General Knowledge Today

Environment-3: Wetlands and Forests

Target 2016: Integrated IAS General Studies
Last Updated: January 12, 2016
Published by: GKTODAY.IN

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Wetlands

Wetlands

India has over 27000 wetlands of which over 23000 are inland wetlands while around 4000 are coastal wetlands. [Number of inland wetlands > Number of coastal wetlands]. Wetlands occupy 18.4% of the country's area of which 70% are under paddy cultivation.

Further, out of an estimated 4.1 m ha of wetlands, 1.5 m ha are natural, while 2.6 m ha are manmade. This implies that majority of the wetlands in India are Manmade.

The coastal wetlands occupy an estimated 6,750 sq km, and are largely dominated by mangrove vegetation.

Types of Indian Wetlands

Wetlands in India are distributed in different geographical regions. Based on their origin, vegetation, nutrient status and thermal characteristics, they are classified into different types. The following list shows a wetland type and its examples in India.

- Glaciatic Wetlands
  - Tsomoriri (J&K)
  - Chandertal (Himachal Pradesh)
- Tectonic Wetlands
  - Nilnag in Jammu and Kashmir
  - Khajjiar in Himachal Pradesh
  - Nainital and Bhimtal in Uttarakhand.
- Oxbow Wetlands
  - Dal Lake, Wular Lake in Jammu & Kashmir
  - Loktak Lake in Manipur
  - Deepor Beel in Assam
  - Kabar in Bihar
  - Surahtal in Uttar Pradesh
- Lagoons
  - Chilika in Odisha
- Crater Wetlands
  - Lonar lake in Maharashtra
- Salt Water Wetlands
  - Pangong Tso in Jammu and Kashmir
  - Sambhar in Rajasthan
- Urban Wetlands

- Dal Lake in Jammu and Kashmir
- Nainital in Uttarakhand
- Bhoj in Madhya Pradesh

- Ponds/Tanks, Man-made Wetlands
  - Harike in Punjab
  - Pong Dam in Himachal Pradesh.
- Reservoirs
  - Idukki, Hirakud dam, Bhakra-Nangal dam
- Mangroves
  - Bhitarkanika in Odisha
- Coral reefs, creeks and estuaries.

There are more than 100 identified wetlands under the National Wetland Conservation & Management Programme (NWCMP).

Legal Framework Around Wetlands

As of now there is no specific legal framework for wetland conservation, management and their wise use in India. Currently, wetlands come under the Environment (Protection) Act, 1986 and other various legal instruments, related to environment and forests.

Ramsar Convention on Wetlands

Ramsar Convention is formally known as *Convention on Wetlands of International Importance, especially as Waterfowl Habitat*. It was signed on 2 February 1971 at Ramsar in Iran. That date is celebrated as *World Wetland Day* now.

Objectives

Ramsar Convention has two fold objectives viz. Conservation and sustainable utilization of wetlands; and stop the encroachment and loss of wetlands.

This treaty is not a legal binding treaty and is not a part of UN & UNESCO conventions.

Key Facts

There are around 2100 Ramsar sites around the world of which maximum are in UK. The Largest area covered by Ramsar Sites is in Canada. Ramsar secretariat is hosted by IUCN World Conservation Union in Gland, Switzerland.

How does it work?

First of all a country joins the Ramsar Convention. With this, it gets itself listed into the international effort for the conservation and wise use of wetlands. Once a country has joined, there are three commitments which it has to fulfill as obligations:

- It has to designate at least one of its wetlands into the List of Wetlands of International

Importance called "Ramsar List". Once that is done, it can later designate more such wetlands.

- The above designation has to be based upon criteria that take into account the ecology, botany, zoology, limnology (freshwater science) or Hydrology. Thus, not every wetland becomes a Ramsar site but only those which have significant values related to these fields.
- The country has to make all efforts for wise use and conservation of the Ramsar Sites in its territory. Being a part of Ramsar convention gives it access to know-how of conservation in different parts of the world.
- If the ecological character of any Ramsar wetland has changed, or is changing or is likely to change as the result of technological developments, pollution or other human interference, it will inform without delay to the Ramsar Secretariat.
- Once this information has been provided to Ramsar Secretariat, it will do the following
    - Enter the wetland into its **Montreux Record** (a record for such sites where there has been or likely to be adverse ecological change)
    - Send a Ramsar Advisory Mission to the country. This mission will analyse the situation and define how to tackle the threats to the wetland.
    - Once the appropriate measures have been taken, the site will be removed from Montreux Record.

