamic processes, e.g. Water cycle, nutrient cycle and food chain, therefore, known as “kidney of landscape” or “biological super market” by the experts or the areas where the soil is saturated with water are crucial incubators known for high diversity (Allen-Diaz et al., 2004). Wetland provides various plant species. These plants are use as food, fodder, timber, it is as medicine, provide shelter for birds. It is important to know value of that plants. So that we can understand the value of that plant by

vegetation analysis. Nowadays wetlands destroy by various activities: urbanization, land use change, drainage to agriculture use, and pollution from industrial effluents and agricultural runoff, climate change and viability. Loss in wetland area results in adverse impact on the key functions (ecosystem goods and services) performed by wetlands (Zedler and Kercher, 2005). Kanewal Wetland is an Irrigation Reservoir. This is man-made wetland having freshwater that is retained almost throughout the year as besides rainfall, waters from canal networks like those of Mahi and Narmada are also supplied to it. Its water used for irrigation and drinking purposes. There is Vast sheet of open water fragmented by yellow-brown blanket of live or decomposing submerged vegetation; Lush green, dense and extensive underwater meadows of submerged hydrophytes, three large islands with one having farmlands and one having date-palm trees with

heronry, pink-green carpet of lotus and dense growth of typha angustata, and there are various migratory water birds surrounding area of Kanewal wetland.

II. METHODOLOGY

2.1. Study area: -

Kanewal (22028'00" N and 72032'00" E) is located in Tarapur taluka, Anand district the distance of about 60 km from Anand, 80 km from Ahmedabad. It is situated 30 km north of the tip of Gulf of Khambhat and around 50 km south east of the southern portion of Nalsarovar the only Ramsar site in the state.

2.2. Map of Study area:-



Image: 1: Map of Anand district, Gujarat



Image: 2: Map of Kanewal Lake

For present study Kanewal wetland was visited in 2018-2019 during every seasons. It takes 1 week

during every seasons. Plants were recorded by field survey. Random quadrat laid for analysis of vegetation. Vegetation were divided in to three layers: Upper layer, middle layer and ground layer. Aquatic plants were divided in to four parts: Under water plants, rooted plants with floating leaves, free floating leaves and emergent plants.

III. RESULT AND DISCUSSION

3.1. Vegetation layer of Kanewal wetland

Vegetation can be divided in to three layers, upper tree layer, middle shrub and climber layer, lower herbaceous layer.

- **Upper layer:**

Acacia farnesiana (L.) Willd. *Acacia leucophloea* (roxb.) willd., *Acacia nilotica* (L.) Delile subsp. *adstringens* (Schum. & Thonn.) Roberty, *Aerva lanata* (L.) Juss. *Delonix elata* (L.) Gamble, *Eucalyptus globulus* Labill. *Ficus racemosa* L., *Ficus religiosa* L., *Gliricidia sepium* (Jacq.) Walp. *Holoptelea integrifolia* Planch, *Melia azedarach* L., *Pongamia pinnata* (L.) Pierre, *Prosopis julifera* (Sw.) DC., *Senna siamea* (Lam.) H. S. Irwin & Barneby are the tree species, out these *Eucalyptus globulus*, and *Melia azedarach*, *Senna Siamea* are the cultivated species at Kanewal.

- **Middle layer:**

Anisomeles indica (L.) O. ktze., *Calotropis gigantea* (L) Dryand, *Calotropis procera* (Aiton) Dryand, *Jatropha gossypifolia* L., *Lantana camara* L. var. *aculeata* (L.) Mold, , *Ocimum gratissimum* L, *Opuntia elatior* Mill, *Peristrophe paniculata* (Forssk) Brummitt, *Phyllanthus reticulatus* Poir, *Plumbago auriculata* Lam. , *Salvadora persica* L., *Senna occidentalis* (L.) Link, *Solanum indicum* L, *Solanum nigrum* L, *Solanum diphyllum* L., *Ziziphus rugosa* Lam. Out of these *lantana camara* is invasive species. *Cissus trifoliata* (L.) L., *Ctenolepis garcini* (L.) C. B. Clarke, *Dregea volubilis* (L f) Benth ex Hk f., *Luffa acutangula* (L)

