Session on Precision Agriculture

Why in News

Recently, a session on **"Sensors and Sensing for Precision Agriculture"** was organised by the Indian Council of Agricultural Research-Indian Agricultural Research Institute (ICAR-IARI).

Precision Agriculture

- Precision agriculture (PA) is an **approach where inputs are utilised in precise amounts to get increased average yields,** compared to traditional cultivation techniques such as **agroforestry**, **intercropping**, crop rotation, etc.
- Sustainable PA is this century's most valuable innovation in farm management that is based on using **Information and Communication Technologies** (ICTs).
- It is **based on sustainable agriculture and healthy food production** and it consists of profitability and increasing production, economic efficiency and the reduction of side effects on the environment.
- **Benefits:**

  - Increases agriculture productivity.
  - Prevents soil degradation.
  - Reduces chemical application in crop production.
  - Efficient use of water resources.
  - Disseminates modern farm practices to improve the quality, quantity and reduced cost of production.
  - Changes the socio-economic status of farmers.
- **Challenges:**

  - Research suggests **educational and economic challenges** as the two most important in the application of precision agriculture.
    - Among the **variables that contribute to educational challenges,** lack of local experts, funds, knowledgeable research and extension personnel have more of an impact compared to others.
    - PA and initial costs have more of an impact among the **economic challenges** compared to the other issues.

Key Points

- **Discussions at the Session:** Recent **advances in the field of sensors,** remote sensing**, deep learning,** artificial intelligence **and** Internet of Things (IoT) **for monitoring and quantification** of soil, plant and environment to enhance farm productivity with increased input use efficiency and environmental **sustainability**.
- **Part of VAIBHAV Summit:** The session is a part of the **Vaishwik Bhartiya Vaigyanik (VAIBHAV) Summit 2020.**

- VAIBHAV is a **Government of India initiative** to bring together the thought process, practices, research and development (R&D) culture of overseas and Indian scientists/academicians.
  - **Research Gaps Identified:**

    - **Development of indigenous low-cost sensors** with integrated platforms, robotics, IoT for high throughput field phenotyping and soil and crop health monitoring and management.

      - **Phenotyping is the process** of determining, analysing or predicting all or part of an organism's phenotype (observable physical properties of an organism).
    - **Big data analytics and modelling** for sensor-based early detection of stresses, discrimination in the agriculture sector.
    - **Standardized protocols for** Unmanned Aerial Vehicle (UAV) based imaging using different sensors, inter sensor calibration and data analytics for near real-time crop condition monitoring and management.
    - **Development of affordable scale neutral precision agricultural technologies** suitable to the ecosystem of Indian agriculture.

      - Scale neutrality means, if other things remain the same, one small plot of land gives the same proportion of output as a large land holding.

Way Forward

- Keeping in view the research gaps, a specific objective-driven collaboration needs to be proposed.
- More R&D in the field and on the concept is needed. For that, collaborations with global universities can be done for further excelling in education and research and capacity building.

Source: PIB

PDF Refernece URL: https://www.drishtiias.com/printpdf/session-on-precision-agriculture