

REVISION SERIES ENVIRONMENT

WETLANDS IN INDIA

- Wetlands are areas filled with **static or flowing water**.
- These could be **natural or man-made**, and include marshes, fens and peatlands.
- They could also be **inland and coastal**.
- Lakes and ponds, estuaries, swamps, marshes, floodplains of rivers and even **man-made water bodies** such as reservoirs that are created when rivers are dammed qualify as wetlands according to the **Wetlands Division under the Ministry of Environment, Forest and Climate Change (MoEFCC)**.
- Termed '**kidneys of landscape**', wetlands contribute to water purification, water regulation, biodiversity, aesthetics and recreation, according to the United Nations.

WETLANDS IN INDIA

- As per the Division, **India** is home to more than **7.5 lakh** wetlands.
- India has nearly **4.6% of its land as wetlands** covering an **area of 15.26 million hectares** and has **49 sites** designated as Wetlands of International Importance (Ramsar Sites), with a surface area of 1.09 million hectares.
- India has **19 types of wetlands**.
- In state-wise distribution of wetlands, **Gujarat is at the top** (17.56% of total geographical area of the state or 22.7% of total wetlands areas of the country thanks to a long coastline).
- It is followed by **Andhra Pradesh, Uttar Pradesh, and West Bengal**.

WETLANDS IN INDIA

- Wetlands are regulated under the **Wetlands (Conservation and Management) Rules, 2017**.
- The 2010 version of the Rules provided for a **Central Wetland Regulatory Authority**, but new Rules of 2017 replaced it with **state-level bodies** and created a **National Wetland Committee**, which functions in an **advisory role**.
- On the occasion of the **World Wetland Day 2021**, the Minister of State for Environment, Forest and Climate Change, announced the establishment of a **Centre for Wetland Conservation and Management (CWCM)**, as a part of the National Centre for Sustainable Coastal Management (NCSCM), Chennai, an institution under the Ministry.

WORLD WETLANDS DAY

- World Wetlands Day is celebrated every year on **2nd February**.
- This day marks the date of the **adoption of the Convention on Wetlands on 2nd February 1971**, in the Iranian city of Ramsar on the shores of the Caspian Sea.
- The year 2021 also commemorates the **50th anniversary** of the Convention on Wetlands signed on 2nd February 1971 in the Iranian city of Ramsar.
- It was **first celebrated** in 1997.
- **Theme for 2022:** Wetlands Action for People and Nature.

NATIONAL WETLAND DECADAL CHANGE ATLAS

- On the occasion of WWD 2022, "**National Wetland Decadal Change Atlas**" prepared by the **Space Applications Centre (SAC), Ahmedabad** was also released highlighting the changes which have happened in Wetlands across the country in the past decade.
- The **original Atlas was released by SAC in 2011** and has over the years been used extensively by all the State Governments also in their planning processes.

NATIONAL WETLAND DECADAL CHANGE ATLAS

- Scientists at the Space Applications Centre, Ahmedabad, **mapped wetlands larger than 2.25 hectares in area** across the country, using satellite imagery.
- While **ground-truthing** is a crucial part of such analyses that use remotely-sensed data, this is **missing in the Atlas**; this is apparently due to the 'restrictions' caused by the COVID-19 pandemic, according to the Atlas.

NATIONAL WETLAND DECADAL CHANGE ATLAS

- According to the Atlas, the **area under wetlands in India** has increased by 0.64 million hectares (Mha), from 15.34 Mha in 2006-07 to 15.98 Mha in 2017-18.
- Wetlands have **increased in number** too during this time, by 18,810.
- State-wise, **Tamil Nadu, Maharashtra and Andhra Pradesh** have the highest numbers of wetlands, while Gujarat leads in terms of wetland area.
- But interestingly, **most of this increase is in man-made wetlands** (which comprise only one-third of India's total wetlands), not natural ones.
- Inland man-made wetlands have increased by around 80%, and coastal man-made ones by 17%.

RAMSAR SITES IN INDIA

- India has a network of **49 Ramsar sites** covering an area of 10,93,636 hectares, the **highest in South Asia**.
- The **countries with the most Ramsar Sites are the United Kingdom (175) and Mexico (142)**, as per the Ramsar List. Bolivia has the largest area with 148,000 sq km under the Convention protection.

