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Present Status and Scope of Precision Farming in India

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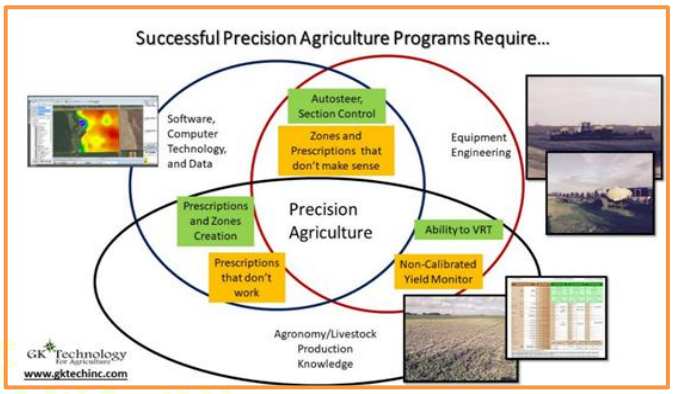
Agriculture is a cornerstone of India's economy, contributing nearly 20% to the GDP and employing over 41% of the population. The net sown area spans in 2021-22 is 141 million hectares (Dept. of agriculture & farmers welfare) while degraded and uncultivable land covers a significant portion of the country's total area.



The Green Revolution of the 1960s helped India achieve self-sufficiency in food production, significantly boosting wheat output from six million tonnes in 1947 to over 72 million tonnes by 1999. This progress was driven by fertilizers, irrigation, high-yielding crop varieties and mechanization. However, excessive reliance on these inputs has led to land degradation and stagnation in productivity.

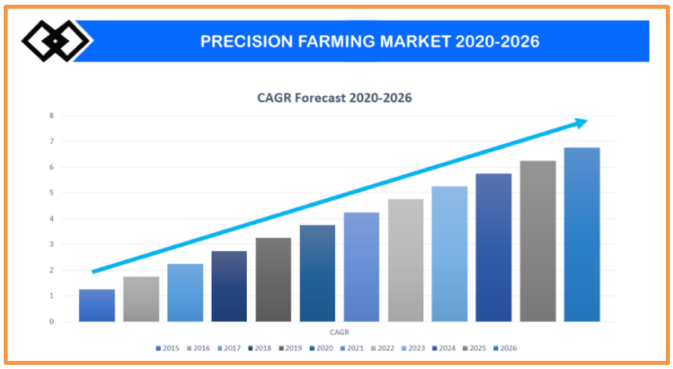
To overcome these challenges, transitioning to an "Evergreen Revolution" through modern technologies is crucial. Precision farming offers a sustainable solution by integrating data-driven techniques to optimize productivity, enhance resource efficiency and minimize environmental impact. By adopting advanced agricultural practices, India can ensure long-term food security and ecosystem conservation.

Status of precision farming in India

Approximately 20 million hectares of land in India are utilized for mulching, while 1.9 million hectares are covered with crops, including plantations with leguminous cover. Around 5 million farmers across the country have adopted mulching as an agricultural practice. It is estimated that in India 3 million farmers have adopted precision farming techniques and around 9.2 million-hectare area has been covered under precise micro-irrigation techniques-drip and sprinkler irrigation.

Scope of Protected Cultivation in India

- **Farming in Challenging Conditions** – Greenhouse cultivation can transform barren and fallow lands into productive areas, benefiting local communities.
- **Urban Agriculture** – Greenhouses ensure a year-round supply of fresh vegetables, ornamental plants and high-value crops for growing urban markets.



- **Boosting Exports** – Greenhouse farming enhances the production of export-oriented crops like cut flowers, strengthening India's global agricultural trade.
- **Plant Propagation & Biotechnology** – Controlled environments support seedling growth, tissue culture propagation and advanced techniques like hydroponics.
- **Medicinal & Rare Plant Cultivation** – Greenhouses provide ideal conditions for large-scale production of high-value medicinal herbs and rare plant species

Steps for Implementing Precision Farming in India

1. **Research and Assessment** – Establish multidisciplinary teams to evaluate the feasibility and benefits of precision farming.
2. **Farmer Cooperatives** – Encourage the formation of farmer groups to collectively adopt and benefit from precision agriculture.
3. **Regulatory Measures** – Implement policies to prevent the excessive and unregulated use of agricultural inputs.
4. **Pilot Projects** – Conduct field trials to demonstrate the effectiveness of precision farming techniques.
5. **Farmer Awareness** – Educate farmers on the risks of improper input usage, such as imbalanced irrigation, fertilizers and pesticides.

Government Initiatives in Precision Farming

Pradhan Mantri Krishi Sinchai Yojana (PMKSY): Launched on **July 1, 2015**, PMKSY aims to provide irrigation facilities to all agricultural fields under the motto **"Har Khet Ko Paani"** and promote water-efficient farming with **"Per Drop More Crop."**

Key Features

- **Duration:** 2015-16 to 2019-20 (Extended components: 2021-26)
- **Financial Allocation:** ₹50,000 crore
- **Area Covered Under Micro-Irrigation (2022-23):**

✓ **Drip Irrigation:** 5.32 lakh hectares
✓ **Sprinkler Irrigation:** 5.70 lakh hectares
✓ **Total:** 11.02 lakh hectares (**Dept. of agriculture, cooperation & farmers welfare)**

Major Components

1. **Accelerated Irrigation Benefits Programme (AIBP)** – Focuses on expediting irrigation projects.
2. **Har Khet Ko Pani (HKKP)** – Includes:

✓ Command Area Development (CAD)
✓ Surface Minor Irrigation (SMI)
✓ Renovation of Water Bodies
✓ Groundwater Development

3. **Watershed Development** – Improves rain-fed farming through soil and water conservation.
4. **Per Drop More Crop** – Promotes micro-irrigation techniques like **drip and sprinkler irrigation.**

Financial Assistance

- **Drip Irrigation:** Up to **55% subsidy** for small/marginal farmers and **45%** for others (limited to 5 hectares).
- **Sprinkler Irrigation:** Assistance for various types, including portable and high-volume systems.

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