Roxb, *Operculina turpethum* (L.) Silva Manso, *Oxystelma esculentum* (L. f.) Sm., *Pergularia daemia* (Forssk) Chiov, *Rivea hypocrateriformis* Choisy, *Teramnus labialis* (L f) Spreng, *Teramnus mollis* Benth. that are the climber species found in the study area. *Operculina turpethum* and *cissus trifoliata* aggressive species found at Kanewal wetland.

• **Ground layer:**

Alternanthera sessilis (L.) R. Br. ex DC., *Alysicarpus vaginalis* (L.) DC., *Bergia odorata* Edgew., *Boerhavia diffusa* L, *Cynodon dactylon* (L) Pers. *Desmodium triflorum* (L.) DC. *Eleusine indica* (F) Gaerth, *Indigofera tinctoria* L. are the most common species. *Apluda mutica* L., *Aristida hystrix* L. f, *Digitaria ciliaris* (Retz.) Koeler., *Eragrostis uniloides* (Retz.) Nees ex Steud., *Panicum* spp are major grass species at Kanewal Wetland.

3.3. Vegetation of Kanewal Wetland:-

3.2. Aquatic plants in Kanewal wetland

Nelumbo nucifera, *Potamogeton pectinatus*, *Potamogeton perfoliatus*, *Potamogeton nodosus*, *Nymphodes indica*, *Nymphaea pubescence*, *Utricularia stellaris*, *Hydrilla verticillata*, *Najas marina*, *Najas minor*, *Ottelia* spp are major aquatic angiosperms.

- 1) Underwater Plants: *Vallisneria spiralis*, *Hydrilla verticellata*, *Najas* spp., Char asp. (macro-alga), *Nitella* sp. (a macro-alga), *Ottelia alismoides* and etc.;
- 2) Rooted Plants with Floating Leaves: *Nymphoides cristatum*, *M. indicum*, *Nelumbo nucifera*, *Nymbphaea* sp., *Ipomoea aquatic*;
- 3) Free Floating Plants: *Eichhornia crassipes*. *Lemna* spp., *Wolffia globose*, *Azolla pinnata*;
- 4) Emergent Plants: *Typha augustata*, *Polygonum* sp., *Limnophyton obtusifoliuym*, *Sedges*

Table: 1: List of plants from Kanewal wetland

Sr. No	Botanical name	Local name	Family	Habit
1	<i>Acalypha indica</i> L.	Vaichikato, Dadari, Dadarjo, Dadaro	Euphorbiaceae	Herb
2	<i>Launaea procumbens</i> (Roxb.) Ramayya & Rajagopal	Moti Bhonpatri	Asteraceae	Herb
3	<i>Acacia farnesiana</i> (L.) Willd.	Needle brush	Mimosaceae	Tree
4	<i>Acacia leucophloea</i> (Roxb.) Willd.	Dev Baval	Mimosaceae	Tree
5	<i>Acacia nilotica</i> (L.) Delile subsp. <i>adstringens</i> (Schum. & Thonn.) Roberty	Babul	Mimosaceae	Tree
6	<i>Acanthospermum hispidum</i> DC.	Goat's Head Plant	Asteraceae	Herb
7	<i>Achyranthes aspera</i> L. var. <i>aspera</i>	Aghedo, Aapamarg	Amaranthaceae	Herb
8	<i>Achyranthus aspera</i> L.	Anghedi, Anghedo	Amaranthaceae	Herb
9	<i>Aerva lanata</i> (L.) Juss.	Kapuri, Gorkh-ganjo	Amaranthaceae	Tree
10	<i>Alternanthera polygonodius</i> (L) R Br ex Sweet	Jal Jambvo,	Amaranthaceae	Herb
11	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	Pani ni Bhaji	Amaranthaceae	Herb