RAMSAR SITES IN INDIA

- **Maximum sites** in the state of **UP - 10**
- **Sundarbans** is the **largest Ramsar Site** in India.
- **Renuka Wetland** of Himachal Pradesh is the **smallest Ramsar Site** in India, followed by **Chandertal Wetland** in Himachal Pradesh.

2 NEW RAMSAR SITES IN INDIA

- On the occasion of **World Wetlands Day on February 2, 2022**, Union Environment Minister Bhupendra Yadav declared **Bakhira Wildlife Sanctuary in Uttar Pradesh and Khijadiya Wildlife Sanctuary in Gujarat** as Ramsar sites.
- With the inclusion of these two sanctuaries in the Ramsar site, the total number of protected wetlands in the **country has increased to 49**.

BAKHIRA WILDLIFE SANCTUARY

- The **Bakhira Bird Sanctuary** is the **largest natural flood plain wetland** of India in Sant Kabir Nagar district of **Eastern Uttar Pradesh**.
- This is an **important lake of eastern UP**, which provides a **wintering and staging ground** for a number of migratory waterfowls and a breeding ground for resident birds.

KHIJADIA WILDLIFE SANCTUARY

- Khijadiya Bird Sanctuary is a bird sanctuary located in Jamnagar district of **Gujarat, India**.
- About **300 species of migratory birds** have been recorded here.
- It is unique in having both **fresh water lakes, salt and freshwater marshlands**.

CENTRAL ASIAN FLYWAY

- Flyway is a **geographical region** within which a **single or a group of migratory species completes its annual cycle** – breeding, moulting, staging and non-breeding.
- The Central Asian Flyway (CAF) covers a **large continental area of Eurasia between the Arctic and Indian Oceans** and the associated island chains.
- The Flyway comprises several important migration routes of waterbirds, most of which extend from the **northernmost breeding grounds** in the Russian Federation (Siberia) to the **southernmost non-breeding (wintering) grounds** in West and South Asia, the Maldives and the British Indian Ocean Territory.
- The birds on their annual migration cross the borders of several countries.
- Geographically the flyway region **covers 30 countries of North, Central and South Asia and Trans-Caucasus.**

DEFINITION OF FOREST

- What constituted a “forest” was **dramatically expanded** following a **Supreme Court judgment** in a petition filed by the late **Godavarman Thirumulpad**.
- *N Godavarman Thirumulpad versus Union of India and Others* (1996) - Now, “forest” also included all areas recorded as “forest” in any government record, **irrespective of ownership, recognition and classification**; all areas that conformed to the “dictionary” meaning of “forest”, and all areas which are identified as “forest” by an expert committee constituted by the Supreme Court following the 1996 order.

FOREST CONSERVATION ACT 1980

PROPOSED AMENDMENTS

- The Forest (Conservation) Act, 1980, came into force to **address deforestation.**
- It **prohibits** the felling of forests for any “non-forestry” use without prior clearance by the central government.
- States notified **forest land**, the FCA made it necessary to get the **Centre’s permission for using such forest land for “non forestry purposes”** and the creation of an **advisory committee to recommend such re-classification.**
- The current definition of forests has locked land across the country; **even private owners cannot utilise their own property for non-forestry purposes.**

FOREST CONSERVATION ACT 1980 PROPOSED AMENDMENTS

- The amendments broadly, proposes to exempt certain categories of infrastructure project developers from approaching the Centre for permission to use forest land for non-forestry purposes.
- For instance, it has **proposed absolving agencies** involved in national security projects, border infrastructure projects, land owned by the Railways or the Road Transport Ministry that was acquired before 1980 or when the Act came into force.

FOREST CONSERVATION ACT 1980

PROPOSED AMENDMENTS

- Proposes to facilitate new technologies such as **Extended Reach Drilling (ERD)** for extraction of oil and natural gas found deep beneath the forest land by drilling holes from outside the forest areas.
- It also distinguishes individuals whose lands fall within a state-specific Private Forests Act or comes within the dictionary meaning of forest as specified in the 1996 Supreme Court order.
- The government proposes to allow the “construction of structures for bona fide purposes” including residential units up to 250 sq m as a one-time relaxation.

FOREST CONSERVATION ACT 1980

PROPOSED AMENDMENTS

- It has **proposed making forest laws more stringent** for notified forests, making offences non-bailable with increased penalties including imprisonment of up to one year.
- It has **disallowed any kind of diversion in certain forests.**

MIYAWAKI FOREST

The technique was pioneered by Japanese botanist, Akira Miyawaki, and is believed to **ensure 10 times faster plant growth, which results in plantation, that is 30 times denser than usual.**

Saplings planted close together grow rapidly as they compete for light.

