



GROWTH FORMS OF MACROPHYTES IN SALONA TAL AND ITS ADJOINING WETLANDS OF UTTAR PRADESH

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ABSTRACT

Salona Tal with their wetlands has large eutrophic water body spread over 4234 sq. km. During the survey 193 angiosperm species belonging to 118 genera of wetland and aquatic macrophytes with rare species e. g. *Centrostachys aquatica*, *Alternanthera philoxeroides*, *Neptunea oleracea* etc. are reported and classified according to their growth forms and enumerated with their diversity, growth form and phenology. Current status and conservation measure are also reported in this paper.

KEY WORDS

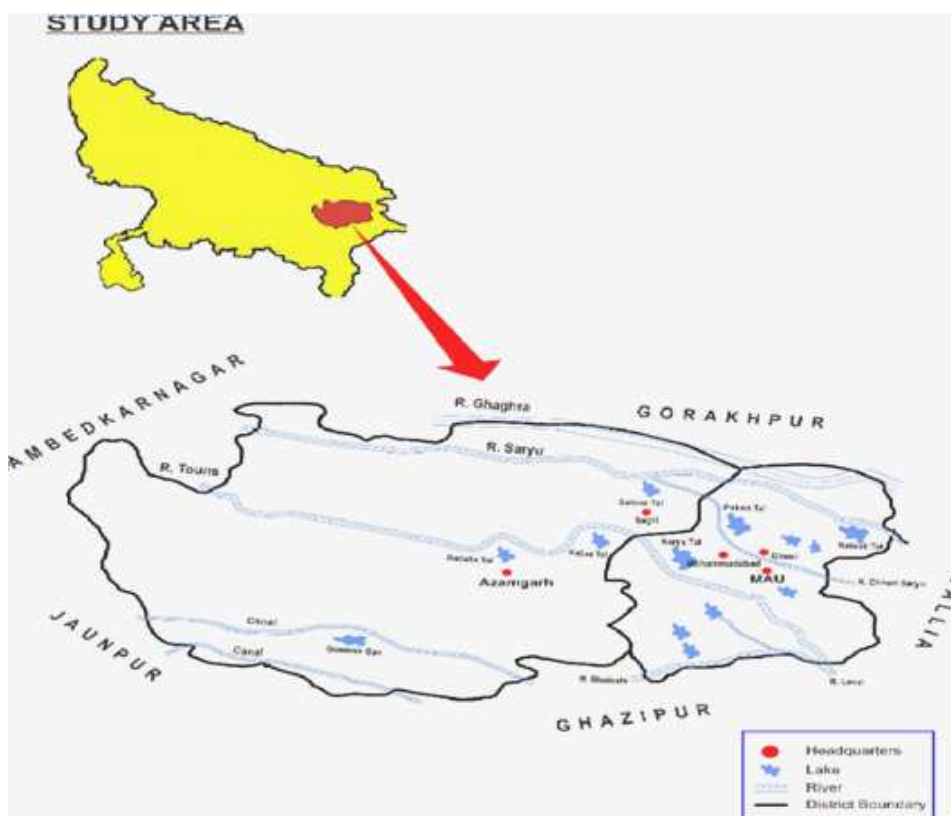
Growth form, Diversity, Salona Tal, Adjoining Wetlands.

INTRODUCTION

Plants Growth form schemes constitute a way of classifying plants alternatively to the ordinary species-genus- family scientific classification. The scientific use of growth form schemes emphasizes plant function in the ecosystem and that the same function or adapted ness to the environment may be achieved in a number of ways. Conversely unrelated species may share a growth form through convergent evolution. Growth form and life form are essentially synonymous concepts, despite attempts to restrict the meaning of growth- form to types differing in shoot architecture. Plants exhibits a very broad range in features, some that can be observed without magnification, some that can only be appreciated with substantial magnification and others that can only be studied using special instrumentation to measure

physiological properties. This site will provide information on plant diversity, especially variation in the vegetative plants as they are related to the natural habitat. Earlier the wetland of India was explored by Biswas & Calder (1937), Subramanyam (1962), Cook (1996) and Fassett (2000). An account of Uttar Pradesh was given by Maliya & Singh (2004). For Wetlands and their conservation, proper study of growth form of wetland macrophytes also reviewed by IUCN (1971), Gopal (1973), Wells (1992), WWF-India (1993) and Williams (1997). The study area has been surveyed and a brief account of wetland vegetation is enumerated with their diversity, habit, growth form, phenology and rarity of species. All the plants are arranged under their respective family according to Bentham & Hooker system of classification.