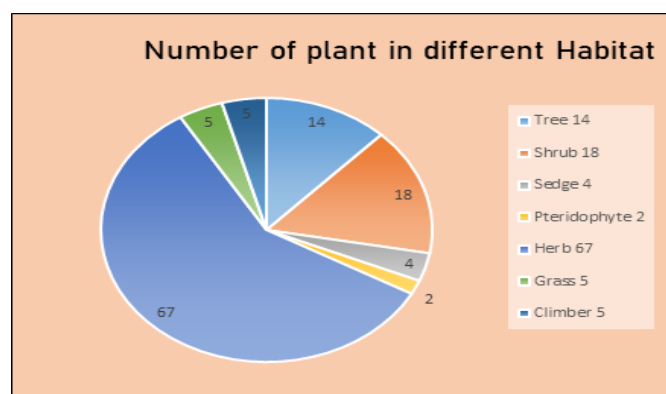
12	<i>Alternanthera sessilis</i> (L.) R.Br. ex DC		Amaranthaceae	Herb
13	<i>Alysicarpus vaginalis</i> (L.) DC.	Gadar Samervo, Bhoy samervo	Fabaceae	Herb
14	<i>Amaranthus spinosus</i> L	Kantemath	Amaranthaceae	Herb
15	<i>Amaranthus spinosus</i> L	Kantado -Dhimdo	Amaranthaceae	Herb
16	<i>Andrographis paniculata</i> (Burm.f.) Nees	Ruchhado -Samervo	Acanthaceae	Herb
17	<i>Anisomeles indica</i> (L.) O. ktze.	Chodharo	Lamiaceae	Shrub
18	<i>Apluda mutica</i> L.	Ponai	Poaceae	Grass
19	<i>Aristida hystricula</i> L. f	Lapdo	Poaceae	Grass
20	<i>Bacopa monnieri</i> (L) Wettst	Bam	Scrophulariaceae	Herb
21	<i>Bergia odorata</i> Edgew.	Lavaru, Ropatri	Elatinaceae	Herb
22	<i>Blepharis boerhaviifolia</i> Pers.	Chopa ni vel	Acanthaceae	Herb
23	<i>Boerhavia diffusa</i> L	Satodi	Nyctaginaceae	Herb
24	<i>Calotropis gigantea</i> (L) Dryand	Aakdo	Asclepiadaceae	Shrub
25	<i>Calotropis procera</i> (Aiton) Dryand	Nano akado	Asclepiadaceae	Shrub
26	<i>Cissus trifoliata</i> (L.) L.	Marine ivy	Vitaceae	Climber
27	<i>Cleome viscosa</i> L.	Pili-tilvan	Capparaceae	Herb
28	<i>Commelina benghalensis</i> L.	Shishmuliu	Commelinaceae	Herb
29	<i>Commelina diffusa</i> Burm f	Kanshura, Creeping Dayflower	Commelinaceae	Herb
30	<i>Corchorus aestuans</i> L	Chunch	Tiliaceae	Herb
31	<i>Corchorus capsularis</i> L	Chunchi	Tiliaceae	Herb
32	<i>Corchorus fascicularis</i> Lam	Ubhi-baufali	Tiliaceae	Herb
33	<i>Corchorus olitorius</i> L	Jute, Chhunchhdo	Tiliaceae	Herb
34	<i>Crotalaria annua</i> Milne-Redh.		Fabaceae	Herb
35	<i>Crotalaria medicaginea</i> Lam	Ranmethi	Fabaceae	Herb
36	<i>Ctenolepis garcini</i> (L.) C. B. Clarke	Garcen's Bur Cucumber	Cucurbitaceae	Climber
37	<i>Cucumis melo</i> L. subsp. <i>agrestis</i> (Naudin) Pangalo var. <i>agrestis</i> Naudin	Muskmelon	Cycurbitaceae	Climber
38	<i>Cynodon dactylon</i> (L) Pers	Darbh	Poaceae	Herb
39	<i>Cyperus bulbosus</i> Vahl		Cyperaceae	Sedge
40	<i>Cyperus compressus</i> L	Poorland -flatsedge	Cyperaceae	Sedge
41	<i>Cyperus difformis</i> L.	Small flower umbrella sedge, Rice sedge	Cyperaceae	Sedge
42	<i>Cyperus rotundus</i> L.	Chido, Moth, Chiyo	Cyperaceae	Sedge