The Ramsar convention also makes the countries cooperate in matters of conservation of the trans-boundary wetlands, shared water systems, and shared or migratory species, and to share expertise and resources with Parties less able to meet their commitments.

India's Ramsar sites

India became a contracting party to the Ramsar Convention in October 1981 and designated Chilika Lake (Odisha) and Keoladeo National Park (Rajasthan) as its first two Ramsar Sites. Four additional sites were designated in 1990: Sambhar Lake (Rajasthan), Loktak Lake (Manipur), Harike Lake (Punjab) and Wular Lake (Jammu & Kashmir). Currently, India has 26 Ramsar Sites as follows:

- Andhra Pradesh
    - Kolleru Lake
- Assam
    - Deepor Beel
- Himachal Pradesh
    - Chandertal Wetland
    - Pong Dam Lake
    - Renuka Wetland (This is smallest wetland of India)
- Jammu & Kashmir

- Hokera Wetland
- Surinsar-Mansar Lakes
- Tsomoriri
- Wular Lake

- Kerala
  - Ashtamudi Wetland
  - Sasthamkotta Lake
  - Vembanad-Kol Wetland (Largest Wetland of India)
- Madhya Pradesh
  - Bhoj Wetland
- Manipur
  - Loktak Lake (Montreux Record)
- Odisha
  - Bhitarkanika Mangroves
  - Chilika Lake
- Punjab
  - Harike Lake (Harike Wetland and the lake are manmade and were formed by constructing the head works across the Sutlej river, in 1953)
  - Kanjli
  - Ropar
- Rajasthan
  - Keoladeo National Park (Montreux Record)
  - Sambhar Lake
- Tamil Nadu
  - Point Calimere Wildlife and Bird Sanctuary
- Tripura
  - Rudrasagar Lake
- Uttar Pradesh
  - Upper Ganga River (Brijghat to Narora Stretch)
- West Bengal
  - East Calcutta Wetlands
- Gujarat
  - Nalsarovar Bird Sanctuary (Latest wetland added)

Current wetlands in Montreux Record

Currently, two wetlands of India are in Montreux record viz. Keoladeo National Park, Rajasthan and Loktak Lake, Manipur. Further, Chilka lake was placed in the record but was later removed from it.

National Wetland Conservation Programme (NWCP)

This programme was launched in 1986 and has identified some 115 wetlands for urgent protection and conservation.

Forests

State of Forests Report – 2015

State of Forests Report is published by the Forest Survey of India (FSI) on a biennial basis since 1987. Forest cover of the country is mapped through indigenous RESOURCESAT -2 satellite data with a LISS III sensor.

Key Definitions

Canopy and Canopy Density

The cover of branches and Foliage formed by the crown of trees is called Canopy. The *percentage area of land* covered by the canopy of trees is called *Canopy density*.

Forest Cover

All lands which are more than 1 hectare in area and with a *Canopy density* of more than 10% irrespective of the ownership and legal status is called *Forest Cover*. Also it does not make any distinction whether the forest is natural or manmade forest, government or private, recorded or not recorded. It includes bamboo, orchards, palm etc.

Recorded Forest Area and Forest Blank

The area recorded as "forests" in the Government records is called *Forest Area* or *Recorded Forest Area*. The patches within the forest area which have little or no trees are called "*Forest Blank*". The recorded Forest Area denotes the legal status of the land. It is defined as the geographic area recorded as forest in government records, state law or any local law. It is different from the forest cover as forest area may include areas with less than 10% of tree canopy density and may exclude areas more than 10% of tree canopy density.

E-Watch

It is a web based GIS application developed for monitoring various activities funded under CAMPA (Compensatory Afforestation Fund Management and Planning Authority) CAMPA is meant to promote afforestation activities in order to compensate for forest land diverted to non-forest uses).

Carbon Stock

It is defined as the amount of carbon stored in the ecosystem of the forest especially in living biomass and soil.

Best Season to get Satellite Data of Forests

October – December is the best season. The reflectance from the forests is dependent on the crown

foliage and its chlorophyll content. Due to seasonal variability of the tree phenology over the year, season of satellite data acquisition is of utmost importance for forest cover assessment.