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MATERIAL AND METHOD

Study Area

Salona Tal and its neighbouring wetlands comprises some what irregular shaped area spread in the district Azamgarh and Mau between the parallels of $25^{\circ} 38'$ and $26^{\circ} 27'$ north latitude and the meridians of $82^{\circ} 40'$ and $83^{\circ} 52'$ east longitude in an area of 4234 sq. km up to the height of 77.65 m from the sea level. The area has many natural water resources including river Ghaghra, Tons (Tamasa) and Saryu while Chhoti Saryu, Baisahi, Maghaei and Leuri are tributaries of river Saryu. In the north west of studies area Salona Tal in Sagri tahsil is the largest Tal is estimated to be over 3660 m long and about 2750 m broad with depth of 6 m. In the northern section

Pakri- Pewa Tal in Ghosi tahsil is 9.6 km long and 3.2 km broad while Narya tal in Mohamdabad tahsil spread in 2023 ha. Ratoli Tal in Ghosi tahsil in 2040 ha., Badaila Tal (Pakri Tal) 250 ha., nearly 2 km from Uchigodam Market, Kajua lake 90 ha., in Mubarkpur, Girital 80 ha., in Kashipur and smaller ponds Koila, Kasila-Kaili, Duhia, Birna, Ara Telhnan and Manchhil. In the Southern region those known as Kotail, Jamuawan, Gumiadih, Kumbh, Pukh, Asauni and largest of all Gambhirban.

Growth Forms

Most life form schemes are concerned with vascular plants only. The most widely applied life form scheme is Raunkiaer system. Cook (1990) summarized aquatic plants and suggested a



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classification based on growth form or the way it survives in adverse condition. The different types of growth forms are-

Pleustophyte (Ple): Free floating at the water surface. *e. g. Eichhornia crassipes, Pistia stratiotes, Lemna perpusilla, Ceratophyllum demersum, Utricularia exolata.*

Rosulate (Ros): Submerged, bottom rooted, leaves in a rosette. *e.g. Ottelia alsimoides, Vallisneria spiralis.*

Vittate (Vit): Submerged plants rooted in the substrate and leaves arranged along elongated stem or cauline. *e. g. Hydrilla verticillata, Najas graminea, Potamogeton crispus.*

Epihydantes (Eph): Bottom rooted with floating leaves. *e. g. Trapa natans, Nelumbo nucifera, Nymphaea nouchali, Nymphoides indicum.*

Haptophyte (Hap): Plant attached to but not penetrating the substrate. *Ipomea aquatica, Bacopa monnieri.*

Hyperhydate (Hyp): Leaves and stem emerging above the water surface. *e. g. Aeschynomene indica, Veronica anagalis-aquatica, Hydrolea zeylanica.*

Tenagophyte (Ten): Plant with juvenile phase submerged in or floating on water and the adult phase terrestrial. *e. g. Typha angustifolia, Eleocharis sp, Cyperus sp.*

Helophytes (Hel): Plants not physiologically bound to water but tolerating longer periods of submergence. *Bergia ammannioides, Melochia chorchorifolia.*

RESULT

In present enumeration a total number of 193 species of 118 genera and 56 families are identified from all wetland areas. Out of these 82 species are Tenagophyte, followed by 43 species Helophyte, 28 species Hyperhydate, 13 species Pleustophyte, 12 species Epihydante, 11 species Vittate, 2 species Haptohydate and 2 species Rosulate. The dominant families are Cyperaceae (28) while other is Poaceae (28), Asteraceae (13) and Polygonaceae (7), Scrophulariaceae (6), Fabaceae (6), Commelinaceae (6), Acanthaceae (5) and Amaranthaceae (5) also have highest species diversity however many of their species are not restricted only to wetland but also to nearly moist soil also.

Table 1.
Analysis of Wetlands Plants

Group	Genus	Species	Family
Monocot	58	96	20
Dicot	60	97	36
Total	118	193	56

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Table 2.

