INTERNATIONAL ASSOCIATION OF BIOLOGICALS AND COMPUTATIONAL DIGEST
International & Peer-Reviewed Journal
E-ISSN: 2583-3995

A REVIEW ON WETLAND PLANT DIVERSITY OF GUJARAT

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ABSTRACT

Gujarat is a state in India that has a lot of wetlands. Gujarat is actually the top state when it comes to the size of the wetlands because its wetland area makes up an incredible 23% of the nation's total wetland area. According to Space Applications Center (SAC-ISRO), there are 34,749.50 square metres of wetlands overall. In the study on plant diversity of Gujarat, information on primary types of wetlands and their uses as well as their capacity to store water was also obtained. Moreover, some species of plants that thrive in nearby wetlands were also investigated for Gujarat wetland plant diversity., Gujarat wetlands include medicinal plants. Some of their species were found. The paper identified 124 species, 56 genera and 29 families from Gujarat. In 24 herbs, 4 creepers, 4 shrubs and 4 trees were found.

Keywords: *Wetland, Gujarat, Plant diversity.*

INTRODUCTION

The term "wetland" refers to a wide range of wet environments, including wetlands, swamps, bogs, fens, and temporarily waterlogged areas. Wetlands are subject to their surroundings. All biota (plants, animals and bacteria) are controlled by water; wetland, according to some, is a euphemism for "swamp", which has generated adverse reactions as it is used in literature and common speech (National Research Council, et al,.1995). If true, it is most likely an accidental euphemism because it is clear that the term "wetland" is straightforward. A word composed of the words "wet" and "ground" that expresses only general conditions. Soils Such soils have water at or near the surface for long periods, which affects how the land is used. Wetland has been a popular term for some time. When contrasting the importance of sphagnum growth in the United States with Europe, Scheler (1890) refers to the marshes of the "Old World". Dachnowski's objection that "wetland" was commonly used in early literature serves as further evidence. The terms "wetland," "overflow lands," "swampland" and "dung" were frequently used. hindered the study of peat by scientists (Daknowski, et al,.1920). Wetlands do not require constant flooding of the area. If such a situation exists, such lands shall be referred to as "submerged lands" or "flooded lands" instead of "wetlands". Instead, \wetland refers to terrain that is heavily wet for variable periods - land that is periodically wet. And, if not, can be dried or at least exposed to air for a while. to wave energy (Nunn, p. 2021) other reason such as aquatic plants with floating leaves such as water lilies make them impossible to colonize. Frequency and length of flooding and/or soil saturation (near the surface) must be considered when considering wetlands over time. The last factor that prevents most plants from growing in wetlands is repeated prolonged wetness, which puts a lot of stress on the vegetation (Knotters, O. et al.,2013). Consequently, the basic inquiries for defining wetlands are: (1) How long and how often should the region remain wet? (2) Should humidity be maintained during the growing season or should humidity also be considered during the growing season? (3) Should the soil be moist, how important is the soil surface, or, if not, how deep? When reviewing existing wetland definitions, keep these questions in mind. The answers to these inquiries are crucial to growth metrics and cohorts. Different definitions of wetlands have been devised for different purposes, reliable indicators of the presence of wetlands (eg, plants, animals and soil (Craig, R. K. et al, 2013). Original Wetlands More definitions developed for scientific research or management purposes. uses. A basic tool developed for wetland mapping projects. Since the 1960s many definitions have been developed to specify parameters for the management of "wetlands". There are numerous wetland laws as well as government wetland policies. (Tiner, R. W. et al,.2016). Wetland

indicators: a guide to wetland design, identification, delineation, classification and mapping. CRC Press.)

