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