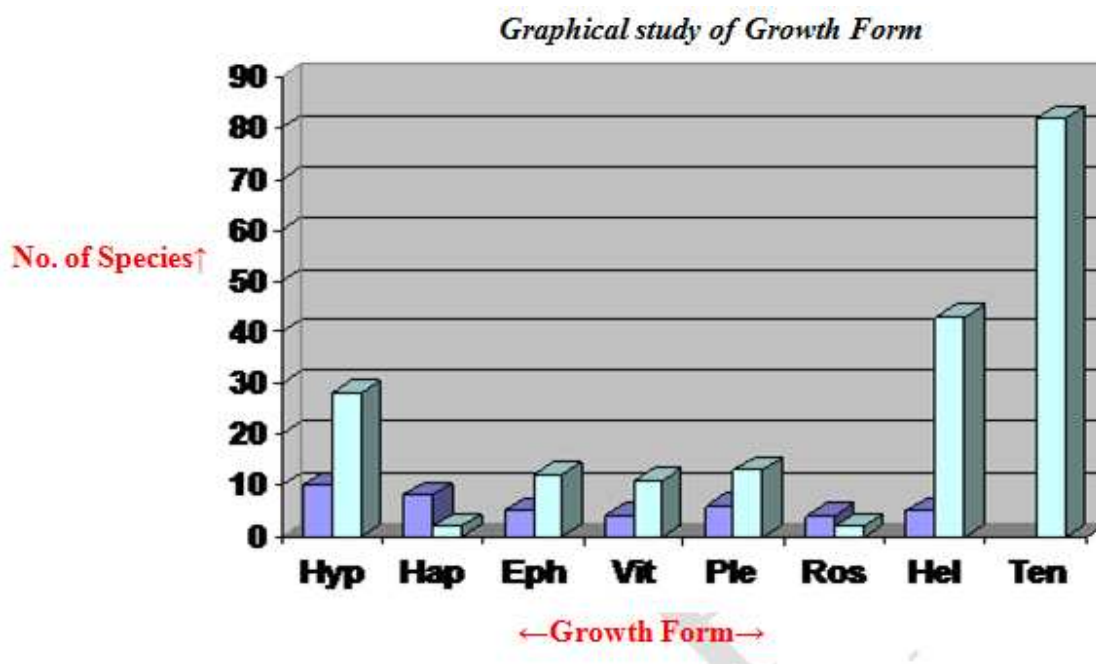


Table 3.
Aquatic Plants

S. No.	Name of Plant	Family	Phenology	Habit
1.	<i>Ranunculus sceleratus</i> L.	Ranunculaceae	Jan.-April	Hyp
2.	<i>Eurale ferox</i> Salisb.	Nymphaeaceae	Feb. - May	Eph
3.	<i>Nymphaea nouchali</i> Burm. f.	Nymphaeaceae	Aug.-Nov.	Eph
4.	<i>N. pubescens</i> Willd.	Nymphaeaceae	Aug.-Nov.	Eph
5.	<i>Nelumbo nucifera</i> Gaertner	Nelumbonaceae	Aug.-Oct.	Eph
6.	<i>Nasturtium officinale</i> R.Br.	Brassicaceae	Dec. - July	Hyp
7.	<i>Arenaria serpyllifolia</i> L.	Caryophyllaceae	Feb. - May	Ten
8.	<i>Polycarpon prostratum</i> (Forssk.) Asch. & Schwein.	Caryophyllaceae	April – Oct.	Hel
9.	<i>Tamarix dioica</i> Roxb. ex Roth.	Tamaricaceae	Aug. – Nov	Hel
10.	<i>Bergia ammannioides</i> Heyne ex Roth.	Elatinaceae	Jul. – Nov.	Hel
11.	<i>Melochia corchorifolia</i> L.	Sterculiaceae	Aug.-Dec.	Hel