43	<i>Dactyloctenium aegyptium</i> (L) P Beauv	Makra, Crow foot grass	Poaceae	Herb
44	<i>Delonix elata</i> (L.) Gamble	Creamy Peacock Flower, Safed gulmohar	Fabaceae	Tree
45	<i>Desmodium triflorum</i> (L.) DC.	Ran methi	Fabaceae	Herb
46	<i>Digitaria ciliaris</i> (Retz.) Koeler	Bamboo grass	Poaceae	Grass
47	<i>Dregea volubilis</i> (L f) Benth ex Hk f	Dodi, Moti Dodi	Asclepiadaceae	Climber
48	<i>Echinops echinatus</i> Roxb.	Utkanto, Shuliyo	Asteraceae	Herb
49	<i>Eleusine indica</i> (F) Gaerth	Nagli	Poaceae	Herb
50	<i>Eragrostis tenella</i> L	Kalavo	Poaceae	Herb
51	<i>Eragrostis uniloides</i> (Retz) Nees ex Steud.	Chinese Lovegrass	Poaceae	Grass
52	<i>Eucalyptus globules</i> Label.	Nilgiri	Myrtaceae	Tree
53	<i>Euphorbia hirta</i> L	Asthmaweed	Euphorbiaceae	Herb
54	<i>Euphorbia hypericifolia</i> L.	Dhudheli	Euphorbiaceae	Herb
55	<i>Ficus racemosa</i> L.	Umbar, Audumbar	Moraceae	Tree
56	<i>Ficus religiosa</i> L.	Peepal, Pimpal, Ashta, Ashit	Moraceae	Tree
57	<i>Gliricidia sepium</i> (Jacq.) Walp.	Maxican lilac	Fabaceae	Tree
58	<i>Holoptelea integrifolia</i> Planch.	Dudheli	Ulmaceae	Tree
59	<i>Hydrilla verticillata</i> (L. f.) Royle	Hydrilla, Indian star vine	Hydrocharitaceae	Herb
60	<i>Impatiens balsamina</i> L.	Gulmehdi	Balsaminaceae	Herb
61	<i>Indigofera linifolia</i> Retz.	Jinkigali	Fabaceae	Herb
62	<i>Indigofera tinctoria</i> L.	Gali	Fabaceae	Herb
63	<i>Ipomoea aquatica</i> Forssk.	Nali ni bhaji	Convolvulaceae	Climber
65	<i>Ipomoea cairica</i> (L) Sw.	Narvel	Convolvulaceae	Climber
67	<i>Jatropha gossypifolia</i> L.	Bellyache bush	Euphorbiaceae	Shrub
68	<i>Lantana camara</i> L. var. <i>aculeata</i> (L.) Mold.	Gandhari	Verbenaceae	Shrub
69	<i>Lepidagathis trinervis</i> Nees	Harancharo	Acanthaceae	Herb
70	<i>Leucaena leucocephala</i> (Lam.) de Wit	White leadtree	Mimosaceae	Herb
71	<i>Luffa acutangula</i> (L) Roxb	Turiya	Cucurbitaceae	Climber
72	<i>Marselia</i> spp.	Water Clover	Marseliaceae	Pteridophyte
73	<i>Martynia annua</i> L.	Tiger's Claw	Martyniaceae	Herb