According to (Ghermandi et al. 2008), wetlands are the most productive ecosystems on the planet and provide a variety of critical benefits to human society (Ten Brink et al., 2012). Yet, they are environmentally conscious and flexible systems (Turner et al., 2000). Wetlands do incredibly well. Influential, varied according to their origin, location, water regime species and chemistry, and soil and sediment properties (Space Applications Center, et al,.2011). Worldwide, the area according to Lehner and Doll (2004), wetland habitats cover more than 917 million hectares (m ha). One of the earliest, most widely used wetland classification schemes (Koverdin et al., 1979) classified wetlands, based on their hydrological, ecological, and geological characteristics, into marine (coastal wetlands), estuarine (including deltas, tidal marshes, mangrove swamps), lacustrine. (lakes), fluvial (with rivers and streams), and palustrine ('swamps' - wetlands, swamps). and bogs). However, in 1971, the government ratified the Ramsar Convention on Wetlands, an international agreement defining wetlands as "marsh, fen, peatland, or areas of water, whether natural or artificial, permanent or temporary., water that is still. or flowing, fresh, brackish, or salt" (section 1.1). Conservation and wise use of wetlands and their resources requires action and international cooperation. (Bassi, N., Kumar, et al, 2014)

A classification of wetlands was developed and used by the US Fish and Wildlife Service in 1979 (Cover Dean et al., 1979) Wetlands are divided into five main categories based on their classification according to their hydrological, ecological and geological conditions. (Arya, AK, et al, 2020). (Review on Distribution and Importance of Wetlands from the Perspective of I Types of Wetlands)

TYPES OF WETLANDS

Based on types, wetlands are classified as marshes, swamps, bogs, fens, estuaries, lakes and ponds, river floodplains, and oxbow lakes: Dia. Journal of Applied and Natural Sciences, 12(4), 710-720. (Arya et al, 2020)

1. **MARSH:** A marsh form of the wetland is submerged under water and is home to vegetation that grows on wetlands. Both inland and coastal habitats contain them. Marshes can also be found underground and underground. (Kumar. et al, 2009)

2. **SWAMP:** Swamps are characterized primarily by their woody plants. Swamps are classified as a swap between forests and shrubs. Both fresh water and salt water contain them.

3. **FAN:** These are high-nutrient wetlands that are the result of rainfall. Precipitation, or precipitation, is the main source. (Vanita. et al,.2016)

4. **BOGS:** Peatlands that are flooded are called bogs. The primary source of water in bogs is rainfall. They are found in depressions that prevent flooding downstream. Bogs sustain much less plant growth than fens. (Kumar.P.et al,.2009)

5. **LAKES AND PONDS:** A diverse group of inland freshwater ecosystems are found in lakes and ponds around the world. They provide both terrestrial and aquatic organisms with essential resources and habitats. (Kumar. P. et al, 2009)

6. **FLUVIAL PLAINS:** These are areas near a river or stream. They can be drowned by water that overflows the waterway. The Yamuna floodplains serve as Delhi's main water source. (Kumar. P. et al, 2009)

7. **LAKE OXBOW:** When the river banks are blocked by sediment accumulation or when the river channel changes, the crescent-shaped body of water separates and becomes an oxbow lake. Oxbow lakes are abundant in the Ganges and Brahmaputra River basins. Ansupa is a bull's bow at the highest point of the Mahanadi delta. (Kumar. et al,.2009)

8. **ESTUARIES:** An estuary is a body of brackish water with free access to the open ocean partially blocked off the coast by one or more rivers or streams. Estuaries act as

transition zones from rivers to seas. Example: A long sand bar separates the Chilika Lagoon in Odisha from the Bay of Bengal. (Patil Amrita et al.2023)

WETLAND FUNCTION

Wetlands help reduce soil erosion downstream by slowing water flow. Some wetlands serve to aid in flood management by holding excess water during storm events, particularly on floodplains and in coastal locations. Many wetlands act as temporary water storage, allowing water to evaporate or seep into the earth. Wetlands serve a variety of ecological purposes. Wetland ecosystems are extremely complex, and our understanding of them is constantly improving. (Smith. R. D.et al,1995) The following environmental benefits that wetlands offer have already been noted by wetland ecologists:

- **PURIFICATION OF WATER:**

Wetlands maintain water quality by retaining excess nutrients, heavy metals and sediments. When wetlands are connected to groundwater or surface water sources, such as rivers and lakes, and are used by people for drinking, swimming, fishing, or other activities, these services are especially critical. Fish and other animals rely on these same processes. (Brinson, M. M., et al., 1995)

