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News Analysis (07 Dec, 2018)

National Mission on Interdisciplinary Cyber-Physical Systems

The Union Cabinet has approved the launching of **National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS)** to be implemented by **Department of Science & Technology** for a period of **five years.**

> NM-ICPS covers entire India which includes Central Ministries, State Governments, Industry and Academia.

Cyber-Physical Systems

- Cyber-physical systems **integrate** sensing, computation, control and networking **into physical objects and infrastructure,** connecting them to the Internet and to each other.
- Few Potential applications: **Driverless cars** that communicate securely with each other **on smart roads**, Sensors in the home to **detect changing health conditions,** improving **agricultural practices** and enabling scientists to address issues arising out of climate change,etc.
- Advances in cyber-physical systems will enable capability, adaptability, scalability, resiliency, safety, security and usability that will far exceed the simple embedded systems of today.

Objective

- The NM-ICPS is a comprehensive Mission which would address technology development, application development, human resource development & skill enhancement, entrepreneurship and start-up development in Cyber Physical System (CPS) and associated technologies.
- The Mission aims at establishment of **15 Technology Innovation Hubs (TIH)**, **six Application Innovation Hubs (AIH)** and **four Technology Translation Research Parks (TTRP).**

- These Hubs & TTRPs will connect to **Academics, Industry, Central Ministries and State Government** in developing solutions at reputed academic, R&D and other organizations across the country in a hub and spoke model.
- The Hubs & TTRPs have **four focused areas** along which the Mission implementation would proceed, namely:
    - Technology Development,
    - HRD & Skill Development,
    - Innovation, Entrepreneurship & Start-ups Ecosystem Development, and
    - International Collaborations.

Background

- CPS and its associated technologies, like Artificial Intelligence (AI), Internet of Things (IoT), Machine Learning (ML), Deep Learning (DP), Big Data Analytics, etc. have pervaded and is playing a transformative role in almost every field of human endeavour all most in all sectors.
- Therefore, It has become imperative for government and industries to be **prepared to adopt these emerging and disruptive technologies in order to remain competitive**, drive societal progress, generate employment, foster economic growth and to improve the overall quality of life and sustainability of the environment.

Impact

- CPS technologies provide a **cutting edge to a Nation's scientific, engineering, and technological innovative capabilities;** support other missions of the government, provide industrial and economic competitiveness and have truly **became a Strategic Resource**.
- The proposed Mission would act as an **engine of growth that would benefit national initiatives** in health, education, energy, environment, agriculture, strategic cum security, and industrial sectors, Industry 4.0, SMART Cities, Sustainable Development Goals (SDGs) etc.
- CPS is an integrated system of upcoming technology, which in turn is being taken up on priority basis by countries in the race for development. CPS will indeed bring a paradigm shift in entire skill sets requirement.
- The **job opportunities will be enhanced** through the Mission by imparting advanced skills and generating skilled manpower as per the requirement of the industry/society. Accordingly, it is estimated that, about 40,000 jobs will be created in the short term and about 2,00,000 in long term.

Agriculture Export Policy 2018

The Union Cabinet has approved the Agriculture Export Policy, 2018.

- The policy would help the government in achieving the target of doubling farmers income.
- The vision of Agriculture Export Policy is to **harness the export potential of Indian agriculture, through suitable policy instruments, to make India global power in agriculture and raise farmers income.**
- **Objectives of the Policy**
  - To double agricultural exports from present ~US$ 30+ Billion to ~US$ 60+ Billion by 2022 and reach US$ 100 Billion in the next few years thereafter, with a stable trade policy regime.
  - To diversify the export basket, destinations and boost high value and value-added agricultural exports including a focus on perishables.
  - To promote novel, indigenous, organic, ethnic, traditional and non-traditional Agri products exports.
  - To provide an institutional mechanism for pursuing market access, tackling barriers and deal with sanitary and phytosanitary issues.
  - Enable farmers to get the benefit of export opportunities in the overseas market.

