

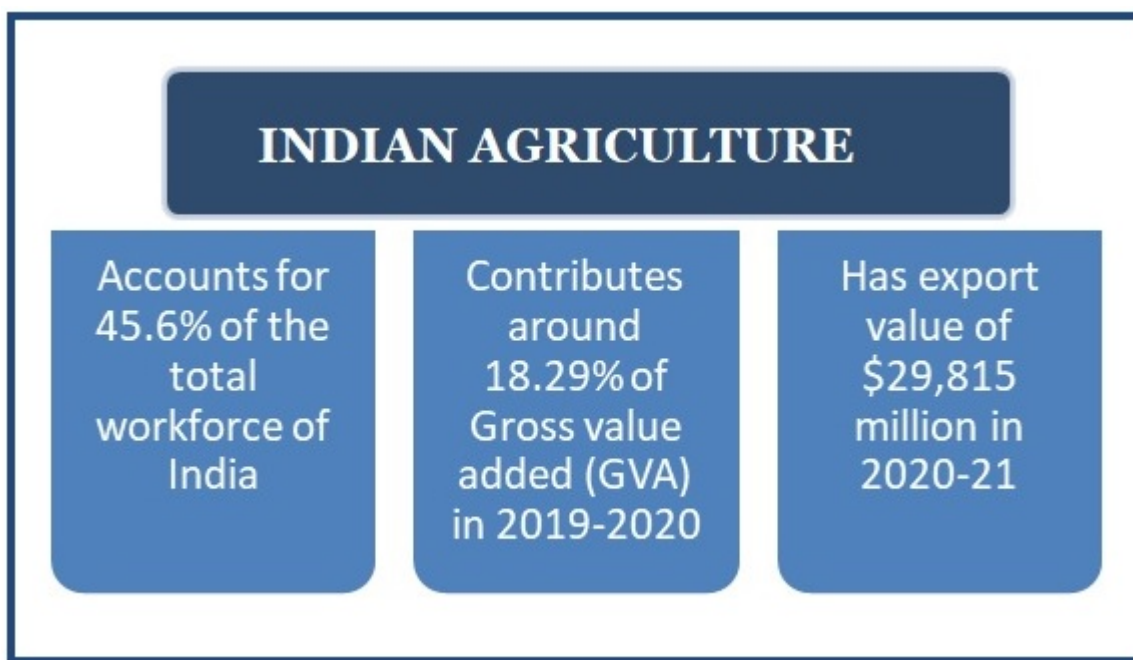
## Role of Drones in Agriculture

### 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](#)

