News Analysis (02 Aug, 2019)

Economic Valuation of Tiger Reserves

The **National Tiger Conservation Authority (NTCA)** has released a study titled **"Economic Valuation of Tiger Reserves in India: A Value+ Approach".**

- The study, authored by the **Centre for Ecological Services Management** at the **Indian Institute of Forest Management (Bhopal),** estimated the **economic valuation, based on ecosystem services, of ten tiger reserves** in the country. The ten Tiger Reserves are:
    - Anamalai (Tamil Nadu),
    - Bandipur (Karnataka),
    - Dudhwa (Uttar Pradesh),
    - Melghat (Maharashtra),
    - Nagarjunsagar-Srisailam (Andhra Pradesh/ Telangana),
    - Pakke (Arunachal Pradesh),
    - Palamau (Jharkhand),
    - Panna (Madhya Pradesh),
    - Similipal (Odisha), and
    - Valmiki (Bihar)
- **Objective:** The objective behind the report is to enhance tiger conservation by highlighting the holistic economic benefits of protected areas.
- **Approach:** The **Value+ approach** was used in the study, where the **"VALUE" represents** all the **benefits in monetary terms** for those services where monetary economic valuation is possible and derived based on the available knowledge, tools and methods.

    The "+" represents all those benefits **for which economic valuation is currently not possible** on account of lack of accepted methodologies, knowledge, available technology, current resources and/or understanding of the system.

Ecosystem Services and Tiger Reserves

- Ecosystems Services can be defined as **benefits in terms of goods or services provided by nature** which are of fundamental **importance to human well-being,** for health, livelihoods, and survival.
- In the context of natural resource development, Tiger Reserves are the primary repositories of forests and other natural ecosystems.
- A range of **ecosystem services emanate from tiger reserves** such as Non Timber Forest Products (NTFPs) provisioning, employment generation, carbon sequestration, biological control, habitat for species, genepool protection, gas regulation, pollination, fuelwood, fodder grazing, watershed protection, increased soil fertility, physical and mental well being, spiritual tourism etc.

Economic Value of Tiger Reserves

- The study findings indicate that the natural ecosystems in the Tiger Reserves (TRs) provide adequate resources to humans in the range of Rs. 1643-7042 crore.
- **TRs offer protection from disease, predators, and parasites,** which is an avoided cost in the range of Rs. 7.7 crore to Rs. 24.15 crore.
- They also help in maintaining a benign physical and chemical environment for amenable living conditions by providing necessary infrastructure and ecosystem services worth Rs. 2567-8260 crore.
- The tiger reserves play a **significant role in the lives of local communities** and conserve a range of traditional values apart from providing recreation and leisure. Thus the socio-cultural fulfilment benefits from these TRs range from 0.3 crore to 62.144 crore.
- They conserve ecosystems and natural assets worth Rs. 15310-98530 crore.

Suggestions

- **Ecosystem services should be kept as a focal area** in Tiger management.
- Comprehensive analysis of ecosystem services may result in establishing partnerships with relevant stakeholders, effective policies and mechanisms for incentivizing conservation.
- **Adequate investment in natural capital** contained in tiger reserves is essential to ensure the flow of ecosystem services in the future.

Note

The Indian Institute of Forest Management is an autonomous institute of Ministry of Environment, Forest and Climate Change, established in 1982.

Source: TH

Multi-cropping

A recent study conducted by the **Centre for Economic and Social Studies** (CESS) has highlighted the importance of multi-cropping system.

- In multi cropping system, farmers grow **two or more crops** on farmland in one calendar year (unlike mono-cropping, that involves planting only one crop on a field). It includes inter-cropping, mixed-cropping and relay cropping.
    - **Intercropping:** Is growing two or more crops simultaneously in a definite cropping pattern.
    - **Relay cropping:** Relay cropping involves growing of two or more crops on the same field with the planting of the second crop after the first one has reached its reproductive stage.
    - **Mixed intercropping:** It involves growing more than one crop simultaneously **without any distinct row arrangement.**
- Multi cropping system is common in **tropical regions** having more rainfall, higher temperatures, and a longer growing season.