74	<i>Melia azedarach</i> L.	Bakani Limbdo, Persian Lilac	Meliaceae	Tree
75	<i>Najas marina</i> L.	Spiny Water Nymph	Najadaceae	Herb
76	<i>Nelumbo nucifera</i> Gaertn.	Indian Lotus	Nelumbaceae	Herb
77	<i>Nymphaea pubescens</i> Willd.	Water Lily	Nymphaeaceae	Herb
78	<i>Nymphoides indica</i> (L.) Kuntze	Water Snowflake	Menyanthaceae	Herb
79	<i>Ocimum gratissimum</i> L.	Mala tulsi	Lamiaceae	Herb
80	<i>Ocimum gratissimum</i> L.	Mala tulsi	Lamiaceae	Shrub
81	<i>Oldenlandia corymbosa</i> L.	Diamond Flower, corymbose hedyotis, flat-top mille grains	Rubiaceae	Herb
82	<i>Operculina turpethum</i> (L.) Silva Manso	Indian Jalap/ Transparent Wood Rose	Convolvulaceae	Climber
83	<i>Opuntia elatior</i> Mill	Prickly Pear	Cactaceae	Shrub
84	<i>Ottelia alismoides</i> (L.) Persoon	Duck lettuce	Hydrocharitaceae	Herb
85	<i>Oxystelma esculentum</i> (L. f.) Sm.	Jaldudhi	Asclepiadaceae	Climber
86	<i>Panicum</i> spp	Panicgrass	Poaceae	Grass
87	<i>Parthenium hysterophorus</i> L.	Congress grass	Asteraceae	Herb
88	<i>Pergularia daemia</i> (Forssk) Chiov	Chamar dudheli	Asclepiadaceae	Climber
89	<i>Peristrophe paniculata</i> (Forssk) Brummitt	Kali aghedi	Acanthaceae	Shrub
90	<i>Phyllanthus erectus</i> (Medik.) M.R.Almeida	Stone-breaker, Seed under leaf	Euphorbiaceae	Herb
91	<i>Phyllanthus reticulatus</i> Poir	Kamboi	Euphorbiaceae	Shrub
92	<i>Physalis</i> sp.	Berry	Solanaceae	Shrub
93	<i>Pluchea tomentosa</i> DC.	Wolly Champhor- Weed	Asteraceae	Herb
94	<i>Plumbago auriculata</i> Lam.	Nila chitrak	Plumbaginaceae	Shrub
95	<i>Pongamia pinnata</i> (L.) Pierre	Karanj, Kanajhi	Fabaceae	Tree
96	<i>Potamogeton nodosus</i> Poir.	Longleaf Pond Weed	Potamogetonaceae	Herb
97	<i>Potamogeton perfoliatus</i> L.	Perfoliate Pond weed	Potamogetonaceae	Herb
98	<i>Prosopis julifera</i> (Sw.) DC.	Gandobaval	Mimosaceae	Tree
99	<i>Pupalia lappacea</i> (L.) Juss. var. lappacea	Nagadamani	Amaranthaceae	Herb
100	<i>Rivea hypocrateriformis</i> Choisy	Common Night Glory	Convolvulaceae	Climber
101	<i>Salvadora persica</i> L.	Piludi	Salvadoraceae	Shrub
102	<i>Senna alata</i> (L.) Roxb.	Candle bush	Caesalpinaceae	Shrub

