International Journal of Academic Research
ISSN: 2348-7666; Vol.6, Issue-1, January, 2019
Impact Factor: 6.023; Email: drtvramana@yahoo.co.in

Wet lands- distribution, policy environment & schemes, significance & threats in India.

T.M A. Niveditha
Lecturer in Botany, Dr. V. S. Krishna Govt.
Degree College (A), Visakhapatnam,
Andhra Pradesh.

Abstract: Wetlands are among the most productive ecosystems on the planet, have enormous diversity and they are classified into different types based on their origin, vegetation, nutrient status, thermal characteristics etc. Only 26 wetlands in India have been designated as Ramsar Sites. They are important because they provide multiple use water services, marshes play an important role in carbon cycle and have relatively greater capacities to sequester additional carbon dioxide (CO2), act as a sink for contaminants in many agricultural and urban landscapes, lessen the impacts of flooding by absorbing water and reducing the speed at which flood water flows. They also help to trap suspended solids and nutrient load during flooding, support species diversity through playing a significant role in the support of food chains. Threats to wetland ecosystems comprise the increasing biotic and abiotic pressures and perils. Let us dedicate ourselves to the cause of healthy and dynamic aquatic ecosystems, and sensitize other members of society to the need for their effective conservation and scientific management. The Ramsar Convention Award 2018 for Wetland Wise Use is presented to Fundación Global Nature, Spain. It acknowledges contributions to the long-term sustainable use of wetlands. The Ramsar Convention Award 2018 for Young Wetlands Champions is presented to the Youth Climate Action Network of Samoa (YCAN).

Key words: Wet lands, types, distribution, significance,threats, conservation and manageme

Introduction: Prasad *et. al.*, 2002 reviewed the status and distribution of wetlands and causes and consequences of wetland losses. It also provides an overview of the use of Remote Sensing and Geographic Information System (GIS) tools in flood zonation mapping, in monitoring irrigation and cropping patterns, water quality analysis and modeling, change analyses and in mapping of surface water bodies and wetlands. Wet lands are some of the most important and valuable ecosystems on Earth and are called "kidneys of the Earth". There are two basic types of wetlands: natural and constructed [Mitsch & Gosselink, 2007].Wetlands can improve water quality, protect shorelines, recharge groundwater, ease flood and drought severity, and provide unique habitats for many plants and animals. Scientists and government staff have paid increasing attention to wetlands to maintain the biodiversity of the aquatic system [Mitsch & Gosselink, 2007; Fickas *et. al* .,2010]. A wetland is a generalized concept including coastal wetlands, peat land, mangrove forests, estuarine wetlands, marshes, and other types of wetland. The coastal wetland functions as an important nutrient cycling capacity source to maintain water quality

[Schmidt, K.; Skidmore,2003]. February 2nd of every year is observed as World Wetlands Day. It marks the date of the signing of the Convention on Wetlands on 2 February 1971, in the Iranian city of Ramsar on the shores of the Caspian Sea. Therefore, this Convention came to be known as the Ramsar Convention (1971). Making an encouraging beginning in the year 1997, each year on 2 February, government agencies, non-governmental organizations, groups of citizens at all levels of the community commemorate this day by undertaking actions aimed at raising public awareness of wetland values and benefits [6].

Ramsar Convention on Wetlands of 1971 defines wetlands as - "Areas of marsh, fen, peat land 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."

Broadly speaking, wetlands are shallow water bodies in which water keeps up for most part of the year and recedes below the surface level during the dry season. The biotic community undergoes time changes from aquatic/marshy to mesophytic types. These are complex hydrological and biogeochemical systems and have been recognized as distinctly separate ecosystems between the terrestrial and aquatic ones.

Distribution: Wetlands in India are distributed in different geographical regions ranging from Himalayas to Deccan plateau. The variability in climatic conditions and changing topography is responsible for significant diversity.