By planting a **native tree assortment**, replicating the vegetation layers found in a mature forest, Miyawaki was **engineering (and fast-forwarding) the stages of ecological succession** by which a degraded plot turns naturally into a forest.

According to experts, **planting dozens of native species in the same area**, which becomes **maintenance-free** after the first three years.

MIYAWAKI FOREST

- These **fast-shooting micro forests**, say advocates of the method, **could cool concrete cities, clean the air, sustain wildlife, and form carbon sinks.**
- The method is quickly finding favour in government corridors and corporate boardrooms to restore urban spaces.
- But the theory, critics say, far outstrips the evidence in India.
- They argue that the method is **expensive**, its benefits unclear, and Miyawaki's techniques **violate fundamental principles of ecological restoration.**

BONN CHALLENGE

- “**Bonn Challenge**” is a global effort to bring **150 million hectares** of the world’s deforested and degraded land into restoration by 2020, and **350 million hectares by 2030**.
- At the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) 2015 in Paris, India joined the **voluntary Bonn Challenge** and pledged to bring into restoration 13 million hectares of degraded and deforested land by 2020, and an additional 8 million hectares by 2030.
- **India’s pledge** is one of the **largest in Asia**.
- In 2020, the **World Economic Forum** launched the **One Trillion Trees Initiative** inspired by a highly criticised study in *Science* the previous year, which said that the “most effective climate change solution to date” was reforestation.

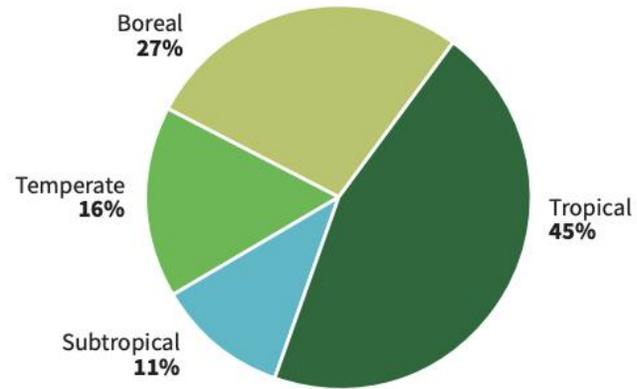
ONE TRILLION TREES INITIATIVE

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GLOBAL FOREST RESOURCES ASSESSMENT 2020

- **Global Forest Resources Assessment 2020 (FRA 2020) report is released by the United Nations Food and Agriculture Organization (FAO).**
- **The FRA 2020 is based on the assessment of more than 60 forest-related variables in 236 countries and territories in the period of 1990–2020.**
 - **The tropical domain has the largest proportion of the world's forests (45 percent), followed by the boreal, temperate and subtropical domains.**
 - **More than half (54 percent) of the world's forests is in only five countries – the Russian Federation, Brazil, Canada, the United States of America and China.**
 - **India is at 10th spot.**
 - **The world's forest area is decreasing, but the rate of loss has slowed.**

Proportion of global forest area
by climatic domain, 2020



Top five countries for forest area, 2020 (million ha)

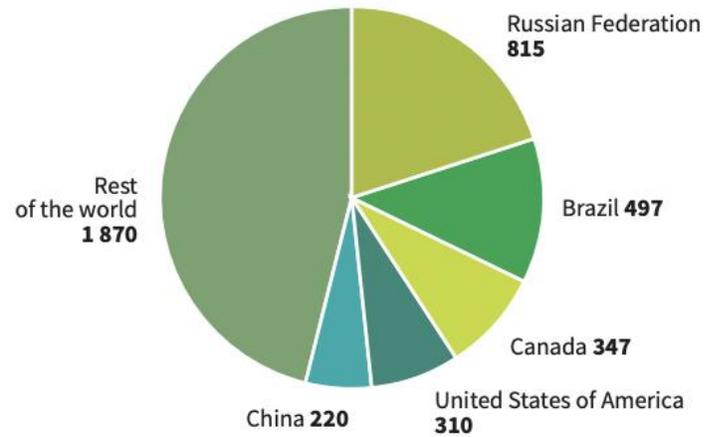


TABLE 3. Top ten countries for forest area, 2020

Ranking	Country	Forest area		
		1 000 ha	% of world forest area	% cumulative
1	Russian Federation	815 312	20	20
2	Brazil	496 620	12	32
3	Canada	346 928	9	41
4	United States of America	309 795	8	49
5	China	219 978	5	54
6	Australia	134 005	3	57
7	Democratic Republic of the Congo	126 155	3	60
8	Indonesia	92 133	2	63
9	Peru	72 330	2	64
10	India	72 160	2	66

