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Precision Farming – Optimizing Inputs and Enhancing Smallholder Farmers' Income in Madhya Pradesh (Case Study)

Precision Farming Initiative:

Mr. Dipesh Patel, a farmer from Sehore district in Madhya Pradesh, has been implementing Precision Agriculture tools in combination with organic farming over the past three years. Through the support of the Precision Farming project, IoT-based devices including Soil Moisture Stations, a Weather Station, and an iScout Insect Monitoring Camera were installed on his farm. These tools provided real-time data which helped him make timely and informed decisions for irrigation, pest management, and field operations.

Qualitatively, Dipesh has improved soil health, enhanced crop quality, and developed a strong example for sustainable agriculture. His success story has inspired neighboring farmers to adopt similar practices, making his farm a demonstration site.

In the 2023 Kharif season, beneficiary farmer Mr. Dipesh Patel planted soybean in his field. Compared to the average surrounding farmers, Mr. Patel harvested 24% higher soybean yield (7.2 vs. 5.8 qtl/acre). With the adoption of the precision agriculture advisories, Mr. Patel had 75% higher net benefit from the wheat production compared to the average control farmers. Based on the fertilizer advisories, Mr. Patel reduced nitrogen and phosphorus applications compared to the average control farmer. Similarly, Mr. Patel reduced production costs by 10% and invested 51% less money in pesticide applications than the average control farmer.

Impact of precision agriculture advisory on soybean productivity, input use, total production cost and net benefit with beneficiary farmer Mr. Dipesh Patel compared to the average of surrounding control farmers (five) during wheat cultivation (2023/24) Sehore district. Values presented for control farmer average + standard deviation

Key Technologies:

- Weather forecasting information
- Smart irrigation management
- Smart fertilizer management
- Timely detection of diseases and pests
- Precision nutrient and water management
- Smart advisory and alerts through the i-Krishi App

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Success Points of Precision Farming Benefits at ICARDA, Sehore (Amlaha), Madhya Pradesh

- **Increased Yields**: 8–15% higher yields for soybean, wheat, and cotton
- **Higher Income**: 25–30% increase in overall farm income.
- **Reduced Costs**: 10% lower total production costs; 51% less investment in pesticides.
- **Resource Efficiency**: 15–20% savings in chemical fertilizers (nitrogen and phosphorus); 1–2 fewer irrigation cycles.
- **Environmental Benefits**: Improved soil health, reduced pesticide use by 15–20% (saving 1–2 spray applications), and sustainable farming practices.
- **Farmer Empowerment**: Real-time data via IoT tools (Soil Moisture Stations, Weather Station, iScout Camera) and i-Krishi App for informed irrigation, pest, and nutrient management.
- **Community Impact**: Demonstration site inspiring neighboring farmers to adopt precision agriculture.

Photographs :-

Soil Moisture sensor

Iscout Camera

Weather Station

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