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News: National Pest Surveillance System (NPSS)

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- National Pest Surveillance System (NPSS), an AI powered programme was recently launched by Ministry of Agriculture to connect farmers with scientists and experts by mobile phones on controlling pests.
- The aim of the programme is to reduce the dependence of farmers on pesticide retailers and to inculcate a scientific approach among them towards pest control.
- The NPSS will analyse latest data using AI tools to help farmers and experts in pest control and management.
- The NPSS is expected to help 14 crore beneficiaries.
- Farmers can take photos of the infected crops or the insect using the system on their mobile phones and these photos will reach the experts.
- The application will also help in determining the correct quantity of pesticide to be used.

News: International Seabed Authority (ISA) and United Nations Convention on the Law of the Sea (UNCLOS)

- Recently, the International Seabed Authority (ISA), an agency under the United Nations Convention on the Law of the Sea (UNCLOS), celebrated its 30th anniversary.

International Seabed Authority (ISA)

- The International Seabed Authority (ISA) was formed on 16th November 1994 as an **intergovernmental body under the United Nations Convention on the Law of the Sea (UNCLOS)**.
- The International Seabed Authority (ISA) was formed **as an initiative for organising, regulating and controlling all the mineral-related activities in the international seabed area** that are beyond the limits of national jurisdiction.
- The ISA held its first inaugural meeting in its host country, **Jamaica (Kingston in HQ)**, on 16 November 1994, the day the Convention came into force.
- There are **168 Members including India and European Union in ISA**.
- The **area under its jurisdiction covers around 54% of the total area of the world's oceans**.

Mandate

- Regulating the conduct of all exploration activities and exploitation of deep-sea minerals.
- Protection of the marine environment from harmful effects of deep seabed-related activities.
- Encourage marine scientific research.

India and ISA

- On 18th January 2024, India submitted two applications for exploration in the international seabed area of the Indian Ocean.
- Polymetallic sulphides in the Indian Ocean Ridge (Carlsberg Ridge).
- Cobalt-rich ferromanganese crusts of the Afanasy-Nikitin Seamount in the Central Indian Ocean.
- Currently, India holds two contracts for exploration in the Indian Ocean.
- Polymetallic nodules and sulphides in the Central Indian Ocean Basin and Ridge.

United Nations Convention on the Laws of the Seas

(UNCLOS)

- The United Nations Convention on the Law of the Sea (UNCLOS) is an international treaty which was adopted and signed in **1982 in Montego Bay (Jamaica)**.
- The Law of the Sea Convention **defines the rights and responsibilities of nations with respect to their use of the world's oceans.**
- It **establishes guidelines for businesses, the environment, and the management of marine natural resources.**
- The Convention has become the legal framework for marine and maritime activities.
- UNCLOS came into **force in 1994.**
- The convention has been ratified by 168 parties, which includes 167 states (164 member states of the United Nations plus the UN Observer state Palestine, as well as the Cook Islands, Niue and the European Union).
- **India is a member. USA is the most important non-subscriber** to the UNCLOS.
- UNCLOS divides the marine areas into Internal Waters, Territorial Seas, Contiguous Zone, Exclusive Economic Zone and High Seas (Open Oceans).

- **Internal waters:** Waters on the landward side of the baseline. Each **state has full sovereignty** over the Internal Waters.
- **Territorial seas:** Extends from **12 nautical miles from the baseline**. (1 nm = 1.85km). States have sovereignty and jurisdiction over surface, seabed, subsoil and even airspace.
- **Contiguous Zone:** Extends from **24 nautical miles from baseline**. Jurisdiction of state over contiguous zone is limited to ocean surface and sea floor but not airspace.
- **Exclusive Economic Zone:** Extends from **200 nautical miles from baseline**. Rights to explore and exploit natural resources and rights to carry out activities like energy-production can be done by the state. However, it is not exclusive.
- **High-Seas:** **Ocean Surface over the EEZ** is termed as High-Seas. It is considered as common heritage of mankind. It is **beyond any national jurisdiction**.
- **Protection of seas until 5 nautical miles is vested with coastal police and Coast guard and till 30 miles is vested with Coast Guard and rest is with Indian Navy.**

Deep Ocean Mission

- The Deep Ocean Mission proposes to explore the deep ocean similar to the space exploration started by ISRO about 35 years ago.
- The estimated cost of the mission will be Rs. 4077 crore for a period of five years to be implemented in a phase-wise manner.
- The estimated cost for the first phase for the 3 years (2021-2024) would be Rs.2823.4 crore.
- The deep ocean mission will be a mission mode project to support the Blue Economy Initiatives of the government.
- Ministry of Earth Sciences is the nodal agency for DOM.
- The focus of the mission will be on deep-sea mining, ocean climate change advisory services, underwater vehicles and underwater robotics related technologies.
- It also includes the construction of Offshore-based desalination plant using tidal energy.
- The technology and expertise needed in such missions is now available with only five countries - US, Russia, France, Japan and China. India will now be the sixth country to have it.