Need For Export Policy

- The policy can **address challenges to exporting agricultural products** from India like low farm productivity, poor infrastructure, global price volatility to market access.
- **India's share in global exports of agriculture products was merely 2.2 % in 2016.**
- India has remained at the lower end of the global agriculture export value chain given that the **majority of its exports are low value, semi-processed and marketed in bulk.** The share of **India's high value and value-added agriculture produce in its agri-export basket is less than 15% compared to 25% in the US and 49% in China.**
- India is **unable to export its vast horticultural produce due to lack of uniformity in quality, standardization and its inability to curtail losses across the value chain.** Given the globalization of value chains, it is imperative that the country make concerted efforts to boost exports of high margin, value-added and branded processed products.
- The **vision of doubling farmers income by 2022** will require a series of interventions to improve production and productivity along with economizing the cost of production. Th**is would also require India to augment its exports to the global market. Hence, it is necessary to have an agriculture export policy in place.**

Key Recommendations of Agricultural Export Policy 2018

Strategic   Policy Measures

Infrastructure and Logistics Boost

Whole Government Approach to boost exports

Greater involvement of State Governments in Agri Exports

Operational   Focus on Clusters

Promoting Value-added exports

Marketing and promotion of "Produce of India"

Infrastructure and Logistics to support agricultural exports

Establishment of Strong Quality Regimen

Self-sufficiency and export-centric production

Research & Development

Miscellaneous

- **Stable Trade Policy Measures** to ensure recommends providing an assurance that the processed agricultural products and all kinds of organic products **will not be brought under the ambit of any kind of export restriction.**
    > The Model Agricultural produce market committee (APMC) act must be adopted by all states and E-NAM must be established.
- **Liberalizing Land Leasing Norms** and adoption of the Model Contract Farming Act by state governments in order to promote agricultural exports.
    > Contract farming is expected to bring in large-scale private investments in agriculture thus leading to large-scale mechanization. This will further produce surplus volumes of the standardized, exportable quality of agricultural products.
- **Infrastructure and Logistics Boost** by identifying ports for the export of agricultural products. Development in port infrastructure like dedicated perishable berths.
- **Whole Government approach** which will ensure all government department and ministries like Ministry of Agriculture, Ministry of Food Processing Industries, Ministry of Shipping & Transport, Ministry of Railways and Ministry of Consumer Affairs involved in agricultural production, processing, transportation and export should work

together to address bottlenecks at every level.

- **State government involvement:** As Agriculture is a state subject it is necessary to bring on board the state governments for positive agricultural reforms. Each state has its own agricultural nuances, like one state may be experiencing a drought while another may be dealing with floods. Thus it is necessary to align state agricultural policies with the nation's overarching goals.
  - State governments must identify the government department for the promotion of the agricultural export.
  - The states must include agriculture export in state export policy and build infrastructure and logistics to facilitate agricultural export.
- **Focus on Export centric Clusters** for pre- and post-harvest management of the production as well as in upgrading the supply chain to attain much higher levels of export from those clusters.
- **Promoting Value Added Exports of** indigenous and tribal products.
  - Through the National Programme on Organic Production (NPOP), organic food parks and by the uniform quality and packaging standards India can tap the potential for increasing organic exports.
  - Promotion of Research & Development (R&D) activities, promoting "produce in India" through the constitution of separate funds dedicated to organic, value-added, ethnic, GI and branded products.
- **Post-Harvest Infrastructure** that can support the smooth logistical movement of agri-produce exports. This will have a direct co-relationship in increasing export volumes, assuring quality & ensuring better price realization per unit.
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    Digitization of land records, geo-mapping of lands, registration of farmers and farm producer organizations (FPOs) is critical to smooth agricultural exports.
- **Establishment of Strong Quality Regimen** with the focus on strong R&D, new varieties, state of the art lab and a lab networking process for effective accreditation and monitoring.
    An institutional mechanism should be provided that would pursue market access, tackle barriers and deal with sanitary and phytosanitary issues against India's agricultural exports that come up from time to time.
- **Research and Development** led by private industry along with higher infrastructure spend by the government will be the key to boosting agricultural exports.
    Along with this, innovations in packaging, improving the shelf life of products and greater R & D in developing products to suit the palates of importing countries should be a priority.
- The policy has recommended setting up of **an agri-startup fund.**

Seabed 2030: Mapping of Seafloor

The **U.N.-backed project, called Seabed 2030**, is working to pool data to create a map of the **entire ocean floor by 2030**. The map will be freely available to all.