TABLE 7. Top ten countries for average annual net loss of forest area, 2010–2020

Ranking	Country	Annual net change	
		1 000 ha/yr	%
1	Brazil	-1 496	-0.30
2	Democratic Republic of the Congo	-1 101	-0.83
3	Indonesia	-753	-0.78
4	Angola	-555	-0.80
5	United Republic of Tanzania	-421	-0.88
6	Paraguay	-347	-1.93
7	Myanmar	-290	-0.96
8	Cambodia	-252	-2.68
9	Bolivia (Plurinational State of)	-225	-0.43
10	Mozambique	-223	-0.59

Note: The rate of change (%) is calculated as the compound annual change rate.

TABLE 8. Top ten countries for average annual net gain in forest area, 2010–2020

Ranking	Country	Annual net change	
		1 000 ha/yr	%
1	China	1 937	0.93
2	Australia	446	0.34
3	India	266	0.38
4	Chile	149	0.85
5	Viet Nam	126	0.90
6	Turkey	114	0.53
7	United States of America	108	0.03
8	France	83	0.50
9	Italy	54	0.58
10	Romania	41	0.62

Note: The rate of change (%) is calculated as the compound annual change rate.

INDIA STATE OF FOREST REPORT 2021

- Minister for Environment, Forest and Climate Change, recently released the **biennial** “India State of Forest Report 2021 (ISFR)”.
- The report is published by the **Forest Survey of India (FSI)** which has been mandated to assess the **forest and tree resources of the country** including wall-to-wall forest cover mapping in a **biennial cycle**.
- Forest survey of India (FSI), an **organization under the Ministry of Environment Forest, & Climate Change, Government of India**.
- Starting 1987, 17 assessments have been completed so far.
- ISFR 2021 is the **17th report** in the series.

INDIA STATE OF FOREST REPORT 2021

The report **contains information** on -

- Forest cover
- Tree cover
- Mangrove cover
- Growing stock inside and outside the forest areas
- Carbon stock in India's forests

INDIA STATE OF FOREST REPORT 2021

- In addition to the regular chapters, this time round, a special chapter on **“Forest Cover assessment in Tiger reserves and Tiger corridor areas of the country and decadal change in Forest Cover”** has also been included.
- Results of the two special studies namely **Above Ground Biomass Estimation using Synthetic Aperture Radar data** (carried out in collaboration with ISRO) and **Climate hot spots in forest areas studies** (carried out in collaboration with BITS Pilani, Goa campus) are also being presented in this report.
- **New initiatives** taken up in the **last two years** by the **Forest Survey of India (FSI) team** are also being presented as a special chapter.
- **India's progress towards achieving the Nationally Determined Contribution commitments** are also included as part of the chapter on Forest carbon assessment.

FOREST COVER AND FOREST AREA

- The term **'Forest Cover'** refers to all lands **more than one hectare in area with a tree canopy of more than 10%**, irrespective of land use, ownership and legal status.
- It may include even orchards, bamboo, palm etc and is assessed by a wall-to-wall mapping exercise using **remote sensing technique** followed by **intensive ground truthing**.
- On the other hand, the term **'Recorded Forest Area'** or **'Forest Area'** refers to all the **geographic areas recorded as 'Forests' in government records**.
- Recorded forest area mainly consists of Reserved Forests (RF) and Protected Forests (PF), which have been notified under the provisions of Indian Forest Act, 1927 or its counterpart State Acts.



