

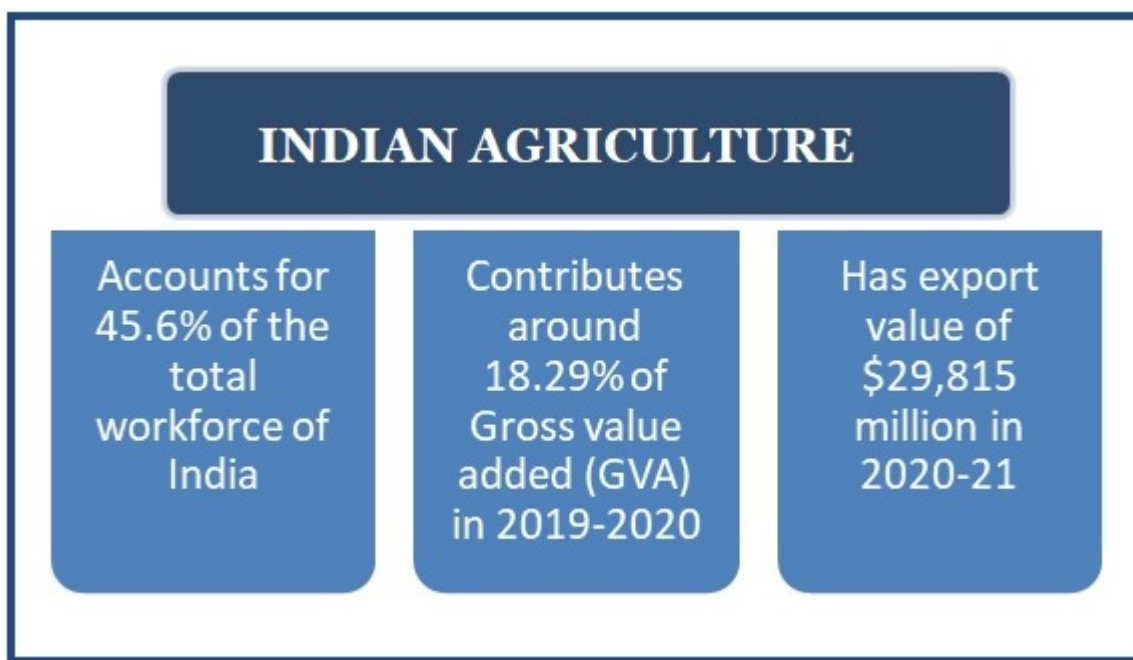
Role of Drones in Agriculture

Why in news?

World Economic Forum (WEF), in its latest report, stated that drones have the potential to be the indicator of technology-led transformation of Indian agriculture.

What is the significance of the farm sector?

- India's agriculture sector provides livelihood for 8% of families and ensures food security to 1.3 billion of people.
- Indian agriculture is not just significant for the domestic market but it is also a key component of the global food supply chain.



What are the challenges in the agriculture sector?

- Food security challenges are compounded by nutritional security, self-sufficiency, ecological problems, climate change and sharp inflation.
- The farm sector faces challenges, including
 - Fragmented landholdings
 - Inefficient usage of agricultural inputs
 - Poor availability of credit and financial inclusion
 - Lack of market access
 - Poor post-harvest infrastructure

What role do drones play in addressing the challenges?

- The term drone, sometimes referred to as **unmanned aerial vehicles (UAVs)** refers to any aerial vehicle that receives remote commands from a pilot or relies on software for autonomous flight.
- Many drones display features like cameras for collecting visual data and propellers for stabilising their flight patterns.

Role of drones

- **Applications**- There are multiple uses for drones, including
 - Pesticide and nutrient application
 - Mapping water spread area
 - Sampling water
 - Mapping macrophyte infestation
 - Aquaculture management practices
- **Cost of application** - As per WEF, drone usage could reduce the cost of application by 20% and mitigate health hazards of manual work.
- **Precision agriculture** - It is also useful in promoting precision agriculture, thereby optimising input use.
- **Productivity** - Precision agriculture know-how and farm advisory services based on data sources can enable 15% increase in productivity.
- **Evidence-based planning** - Drones enable data collection and resource-efficient nutrient application which facilitates crop production forecast, and evidence-based planning.
- **Emerging technologies** - Drones can be an effective enabler for mainstreaming emerging technologies such as yield estimation or insurance.
- **Aid in government initiatives** - With drones, government initiatives like Per Drop More Crop will improve and water use inefficiency in irrigation will decline.
- Drones' data integrated with GIS and Google Earth satellite images will streamline schemes like PMFBY by aiding crop cutting experiments, crop-loss estimation, insurance determination and dispute resolution.
- **Agri-research** - With drones, agri-research will become highly customised and localised.
- **Better pricing** - Since drones can capture backward and forward linkages, food processing industries will procure from farmers at better prices.

WEF has cited that drones have the potential boost the country's gross domestic product by 1-1.5% while adding at least 5 lakh jobs in the coming years.

What steps were taken by the government to promote the use of drones?

- The agriculture ministry had released standard operating procedures (SOPs) for using drones in pesticide and nutrient application.
- Agriculture Ministry provides grant upto Rs. 10 lakhs to agricultural institutes for purchase of drones.

- Union Finance Minister has announced in the Budget 2022-23 that the Centre will promote 'Kisan Drones' to help farmers assess crops, digitise land records, spray insecticides and nutrients.
- The government has notified the [Drone Rules 2021](#) which is expected to make drone operations simpler for civilian drone operators.
- New Delhi has eased drone policies with mechanisms such as the Production Linked Incentive scheme and import bans paving the way for the domestic manufacturing sector.

What is the need of the hour?

- The need is to scale up drone use in the agriculture sector from the present 10,000 aerial vehicles.
- Civil-military engagement should be promoted to realise gains from cross-industry application of drones.
- Consultations may be held with experienced strategic partners like **Israel** where AI-enabled drones are used for mapping plots, assessing crop damage, and even plucking only ripe apples.
- Farmer Producer Organisations (FPOs) and custom hiring centres should be encouraged to buy and loan them to the farmers for a nominal fee.
- As reported by ICAR, other challenges such as weather dependency of drones, improper internet connectivity across farms, unskilled end user, and potential for misuse, etc. should be addressed.
- India also needs a national level streamlining of production systems and production capacity, and rapid cycle manufacturing.

References

1. [The Hindu Businessline | Drones: Giving farmers the wings to fly](#)
2. [Economic Times | Drones can boost India's GDP by up to 1.5%](#)
3. [Financial Express | Use of drones in agricultural sector](#)