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12.	<i>Pentapetes phoenicea</i> L.	Sterculiaceae	Aug. – Nov.	Hel
13.	<i>Corchorus aestuens</i> L.	Tiliaceae	Sept.-Jan.	Hel
14.	<i>C. capsularis</i> L.	Tiliaceae	Sept.- Nov.	Hel
15.	<i>Oxalis corniculata</i> L.	Oxalidaceae	Jan.-Dec.	Hyp
16.	<i>O. debilis</i> var. <i>corymbosa</i> DC.	Oxalidaceae	April-June	Hyp
17.	<i>Aeschynomene aspera</i> L.	Fabaceae	Oct.-Nov.	Hyp
18.	<i>A. indica</i> L.	Fabaceae	Oct.-Nov.	Hyp
19.	<i>Lathyrus sativus</i> L.	Fabaceae	Jan.-March	Hel
20.	<i>Medicago polymorpha</i> L.	Fabaceae	Jan.-Feb.	Hel
21.	<i>Melilotus alba</i> Desr.	Fabaceae	Feb.-April	Hel
22.	<i>Vicia hirsuta</i> (L.) S.F. Gray	Fabaceae	Nov.-March	Hel
23.	<i>Neptunia oleracea</i> Lour.	Mimosaceae	Sept. - April	Ple
24.	<i>Potentilla supina</i> L.	Rosaceae	Jan. - April	Hel
25.	<i>Ammannia baccifera</i> L.	Lythraceae	Nov. - April	Ten
26.	<i>A. multiflora</i> Roxb.	Lythraceae	Nov.-Feb.	Ten
27.	<i>Rotala indica</i> (Willd.) Koehne	Lythraceae	Sep. – Jan.	Hyp
28.	<i>R. rotundifolia</i> (Buch. Ham. Ex Roxb.) Koehne	Lythraceae	Oct. – Feb.	Vit
29.	<i>Ludwigia adscendens</i> (L.) Hara	Onagraceae	Jan.-June	Ple
30.	<i>L. octovalvis</i> (Jacq.) Raven	Onagraceae	Nov.-Jan.	Hyp
31.	<i>L. perennis</i> L.	Onagraceae	Nov.-Jan.	Hyp
32.	<i>Trapa natans</i> L. var. <i>bispinosa</i> (Roxb.) Makino	Trapaceae	Sept.-Oct.	Eph
33.	<i>Glinus lotoides</i> L.	Molluginaceae	March - July	Hel
34.	<i>G. oppositifolius</i> (L.) DC.	Molluginaceae	Jul.- Oct.	Hel
35.	<i>Mollugo pentaphylla</i> L.	Molluginaceae	Sep. – Oct.	Hel
36.	<i>Centella asiatica</i> (L.) Urban	Apiaceae	Nov. – Jan.	Hel
37.	<i>Oenanthe javanica</i> (Blume.) DC.	Apiaceae	March - June	Hyp
38.	<i>Seseli diffusum</i> (Roxb. ex Sm.) Sant. & Wagh.	Apiaceae	March - June	Ten
39.	<i>Dentella repens</i> (L.) J.& G. Forster	Rubiaceae	Throughout year	Hel
40.	<i>Hedyotis corymbosa</i> (L.) Lam.	Rubiaceae	Aug. – Oct.	Hel
41.	<i>H. diffusa</i> willd.	Rubiaceae	Aug. – Dec.	Hel
42.	<i>H. pumila</i> L. f.	Rubiaceae	Aug. – Nov.	Hel
43.	<i>Adenostema lavenia</i> (L.) Kuntze.	Asteraceae	Dec. – Aug.	Hel
44.	<i>Caesulia axillaris</i> Roxb.	Asteraceae	Sep. - May	Hyp
45.	<i>Centipeda minima</i> (L.) Br. & Asch.	Asteraceae	Nov. - March	Hel
46.	<i>Conyza semipinnatifida</i> Wall. Ex DC.	Asteraceae	Sept. – Jan.	Hel



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47.	<i>Cotula hemispherica</i> (Roxb.) Wall ex Cl.	Asteraceae	Dec. - April	Hel
48.	<i>Eclipta prostrata</i> (L.) L.	Asteraceae	March - April	Hel
49.	<i>Enhydra fluctuans</i> Lour.	Asteraceae	Jan. - March	Hel
50.	<i>Gnaphalium polycaulon</i> Pers.	Asteraceae	March - April	Hel
51.	<i>G. pulvinatum</i> Delile	Asteraceae	Nov. - April	Hel
52.	<i>Grangea moderaspata</i> (L.) Poir.	Asteraceae	Dec. - May	Hel
53.	<i>Pluchea lanceolata</i> Cl.	Asteraceae	April - July	Hel
54.	<i>Sphaeranthus indicus</i> L.	Astraceae	Nov. - April	Hel
55.	<i>Spilanthes paniculata</i> Wallich ex DC.	Astraceae	March - April	Hel
56.	<i>Sphenoclea zeylanica</i> Gaertner	Sphenocleaceae	Aug.-Nov.	Hyp
57.	<i>Anagalis arvensis</i> L.	Primulaceae	Dec.-March	Hel
58.	<i>Centaurium centaurioides</i> (Roxb.) Rao & Kammathy	Gentianaceae	Feb. - April	Hel
59.	<i>Canscora diffusa</i> (Vahl.) R.Br.	Gentianaceae	Sept. - March	Ten
60.	<i>Hoppea dichotoma</i> Willd.	Gentianaceae	Sep. - Jan.	Hel
61.	<i>Nymphoides hydrophylla</i> (Lour.) O. Kuntze	Menyanthaceae	Aug.-Oct.	Eph
62.	<i>N. indica</i> (L.) Kuntze	Menyanthaceae	Aug.-Oct.	Eph
63.	<i>Hydrolea zeylanica</i> (L.) Vahl	Hydrophyllaceae	Aug.-Oct.	Hyp
64.	<i>Ipomoea aquatica</i> Forssk	Convolvulaceae	Sept.-Feb.	Hap
65.	<i>I. carnea</i> Jacq.	Convolvulaceae	Aug.-April	Hyp
66.	<i>Bacopa monnieri</i> (L.) Wettst.	Scrophulariaceae	July-Dec.	Hap
67.	<i>Dopatrium junceum</i> (Roxb.) Buch. - Ham. ex Benth.	Scrophulariaceae	Sep. - Nov.	Ten
68.	<i>Limnophila indica</i> (L.) Druce	Scrophulariaceae	Aug.-March	Vit
69.	<i>Lindernia ciliata</i> (Colms.) Pennel	Scrophulariaceae	Aug.-March	Ten
70.	<i>L. procumbens</i> (Krock) Borbos	Scrophulariaceae	Oct.-June	Ten
71.	<i>Veronica anagallis-aquatica</i> L.	Scrophulariaceae	Jan.-April	Hyp
72.	<i>Utricularia aurea</i> Lour.	Lentibulariaceae	Oct. - Jan.	Ple
73.	<i>Utricularia exolata</i> R. Br.	Lentibulariaceae	Sept.-Jan.	Ple
74.	<i>U. inflexa</i> var. <i>stellaris</i> (L. f.) Taylor	Lentibulariaceae	Dec.-March	Ple
75.	<i>Hygrophila auriculata</i> (Schumach.) Heine	Acanthaceae	Oct.- Jan.	Ten
76.	<i>H. polysperma</i> (Roxb.) T. Anderson	Acanthaceae	Oct.-April	Hyp
77.	<i>Justicia quinqueangularis</i> Koenig ex Roxb.	Acanthaceae	Aug.-April	Hel
78.	<i>Rungia pectinata</i> (L.) Nees	Acanthaceae	Nov. - June	Hel
79.	<i>R. repens</i> (L.) Nees	Acanthaceae	Oct. - Feb.	Hel
80.	<i>Pogostemon stellatus</i> (Lour.) Kuntz.	Lamiaceae	Sept. - Feb.	Hyp