Deciduous forests allow more reflectance from the ground surface during leafless period thus making their own detection and classification difficult. Hence, data of the spring-summer season is not suitable for interpretation of such forest types. During rainy season, the situation is compounded due to non availability of cloud-free data and mixing of agricultural and other green covers with forest cover due to similarity in their spectral reflectance. Taking these limitations into consideration, satellite data of the period October to December is considered to be the most suitable for forest cover mapping of the entire country. However, in cases where cloud free data is not available for this period, data of January to March is procured.

Types of Forest Covers

The degraded forest lands which have a Canopy density of less than 10% are called *Scrubs.* The Lands with Canopy density of 10-40% are called *Open Forests*. The Land with forest cover having a canopy density of 40-70% is called the *Moderately Dense Forest* (MDF) The Lands with forest cover having a canopy density of 70% and more are called *Very Dense Forests* (VDF).

State of Forests Report 2015: Key Findings

- Total forest cover in India: 7,01,673 sq km (increase of 3775 sqkm)
- Total forest cover as percentage of geographical area: 21.34 per cent
- Total tree cover in India: 92,572 sq km (increase of 1306 sq km)
- Total tree cover as percentage of geographical area : 2.82 per cent
- State with largest total forest cover: Madhya Pradesh having 77, 462 sq km
- State having highest forest cover as % of its area: Mizoram (88.93 per cent)
- Increase in carbon sink:103 million tonnes CO2 equivalent

Top five states with maximum forest cover

India's top five states with maximum forest cover (in km²) are as follows:

1. Madhya Pradesh (77,462)
2. Arunachal Pradesh (67,248)
3. Chhattisgarh (55,586)
4. Maharashtra (50,628)
5. Orissa (50,354)

Top five states with maximum forest cover as part of their area

Top five states / UTs with maximum forest cover as percentage of their own geographical area are as follows:

1. Mizoram (88.93%)
2. Lakshadweep (84.56%)

3. A&N islands (81.84%)
4. Arunachal Pradesh (80.30%)
5. Nagaland (78.21%)

Forest Cover in Altitude Zones

Altitude Zones	% of forest found
0-500m	52.50
500-1000m	28.27
1000-2000m	10.88
2000-3000m	5.76
3000-4000m	2.46
Above 4000m	0.13

Important Observations

- Out of the total forest cover, the maximum share is of *Moderate Dense Forests*, followed by Open Forests. The very dense forests in India are in just around 2.5% of total geographical area of the country.

- Among all the states of India the states which have shown considerable improvement in their forest cover are: Tamil Nadu, Jammu and Kashmir, Uttar Pradesh, Kerala, Karnataka.
- The states where forest cover has decreased substantially are Mizoram ,Telangana, Uttarakhand, Nagaland, Arunachal Pradesh.
- The total forest cover in the hill districts of the country is 283,015 sq km which is 39.99 % of total geographic area of these districts. In the latest report the hill districts have recorded a net increase of 1680 sq km area.
- North east constitutes only 7.98% of geographical area of the country but it occupies *one fourth of the forest cover*. However according to the current report there is a decrease in the forest cover in the north east by 628 sq km which is primarily because of shifting cultivation and increase in biotic pressure.

Mangroves Cover

In world's total mangrove vegetation, India's share stands at 3%. Currently Mangrove cover in India is 4740 km² which is 0.14 % of the country's geographical area. Sundarbans in West Bengal accounts for almost half of the total area. As compared to 2013 there is a net increase of 112 sq km in the mangrove cover. Top five states with maximum Mangrove cover are as follows:

1. West Bengal (2106)
2. Gujarat (1107)

3. Andaman & Nicobar Island (617)
4. Andhra Pradesh (367)
5. Odisha (231)

Mangroves are also found in Tamil Nadu, Goa, Kerala, Daman & Diu, Karnataka and Puducherry.

Total Carbon Stock

The total carbon stock has also increased by 103 million tonnes or an increase of 1.48 in percentage terms compared to previous assessments. The total carbon stock in the country's forest is around 7, 044 million tonnes. The increase in the carbon stock shows the commitment of the country towards achieving INDC target of additional carbon sink of 2.5 to 3.0 billion tonnes of CO2.