Classification:They are classified[6] into different types based on their origin, vegetation, nutrient status, thermal characteristics, like

Glaciatic Wetlands (e.g., Tsomoriri in Jammu and Kashmir, Chandertal in Himachal Pradesh), Tectonic Wetlands (e.g., Nilnag in Jammu and Kashmir, Khajjiar in Himachal Pradesh, and Nainital and Bhimtal in Uttaranchal), Oxbow Wetlands (e.g., Dal Lake, Wular Lake in Jammu and Kashmir and Loktak Lake in Manipur and some of the wetlands in the river plains of Brahmaputra and Indo-Gangetic region. Deepor Beel in Assam, Kabar in Bihar, Surahtal in Uttar Pradesh) Lagoons (e.g., Chilika in Orissa) Crater Wetlands (Lonar lake in Maharashtra) Salt water Wetlands (e.g., Pangong Tso in Jammu and Kashmir and Sambhar in Rajasthan) Urban Wetlands (e.g., Dal Lake in Jammu and Kashmir, Nainital in Uttaranchal and Bhoj in Madhya Pradesh) Ponds/Tanks, man-made Wetlands (e.g., Harike in Punjab and Pong Dam in Himachal Pradesh).Reservoirs (e.g., Idukki, Hirakud dam, Bhakra-Nangal dam) Mangroves (e.g., Bhitarkanika in Orissa) Coral reefs (e.g., Lakshadweep) Creeks (Thane Creek in Maharashtra), seagrasses, estuaries, thermal springs are some kinds of wetlands in the country.

Ramsar Sites in India*:* Ramsar Sites in India India became a contracting party to the Ramsar Convention in 1981. The Chilika lagoon in Orissa and the Keoladeo National Park in Rajasthan are the first two wetlands designated as Ramsar sites in 1981. Since then total 26 wetlands in the country have been designated as Ramsar sites by 2012. Maximum number of sites was designated during 2002. The latest one in

the series is the Nal Sarovar bird Sanctuary in Gujarat designated during 2012. Though India has numerous wetlands of various types, there are certain criteria of selection of sites for Ramsar designation.

As per the Article 2.2 of the Ramsar Convention [8], broadly the wetlands are categorized under two Groups under nine criteria.

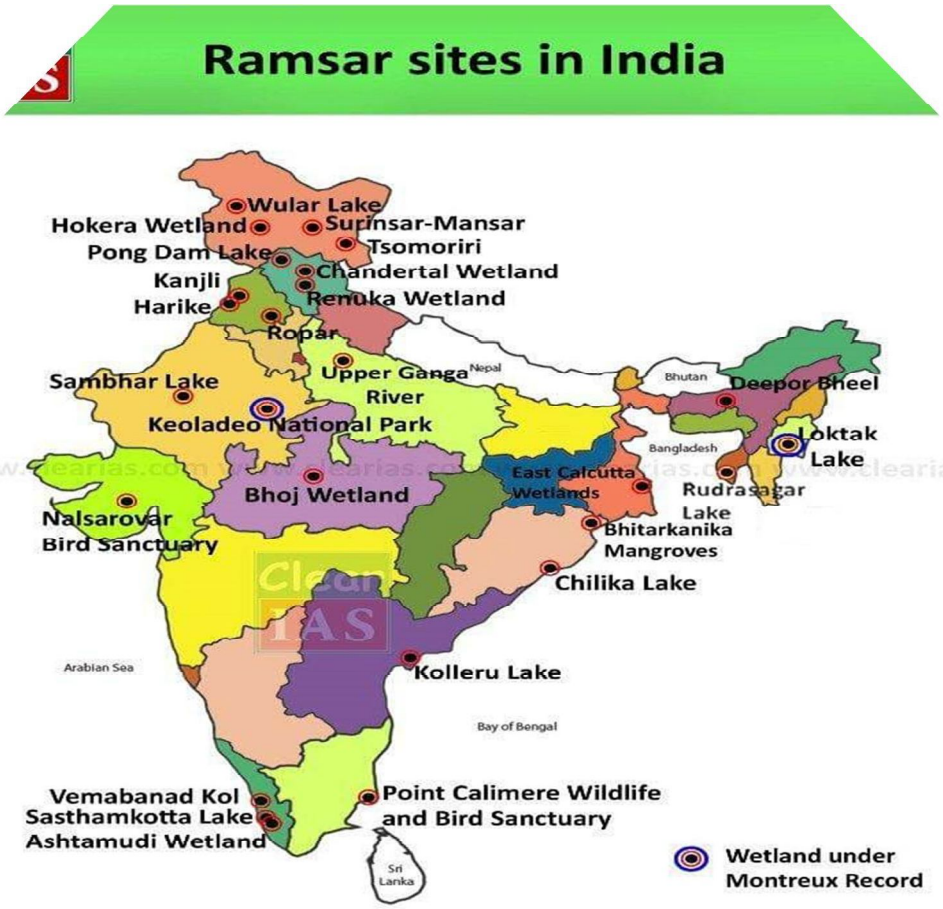
Group A sites are selected under the Criterion 1 as "Sites containing representative, rare or unique wetland types". Group B sites are sites of international importance for conserving biological diversity. There are total eight criteria based on species and ecological communities under Group B. A brief of these criteria is given below:

Group A of the criteria: Sites containing representative, rare or unique wetland types. Comprises only one criterion.

Criterion 1: A wetland should be considered internationally important if it contains a representative, rare or unique example of a natural or near-natural wetland type found within the appropriate bio-geographic region.

Group B of the criteria: Sites of international importance for conserving biological diversity. This group comprises the rest of nine criteria which are based on species and ecological communities.

Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered or critically endangered species or threatened ecological communities. Criterion 3: A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular bio-geographic region. Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at critical stage in their life cycles or provides refuge during adverse conditions. Criterion 5: A wetland should be considered internationally important if it regularly supports 20, 000 or more waterbirds. Criterion 6: A wetland should be considered internationally important if it regularly supports 1 % of the individuals in a population of one species or sub-species of waterbirds. Criterion 7: A wetland should be considered internationally important if it regularly supports a significant proportion of indigenous fish subspecies or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity. Criterion 8: A wetland should be considered internationally important if it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend. Specific criteria based on other taxa. Criterion 9: A wetland should be considered internationally important if it regularly supports 1 % of the individuals in a population of one species or subspecies of wetland-dependent non-avian species.



Copyright: clearias.com. NB: The map is just for understanding purpose and is not drawn to scale.

As wet lands are biodiversity rich places , these should be conserved to preserve wet land biodiversity. Celebration of World Wet Land Day is highly significant as it is creating awareness among students, public. It should be more popularized to protest against invaders into wet lands.

Policy environment & associated schemes:

• Ramsar Convention: The convention is named after Ramsar in Iran in which the convention was ratified in 1971. The convention is aimed at augmenting national action and international cooperation for the conservation and wise use of wetlands and their resources.

• India is a signatory to the convention. So far, 26-sites have been designated as Wetlands of International Importance (Ramsar Sites) and 6 more are under the process of being designated.

• National Wetland Conservation Programme (NWCP): It was launched in 1985 to enable conservation and wise use of wetlands in the country so as to prevent their further degradation.

• The Central Wetlands (Conservation and Management) Rules: They were notified for the first time in 2010 for better management and regulation of wetlands across the country. It saw the formation of Central Wetlands Regulatory Authority (CWRA) whose term ended on 31 March 2015 and it wasn't reconstituted since then.

• National Environment Policy 2006: Recognising the importance of wetlands, it calls for developing a national inventory of such wetlands and implementing a wide spectrum of policies and plans for wetland conservation and their environmental impact assessment (EIA).