- **SHORELINE STABILIZATION:**

Wetlands that are found along the banks of lakes, rivers, and streams help prevent coastal soil erosion brought about by wave and current forces. Wetland plants act as buffers by releasing water energy and stabilizing the soil with their extensive root systems. (https://dec.vermont.gov/watershed/wetlands/functions/erosion-control)

- **GROUNDWATER RECHARGE AND STREAM FLOW MAINTENANCE:**

Surface water, rainwater and snow that seep into the ground recharge aquifers and groundwater. Because they hold water and give it time to seep into the aquifer, wetlands near surface water sources are critical. Water from the ground is used for irrigation, drinking and maintaining the flow of water in our lakes, rivers, streams and reservoirs. The gradual transfer of groundwater to surface water usually helps maintain minimum water levels during low stream flows or lake levels. Additionally, by releasing stored water directly into streams, lakes, and reservoirs, wetlands contribute to the maintenance of these systems. Wetlands are critical to a properly functioning hydrologic cycle because of their numerous complex interactions with groundwater, stream, and lake and reservoir water levels Values (https://ecology.wa.gov/Water-Shorelines/Wetlands/Education-training/Functions-values-of-wetlands)

- **FLOOD PROTECTION:**

By storing excess water after a storm and slowly releasing it, almost every wetland can provide some level of flood protection. The effectiveness of a wetland to reduce local and downstream flooding depends on its size, shape, location and soil type. Wetlands can temporarily store water and restrict its flow, which reduces the severity of floods, although they cannot be completely avoided. Wetland soil is like a sponge that can hold much more water than other types of soil. Wetlands in remote areas can also reduce localized flooding. If there weren't wetlands to catch stormwater runoff, more backyards and basements could flood. (Smith. R. D.et al,.1995)

Fish, wildlife and even endangered species can find a home in wetlands. Not all wetlands provide all of these benefits, and the efficiency of your particular wetland will depend on its location and type. (At Home with Wetlands - A Landowners Guide. Joy P. Michaud, August 2001)

WETLANDS IN GUJRAT

A wetland, a complex ecosystem in which the land is flooded or saturated, favours a specialized assemblage of plants, animals, and microbes that have developed adaptations to survive periods of stagnant or slowly moving water. Due to legislation and other regulations passed in the 1970s, wetlands and the subdiscipline of wetland ecology are relatively recent topics of research in the field of ecology. On the other hand, wetlands were not formally used in the US until 1953. The basis for further publications on waterfowl habitat in the United States was provided by Fish and Wildlife Service (USFWS) reports. Since then, ecologists and government officials have classified wetlands in various ways. There is no single official definition (Crandell C.J. et al, 2023).

Gujarat has the largest number of wetlands of all types including mangroves, coral reefs, beaches and wetlands. Flood plain systems, mudflats, tidal flats, freshwater lakes and reservoirs. Following are the hotspots for Gujarat's unique biodiversity. Farming at Flamingo City in the Great Desert of Kutch, Gujarat, halfway between Khadir and The Patch Belt. Flamingo migration land. Northern desert areas of Kutch - the habitat of spiny tail Uromastyxhardwickii, lizard. The only remaining population of Indian wild donkeys lives in the Small Desert Wild Donkey Sanctuary of Kutch, and the Gaga Great Indian Bustard Sanctuary protects the grassland birds. The magnificent Indian bustard is a bird classified in the Red Data Book. Girnar forests of Junagadh District; Vijayanagar Forests of Sabarkantha District; Vela Vadar National Park; Vansada National Park, Valsad District; Vajpur Forests of Surat District; Narayana Sarovar Chinkara Sanctuary; Ratnam Hal Sloth Bear Sanctuary; Nala Lake Bird Sanctuary; Shalamnesar Wildlife Sanctuary, Bharuch District; Purna Wildlife Sanctuary, Dang District; Gir Wildlife Sanctuary and National Park, Jung (Stanley, O.D. et al,.2004). Wetland ecosystems and marine habitat diversity in Gujarat, India. Journal of Coastal Development, 7(2), 49-64.)