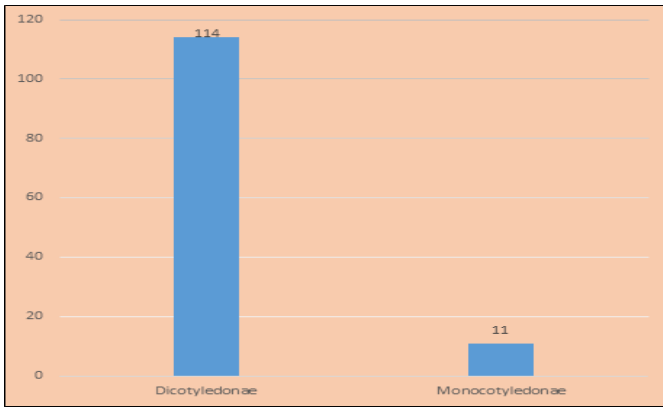
103	<i>Senna siamea</i> (Lam.) H. S. Irwin & Barneby	Kassod	Caesalpinaceae	Tree
104	<i>Senna auriculata</i> (L.) Roxb.	Awala, Tarwar	Caesalpinaceae	Shrub
105	<i>Senna occidentalis</i> (L.) Link	Coffeeweed	Caesalpinaceae	Shrub
106	<i>Senna tora</i> (L.) Roxb.	Stinking cassia	Caesalpinaceae	Herb
107	<i>Sesamum indicum</i> L.	Safedtil	Pedaliaceae	Herb
108	<i>Setaria italica</i> (L) P Beauv	Chano	Poaceae	Herb
109	<i>Sida acuta</i> Burm f	Bala	Malvaceae	Herb
110	<i>Sida orientalis</i> Cav	Bala	Malvaceae	Herb
111	<i>Sida rhombifolia</i> L.	Heart-leaf, Sahadeva	Malvaceae	Herb
112	<i>Sida cordata</i> (Burm.f.) Borss. Waalk.	Bhuyinii, Bhoybala	Malvaceae	Herb
113	<i>Solanum indicum</i> L	Jangli ringni	Solanaceae	Shrub
114	<i>Solanum nigrum</i> L	Piludi	Solanaceae	Shrub
115	<i>Solanum diphyllum</i> L.	Twoleaf nightshade	Solanaceae	Shrub
116	<i>Spermocoe articularis</i> L.F.	False buttenweed	Rubiaceae	Herb
117	<i>Stuckenia pectinata</i> (L.) Börner	Fennel Pondweed	Potamogetonaceae	Herb
118	<i>Teramnus labialis</i> (L f) Spreng	Ran-udid	Fabaceae	Climber
119	<i>Teramnus mollis</i> Benth.	Blue wiss, Horse wine, Rabbit wine	Fabaceae	Climber
120	<i>Trianthema portulacastrum</i> L		Aizoaceae	Herb
121	<i>Tribulus terrestris</i> L	Bethu Gokhru	Zygophyllaceae	Herb
122	<i>Trichodesma indicum</i> (L.) Lehm. var. <i>indicum</i>	Adhapushpi	Boraginaceae	Herb
123	<i>Typha latifolia</i>	Common cattail	Typhaceae	Herb
124	<i>Xanthium strumarium</i> L.	Gokhru	Asteraceae	Herb
125	<i>Ziziphus rugosa</i> Lam	Suran	Rhamnaceae	Shrub

Study reveals about 125 species of angiosperms and one species of Pteridophytes. These 125 species belong to 97 Genera and 46 Family. Study represents 14 tree 18 shrub, 5 climbers 68 herb, 4 sedges, and 5 grass species.



Graph: 1: Number of plants in different Habitat

VI. REFERENCES



Graph: 2: Number of species in Class Dicotyledonous and Class Monocotyledon

IV. CONCLUSION

Vegetation of Kanewal wetland shows the diversity of different plant species. Study reveals about 125 species of angiosperms and one species of Pteridophytes. These 125 species belong to 97 Genera and 46 Family. Study represents 14 trees 18 shrubs, 5 climbers 68 herbs, 4 sedges, and 5 grasses species. Mostly there are vegetation of *Typha* is observed. *Eichhornia crassipes* is very fast growing there. It may cause eutrophication to wetland. Which is harmful for aquatic plant species and other aquatic animals. During the summer water level decreases at that time increasing in algal blooms, which cover the upper layer of the water. Many medicinally important species were found there. It is necessary to protect the land from excessive cutting and grazing of animals.

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