

## Highly Hazardous Pesticides in Himachal Pradesh

**Mains:** *GS II - Health | GS III - Environmental pollution and degradation.*

### Why in News?

Recently, the rapid expansion of intensive horticulture in Himachal has led to increasing dependence on Highly Hazardous Pesticides (HHPs), raising serious concerns.

### What are Highly Hazardous Pesticides (HHPs)?

- **HHPs** - They are chemicals that pose exceptionally high risks to human health and the environment.
- **Characteristics** - They are characterized by acute toxicity, long-term health impacts, persistence in ecosystems, and potential to contaminate food chains and water bodies.
- **Reason behind ban** - Many HHPs have been banned or restricted globally due to their association with:
  - Cancer and chronic diseases
  - Neurological disorders
  - Reproductive and developmental problems
  - Farmer poisoning and occupational hazards
  - Environmental degradation
- Despite global concerns, several such pesticides continue to be used in Indian agriculture, particularly in regions with intensive cultivation systems.

### Why Himachal Pradesh is vulnerable?

- **Domination of agriculture** - Unlike many agrarian states that focus on cereals, Himachal Pradesh's agriculture is dominated by high-value crops such as apples, pears, stone fruits, peas, tomatoes, capsicum, and other off-season vegetables.
- These crops are highly susceptible to pests and diseases, requiring repeated pesticide applications throughout the growing season.
- **Multiple spraying of pesticide** - In apple-growing districts such as Shimla, Kullu, and Kinnaur, farmers often spray pesticides multiple times before harvest.
- **Chemicals for productivity** - Similarly, vegetable-growing regions like Solan depend heavily on chemical inputs to maintain productivity and market competitiveness.
- The cultivation pattern creates a cycle of intensive pesticide dependence, increasing both occupational exposure and environmental contamination.

### What are the public health implications?

- **Occupational Hazards for Farmers** - Farmers are the first victims of excessive

pesticide use.

- Repeated exposure during mixing, spraying, and handling pesticides can lead to, Eye irritation, Skin disorders, Respiratory problems, Headaches and dizziness.
- It could also lead to Acute poisoning, Long-term neurological complications
- Many orchard workers and farmers experience these symptoms regularly, making pesticide exposure an accepted but dangerous aspect of agricultural work.
- **Rising Cancer Burden** - The state has reported one of the highest cancer incidence rates in India, with a growth rate significantly above the national average.
- While cancer is a multifactorial disease, medical experts and policymakers have increasingly pointed towards excessive pesticide and chemical fertilizer use as a contributing factor.
- The growing cancer burden imposes significant economic and social costs on families, healthcare systems, and rural communities.
- **Water Contamination** - Heavy rainfall during pesticide application periods washes chemical residues into local streams and rivers.
- This runoff contaminates Surface water, Groundwater, Aquatic ecosystems and Drinking water sources.
- The contamination of water resources poses risks not only to local populations but also to downstream communities dependent on Himalayan rivers.
- **Soil Degradation** - Healthy soil contains diverse microorganisms that support nutrient cycling and plant growth. Excessive use of pesticides disrupts this delicate ecological balance.
- The consequences include, Decline in beneficial microbial populations, Reduced soil fertility, Lower nutrient availability, Increased dependence on synthetic fertilizers.
- As natural soil functions weaken, farmers become trapped in a cycle of increasing chemical input use, raising production costs and reducing sustainability.
- **Biodiversity Loss** - Himachal Pradesh's horticulture sector relies heavily on pollinators, particularly bees, for successful fruit production.
- However, indiscriminate pesticide use adversely affects pollinator populations.
- Declining bee populations have forced many farmers to rent commercial bee colonies for pollination services. This represents an ecological and economic burden that was largely absent in traditional farming systems.
- Pesticides also affect Butterflies, Beneficial insects, Birds, Aquatic organisms
- The loss of biodiversity weakens ecosystem resilience and threatens long-term agricultural productivity.