SOME PAST STUDIES:

Ronak R. Char did a wonderful job. In total there are 36 species, 32 genera and 23 families, whose plant diversity is sought after. 24 herbs, 4 creepers, 4 shrubs and 4 trees were found. This study will benefit ecologists for wetland field analysis, reporting and biodiversity conservation. Bandali Lake Wetland (Dumelav), Godhra, Panchmahal, Gujarat (Charan RR et al., 2019)

Great work was done by Baldev Panchal who discovered plant diversity During the present survey conducted in the research area, a total of 4 species in 4 genera and 3 angiosperm families were reported for the first time. Monocotyledons make up 75% of all known species, while dicots make up 25%. According to the current inventory, the study region has a significant number of different aquatic and wetland plant species. Rupur Lake, Patan District, Gujarat (Baldev Panchal et al., 2019)

Great work by PJ Dabgar who has a variety of plants. There were 63 species and 31 families of dicotyledons. Monocotyledons had 19 species and 12 families. Asteraceae has the largest number of species at seven. Lamiaceae (04 species), Cypressaceae (04 species), and Primulaceous are the next three families in order of dominance (03 species). Nymphaea (02 species), Portulaca (02 species), and Amania (02 species) in generation 73 at Vadwana Wetland, Dabhoi Taluka (Gujarat) (PJ Dabgar - Bioscience Discovery, 2012)

Great work was done by Bhaskar Panjani who discovered the plant During the present survey, which was conducted in the research area, 22 species, 18 genera and 12 families of angiosperms were recorded for the first time. Monocotyledons account for 42% of all documented species, while monocots account for 58%. In the present study, the family Cyperaceae emerged as the dominant family, and the genus Cyperus was considered the dominant genus. Azolla pinnata r. It is an aquatic pteridophyte. Brown recorded while conducting fieldwork in the study region. The results of the present study allow us to conclude that the study area is well adapted to specific edaphic and climatic conditions and contains a significant number of different aquatic and wetland plant species. In the downstream area of the Sipu River near Sipu Dam, Banas Kantha, Gujarat (P Bhaskar et al, 2018).

Locals of the Aravalli district use approximately 18 different types of aquatic and wetland medicinal species, and Patel, M.M. W High has a wonderful job of discovering plant diversity and some aquatic and wetland medicinal plants. In the Aravalli district of Gujarat, the plant has been used for a long time to treat many diseases. (MM Patel. et al,.2016)

Great work by AM Suthar whose study A comparative account of the diversity of hydrophytes in some inland wetlands In this study, the hydrophyte species diversity of three inland wetlands – Pariz, Kanewal and Wadhwa wetlands – of central Gujarat was compared. 19 species of hydrophytes, including 8 species of submerged roots, 1 species of free-floating, 5 species of floating leafy roots and 5 species of emergent hydrophytes. Around that time, a comparatively large diversity of hydrophytic plant species was found in central Gujarat's Period, Kanewal and Wadhwa. (Ashok M. Suthar, et al,.2019)

CONCLUSION

Regarding the flora diversity of Gujarat, 25 to 30 review papers were studied between 2004 to 2023. It was found that marshes, estuaries, lakes, oxbows, swamps, fluvial plains, fens, bogs, ponds and lakes are the main forms. Wetlands The use of wetlands to prevent soil erosion in certain wetlands, particularly floodplains and coastal locations, helps in flood management by storing excess water during storm events. Extensive root systems stabilize the soil and act as a buffer for the water purification process. Groundwater recharge is also helpful. For flood protection, wetlands are crucial. Moreover, some medicinal plants were found near wetlands. During the examination of wetland review papers, a total of 124 species, 56 genera and 29 families were identified. In 24 herbs, 4 creepers, 4 shrubs and 4 trees were found. Three angiosperm families, four genera and a total of four species were discovered for the first time.

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