Indian Economy · GS - III

Examine the potential of artificial intelligence and precision agriculture in enhancing farmers' income and climate resilience in India. Discuss the challenges associated with their adoption.

EXAM YEAR	PAPER	SUBJECT
DAILY PRACTICE 12/11/2026	GS - III	Indian Economy

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Precision farming, AI-based advisory, remote sensing, IoT sensors, climate-smart agriculture, input-use efficiency, digital divide, small landholdings, data privacy, institutional support.

Model Answer

Introduction

Indian agriculture faces challenges such as fragmented landholdings, climate variability, rising input costs and uncertain market returns. Artificial intelligence (AI) and precision agriculture can help address these challenges through data-driven farming practices.

Potential Benefits

1. **Resource efficiency:** GPS, sensors and smart irrigation optimise the use of water, fertilisers and pesticides.
2. **Crop management:** AI-based applications support pest detection, disease monitoring, weather forecasting and yield estimation.
3. **Climate resilience:** Predictive tools and climate-resilient crop varieties help farmers adapt to droughts, heat stress and irregular rainfall.
4. **Income enhancement:** Better productivity, reduced input wastage and improved market information can strengthen farm profitability.

5. **Agricultural exports:** Improved quality monitoring and traceability can enhance compliance with international standards.

Challenges and Way Forward

High technology costs, inadequate digital literacy, fragmented holdings, unreliable connectivity and limited access to quality data constrain adoption. Government support should promote affordable digital infrastructure, farmer training, agricultural extension services, public-private partnerships and region-specific AI solutions.

Conclusion

Technology-driven agriculture can contribute to sustainable productivity and higher farm incomes. However, inclusive access and strong institutional support are essential to ensure that small and marginal farmers also benefit.

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