• National Plan for Conservation of Aquatic Ecosystems (NPCA): It was unveiled in 2015 to provide for policy framework and support to State Governments for integrated management of wetlands. This initiative was launched by merging two separate Centrally Sponsored Schemes (CSS), namely the National Wetlands Conservation Programme (NWCP) and the National Lake Conservation Plan (NLCP).

• Capacity Building: in order to increase the capacity of wetland managers, up gradation of the existing Wetland Research and Training Centre of Chilika Development Authority at Barkul, Odisha into the National Capacity Development Centre for Wetlands is under consideration.

The new rules stipulate setting up of a State Wetlands Authority in each State and union territories that will be headed by the State's environment minister and include a range of government officials. They will also include one expert each in the fields of wetland ecology, hydrology, fisheries, landscape planning and socioeconomics to be nominated by the state government. The State authorities will also need to prepare a list of all wetlands of the State or union territory within three months, a list of wetlands to be notified within six months, a comprehensive digital inventory of all wetlands within one year which will be updated every ten years.

To oversee the work carried out by States, the rules stipulates for setting up of National Wetlands Committee, which will be headed by the MoEFCC Secretary, to monitor implementation of these rules.

The Committee will also advise the Central Government on appropriate policies and action programmes for conservation and wise use of wetlands, recommend designation of wetlands of international importance under Ramsar Convention, advise on collaboration with international agencies on issues related to wetlands etc.

Maharashtra state forest department in Feb. 2017 identified 507 wetlands (369 in forest areas and 118 in non-forest areas) for taking up conservation and management in a holistic manner for wise use for the benefit of local community, conservation of biodiversity and usefulness to the society. Of the 507 wetlands, maximum are from Vidarbha including from Nagpur (35), Bhandara (88), Gondia (42), Gadchiroli (52), Chandrapur (41) and Yavatmal (21). These wetlands were identified in accordance with Wetlands Rules, 2010. These included, wetlands identified in forest area of 10 ha and above in size while those in non-forest area of 500 ha and beyond.

Karnataka KLCDA declares 176 lakes in Bengaluru as wetlands In April, 2017 the process to protect city's lakes from

encroachment and misuse finally started when the Karnataka Lake Conservation and Development Authority (KLCDA) has sought for the declaration of 176 'live' lakes in the city as 'wetlands'. Once notified by the MoEF&CC, any changes in the land use of these lakes such as diversion of lake land for roads or layouts or any other purpose could only be done by through the approval of the Union government. Officials and activists hoped that the added protection on land would stop the continued 'legal' and 'illegal' encroachment of lakes. *What is the reason the dawn of this wisdom by Gujarat* Govt finally forms 23-member wetlands panel In June 2017, after six years, the Gujarat govt finally formed a 23-member state wetlands conservation authority, for conservation and management of the state's wetlands. The committee was formed under the Wetlands (Conservation and Management) Rules 2010. However, the steering committee is yet to be formed. The committee will be responsible for preparing an inventory of wetlands in the state. It will also identify and list particular wetlands to be regulated under the provisions of the rules. The committee will mainly lay emphasis on Nalsarovar, which was the only Ramsar site in Gujarat

Manipur CM calls for review of Loktak project, removal of Ithai barrage In most important development, in August 2017 Chief Minister (CM) Nongthombam Biren Singh urged Prime Minister (PM) Narendar Modi to review the Loktak Project as a permanent solution for frequent floods in the State. The Ithai barrage has become the main cause of flood in the State and in needs to be removed. It further says that Loktak project was taken up long before only to get some power but now the State is having sufficient power resources from others. Damages done by the flood is giving more loss to the State *Tamil Nadu* Govt notifies wetlands protection committee In Oct. 2017, the state govt has notified committees for the protection of the wetlands. This seems largely following the SC directions, but unless the committees have at least 50% of the members, credible independent non govt persons, there is little hope for improvement.