TREE COVER AND TREES OUTSIDE FOREST (TOF)

- Tree cover is defined as all **tree patches of size less than 1 ha occurring outside the recorded forest area.**
- Tree cover includes trees in all formations including scattered trees.
- Though TOF and tree cover appear as similar terms but they are two different entities as defined the FSI's assessment, though closely related to each other.
- TOF refers to all trees growing **outside RFA irrespective of patch size** which could also be larger than 1 ha.
- Thus, **tree cover becomes a subset of TOF.**

INDIA STATE OF FOREST REPORT 2021

Table 2.2 Forest Cover classified in terms of canopy density classes

Class	Description
Very Dense Forest	All lands with tree canopy density of 70 percent and above.
Moderately Dense Forest	All lands with tree canopy density of 40 percent and more but less than 70 percent.
Open Forest	All lands with tree canopy density of 10 percent and more but less than 40 percent.
Scrub	Forest lands with canopy density less than 10 percent.
Non-forest	Lands not included in any of the above classes. (includes water)

INDIA STATE OF FOREST REPORT 2021

- **Green Wash**

- The extent of wooded areas generally shown in light green colour on the Survey of India toposheets.

- **Growing Stock**

- The sum (by number or volume) of all the trees growing/ living in the forest or a specified part of it.

INDIA STATE OF FOREST REPORT 2021

- The **Total Forest and Tree cover** is **24.62%** of the geographical area of the country.
- The **Total Forest cover** is 7,13,789 sq km which is **21.71%** of the geographical area of the country.
- The **Tree cover** is **2.91%** of the geographical area of the country.
- As compared to ISFR 2019 the current assessment shows an increase of **0.28% of forest and tree cover put together**, at the national level (**Forest Cover - 0.22%** and **Tree Cover - 0.76%**)

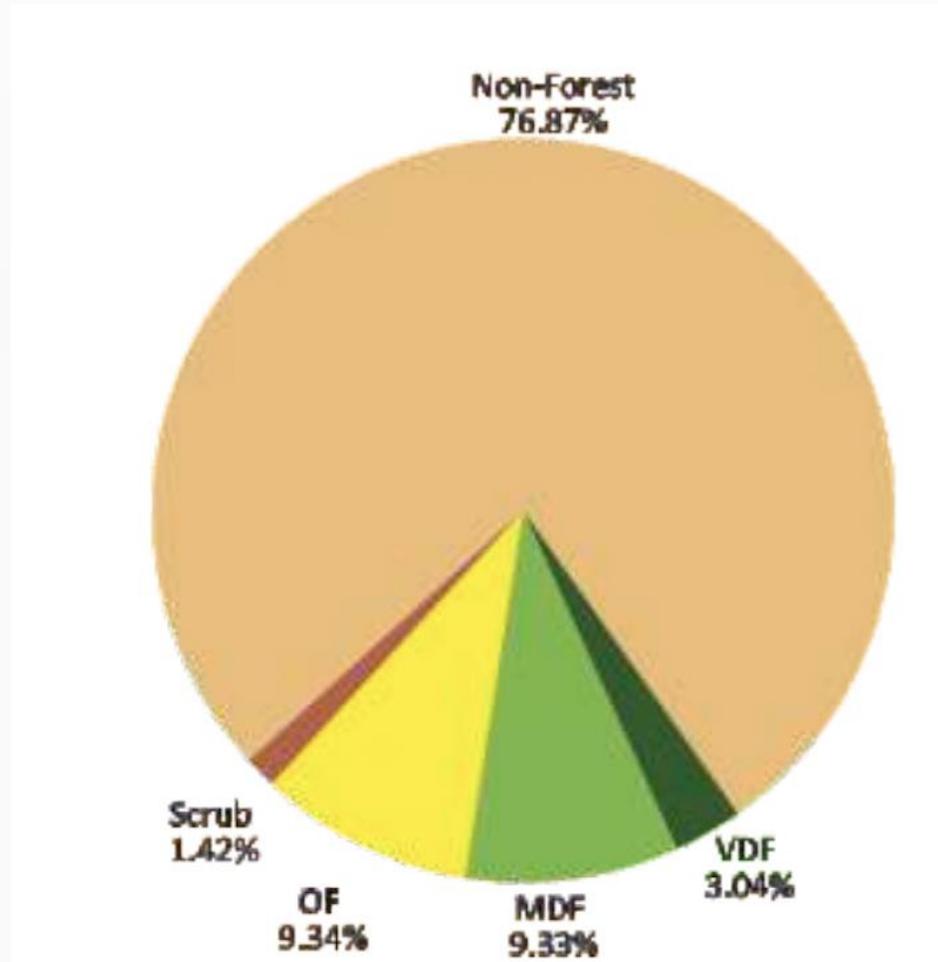
INDIA STATE OF FOREST REPORT 2021

Table 2.3 Forest Cover of India

(in sq km)