- The project was **launched in 2017** is a collaboration between the Nippon Foundation (Japanese philanthropic organisation) and Gebco (non-profit association of experts).
- So far, the biggest data contributors to Seabed 2030 have been Dutch energy prospector Fugro and deep-sea mapping firm Ocean Infinity which were also involved in the search for Malaysia Airlines jet MH370, which disappeared in 2014.
- The advanced **sonar technology** and advent of new technology such as **underwater drones and robots** is also speeding up the mapping process.

Benefits

- **Economic:** More than 90% of the world's trade is carried by sea, making safe navigation a key motivator for mapping.
  - It will **help the "blue economy",** as countries and companies seek to protect or exploit deep-sea resources - from exploring for oil and gas to installing wind farms or laying fibre-optic cables for the Internet.
- **Environmental:** it would provide a **better idea of sea levels as ice melts** and warn about **impending tsunamis** that could devastate coastal communities.

Challenges

- Even after collaboration at a scientific and technical level to share data, countries may use that knowledge **against one another in geopolitical spats.**
- Few countries are **reluctant to give up strategic proprietary data to the Seabed 2030 project**, largely due to national security concerns or in areas with sensitive geopolitical tensions, such as the South China Sea.

Conclusion

- The project gains importance in the **context of negotiations over UN Sustainable Development Goal (Goal 14 - to conserve and sustainably use the oceans)** due to be completed by 2020.
- Moreover, the next phase of the project will also **encourage data donors and crowdsourcing** - not just from exploration vessels, but also from cargo ships, recreational sea-users and fishing boats.

Air Pollution in India: One in 8 Deaths due to Air Pollution

A recent study under **India State-Level Disease Burden Initiative** has estimated the exposure to air pollution and its **impact on deaths, disease burden, and life expectancy**

in every state of India in 2017.

- The study was conducted by the **Indian Council of Medical Research (ICMR)**, Public Health Foundation of India (PHFI), and Institute for Health Metrics and Evaluation (IHME) in collaboration with the Ministry of Health and Family Welfare.
- It has been estimated that **one in every eight deaths in India is attributable to air pollution** which now contributes to more disease burden than tobacco use.
- In India, the major **sources of ambient particulate matter pollution** are coal burning for thermal power production, industrial emissions, construction activity and brick kilns, transport vehicles, road dust, residential and commercial biomass burning, waste burning, agricultural stubble burning, and diesel generators.

Key Findings

- India has one of the highest exposure levels to air pollution globally.
- 77% of India's population was exposed to mean PM 2·5 more than 40 μg/m³, which is the recommended limit set by the National Ambient Air Quality Standards of India.
- India accounts for around **26%** of the global premature deaths and disease burden due to air pollution. This is disproportionately high because India only holds **18%** of the global population.
- Air pollution was **the second largest risk factor contributing** to the disease burden in India after malnutrition in 2016, with an increasing trend in exposure to ambient particulate matter pollution and a decreasing trend in household air pollution.
- Contrary to the popular association of air pollution with respiratory diseases only, in India, the disease burden included ischaemic heart disease, stroke, chronic obstructive pulmonary disease and lung cancer, which is commonly associated with smoking.
- More than half of the 12.4 lakh deaths in India were of persons younger than 70 and this can be attributed to air pollution in 2017.
- The **average life expectancy** in India **would have been 1.7 years higher** if the air pollution level were less than the minimal level causing health loss.
- India has **one of the highest annual average ambient particulate matter PM2·5** exposure levels in the world.
- In 2017, no state in India had an annual population weighted ambient particulate matter mean PM2·5 less than the WHO recommended level of 10 μg/m³ (PM 2.5 particles are those that are suspended in air and have a diameter lesser than 2.5 microns).
- States in north India had some of the highest levels of both ambient particulate matter and household air pollution, especially Bihar, Uttar Pradesh, Rajasthan, and Jharkhand.
- Delhi, Haryana, and Punjab in north India had some of the highest ambient particulate matter pollution exposure in the country.
- The **Disability Adjusted Life Years (DALY)** which is a measure of overall disease