Significance of wetlands:

Wetlands are considered to have unique ecological features which provide numerous products and services to humanity. Ecosystem goods provided by the wetlands mainly include - water for irrigation, fisheries, non-timber forest products, water supply and recreation.

The major services include carbon sequestration, flood control, groundwater recharge, nutrient removal, toxics retention and biodiversity maintenance.

• Agriculture and allied sectors: Wetlands such as tanks, ponds, lakes, and reservoirs have long been providing multiple-use water services which include water for irrigation, domestic needs, ground-water recharge, etc.

• In terms of growth in fish production in India, wetlands play a significant role. Around 61 percent of fish production in the country is from inland water bodies and it is also the second largest aquaculture farmed fish producer in the world.

• Carbon sequestration: Swamps, mangroves, peat lands, mires and marshes play an important role in carbon cycle. Wetland soils may contain as much

as 200 times more carbon than its vegetation.

• In India, coastal wetlands are playing a major role in carbon sequestration. The total extent of coastal ecosystems (including mangroves) in India is around 43000 km.

• Overall, mangroves are able to sequester about 1.5 metric tonne of carbon per hectare per year and the upper layers of mangrove sediments have high carbon content, with conservative estimates indicating the levels of 10 percent.

• Pollution abatement: Wetlands act as a sink for contaminants in many agricultural and urban landscapes. In India too, wetlands are polluted through agricultural runoff and discharge of untreated sewage and other waste from urban areas.

• Flood control: Wetlands play an important role in flood control. Wetlands help to lessen the impacts of flooding by absorbing water and reducing the speed at which flood water flows. Further, during periods of flooding, they trap suspended solids and nutrient load.

• A large network of lakes and ponds in major cities like Srinagar, Bhopal, Bengaluru, Chennai and Hyderabad were constructed with the objective of flood control.

• Besides, the mangroves along the sea shores, especially on the western coast in West Bengal and Odisha have been playing a major role in protecting the coastal environment from the destruction of cyclones that frequently emanate in the Bay of Bengal.

• Biodiversity hotspots: Wetlands are important in supporting species diversity. Because wetlands provide an environment where photosynthesis can occur and where the recycling of nutrients can take place, they play a significant role in the support of food chains.

• In India lakes, rivers and other freshwater bodies support a large diversity of biota representing almost all taxonomic groups. For example, freshwater ecosystems of Western Ghats alone have 290 species of fish. Similarly, Loktak lake is famous for being the only refuge of the endangered Sangai (Manipur brow-antlered deer).

• Wetlands are also important breeding areas for domestic and migrating bird species. In many such wetland areas of India, like Bharatpur wild life sanctuary in Rajasthan, and little Rann of Kutch and coastal areas of Saurashtra in Gujarat, many migratory species of birds, includingsiberian crane, from western and European countries come during winter.

• Sarus cranes, black necked cranes, Gangetic river dolphins, the Indian mud turtle and numerous threatened species of birds and fauna, feed (off) and live in and around wetlands.

• As per an estimate, the approximate number of species of migratory birds recorded from India is between 1200 and 1300, which is about 24 percent of India's total bird species.

• Tourism: Wet-lands such as coral reefs, beaches, reservoirs, lakes and rivers are considered to be a significant part of the tourism experience in the country.

• As per an estimate, every year, around 7 seven million tourist visit Kerala's backwaters, beaches and wildlife sanctuaries, 3 million visit Uttarakhand's

lakes and other natural wetlands and one million visit Dal lake in Jammu and Kashmir.

• Cultural significance: Wetlands especially lakes and ponds (e.g. Pushkar lake in Rajasthan and Ramappa lake in Telangana) are intrinsically linked to the local culture. They are revered by the masses in recognition of the fact that they are the means of sustenance of their livelihood.

