Ramsar Convention and India

The Wetland ecosystem in India is spread over a wide range of varied climatic conditions, from the wetlands in cold Jammu and Kashmir to hot and humid conditions in Peninsular India; thus there is a great diversity of these wetlands. Many of these wetlands are unique with respect to biodiversity, scenic beauty, shelter of migratory birds, resident avifauna, etc. Under the conservation of wetlands in India, several wetlands have been recognized that are a part of National Parks and Sanctuaries.

Wetlands are among the most productive ecosystems besides being a rich repository of biodiversity and are known to play a significant role in carbon sequestration. Wetlands being dynamic and influenced by both natural and man-made activities, need frequent monitoring. Regular updating of the status of the wetlands is significant in view of the accelerating pressure on the very existence of these resources due to developmental activities and population pressure being witnessed currently. According to the Ramsar Convention, wetlands are 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 6 m (www.ramsar.org). In addition, the Convention (Article 2.1) provides that wetlands may incorporate riparian and coastal zones adjacent to the wetlands and islands or bodies of marine water deeper than 6 m at low tide lying within the wetlands[1].

Wetlands occur everywhere, from the tundra to the tropics. The Ramsar Convention has adopted a Ramsar classification of wetland type which includes 42 types grouped into three categories: marine and coastal wetlands, inland wetlands and human-made wetlands. They are the cradles of biological diversity, providing the water and primary productivity upon which countless species of plants and animals depend for survival. They support high concentrations of birds, mammals, reptiles, amphibians, fish and invertebrate species. Wetlands are also important storehouses of plant genetic material.

The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international cooperation for the Convention and wise use of wetlands and their resources. It is the only global environmental treaty that deals with a particular ecosystem and member countries of the Convention cover all geographic regions of the planet. The first call for an international Convention on wetlands came in 1962 during a conference organized at the French Camargue by the International Union for the Conservation of Nature and Natural Resources (currently IUCN), The International Waterfowl and Wetlands Research Bureau (IWRB) and Bird Life International due to concern of the rapidly reclaimed and destroyed wetlands, and consequently the resulting decline in waterfowl population.

A Convention text was developed over the next eight years through a series of international and technical meetings. Finally on 3 February 1971, delegates of 18 nations signed the Convention at Ramsar, Iran. The Convention entered into force on December 1975, upon acceptance by UNESCO. The original Convention signed in Ramsar was amended in 1982 and 1987, and this amended text is the current Convention with 12 articles.

The conservation and wise use of all wetlands through local and national and international cooperation, as a contribution towards achieving sustainable development is the objective of the Ramsar Convention (Figure 2). The wise use of wetlands according to the Convention is the maintenance of their ecological characters, achieved through the implementation of ecosystem approaches, within the context of sustainable development.

There is increasing evidence through the work undertaken by the Scientific and Technical Review Panel (STRP) of the Ramsar Convention, that some types of wetlands (both inland and coastal wetlands) are important in the global carbon cycle, including as carbon stores, especially since a significant proportion of the world's forests are forested wetlands. It is a particular challenge, however, to fully assess and measure carbon in wetlands, since for many of them much of their carbon is in soils (underground) rather than above ground, as for many forests, and many wetlands function as open systems with respect to carbon.

Climate change will impact wetlands in various ways. Small wetlands will dry up and disappear, resulting in a loss of carbon sinks. Permanent wetlands will become seasonal and be subject to greater variation in the water levels. Dramatic fluctuations in the water levels will enhance the release of greenhouse gases (GHGs) from these systems. Biodiversity within affected wetlands will decrease. The combination of wetlands disappearing and water levels fluctuating greatly in the wetlands that remain will lead to a feedback cycle that will perpetuate the loss of wetlands by reducing carbon sinks, increasing GHG fluxes to the atmosphere and further enhancing the greenhouse effect.