burden expressed as the number of years lost due to ill-health rate due to ambient particulate matter pollution, was highest in the case of north Indian states like Uttar Pradesh, Haryana, Delhi, Punjab, and Rajasthan.

Way Forward

- Creating a **robust system** to implement existing clean-air policies, **promoting coordination between the centre and states**, and devising state and district-level pollution control plans are vital to improve air quality.
- **Detailed emission inventories** are needed to provide information on the type of pollutant, its proportion, its source and its chemical properties.
- **Satellite data can supplement the routine monitoring of air pollution**, as it can be more economical than setting up and operating a number of fixed stations. They could also be used to identify potential air quality hot spots.
- The **National Clean Air Programme (NCAP)** which lays down a comprehensive strategy framework for enhanced management of air quality should incorporate the time-bound pollution reduction targets across sectors with fixed accountability and strong legal backing.
- The government already has regulating norms for the emissions from industries and policy on reducing dependency on fuel based power. Emphasis should also be on pollution caused by solid fuel used for cooking, dust pollution, inefficient municipal waste disposal.
- Sustainable government support is required for checking the indoor pollution due to solid fuels.
  - For example, **Pradhan Mantri Ujjwala Yojana** under which women of poor households are being provided free cooking gas connections to reduce their dependence on firewood is a good step but the scheme has failed to convert a majority of the poor LPG users because they find LPG less affordable.

Government Initiatives to Combat Air Pollution

- Notification of National Ambient Air Quality Standards and sector-specific emission and effluent standards for industries;
- Setting up of monitoring network for assessment of ambient air quality;
- Introduction of cleaner gaseous fuels like CNG, LPG etc and ethanol blending;
- Launching of National Air Quality Index (AQI);
- Universalization of BS-IV for vehicles by 2017;
- Leapfrogging from BS-IV to BS-VI standards for vehicles by 1st April 2020;
- Banning of burning of biomass;
- Promotion of public transport network;
- Pollution Under Control Certificate;
- Issuance of directions under Air (Prevention and Control of Pollution) Act, 1981;

- Installation of on-line continuous (24x7) monitoring devices by 17 highly polluting industrial sectors;
- Regulating the bursting of pollution-emitting crackers;
- Notification of graded response action plan for Delhi identifying source wise actions for various levels of air pollution, etc.

Important Facts for Prelims (7th December 2018)

Exercise Hand-In-Hand

- Exercise Hand-in-Hand is **annual military exercise** conducted between **India and China.**
- The joint exercise for the **year 2018** will be conducted from 10 to 23 December 2018 at **Chengdu, China.**
- The aim of the exercise is to build and promote close relations between armies of both the countries and to enhance ability of joint exercise commander to take military contingents of both nations under command.

Ideate for India - Creative Solutions using Technology

- The **National e-Governance Division of Ministry of Electronics and Information Technology (MeitY)** in collaboration with **Intel India** has launched a National Challenge for Youths, **"Ideate for India - Creative Solutions using Technology".**
- The aim of this National Challenge is to give **school students** across the country a platform and opportunity to become solution creators for the problems they see around them and their communities.
- It is open to students of **classes 6 - 12 all across the country - all 29 States and 7 Union Territories** and aims to reach out to at least 1 million youth over the next 3 months.
- There are **11 core theme areas** on which students can share their ideas- healthcare services, education services, digital services, environment, women safety, traffic, infrastructure, agriculture, social welfare, disability and tourism.