Threats to wetlands:

Since the advent of industrialization and urbanization the wetlands came under severe threat due to increased anthropogenic-pressures. As per an estimate, India has lost 38 percent of its wetlands between 1991 and 2001 alone.

1. Urbanization and land use changes: During the 90 year period from 1901 to 1991, the number of urban centres doubled while urban population has increased eightfold. This magnitude of growth exerted tremendous pressure on wetlands and flood plain areas for meeting water and food demand of growing population.

For example, the Kanwar lake in Bihar, Asia's largest freshwater oxbow lake, has shrunk to one-third of its size due to encroachment, much like Jammu and Kashmir's Dal lake. And, about 34000 hectares of the water spread area of the Kolleru lake (Andhra Pradesh) have been reclaimed for agriculture in recent years.

2. Agricultural residues: As a result of intensification of agricultural activities over the past four decades, fertilizer consumption in India has increased from about 2.8 million tons in 1973–1974 to 28.3 million tons in 2010–2011.

3. As per estimates, 10–15 percent of the nutrients added to the soils through fertilizers eventually find their way to the surface water system. High nutrient contents stimulate algal growth, leading to eutrophication of surface water bodies.

4. Municipal and Industrial pollution: Less than 31 percent of the domestic wastewater from Indian urban centers is treated, compared to 80 percent in the developed world, which is largely discharged in the natural water bodies such as streams and rivers.

For example, River Yamuna, which passes through 6 Indian States, receives about 1789 MLD of untreated waste water from the capital city of Delhi alone. This is about 78 percent of the total pollution load that flows in to the river every day. Similarly, untreated industrial effluents have become a major threat to the survival of wetlands. For instance, the Bellandur Lake in Bengaluru city was 'on fire' in May 2015 due to the discharge of effluents (especially nutrient rich foams) by the surrounding industries.

5. Climate Change: In 2007, the UNESCO estimated that Global climate change is expected to become an important driver of loss and change in wet-land ecosystem. These findings are important for India which has been experiencing the flood-drought-flood cycle for the last 2 decades.

As per a study, wetlands located in high altitude as well as coastal areas, like mangroves and coral reefs, are some of the most sensitive classes that will be affected by climate change.

For example, climate change caused rise in level of Tsomoriri Lake in Ladakh, a glacial fed high altitude lake,

thereby causing submerged important breeding islands in the lake where endangered migratory birds like the Black-necked Crane and Bar-headed Goose would breed.

Apart from the above major threats, immersion of idols and religious ritual waste, introduction of exotic species, encroachments and unregulated aquaculture (e.g. Kolleru lake) backed by Bureaucrats-Politicians-Businessmen nexus, dredging, un planned urbanization and development projects are some of the other dangers threatening the existence of wetlands across the country.

Winners of the Ramsar wetland conservation awards 2018

The Ramsar Convention Award for Wetland Wise Use is presented to Fundación Global Nature, Spain. It acknowledges contributions to the long-term sustainable use of wetlands.

The Ramsar Convention Award for Young Wetlands Champions is presented to the Youth Climate Action Network of Samoa (YCAN). It acknowledges a young person or a group of young people between the ages of 18 and 30 who have contributed to the wise use of wetlands.

The restoration and conservation of wetlands has from the outset been the main action for the Fundación Global Nature. In its early days it took steps to restore the La Nava Lagoon, a 2,200 hectare steppe lagoon that was drained in 1968. The recovery of the La Nava Lagoon is one of the most important milestones in the history of Spanish conservation work

YCAN has made significant contributions for wetlands, especially in local communities and for young people in Samoa. Their achievements include; Mangrove rehabilitation and restoration through planting of mangroves as well as the removal of waste. They installed rubbish stands in villages to prevent people from dumping waste in the wetland. Coral reef rehabilitation. YCAN undertook crown of thorns starfish control operations to relieve pressure on corals, they furthermore undertook awareness raising on mangroves and coral reefs highlighting the roles of these wetlands for climate change adaptation and mitigation in communities. In addition, they carried out river tree planting to help rehabilitate one of the biggest rivers in Samoa and combat erosion. They have also undertaken tree planting as well as tagging and releasing turtles—an iconic and endangered coral reef species-- back into the wild from captivity.