Class	Area	Percentage of Geographical Area
Very Dense Forest	99,779	3.04
Moderately Dense Forest	3,06,890	9.33
Open Forest	3,07,120	9.34
Total Forest Cover	7,13,789	21.71
Scrub	46,539	1.42
Non-Forest	25,27,141	76.87
Total Geographical Area	32,87,469	100.00

INDIA STATE OF FOREST REPORT 2021



INDIA STATE OF FOREST REPORT 2021

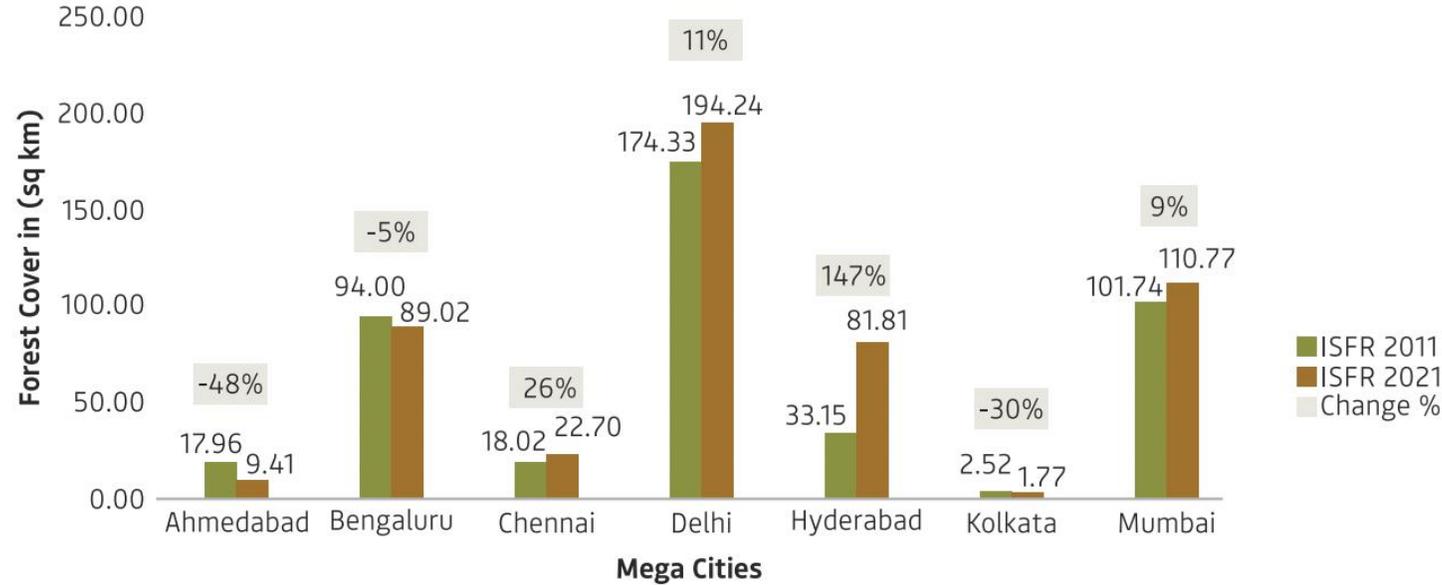
- **Largest forest cover in India -**
 - Madhya Pradesh > Arunachal Pradesh > Chhattisgarh > Odisha > Maharashtra
- The states from the **North eastern region -**
 - Mizoram (84.53%) > Arunachal Pradesh (79.33%) > Meghalaya (76.00%) > Manipur (74.34%) > Nagaland (73.90%).
- The **top five states** in terms of **increase in forest cover -**
 - Andhra Pradesh > Telangana > Odisha > Karnataka > Jharkhand.
- States showing **loss in forest cover -**
 - Arunachal Pradesh > Manipur > Nagaland > Mizoram > Meghalaya.