Significance

- The mission will give a boost to efforts to explore India's vast Exclusive Economic Zone and Continental Shelf.
- The plan will enable India to develop capabilities to exploit resources in the Central Indian Ocean Basin (CIOB).

Potential

- India has been allotted 75,000 square kilometres in the Central Indian Ocean Basin (CIOB) by UN International Sea Bed Authority for exploration of poly-metallic nodules.
- CIOB reserves contain deposits of metals like iron, manganese, nickel and cobalt.
- It is envisaged that 10% of recovery of that large reserve can meet the energy requirement of India for the next 100 years.

Polymetallic Nodules

- Polymetallic nodules (also known as manganese nodules) are potato-shaped, largely porous nodules found in abundance carpeting the sea floor of world oceans in deep sea.

- Besides manganese and iron, they contain nickel, copper, cobalt, lead, molybdenum, cadmium, vanadium, titanium, of which nickel, cobalt and copper are considered to be of economic and strategic importance.
- Deep Ocean Mission will prove to be a game changer in the future. India has 7517 km long coastline. Around 30 per cent of the country's population lives in coastal areas. Ocean is a major economic factor supporting fisheries and aquaculture, tourism, livelihoods and blue trade. Oceans are also a storehouse of food, energy, minerals, and medicines.

There are six components to the programme.

- Under the Mission, a manned submersible will be developed to carry three people to a depth of six thousand metre in the ocean.
- An Integrated Mining System will also be developed for mining Polymetallic Nodules. The exploration studies of minerals will pave the way for commercial exploitation in the near future.
- A research vessel for deep ocean exploration would be built in an Indian shipyard which would create employment opportunities.
- The second component involves developing Ocean Climate Change Advisory Services, which entails developing a suite of observations and models to

understand and provide future projections of important climate variables on seasonal to decadal time scales.

- The next component is **searching for deep sea flora and fauna**, including microbes, and studying ways to sustainably utilise them.
- The fourth component is to **explore and identify potential sources of hydrothermal minerals that are sources of precious metals** formed from the earth's crust along the Indian Ocean mid oceanic ridges.
- The fifth component involves **studying and preparing detailed engineering design for offshore Ocean Thermal Energy Conversion (OTEC)** powered desalination plants.
- OTEC is a technology **which uses ocean temperature differences from the surface to depths lower than 1,000 meters**, to extract energy.
- The final component is aimed at **grooming experts in the field of ocean biology and engineering**. This component aims to translate research into industrial applications and product development through onsite business incubator facilities.

Matsya 6000

- Matsya 6000 is a **manned submersible vehicle under the Deep Ocean Mission by Ministry of Earth Sciences.**
- It has been **designed and developed by National Institute of Ocean Technology (NIOT), Chennai.**
- Matsya – 6000 will go **down deep to 6000metres (6kms) in the Ocean to search for deep – sea resources like minerals.**

Significance

- The **manned submersible will allow scientific personnel to observe and understand unexplored deep-sea areas by direct intervention.**
- It will also boost the Central government's vision of 'New India' that highlights the **Blue Economy** as one of the ten core dimensions of growth.
- India has a unique maritime position, **a 7517 km long coastline, which is home to nine coastal states and 1,382 islands.**
- For India, with its three **sides surrounded by the oceans and around 30% of the nation's population living in coastal areas** and coastal regions play a major economic factor.
- It **supports fisheries and aquaculture, tourism, livelihoods, and blue trade.**

News: Borneo Elephants

- Recently, Borneo elephants (*Elephas maximus Borneensis*) have been classified as 'Endangered' on the IUCN Red List.

Borneo Elephants

- Borneo elephant is a **subspecies of the Asian elephant (*Elephas maximus*) that is native to the island of Borneo.**
- They are **primarily located in Sabah, Malaysia and Kalimantan, Indonesia.**
- They are **genetically distinct from other Asian elephant populations, characterised by their smaller size and unique skull shape.**
- They **are herbivores, and live in family groups led by a matriarch and typically found near water sources such as rivers.**
- Only about **1,000 Borneo elephants remain, with 400 of them being breeding adults.**
- The main threat to them is **human-elephant conflict, poaching, and habitat loss caused by logging and oil palm plantations, leading to the loss of about 60% of their forest habitat in the last 4 decades.**
- Borneo is the **world's 3rd largest island, shared by Malaysia and Brunei in the north and Indonesia in the south.**