In recognition of the important carbon service provided by such wetlands, a number of initiatives are underway to establish and implement mechanisms for achieving carbon offset through carbon markets, including voluntary standards, for wetlands. In October 2008, at the 10th meeting of the Contracting Parties of the Ramsar Convention (Changwon, Republic of Korea), a trilateral agreement, the Danone Fund for Nature (DFN), was signed between the Ramsar Convention, IUCN and the private sector Danone Group to develop and implement a mechanism for financing delivery of carbon offsets for the Danone Group through wetland restoration projects that are in line with the principles and practices of the Ramsar Convention.

The Government of India became a contracting/member party of the Ramsar Convention on 1 February 1982; with six wetlands covering 192,973 ha area as internationally important. The Ministry of Environment and Forests (MoEF), Government of India is the administrative authority for implementation of the Convention in India. The Ramsar contracting parties are committed to implement their objectives of the Convention mainly to designate suitable wetlands for the list of international importance (Ramsar list) and ensure their effective management; work towards the use of all wetlands through national land-use planning, appropriate policies, management actions and public education, and to cooperate internationally concerning transboundary wetlands, shared wetland systems, shared species and development projects that may affect wetlands. The 160 contracting parties designated

Table 1. Ramsar list of Indian wetlands of international importance

Ashtamudi wetlands, Kerala	Deepor Beel, Assam	Keoladeo National Park, Rajasthan	Renuka wetlands, Himachal Pradesh	Surinsar mansard Lake, Jammu and Kashmir
Bhitarkanika mangroves, Orissa	East Calcutta wetlands, Kolkata	Kolleru Lake, Andhra Pradesh	Ropar, Punjab	Tsomoriri, Jammu and Kashmir
Bhoj wetlands, Madhya Pradesh	Harike Lake, Punjab	Loktak Lake, Manipur	Rudrasagar Lake, Tripura	Upper Ganga River, Uttar Pradesh
Chandertal wetlands, Himachal Pradesh	Hokera wetlands, Jammu and Kashmir	Point Calimere Sanctuary, Tamil Nadu	Sambhar Lake, Rajasthan	Vembanad–Kol wetland, Kerala
Chilika Lake, Orissa	Kanjli, Punjab	Pong dam, Himachal Pradesh	Sasthankotta Lake, Kerala	Wular Lake, Jammu and Kashmir

Figure 1. Ramsar sites of India (www.wetlands.org).

1953 wetland sites for the Ramsar list, which covers a total surface area of 190,455,433 ha. India has 25 wetlands in the Ramsar list (Table 1 and Figure 1).

The MoEF carried out its first scientific national inventory of the Indian wetlands at 1 : 250,000 scale at Space Applications Centre (ISRO), Ahmedabad. IRS satellite data were collected, which covered the total wetland area of about 8.26 million ha. A satellite-based wetland atlas of India was released by MoEF on 9 June 2011, which will form the basis of a comprehensive wetland conservation strategy[2]. The major wetland types found in India include river/stream, inter-tidal mudflat, reservoir, tank and lake/pond. India has also some of the some unique wetlands like mangrove and coral reef. With this background, the National Wetland Inventory and Assessment (NWIA) project was formulated. The prime objective of the project is to create a special database of the wetlands of India using satellite remote sensing data. Previous work has shown that there is a sizable fraction of small wetlands in the country. The numerous small wetlands are of great significance for local-level management of hydrology. Thus, inventory at 1 : 50,000 scale was felt essential which enabled mapping of wetlands above the size of 2.25 ha area. The NWIA project was sponsored by MoEF and executed by the Space Applications Centre, Ahmedabad.