INDIA STATE OF FOREST REPORT 2021

- As per the report, there is a **decrease of 902 sq km of Forest Cover** in the **hill districts** of the country.
- There is an **overall decrease in Forest Cover** in the **tribal districts** by 55 sq km, however, the Forest Cover inside the Recorded Forest Areas/Green wash areas in the **tribal districts** shows a decrease of 655 sq km.
- There is an **overall decrease of 1,020 sq. km of Forest Cover in the North Eastern States.**
- The total Forest Cover in the seven major cities is 509.72 sq km which is 10.21% of the total geographical area of the cities and there has been an **increase of 68 sq km of Forest Cover in the last ten years.**

INDIA STATE OF FOREST REPORT 2021

Figure 2.16
Forest Cover
between ISFR
2011 & ISFR
2021 in Mega
Cities



INDIA STATE OF FOREST REPORT 2021

Mangroves

- As per **Global Forest Resource Assessment, 2020 (FRA 2020)**, the world over, 113 countries have Mangrove forests covering an estimated 14.79 million hectares.
- **The largest Mangrove area is reported in -**
 - Asia > Africa > North and Central America > South America.
- **Oceania** has reported the smallest area of Mangroves.
- More than **40% of the total area of Mangroves** was reported to be in just four countries: Indonesia (19%), Brazil (9%), Nigeria (7%), and Mexico (6%).
- **India** - The mangrove cover in India is **4,992 sq km**, which is **0.15% of the country's total geographical area**.
- **Increase in the mangrove cover** as compared to 2019 assessment is 17 sq km.
- The states that show significant gain in Mangrove cover are **Odisha and Maharashtra**.

INDIA STATE OF FOREST REPORT 2021

- The report and the survey for the first time ever have included **Gir Forest, Tiger Reserves, and Tiger Corridors**.
- Of the total 32 tiger reserves, forest cover has shown a **decadal increase in 20 of them**, while the rest of the **10** has shown **decreased forest cover**.
- Forest cover in **tiger corridors has increased** slightly but in the case of **tiger reserves a slight decrease** in forest cover is registered.

INDIA STATE OF FOREST REPORT 2021

Highest number of Tiger Reserves - MP and Maharashtra - 6 each.

Largest Tiger reserve - Nagarjunsagar-Srisailem Tiger Reserve in Andhra Pradesh > Manas in Assam > Indravati in Chattisgarh

Smallest Tiger reserve - Orang in Assam

Highest number of Tigers - Corbett(UK) > Nagarhole(Karnataka) > Bandipur (Karnataka)

No tigers are found in - Palamau(Jharkhand), Dampa(Mizoram) and Buxa(West Bengal)

Highest Tiger density - Corbett > Kaziranga (Assam) > Nagarhole(Karnataka)

Lowest Tiger density - Amrabad(Telangana)>Sanjay Dubri (Madhya Pradesh) > Kalakad Mundanthurai (Tamil Nadu)

INDIA STATE OF FOREST REPORT 2021

- As per the long-term trend analysis performed by FSI, nearly **10.66% area of Forest Cover** in India is under extremely to very highly fire prone zone.
- States under **North-Eastern Region** showed the highest tendency of forest fire, and these states fall under extremely to very highly forest fire zone.
- States like **Mizoram, Tripura, Meghalaya, and Manipur** in the North-Eastern Part of India exhibit the **highest forest fire probability** in terms of its frequency of event occurrence.
- Parts of Western Maharashtra, the Southern part of Chhattisgarh, the Central part of Odisha, and a few parts of Andhra Pradesh, Telangana, and Karnataka are showing patches of extremely and very highly fire-prone zones.

INDIA STATE OF FOREST REPORT 2021

- **Forest cover as a percentage of the area of Tiger reserves, the top five Tiger reserves are -**
Pakke in Arunachal Pradesh (96.83%) > Achanakmar in Madhya Pradesh (95.63%) > Simlipal in Odisha (94.17%) > Kali in Karnataka (92.45%) > Dampa in Mizoram (92.05%).

INDIA STATE OF FOREST REPORT 2021

- Following tiger reserves have **experienced gain in forest cover**:
 - Buxa Tiger Reserve (West Bengal)
 - Indravati Tiger Reserve (Chhattisgarh)
 - Anamalai Tiger Reserve (Tamil Nadu)
- Following tiger reserves have **experienced loss in forest cover**:
 - Kawal Tiger Reserve (Telangana)
 - Bhadra Tiger Reserve (Karnataka)
 - Sunderbans Tiger Reserve (West Bengal)

INDIA STATE OF FOREST REPORT 2021

- The 5,821 wetlands cover 7.20% of the total area of the Tiger reserves.
- The **Sundarban Tiger Reserve** has the largest area under wetlands accounting for 96.76% of its total area.
- **Kanha Tiger Reserve** has the highest number of wetlands, 461 wetlands.