Economical Benefits

- **Higher Productivity:** Multiple cropping system is seen as a way to maximize land productivity in a small area by improving the intensity of land and labor use for better profit and stabilizing farm income.
- **Fodder Stock:** Growing multicrops or polycrops ensures enough fodder stocks for cattles.
- **Food Security:** In multi-cropping system, even if one or two crops fail, farmers still be able to harvest other crops to guarantee food throughout the year.
- **Multiple Uses:** Crops don't just yield grains but also fodder and fuelwood.

Agronomic Benefits

- **Pest Management:** Growing a variety of crops together minimizes pest problems and makes efficient use of soil nutrients, water, and land.
    Leguminous (crops having roots that are able to make soil nitrogen available to other plants), when intercropped with other crops, particularly those that require plenty of nitrogen (e.g. young maize plants and sorghum), results into efficient use of soil nutrients.
- **Weed Management:** It helps to suppress weeds, as weeds find it difficult to grow alongside some crops.
- **Sustainable crop production systems:** This reduces the application of chemical fertilizers and pesticides.

Centre for Economic and Social Studies

- The Centre for Economic and Social Studies (CESS) was established as an autonomous research Centre in 1980.
- Later in 1986 it was recognized as a national institute by the Indian Council of Social Science Research (ICSSR) (Ministry of Human Resource Development, Government of India).
- The Centre for Economic and Social Studies (CESS) has been registered under Section 6(1) (a) of the **Foreign Contribution (Regulation) Act 1976.**

Source: BL

Global Honour for Indian Scientist

Atish Dabholkar, a **theoretical physicist** from India, known for his research on **string theory** and **quantum black holes,** has been appointed as the next director of the Italy-based **International Centre for Theoretical Physics (ICTP).**

- Dabhokar will succeed **Fernando Quevedo** from November 2019.
- He is the second Indian appointed to the post in ICTP history after **Katepalli Sreenivasan,** who was Quevedo's predecessor.
- Dabholkar is currently the head of the High Energy, Cosmology and Astroparticle Physics section of ICTP based in **Trieste, north-east Italy.**
- He is also the winner of the 2006 **Shanti Swarup Bhatnagar Award** for Science and Technology.
- He completed his school education in Kolhapur district of Maharashtra and did his graduation from IIT, Kanpur, and earned a PhD in theoretical physics from Princeton University.
- Until 2010, he was a professor of theoretical physics at **Tata Institute of Fundamental Research in Mumbai,** and has been a visiting professor at Stanford University and a visiting scientist at **CERN.**

International Centre for Theoretical Physics

- International Centre for Theoretical Physics (ICTP) was founded in 1964 by the late Nobel Laureate **Abdus Salam.**
- Its mandate is to **provide education and skills to scientists from developing countries for their** productive careers.
- **It** has helped in **stemming the scientific brain drain** from the developing world.

String Theory

- It is an attempt to combine the **quantum mechanics** (body of scientific laws that describe the behavior of photons, electrons and other particles that make up the universe) and **Albert Einstein's theory of relativity** — with an overarching framework that can explain all of physical reality.
- It tries to do so by positing that particles are actually **one-dimensional,** string-like entities whose vibrations determine the particles' properties, such as their mass and charge.

European Organization for Nuclear Research

- European Organization for Nuclear Research (CERN) is the **European Organization founded in 1954 for Nuclear Research.**
- It aims to provide a unique range of particle accelerator facilities that enable world-class research in **fundamental physics.**
- It operates the world's largest and most powerful particle accelerator i.e **Large Hadron Collider (LHC).**

Theoretical Physics

- It is the development of mathematical formalisms and computational protocols for describing all aspects of objects found in the world around us and their interaction.
- This can involve both providing models for understanding empirical results or constructing self-logical theories for explaining phenomena beyond current experiments.

Shanti Swarup Bhatnagar Award

- The award is named after the founder Director of the **Council of Scientific & Industrial Research (CSIR) India,** the late Dr (Sir) Shanti Swarup Bhatnagar and is known as the 'Shanti Swarup Bhatnagar (SSB) Prize for Science and Technology'.
- The Prize is given each year for outstanding contributions to science and technology.

Source: TH

Deciphering Indus Script

According to the research paper titled **'Interrogating Indus inscription to unravel their mechanism of meaning conveyance',** the Indus inscriptions **can be compared to the structured messages** found on stamps, coupons, tokens and currency coins of modern times.

The Indus inscriptions have not been deciphered due to the absence of bilingual texts,

extreme brevity of the inscriptions, and ignorance about the language(s) encoded by Indus script.