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81.	<i>Phyla nodiflora</i> (L.) E. Greene	Verbenaceae	Throughout year	Ten
82.	<i>Plantago ovata</i> Forsk.	Plantaginaceae	Jan. - March	Hyp
83.	<i>Alternanthera paronychioides</i> St. Hil.	Amaranthaceae	March-Oct.	Ten
84.	<i>A. philoxeroides</i> (Mart.) Griseb.	Amaranthaceae	April-Nov.	Hyp
85.	<i>A. pungens</i> Kunth	Amaranthaceae	Aug.-May	Ten
86.	<i>A. sessilis</i> (L.) R. Br. ex DC.	Amaranthaceae	Aug.-May	Ten
87.	<i>Centrostachys aquatica</i> (R.Br.) Wallich ex Moquin- Tondon	Amaranthaceae	Sep. – Nov.	Hyp
88.	<i>Persicaria barbata</i> (L.) Hara	Polygonaceae	Aug.-April	Ten
89.	<i>P. glabra</i> (Willd.) Gomez.	Polygonaceae	Aug.-April	Ten
90.	<i>P. lapathifolium</i> (L.) Hara	Polygonaceae	Aug.-April	Ten
91.	<i>P. hydropiper</i> Panimirch (L.) Spach.	Polygonaceae	Aug.-April	Ten
92.	<i>P. limbatum</i> (Meissn.) Hara	Polygonaceae	Sep. - June	Ten
93.	<i>P. plebeium</i> R. Br.	Polygonaceae	Oct.-April	Ten
94.	<i>Rumex dentatus</i> L.	Polygonaceae	Jan.-June	Ten
95.	<i>Peperomia pellucida</i> (L.) Kunth.	Piperaceae	June – Aug.	Hel
96.	<i>Pouzolzia zeylanica</i> (L.) Benn.	Urticaceae	Sept. – Dec.	Hel
97.	<i>Ceratophyllum demersum</i> L.	Ceratophyllaceae	Oct.-Feb.	Ple
98.	<i>Hydrilla verticillata</i> (L. f.) Royle	Hydrocharitaceae	Sept.-Dec.	Vit
99.	<i>Hydrocharis dubbia</i> (Bl.) Back	Hydrocharitaceae	Jul. – Jan.	Vit
100.	<i>Nechamandra alternifolia</i> (Roxb.) Thw.	Hydrocharitaceae	Aug. – Feb.	Vit
101.	<i>Ottelia alismoides</i> (L.) Pers.	Hydrocharitaceae	Sep. – Oct.	Ros
102.	<i>Vallisneria spiralis</i> . L.	Hydrocharitaceae	Dec.-April	Ros
103.	<i>Alpinia natans</i> Rosc.	Zingiberaceae	May. Aug.	Ten
104.	<i>Crinum defixum</i> Ker- Gawl.	Amaryllidaceae	Aug. Nov.	Ten
105.	<i>Asphodelus tenuifolius</i> Cav.	Liliaceae	Nov. – Dec.	Ten
106.	<i>Eichhornia crassipes</i> (Mart.) Solms	Pontederiaceae	July-Nov.	Ple
107.	<i>Monochoria hastata</i> (L.) solms	Pontederiaceae	May – Nov.	Hyp
108.	<i>M. vaginalis</i> (Burm. f.) ex Kunth	Pontederiaceae	July-Nov.	Hyp
109.	<i>Amisophacelus axillaries</i> (L.) Rolla.	Commelinaceae	Jul. – Dec.	Ten
110.	<i>Commelina benghalensis</i> L.	Commelinaceae	July-Nov.	Ten
111.	<i>C. erecta</i> L.	Commelinaceae	July-Nov.	Ten
112.	<i>C. husskarlii</i> Cl.	Commelinaceae	Nov. - June	Ten
113.	<i>C. longifolia</i> Lam.	Commelinaceae	Aug.-Nov.	Ten
114.	<i>C. paludosa</i> Blume	Commelinaceae	Aug.-Nov.	Ten
115.	<i>Juncus bufonius</i> L.	Juncaceae	Oct.- March	Ten
116.	<i>Typha angustifolia</i> L.	Typhaceae	Oct. - April	Ten
117.	<i>Acorus calamus</i> L.	Araceae	July – Sept.	Ten