INDIA STATE OF FOREST REPORT 2021

Tree Cover

- There is an **increase of 721 sq km** in the extent of tree cover as compared to the 2019 assessment.
- **Maximum Tree Cover** - Maharashtra > Rajasthan > Madhya Pradesh > Karnataka
- **Maximum Tree Cover as percentage of geographical area** - Chandigarh > Delhi > Kerala > Goa
- **Maximum extent of TOF** - Maharashtra > Odisha > Karnataka
- **Maximum extent of TOF as a percentage of geographical area** - Lakshadweep > Kerala > Goa

INDIA STATE OF FOREST REPORT 2021

Bamboo

- As compared to the ISFR 2019, the total bamboo bearing area in the country has **decreased** by 1.06 million ha.
- States with **Maximum Bamboo Bearing Area** - MP > Arunachal Pradesh > Maharashtra
- States with **highest increase in Bamboo Bearing Area** - Mizoram > Arunachal Pradesh
- Madhya Pradesh has been the **biggest loser** with 2,473 sq. km followed by Karnataka with 1,557 sq. km and Manipur with 1,526 sq. km.
- **Commercial plantations** have been a factor in the marginal increase of 2,261 sq. km of forest cover in the country, the India State of Forest Report (ISFR) 2021 suggests.
- These plantations also seem to be **robbing bamboo of its space**.

INDIA STATE OF FOREST REPORT 2021

- The **Centre had in 2017** amended a section of the **Indian Forest Act of 1927** to change the classification of bamboo **from tree to grass**.
 - Consequently, bamboo grown in private or homestead land by millions of farmers does not require a felling or transit permission from any State Forest Department.
- The **National Bamboo Mission's report** prior to ISFR 2021 **said India had the highest area of 13.96 million hectares** under bamboo and was the second richest country after China in terms of bamboo diversity with 136 species.
- The annual production of bamboo in India in 2019-2020 was 14.6 million tonnes and the bamboo-rattan industry in the country was worth ₹28,005 crore in 2017.
- Data with the International Network for Bamboo and Rattan say **China exports 68% of the world's bamboo and rattan products** valued at \$1,112. The European Union is China's largest importer followed by the US.
- India too is a major importer of Chinese bamboo products.
- This is ironic since the bamboo craft is one of the oldest cottage industries in our country where the plant, called the poor man's timber, has more than 1,000 documented uses including housing and manufacture of paper.

INDIA STATE OF FOREST REPORT 2021

Carbon Stock

- The carbon stock for 2021 has been estimated at **7,204.0 million tonnes**.
- There is an increase of **79,4 million tonnes of carbon stock** as compared to the estimates of the 2019 report.
- **State-wise Maximum carbon stock** - Arunachal Pradesh > Madhya Pradesh > Chhattisgarh > Maharashtra
- **State-wise Maximum per hectare carbon stock** - Jammu & Kashmir > Himachal Pradesh > Sikkim > Andaman & Nicobar Island

INDIA STATE OF FOREST REPORT 2021

(in million tonnes)

Component	Carbon Stock in forest in 2021	Carbon stock in forest in 2019	Net change in Carbon stock	Annual change in Carbon stock
Above Ground Biomass	2,319.9	2,256.5	63.4	31.7
Below Ground Biomass	718.9	700.8	18.1	9.1
Dead wood	47.7	35.8	11.9	6.0
Litter	107.3	127.9	-20.6	-10.3
Soil	4010.2	4,003.6	6.6	3.3
Total	7,204.0	7,124.6	79.4	39.7

INDIA STATE OF FOREST REPORT 2021

Carbon Stock

- Decline in carbon stock primarily occurs due to **destruction of dense forests** which store maximum carbon.
- **Plantation drives and commercial plantations** can make up for green cover but can't replace the carbon lost in deforestation.

INTERNATIONAL DAY OF FORESTS

- The **United Nations General Assembly** proclaimed **21 March** the **International Day of Forests in 2012** to celebrate and raise awareness of the importance of all types of forests.
- Countries are encouraged to **undertake local, national and international efforts** to organize activities involving forests and trees, such as tree planting campaigns.
- The organizers are the **United Nations Forum on Forests** and the **Food and Agriculture Organization of the United Nations (FAO)**, in collaboration with **Governments**, the Collaborative Partnership on Forests and other relevant organizations in the field.
- The **theme** of the International Day of Forests for 2022 is “Forests and sustainable production and consumption”.

ALL THE BEST

Thank You