On the occasion of the World Wetlands Day 2018, the World Heritage Centre welcomes the close collaboration between the Ramsar Convention and the World Heritage Convention. As of today, more than 95 Ramsar Sites of International Importance overlap with more than 69 World Heritage properties. These also include cities such as the World Heritage site of Venice and its Lagoon.

World Wetlands Day 2018 highlights the need for effective conservation of urban wetlands to facilitate an urbanization that is sustainable and that makes cities livable. The importance of urban green spaces, including wetlands and peat lands, and how they can help cities in mitigating and adapting to the effects of climate change is also noted in the Global Report on Culture for Sustainable Urban Development, which was launched by UNESCO in 2016.

The report calls for the implementation of actions harnessing the role of culture in sustainable, resilient and green cities and recommended the promotion of a liveable built and natural environment through the safeguarding of urban cultural and natural heritage. In the conservation of both natural and cultural heritage, the Ramsar and World Heritage Conventions can mutually support each other, as the report "Ramsar and World Heritage Conventions converging towards success" shows. Building on the IUCN study "Managing MIDAs", the report illustrates how dual Ramsar and World Heritage designations can be complementary and how they can offer widened conservation management objectives.

Conclusion

Wetlands are amongst the most productive ecosystems on the Earth. Historically, they have been at the centre of evolution of human civilization for millennia as they are means of precious ecological goods and services. However, unfortunately, they are also ecologically most sensitive eco-systems and are under threat due to increased anthropogenic-pressures. Wetlands for a Sustainable Urban Future, the theme for World Wetlands Day in 2018 aims to raise awareness about how urban wetlands contribute to the future of sustainable cities. Urban wetlands make cities livable in many important ways. They reduce flooding, replenish drinking water, filter waste, provide urban green spaces and are a source of livelihoods.

1. Prasad S.N., Ramachandra,T.V., Ahalya,N., Sengupta, T., Alok Kumar., Tiwari, A.K., Vijayan V.S & Lalitha Vijayan (2002). Conservation of wet lands of India – a review Tropical Ecology 43(1): 173-186.
2. Mitsch, W.J., Gosselink, J.G., 2007. Wetlands, 4th ed. John Wiley & Sons, Inc., New York, USA.
3. Zhang, L.; Wang, M.-H.; Hu, J.; Ho, Y.-S. A review of published wetland research, 1991–2008: Ecological engineering and ecosystem restoration. Ecol. Eng. **2010**, 36, 973–980
4. Fickas, K.C.; Cohen, W.B.; Yang, Z. Landsat-based monitoring of annual wetland change in the Willamette Valley of Oregon, USA from 1972 to 2012. Wetl. Ecol. Manag. **2016**, 24, 73–92.
5. Schmidt, K.; Skidmore, A. Spectral discrimination of vegetation types in a coastal wetland. Remote Sens. Environ.**2003**, 85, 92–108.
6. Conservation of world wet lands: A profile, 2007.http://envfor.nic.in/divisions/csurv/WWD_Booklet.pdf
7. India wetlands Review 2017: Important Government Decisions.https://sandrp.in/2018/02/03/india-wetlands-review-2017-important-governments-decisions/
8. T V R Murthy, J G Patel, S. Panigrahy and J S Parihar (Eds.). 2013. National Wetland Atlas: Wetlands of International Importance under Ramsar Convention, SAC/EPSA/ABHG/NWIA/ATLAS/38/2013, and Space Applications Centre (ISRO), Ahmedabad, India, Pge: 5

http://www.indiaenvironmentportal.org.in/files/file/Atlas-Wetlands-International%20Importance-Ramsar-Convention.pdf