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118.	<i>Colocasia esculenta</i> (L.) Scott.	Araceae	May. – Nov.	Ten
119.	<i>Pistia stratiotes</i> L.	Araceae	Jan.-May	Ple
120.	<i>Lemna perpusilla</i> Torry L.	Lemnaceae	Jun.-Nov.	Ple
121.	<i>Spirodela polyrhiza</i> (L.) schleid.	Lemnaceae	Feb. - April	Ple
122.	<i>Wolffia globosa</i> (Roxb.) Hortog & Plas.	Lemnaceae	July-Nov.	Ple
123.	<i>Limnophyton obtusifolium</i> (L.) Miq.	Alismataceae	Aug.-Oct.	Hyp
124.	<i>Sagittaria guayanensis</i> Humb.	Alismataceae	April-Oct.	Eph
125.	<i>S. trifolia</i> L.	Alismataceae	Dec.-May	Eph
126.	<i>Butomopsis latifolia</i> (D. Don) Kunth.	Butomaceae	Aug.-Dec.	Hyp
127.	<i>Najas graminea</i> Delile	Najadaceae	Aug.-Oct.	Vit
128.	<i>N. indica</i> (Willd.) Cham.	Najadaceae	Aug.-Oct.	Vit
129.	<i>Aponogeton crispum</i> Thunb.	Aponogetonaceae	Aug.-Oct.	Eph
130.	<i>A. natans</i> (L.) Engl.& Krause	Aponogetonaceae	Aug. – Nov.	Eph
131.	<i>Potamogeton crispus</i> L.	Potamogetonaceae	Jan.-April	Vit
132.	<i>P. nodosus</i> Poir.	Potamogetonaceae	Nov. - March	Vit
133.	<i>P. pectinatus</i> L.	Potamogetonaceae	Nov.-April	Vit
134.	<i>P. perfoliatus</i> L.	Potamogetonaceae	Nov. - March	Vit
135.	<i>Zannichellia palustris</i> L.	Zannichelliaceae	Feb.-March	Ple
136.	<i>Eriocaulan cinereum</i> R.Br.	Eriocaulaceae	Aug.- Oct.	Hyp
137.	<i>E. quinqueangulare</i> L.	Eriocaulaceae	Aug. – Nov.	Hyp
138.	<i>Bulbostylis barbata</i> (Rottb.) Cl.	Cyperaceae	July – Dec.	Ten
139.	<i>Bulbosus bulbosa</i> P. Beauv.	Cyperaceae	July – Nov.	Hyp
140.	<i>Carex fedia</i> Nees	Cyperaceae	Feb. - April	Ten
141.	<i>Cyperus alulatus</i> Kern	Cyperaceae	Jul. – Dec.	Ten
142.	<i>C. brevifolius</i> (Rottb.) Hassk	Cyperaceae	Aug.-March	Ten
143.	<i>C. corymbosus</i> Rottb.	Cyperaceae	Dec.-Jan.	Ten
144.	<i>C. difformis</i> L.	Cyperaceae	July-April	Ten
145.	<i>C. exaltatus</i> Retz.	Cyperaceae	Sep.-Feb.	Ten
146.	<i>C. iria</i> L.	Cyperaceae	Aug.-Feb.	Ten
147.	<i>C. rotundus</i> ssp. <i>retzii</i> Kuk.	Cyperaceae	Jul.-April	Ten
148.	<i>C. nutans</i> var. <i>eleusinoides</i> (Kunth) Haines	Cyperaceae	April-May	Ten
149.	<i>C. triceps</i> Endl.	Cyperaceae	Aug.-Dec.	Ten
150.	<i>Eleocharis acutangula</i> (Roxb.) Schult.	Cyperaceae	Aug.-Oct.	Ten
151.	<i>E. atropurpurea</i> (Retz.) J. Presl & K. Presl	Cyperaceae	Aug.-Dec.	Ten
152.	<i>E. dulcis</i> (Burm. f.) Hensch.	Cyperaceae	Sep.-Dec.	Ten
153.	<i>Fimbristylis dicotoma</i> (L.) Vahl	Cyperaceae	July.-Nov.	Ten
154.	<i>F. littoralis</i> Gaud.	Cyperaceae	Sep.-April	Ten