Types of Forests on the basis of Administration

On the basis of administration, the forests in India are of three categories:

Reserved Forests

These forests are under the direct supervision of the government and no public entry is allowed for collection of timber or grazing of cattle. About 53 per cent of the total forest area falls in this category.

Protected Forests

These forests are looked after by the government, but the local people are allowed to collect fuel-wood/timber and graze their cattle without causing serious damage to the forests. These forests occupy about 29 per cent of the total forest area of the country.

Unclassified Forests

The unclassified forests are those in which there is no restriction on the cutting of trees and grazing of cattle. About 18 per cent of the total forest area of the country falls under this category.

Policy towards Forests Rights in India

Before India was established as a British Colony, there was no forest policy. Each ruler of various states in India had his or her own approach to manage the forest resources in their territories. The British imposed the so called ***scientific forest management*** in India whereby their sole agenda was focused on continuous commercial production of the timber. The formula of the forest management at that time in India was a typical European production based forestry model for, the pressure of man of forests was not as high as in current times.

Conflict over Forest Rights and tribal revolts

The permanence settlement of 1757, the forest act of 1865 and 1878 and the forest policy of 1894 were one of the root causes of rebellions and revolts of the indigenous communities in India. These revolts began from 1794 and continued till 1920s. The target of these rebellions was the new land and forest policies which left them devoid of their traditional rights over forests. But the rebellions were crushed ruthlessly and

British kept brining fresh areas under state control, formulating new laws for legitimizing the property rights transferred from communities to state.

In due course of time, forests were **declared state property** and the rights of the forest dwellers vis-a-vis the commercially valued species were curtailed. In some of the forest areas, there was a complete ban on the human activities such as collection of firewood, fodder, medicinal plants, bamboo etc.

In 1864, the Forest Department was established, which strongly asserted the state monopoly over forest resources and exclusion of the tribal communities from almost all kinds of rights over forest produce. This was the foundation of modern principles of Forest Administration in our country.

In 1894, the **first Indian Forest Policy** was adopted by the colonial regime. The policy viewed the forests as the potential sources for generating profits and 'stressed' on the need to preserve forests of the hilly regions. But the hidden agenda was to consolidate the state's property rights over the forests. The forest dwellers were not only denied their traditional rights but no role was given to them in the preservation of the forests. This was the beginning of marginalization of the forest dwellers in India.

Following the independence of India, the Forest Policy Resolution 1952 called for the protection of wildlife and preservation of fauna by demarcating the forests for sanctuaries and national parks. This culminated in the enactment of **Wildlife Protection Act in 1972**. The *Forest Policy 1988 deviated from the economic importance for the first time and treated them as ecological necessity as source of goods for local populations*. These goods were called **Non Timber Forest Produce (NTFP).** This policy also set the target of increasing India's forest cover to 33%.

The 1988 Forest policy paved the way for implementation of the **Joint Forest Management (JFM)** which included the involvement of local village communities and voluntary agencies in the regeneration of the degraded forests. This was for the first time in centuries that the rights of the local communities over the forest lands were specified.

- But the **Wildlife Protection Act** of 1972 had already criminalized the forest people and taken away their traditional NTFP and fishing rights, while poaching could never be effectively stopped.

Forest Rights Act 2006

In 1990, a Joint Forest Management Circular was released by the Government of India, which recommended the involvement of village communities, voluntary agencies in the regeneration of the degraded forest lands. However this circular had no force of law behind it.

However, the **Forest Act 2006** marked a real water shade in the history of the forest communities in India. For the first time, the Government of India via the **Scheduled Tribes and the Other Forest**

Dwellers (Recognition of Forest Rights) Act 2006, admitted that *'forest rights on the ancestral lands and their habitat were not adequately recognized in the consolidation of state forests during the colonial periods as well as in Independent India resulting in Historical injustice with the scheduled tribes and other traditional forest dwellers, who are integral to the very survival of the forest ecosystem".*

This Forest Rights Act 2006 provides the following:

- Tenurial Security and access rights to forest dwellers
- Right to hold and live in forest land under individual or common occupation for habitation or for the self-cultivation for livelihood.
- Right of ownership access to collect, use and dispose of minor forest produce that has been traditonay collected within or outside the village boundaries.
- Other community rights such as on fish and water bodies.
- Rights of settlement and conversion of **forest villages** into **revenue villages**.

