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Q5(a)

Point out the benefits of 'green chemistry' for agrarian transformation in India.

UPSC Civil Services Mains 2020 · Sociology GS 2 · 10 marks · Rural and Agrarian transformation in India

Rural and Agrarian transformation in India: Programmes of rural development, Community Development Programme, cooperatives, poverty alleviation schemes; Green revolution and social change; Changing modes of production in Indian agriculture; Problems of rural labour, bondage, migration.

Core demand of the question

- Point out the benefits of 'green chemistry' for agrarian transformation in India
- Keep the note to a 10-mark length

Revision summary

Green chemistry cuts hazard in the design of farm chemicals.

It can reduce poisoning, residue and water pollution.

Labourers who spray gain if toxicity falls.

Export and soil quality can thicken a healthier commercial agriculture.

Without access for smallholders it becomes a rich-peasant brand.

Introduction

Green chemistry designs chemicals and processes that cut hazard at source. For Indian agrarian transformation it promises safer fields, soils, and exportable harvests, not only a new brand of pesticide.

Body**Benefits on the field**

- Safer synthesis of inputs can lower residue and farmer poisoning in Green Revolution belts where chemical intensity is already high.
- Bio-based solvents, better catalysts, and targeted molecules can mean less runoff into canals and village wells.
- Soil microbes and pollinators survive better than under a blanket spray, which matters for long-run yield, not only for this season's quintal.

Agrarian class and health

- Mazdoors who mix and spray, often Dalit and landless, gain most if toxicity falls. A. R. Desai's labour question is a chemical question too.
- Women's weeding and storage work meets fewer residues in the household grain.

Transformation, not a slogan

- **Green chemistry** supports diversification and quality standards that mandis and exports now demand.
- It fails as transformation if only rich peasants buy patented 'green' packets while smallholders stay on cheap hazardous stock.
- It should sit with MSP, extension, and water, not replace land reform.

Flow diagram

Green chemistry -> Safer inputs less residue
Safer inputs less residue -> Farmer labour health
Safer inputs less residue -> Quality soil transformation
Class access -> Quality soil transformation

Conclusion

Green chemistry benefits agrarian transformation by cutting poison, protecting soil, and raising produce quality. The social benefit is real only if labourers and smallholders get the safer toolkit, not merely a premium market for the already commercial farmer.

Facts & figures

Green chemistry

Design of products and processes that minimise hazard and waste.

Spray labour

Landless and small farmers who bear the body cost of conventional pesticides.

Residue standards

Market rules that safer chemistry can help Indian produce meet.

Green Revolution intensity

The chemical baseline that green chemistry must transform, not only relabel.