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155.	<i>F. miliacea</i> (L.) Vahl	Cyperaceae	Sept. – Jan.	Ten
156.	<i>F. ovata</i> (Burm. f.) Kern	Cyperaceae	Aug.-May	Ten
157.	<i>F. squarrosa</i> var. <i>squarrosa</i> Kern	Cyperaceae	May-June	Ten
158.	<i>F. tetragona</i> R.Br.	Cyperaceae	Aug. – Nov	Ten
159.	<i>Juncellus alopecuroides</i> (Rottb.) Cl.	Cyperaceae	Jul.-Dec.	Ten
160.	<i>Mariscus compactus</i> (Retz.) Druce.	Cyperaceae	Sept. – Jan.	Ten
161.	<i>Schoenoplectus articulatus</i> (L.) Palla	Cyperaceae	Sep. – Dec.	Ten
162.	<i>S. juncooides</i> (Roxb.) Palla	Cyperaceae	Aug. – Nov.	Ten
163.	<i>S. lacustris</i> (L.) Palla	Cyperaceae	Jul. – Jan.	Ten
164.	<i>S. mucronatus</i> (L.) Palla	Cyperaceae	Sep. – Dec	Ten
165.	<i>S. supinus</i> (L.) Palla	Cyperaceae	Jul. – Nov.	Ten
166.	<i>Arundo donax</i> L.	Poaceae	Sep. – Feb.	Hel
167.	<i>Brachiaria ramosa</i> (L.) Stapf.	Poaceae	June – Oct.	Ten
168.	<i>B. reptans</i> (L.) Gard. & Hubb.	Poaceae	Jul. – Oct.	Ten
169.	<i>Brachiaria miliiformis</i> (Presl. ex Presl.) Chase.	Poaceae	Jul. – Dec.	Ten
170.	<i>Coix lachrymal-jobi</i> L.	Poaceae	Sept. – Feb.	Hel
171.	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Aug. – Nov	Hel
172.	<i>Dactyloctenium aegyptium</i> (L.) P. Beauv.	Poaceae	June – Nov.	Ten
173.	<i>Desmostachya bipinnata</i> (L.) Stapf.	Poaceae	June – Nov.	Ten
174.	<i>Echinochloa colonum</i> (L.) Link	Poaceae	Aug.-April	Ten
175.	<i>E. crusgalli</i> (L.) P. Beauv.	Poaceae	Aug.-Nov.	Ten
176.	<i>E. frumentacea</i> Link	Poaceae	Aug.-Nov.	Ten
177.	<i>Eleusine verticillata</i> Roxb.	Poaceae	Jul. – Nov.	Ten
178.	<i>Eragrostis atrovirens</i> (Desf.) Trin.	Poaceae	Aug. – Nov.	Ten
179.	<i>E. gangatica</i> (Roxb.) Steud.	Poaceae	Sep.-Nov.	Ten
180.	<i>Hygroryza aristata</i> (Retz.) Nees ex Wight & Arnott	Poaceae	Oct.-Dec.	Ple
181.	<i>Ischaemum rugosum</i> Salisb.	Poaceae	Aug. – Nov	Ten
182.	<i>Imperata cylindrica</i> (L.) Raeu.	Poaceae	Aug. – Dec.	Ten
183.	<i>Iseilema laxam</i> Hack.	Poaceae	Oct.- Nov.	Ten
184.	<i>Leptochloa chinensis</i> (L.) Nees	Poaceae	Oct. – Dec.	Ten
185.	<i>Leptochloa panicea</i> (Retz.) Ohwi	Poaceae	Jul. – Oct.	Ten
186.	<i>Oryza rufipogon</i> Griff.	Poaceae	Sept.-Nov.	Ten
187.	<i>Panicum paludosum</i> Roxb.	Poaceae	July-Nov.	Ten
188.	<i>Paspalidium punctatum</i> (Burm. f.) Camus	Poaceae	Aug.-Dec.	Ten
189.	<i>Paspalum scrobiculatum</i> L.	Poaceae	Aug.- Sep.	Ten
190.	<i>P. vaginatum</i> Swartz.	Poaceae	Aug. – Nov	Ten
191.	<i>Phragmites vallatoria</i> (Plunk. ex L.)	Poaceae	Sept. – July	Hel