As per this act, **Gram Sabha plays pivotal role** in ensuring the rights of the forest dwellers, decision making, planning and management for Joint Forest Management.

Defining a Forest Village and a Revenue Village

Forest Village

As per the Forest Act 2006, "forest villages" means the settlements which have been established inside the forests by the forest department of any State Government for forestry operations or which were converted into forest villages through the forest reservation process and includes forest settlement villages, fixed demand holdings, all types of *taungya settlements*, by whatever name called, for such villages and includes lands for cultivation and other uses, permitted by the Government.

Revenue Village

A Revenue Village is a small administrative region in India, with defined borders, that is recognized by the District Administration. One revenue village may contain many hamlets.

In the rural areas the smallest area of habitation, viz., the village generally follows the limits of a revenue village that is recognised by the normal district administration. The revenue village need not necessarily be a single agglomeration of the habitations.

Thus, a revenue village has a definite surveyed boundary and each village is a separate administrative unit with separate village accounts. It may have one or more hamlets. The entire revenue village is one unit.

A Revenue Village versus a Hamlet

Normally in India, the 'village' is taken to mean the revenue village administrative unit. However due to immense variation in the sizes of revenue villages in different states, larger revenue villages can contain several hamlets spread over a large area.

Impact on Lives of Forest Dwellers living in Forest Villages

The most significant difference in living standards of the tribals living in forest and revenue villages in India is that the tribals of the Forest villages have lived in the state of insecurity and bondage. The dwellers of Forest Villages can't access various schemes of the state and central governments which are implemented on the basic level of revenue villages. Over 60 years after Independence, the residents of 'forest villages' and other settlements and unsurveyed villages in forests remain deprived of access to most development programmes due to the land on which these are located continuing to be recorded as 'forest'.

- Whereas officially there are an estimated 2500 to 3000 Forest Villages, unofficial estimates suggest their number to be over 10,000.
- As no agency other than forest departments can undertake any development work on forest land, most of these settlements remain outside the jurisdiction of any local government, and their residents in some states cannot obtain even domicile certificates (as only the revenue department can issue these, but it does not have jurisdiction over forest land) or even voting rights.

Due to their residents lacking any legal rights over the land, they are treated like 'non-citizens' ever vulnerable to eviction or displacement without entitlement to compensation or rehabilitation.

Conversion of Forest Villages into Revenue Villages

The 1990 Circular of Ministry of Environment and Forests (MOEF), Government of India had for the first time mandated the conversion of forest villages into revenue villages and settlement of other old habitations. But this circular was lacking legislative backing. Section 2F of the Forest Rights Act 2006 reiterated the MoEF's 1990 guidelines, and enabled the residents of all 'forest villages' as defined above, many created by the forest departments themselves in the past to ensure availability of bonded labour for forestry operations, to get their villages/settlements converted into revenue villages.

Conclusive Note

In 2010, Surma, a tribal village housing around 360 *Tharu* tribe families, in Uttar Pradesh witnessed to become the first tribal village in a forest reserve area to be converted into a revenue village. This means tribals will now get all the constitutional rights given to a citizen of India.

Coral Reefs in India

The major reef formations in India are restricted to the Gulf of Mannar, Gulf of Kachchh, Andaman and Nicobar and Lakshadweep Islands. Scattered coral growth has also been reported along certain inter-tidal belts and submerged banks both on the east and west coasts of the country.

Conditions Required for Healthy Growth of Coral Reef

Coral reefs are huge deposits made up dead shells and secretions of marine organisms like Corals, Calcarious algae, stomatopteroids, gartopods Mollusca etc. The deposits are mostly made up of

Calcium Carbonate. Conditions required for their growth:

- Warm tropical oceans located between 30 degree north and 25 degree south latitudes where a minimum temperature of 20 degree is found and this temperature favour the growth of coral organisms.
- Oceanic water free of sedimentation.
- Transparent parts of ocean bodies.
- Relatively low salinity ocean bodies.

The reefs at present are important to the local community only to the extent of sustenance fishing. Tourism is being developed at some places though local communities do not benefit much from the revenue generated. The health of corals, as deduced from the literature records since 60s has been on steady decline mainly due to stress from anthropogenic pressures and interference.