**Paraquat - A Symbol of the HHP Crisis**

- **Paraquat** - It is a highly toxic herbicide associated with severe poisoning and environmental risks.
- **Concerns** - More than 75 countries have banned or restricted paraquat due to concerns regarding:
  - Human toxicity
  - Occupational exposure
  - Environmental contamination
  - Lack of effective antidotes
- The continued availability of such chemicals in agricultural systems highlights the gap between scientific evidence and regulatory action.
- International experience demonstrates that restricting highly toxic pesticides can significantly reduce poisoning-related deaths without negatively affecting agricultural output.

### What measures could be taken?

- **Strengthening Regulation** - The state government should Identify and phase out the most hazardous pesticides.
- Strengthen monitoring and enforcement mechanisms.
- Establish stricter residue standards.
- Improve pesticide registration and review systems.
- Such measures can reduce both human exposure and environmental contamination.
- **Enhancing Farmer Awareness** - Farmers require access to scientific information regarding, Safe handling practices, Protective equipment, Alternative, pest management techniques, Risks associated with excessive pesticide use, Capacity-building programmes through agricultural extension services can facilitate behavioural change.
- **Pest Management (IPM)** - Integrated Pest Management focuses on minimizing pesticide use through a combination of biological, cultural, and mechanical methods.
- Key components include, Pest monitoring, Biological control agents, Crop rotation, Resistant crop varieties, Targeted pesticide application.
- IPM reduces chemical dependence while maintaining crop productivity.
- **Integrated Weed Management (IWM)** - Instead of relying exclusively on herbicides, weed management can combine Mechanical weeding, Mulching, Crop diversification, Biological approaches.
- This reduces environmental risks and lowers production costs over time.
- **Natural Farming** - Himachal Pradesh has already initiated efforts through the *Prakritik Kheti Khushhal Kisan Yojana (PK3Y)*, which promotes natural farming practices.
- Natural farming offers several benefits like, Reduced chemical inputs, Improved soil health, Enhanced biodiversity, Lower cultivation costs, Greater climate resilience.
- However, the success of natural farming depends on reducing existing pesticide contamination and restoring ecological balance.

### What are the ethical dimensions involved?

- **Right to Health vs Economic Gains** - Intensive horticulture generates income and supports livelihoods.

- However, excessive pesticide use threatens the health of farmers, consumers, and rural communities.
- Ethical dilemma: Should short-term economic benefits be prioritized over human health and well-being?
- **Environmental Ethics and Intergenerational Justice** - Pesticides contaminate soil, water bodies, and biodiversity.
- Ecological damage may persist for decades, affecting future generations.
- **Duty of the State towards Citizens** - The government has a constitutional and moral obligation to protect public health and the environment.
- Failure to regulate hazardous chemicals raises questions of accountability.
- **Precautionary Principle** - Scientific evidence increasingly links HHPs with cancer, poisoning, and ecological damage.
- Even where complete certainty is unavailable, preventive action becomes ethically necessary.
- **Farmers' Welfare and Occupational Safety** - Farmers often face direct exposure due to inadequate awareness, protective equipment, or training.
- Expecting them to bear health risks for food production raises concerns of fairness.
- **Environmental Justice** - Pollution generated in farming areas affects downstream communities through contaminated rivers and groundwater.
- Those suffering environmental damage may not be the direct beneficiaries of pesticide-intensive agriculture.
- **Corporate Ethics and Agrochemical Industry Responsibility** - Manufacturers continue to market pesticides that are banned or restricted elsewhere.
- Ethical concerns arise regarding transparency about risks and responsible business conduct.
- **Sustainable Development Ethics** - The issue highlights the conflict between agricultural productivity and environmental conservation.
- Ethical governance requires balancing economic growth, social welfare, and ecological protection.

### What lies ahead?

- The crisis of Highly Hazardous Pesticides in Himachal Pradesh represents more than an agricultural challenge; it is a public health, environmental, and developmental issue.
- The evidence emerging from hospitals, research institutions, and farming communities points toward the urgent need for action.
- Protecting farmers, preserving Himalayan ecosystems, and ensuring long-term agricultural sustainability require a decisive shift away from hazardous chemical dependence.
- By embracing safer alternatives, stronger regulation, and ecological farming practices, Himachal Pradesh can secure a healthier and more resilient agricultural future while continuing to serve as one of India's most important horticultural regions.

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## **Reference**

[Down To Earth| Pesticide Contamination in Himachal](#)