Findings

- The majority of the **Indus Valley inscriptions** were written **logo graphically** (by using word signs) and not by **using phonograms** (speech sounds units), claims a recent research paper published in Palgrave Communications, a Nature group journal.
- The paper mainly focuses on understanding how Indus inscriptions conveyed meanings, rather than on deciphering what they conveyed.
- The inscribed seals and tablets were **used in some administrative operation** that controlled the commercial transactions of the ancient Indus Valley Civilisation.
- According to paper, though many ancient scripts use **rebus methods** to generate new words, the inscriptions found on the Indus seals and tablets have not used rebus as the mechanism to convey meaning.
- The researcher also rejected the popular hypothesis that the seals were inscribed with Proto-Dravidian or Proto-Indo-European names of the seal-owners.

Rebus Method

- A common perception among some scholars is that the Indus script is logo-syllabic, where one symbol can be used as a word sign at one time and as a syllable-sign at another.
- This method, where a word-symbol also gets sometimes used only for its sound value, is called the rebus principle. **E.g.:**
    The pictures of a honey bee can be combined with a leaf to signify the word "belief" (bee+leaf).

Source: TH

Growing Human Organs in Animals

Scientists in **Japan** have received the **permission** of the government to **try growing human organs in animals.**

- The research led by Hiromitsu Nakauchi, a professor of genetics at Stanford University, is the **first of its kind.**
- The research involves **generating animal embryos —** mice, rats or pigs — that lack a particular organ such as a pancreas.
    - The modified embryos are then implanted with human **"induced Pluripotent Stem (iPS)"** cells that can grow into the missing pancreas.
    - The embryos would be transplanted into wombs where they could theoretically

be carried to term with a functioning human pancreas.

- **Concerns:**
  - Implanting animal embryos with human cells creates what is known as a **chimera**- an entity with both animal and human cells.
  - The process throws up complex **ethical issues,** particularly over concerns that it may not be possible to completely control which organs are formed in the animal by the human iPS cells.
- **Benefit:** This experiment may lead to a future where human organs for transplant could be grown inside animals.

Source: TH

Increasing the Strength of SC Judges

The Union Cabinet of India has approved increasing the strength of judges in the Supreme court.

- The Cabinet has taken a decision to increase the strength (an increase of 10%) from 31 to 34 judges including the Chief Justice of India (CJI).
- The Supreme Court (Number of Judges) Act, 1956 was last amended in 2009 to increase the judge's strength from 25 to 31 (including the CJI).
- As per the **Article 124(1)** of the Constitution of India, the strength of the Supreme Court is fixed by the law made by the Parliament.

Need

- **Rising Pendency:**
  - Between 2006 and 2018 (up to April), there has been an 8.6% rise in the pendency of cases across all courts.
  - Pendency before Supreme Court increased by 36%, High Courts by 17%, and subordinate courts by 7%.
- **Low Disposal Rate:** The disposal rate has stayed between 55% to 59% in the Supreme Court, at 28% in the High Courts, and at 40% in the subordinate courts.

Constitutional Provisions

- **Article 124(1)** states that there shall be a Supreme Court of India consisting of a Chief Justice of India and, until Parliament by law prescribes a large number, of not more than seven other judges.
- **Article 124(2)** states that every judge of the Supreme Court shall be appointed by the President by warrant under his hand and seal after consultation with such number of the judges of Supreme Court and of the High Courts (in states).

- The Parliament is competent to increase the number of judges if it deems necessary.

Source: TH

Hope Probe

The **United Arab Emirates (UAE)** has announced that it will launch the **'Hope Probe'**, the **Arab world's first spacecraft** to **Mars,** in July 2020.

- The space programme, also known as the **Emirates Mars Mission (EMM),** aims at collecting information on Mars, meteorological layers and study the causes of loss of hydrogen and oxygen gases -- the two main constituents of water -- from the upper layer of the Martian atmosphere.
- The mission, if successful, will become the **first space exploration programme** to take a picture of the Mars atmosphere.
- The 'Hope Probe' **will be launched** into orbit in mid-**July 2020.** The spacecraft is expected to reach Mars orbit in the first quarter of 2021, coinciding with the **50^{th} anniversary of the founding of the UAE.**

Source: ToI
