

1. ECOLOGY, ECOSYSTEM AND FUNCTIONS OF ECOSYSTEM

UN DECADE ON ECOSYSTEM RESTORATION

Why in News?

- The United Nations General Assembly (UNGA) proclaimed 2021–2030 as the Decade on Ecosystem Restoration.

About UN Decade on Ecosystem Restoration:

- The UN Decade on Ecosystem Restoration aims to **massively scale up the restoration of degraded and destroyed ecosystems** as a proven measure to fight the climate crisis and enhance food security, water supply and biodiversity.
- Ecosystems addressed include **forests, grasslands, croplands, wetlands, savannahs, inland water, coastal and marine ecosystems, and even urban environments.**

CARBON STORAGE

- Species-rich forests offer stable carbon capture. Teak, eucalyptus plantations had 43% and 55% less carbon storage than natural forests, respectively.
- Rate of carbon capture was more stable across years in forests than in plantations, and carbon capture by forests was more resilient to drought.

SOURCE - SINK DYNAMICS & TIGER POPULATION

Why in News?

- The tiger survey has highlighted that the tiger population in the source-sink is in the ratio of 60:40.

About

- Source-sink dynamics is a **theoretical model** used by ecologists to describe **how variation in habitat quality may affect the population growth or decline of organisms.**
- Source**, is a **high-quality habitat** that on average allows the population to increase.
- Sink**, is **very low-quality habitat** that, on its own, would not be able to support a population.
- However, if the **excess of individuals produced** in the **source frequently moves to the sink**, the sink population can persist indefinitely.

- 33% of the tiger population in India **lives outside its source** i.e, tiger reserves.

AFRICAN BAOBAB TREE

Why in News?

- A recent study published in the journal Scientific Reports has found that the tree 'African Baobab' has 168 chromosomes.

About African Baobab Tree:

- Type of Trees → Baobabs are **deciduous trees** ranging in **height from 5 to 20 meters.**
- Found in → The African baobab (*Adansonia digitata*) is one of the nine species of baobab and is native to **mainland Africa.** They **are also found in African Savannah.**
- Oldest Known Angiosperm Tree → Carbon-14 dating places the **age of a specimen** of African baobab in Namibia at **about 1,275 years.**
- Tree of Life → As African baobab is a **succulent**, which means that during the rainy season it **absorbs and stores water in its vast trunk**, enabling it to produce a **nutrient-dense fruit** in the dry season when all around is dry and arid.

Carbon-14 Dating:

- Also called **radiocarbon dating**, it is a **method of age determination** that depends upon the **decay to nitrogen of radiocarbon (Carbon-14).**
- Carbon-14 is continually formed in nature by the **interaction of neutrons with nitrogen-14** in the Earth's atmosphere.
- The neutrons required for this **reaction are produced by cosmic rays** interacting with the atmosphere.

BBX11 GENE

Why in News?

- Recently, the Indian Institute of Science Education and Research (IISER) has recognized the BBX11 gene that facilitates the greening of crops.

About

- The researchers discovered a mechanism where **two proteins oppositely regulate the BBX11 gene** to **maintain optimum ranges of BBX11.**