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Veldk.				
192.	<i>Urochloa panicoides</i> P. Beauv.	Poaceae	Aug. – Nov.	Ten
193.	<i>Vetiveria zizanioides</i> (L.) Nash	Poaceae	Aug. – Jan.	Hel

DISCUSSION

According to graphical study of growth form Tenagophyte are dominant than Hyperhydate and Epihydate. Minimum number of species has Haptophyte and Rosulate groups because they face the several ecological problems for survival. Tenagophyte have adoptability for terrestrial condition. *Tamarix dioica*, *Bergia ammannioides*, *Melochia chorchorifolia*, *Pentapetes phoenicea*, *Pepromia pellucia*, *Arundo donax* and *Phragmites vallutoria* are not true wetland only water loving, grows near river banks, flooded plains and tolerate submergence, anatomically terrestrial so called as Helophytes. An aquatic plant may experience abundant soil moisture during the entire growing season, but water level drops during the dry season or summer months. When these types of plants commonly experience several water stress and dormancy if water recedes or soil around the root system become very dry. One or a few species of emergent aquatic plants can dominate the fresh water community. Most of these grow aggressively via rhizomes or stolon, crowding out other species. Rhizomes permits these plants to endure periods of environmental stress and the rhizome (or corm) is the overwintering bud of plants growing in cold climates. A number of floating species are excellent organism in which to study logarithmic population growth. Under full sun and non limiting nutrients, a single individuals can be introduced into a pond and multiply rapidly via vegetative means for example, duckweeds clone by forming plantlets on the mother plants doubling in surface coverage approximately every two days. Water

lettuce, *Pistia stratiotes* form new plants around the mother plant via underwater stolons. Water hyacinth, *Eichhornia crassipes* and floating fern species of *Salvinia*, *azolla* also show explosive population growth. In the tropics and heated quite water of ponds and lakes, such species can completely cover the water surface within several months and for that reason are considered permissious aquatic weeds which are removed at great expense and trouble because they clog channels and choke out other form of life in the body water. Plants that normally are submerged typically form their flower raised above the water surface. This is true, e. g. of *Limnophila indica*, *Hydrilla verticillata*, and *Potamogeton pectinatus*. There are some bizarre plants that have underwater pollination mechanism. Most notably *Vallisneria natans*. *Cyperus* and *Sphoenoplectus* are found in shallow temporary water, fringes of permanent water bodies and in slow running streams. These were associated with species of *Lindernia*, *Fimbristylis*, *Eriocaulon* etc. more deep water was mostly harbored by species of *Nymphaea*, *Nymphoides* and other rooted floating species.

Neptunea oleracea, *Limnophila indica*, *Monochoria hastata*, *Centrostachys aquatica*, *Crinum defixum* are rare species distributed in few wetlands and their population is very low. Rarity of species due to environmental factor (e. g. temperature range, rainfall range, requirement and tolerance, altitudinal migration), ecological factor (Compatibility, allelopathy, distribution, origin, habitat), biological factor, pathological cause and anthropological intereferece (grazing, medicinal use and economic value) in the form of habitat destruction or overexploitation. Many



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species such as *Cyperus rotundus*, *Spilanthes paniculata*, *Ammania baccifera* etc. has high medicinal value. They are regularly collected by village medicine practitioners for local use along with their perinating parts.

CONCLUSION

Wetlands have a large diversity of plants needing wetness of varying degrees. These plants are accordingly adapted to the local availability of water and many show transition between annual and perennial habitat and also their type of growth forms. Large wetlands are found in the district catering for the needs of both plants and humans. With rapid urbanization and other land use wetlands are rapidly dwindling in number and size. Hence wetlands such as lakes, streams, ponds (small or big), bogs, marshy grassland etc., have to be conserved and managed sustainable for welfare of the both wetland plants and man. For the conservation of aquatic wealth and their habitat destruction following requirements is needed.

1. A documentation scheme should be initiated for listing of rare, threatened and endangered species and preserve the population in reserve site.
2. Salona Tal is the largest Tal nearly 2023 hectare. It should be declared as a conserved area.
3. Afforestation in catchments area which will play an ecological role in checking the erosion and sedimentation.
4. Water intake for agriculture through drainage, Tube wells, habitat destruction for Resident bird, water quality deterioration due to grazing cattle may be banned.

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