Area estimates of various wetland categories for all the coastal States and Union Territories (UTs) have been carried out using GIS layers encompassing wetland boundary, water-spread, aquatic vegetation and turbidity. In the coastal States/UTs, 120,019 wetlands have been delineated. In addition, 289,459 small wetlands (< 2.25 ha) have also been demarcated as point features. Total wetland area estimated is 9.70 m ha, which is around 6.94% of the geographic area. Total inland wetlands are 5.58 m ha and coastal wetlands are 4.12 m ha. The most dominant type of wetland is inter-tidal mudflats (2.39 m ha) occupying around 24.7% of total wetland area. The other major coastal wetlands are mangrove (471,407 ha), aquaculture pond (284,589 ha), lagoon (246,044 ha), creek (206,698 ha), salt pan (148,913 ha) and coral reef (142,003 ha). Though coral reef belongs to the minor category, it has significance in Lakshadweep, Andaman and Nicobar Islands, Gujarat and Tamil Nadu. According to this study, the presence of aquatic vegetation is observed in many wetland types. The area under aquatic vegetation is significantly higher during pre-monsoon than during post-monsoon period. Qualitative turbidity analysis of the open water varied from moderate to low turbidity.

Mangrove and coral reef are important wetland areas. Indian mangrove area according to this atlas is about 471,407 ha. West Bengal has 209,330 ha area

Figure 2. Piles of nets and bamboo canes used for traditional fishing in the shallow waters of the bay, Chilika Lake, a Ramsar site in India (photo by Najam Khurshid).

under mangrove followed by Gujarat (90,475 ha), Andaman and Nicobar Islands (66,101 ha), Andhra Pradesh (41,486 ha), Maharashtra (30,238 ha) and Orissa (23,395 ha). Coral reefs are observed in Lakshadweep (55,179 ha), Andaman and Nicobar Islands (49,378 ha), Gujarat (33,547 ha) and Tamil Nadu (3899 ha). Total area under coral reef is 142,003 ha. There are 178 lagoons having an area about 246,044 ha, which is 1.61% of the total wetland area of the country. Orissa has 89,023 ha area under lagoons, followed by Andhra Pradesh (47,407 ha) and Kerala (38,442 ha). Inter-tidal mudflats are observed in all the coastal states, except Lakshadweep and Kerala. Gujarat has a large area under inter-tidal mudflats (2,260,365 ha) followed by Tamil Nadu (33,164 ha) and Andhra Pradesh (31,767 ha). In the North East States 4.1% of the total geographic area (1.07 m ha) is under wetlands. Assam has about 9.7% area under wetlands, whereas Mizoram has only 0.66% area under wetlands.

1. The Convention on Wetlands text as amended in 1982 and 1987. Director, Office of International Standards and Legal Affairs, and United Nations Educational, Scientific and Cultural Organization, 13 July 1994.
2. National Wetland Inventory and Assessment, Information Brochure, Ministry of Environment and Forests, Government of India, 9 June 2011.

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The Animal Welfare Act, 2011

The Animal Welfare Board of India (AWBI) has come up with an Animal Welfare Act, 2011 to prevent the infliction of trauma and unnecessary killing of animals[1]. The scientific community has expressed concern over certain aspects of the draft as harsh provisions of the draft might affect research in the country where more than 500 institutions including biomedical research centres, pharma companies and scientific institutions use experimental animals.

The AWBI under this Act can issue directions in writing to any person and have the powers of enquiry into any complaint, to compel the discovery and production of documents and material objects and to receive and record statements. The Board may constitute as many subcommittees as it thinks fit for exercising any power/discharging any duty of the Board.

Every State/Union Territory shall constitute the State Animal Welfare Boards which shall be constituted not later than six months after this Act comes into force and shall make rules in which the State Animal Welfare Board may function. Members of such board are subject to rules made by the State/Union Territory Government and may appoint members necessary for the exercise of powers with the prior approval of the State/Union Territory government.

Under this act, no person/institution shall perform an experiment on animals unless permitted by the committee for the control and supervision of experiments on animals and shall have power to regulate its own procedure in relation to the performance of its duties.

1. Draft – The Animal Welfare Act, 2011, Arrangement of sections. Ministry of Environment and Forests, New Delhi.

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