

6. Pesticide Pollution in India – Environment

Pesticides in the wind – How cotton sprays are polluting India's rural skies. Pesticide overuse in India, especially in cotton farming, is causing widespread environmental contamination and severe health problems due to pesticide drift. This has exposed major gaps in the 1968 Insecticides Act, prompting the new Pesticide Management Bill (2020) to enhance regulation, promote safer alternatives, and ensure farmer compensation.

1. Introduction – The Context of Cotton Farming

Core Issue – Cotton farming in India is linked to the use of large amounts of pesticides.

Contamination Pathway – These pesticides "drift" beyond the fields due to wind and rain.

Affected Areas – This drift contaminates air, water, homes, schools, and ponds.

Human Health Impact – This leads to a range of health issues, including eye irritation, breathing problems, coughs, and nausea.

Vulnerable Group – These symptoms are particularly noted among infants and children.

2. Pesticides

Definition – Pesticides are substances or mixtures of substances.

Primary Function – They are designed to prevent, destroy, repel, or control pests.

Definition of "Pests" – This is a broad category that includes insects, weeds, fungi, rodents, and other organisms.

Reason for Control – These pests are targeted because they interfere with agriculture, public health, ecosystems, or stored products.

3. Types of Pesticides

Insecticides – Used to control or eliminate insects that damage crops, damage stored products, or spread diseases.

Herbicides – Used to suppress, destroy, or inhibit unwanted plants (weeds) that compete with crops for resources.

Fungicides – Used to prevent or control fungal infections that can reduce crop yield or quality.

Rodenticides – Used to control rodent populations in agricultural fields, urban areas, and grain storage facilities.

Biopesticides – A category that uses natural organisms or substances (like microbes or plant extracts) to manage pests; they are generally considered to be environmentally safer alternatives.

4. Pesticide Regulation in India

Primary Legislation and Rules

Insecticides Act, 1968 – This is the primary legislation currently in force. It regulates the manufacture, sale, transport, distribution, and use of pesticides in India.

Pesticides Management Bill (Pending) – This is a proposed modernization of the existing law. It aims to introduce stricter regulation, higher safety standards, and enhanced penalties for violations.

Rules & Guidelines – The government issues various notifications that prescribe specific requirements for registration, correct labeling, and safe-handling practices.

Authorities Involved

Central Insecticides Board and Registration Committee (CIBRC) – This is the central body responsible for approving the registration of new pesticides before they can be sold or used in the country.

State Governments – They handle the on-ground implementation, including enforcement, monitoring, and the licensing of pesticide dealers and applicators.

Central Pollution Control Board (CPCB) – This agency's role is to monitor the environmental impact of pesticides, checking for residues in air, water, and soil.

Food Safety and Standards Authority of India (FSSAI) – This authority is responsible for monitoring pesticide residues in food products to ensure they are within safe limits.

5. Pesticide Management Bill (2020)

Status – The Bill was introduced in the upper house of Parliament (Rajya Sabha).

Objective – It seeks to replace the older Insecticides Act, 1968.

Scope – It aims to update the entire regulatory framework covering the manufacture, import, sale, transport, use, and disposal of pesticides.

Key Provisions of the Bill

Central Registration – Any person or entity wishing to import or manufacture a pesticide must apply to a central registration committee.

Review and Suspension – Registered pesticides will be periodically reviewed for their safety, efficacy, and the availability of safer alternatives. The committee has the power to suspend or cancel registrations.

Promotion of Alternatives – The bill includes provisions to actively promote biological and traditional-knowledge-based pesticides.

Digital Public Access – It mandates the creation of a digital database, accessible to the public in all official languages, containing information on pesticides (including their strengths, weaknesses, risks, and alternatives).

Farmer Compensation – A central fund will be established to provide compensation to farmers who suffer crop losses caused by the use of spurious or low-quality pesticides.

Stringent Penalties – The bill introduces severe penalties (including fines, imprisonment, and forfeiture of stocks) for dealing in unregistered, banned, or fake pesticides.

6. Current Status of Pesticide Pollution

Global Risk (Cambridge Study) – A study by the Cambridge Institute for Sustainability Leadership found that approximately 64% of the world's arable land (across 168 countries) is at risk of pesticide pollution.

India's Hazardous Pesticides – In India, over one-third (around 118 out of 339) of all registered pesticides qualify as "highly hazardous" based on international criteria.

Evidence of Drift (CPCB & PAU) – Field studies detected pesticide residues 10–15 km away from the fields where they were sprayed, confirming long-distance drift.

Weak Regulation (PAN India Report) – A report found the unauthorized use of four highly hazardous pesticides (chlorpyrifos, fipronil, atrazine, paraquat) across multiple states, pointing to high pollution risk and weak regulatory oversight.

Health Impact (India Water Portal) – A study found that 6% of spray sessions in cotton fields led to mild-to-severe poisoning symptoms among both women and men.

7. Concerns of Pesticide Pollution in India

Environmental Concerns – Pesticides are persistent, meaning they remain active in soil, surface water, groundwater, and the atmosphere for long periods. They affect non-target species. **Example** – The death of 20 peacocks in Karnataka due to a fungicide near a lake.

Human Health Concerns – Farmers and sprayers face acute (immediate) poisoning, skin irritation, respiratory issues, and neurological symptoms.

Statistic – It is estimated that India sees around 145 million cases of acute unintentional pesticide poisoning every year.

Socio-Economic Concerns – Affected individuals, often from marginalized communities, must bear high medical expenses and lose income from lost workdays. Even temporary illness reduces overall agricultural output and household income.

Regulatory and Governance Concerns – Unsafe pesticides, including those banned in other countries, are still being sold in India.

Monitoring Gaps – There is a lack of systematic monitoring for pesticide residues in air, soil, or water in most regions.

8. Challenges in Reducing Pesticide Pollution

Regulatory and Policy Challenges

Weak Enforcement – Hazardous pesticides continue to be sold and used despite the Insecticides Act (1968) and partial regulations under the pending Bill (2020).

Example – Highly toxic organophosphates and pyrethroids, which are banned in many countries, remain available in rural markets.

Agricultural and Socio-Economic Challenges

Lack of Knowledge – Many smallholder farmers are unaware of safe spraying practices, correct dosages, or the need for protective equipment.

Example – In Telangana's Warangal district, most cotton farmers spray pesticides by hand or tractor in open fields without any protective gear.

Environmental and Technological Challenges

Drift and Persistence – Sprays can travel several kilometers, contaminating villages and entire ecosystems.

Pest Resistance – The overuse of chemicals leads to pesticide-resistant pests, which in turn drives farmers to apply even more or stronger chemicals.

Case Study – In Punjab's Bathinda and Mansa, pesticide residues were detected in rooftop dust and wells, showing how airborne chemicals affect communities far from the fields.

Health and Social Challenges

Invisible Exposure – Villagers often inhale low-level toxins during spraying seasons without immediate, obvious symptoms, making the risks less visible.

Underreporting – The majority of pesticide-related health issues go undocumented, especially among women, children, and informal workers.

9. Way Forward – Solutions and Strategies

1. Strengthen Regulatory Framework and Enforcement –

Action – Fully implement and operationalize the new Pesticide Management Bill.

Goal – Ensure banned chemicals are effectively removed from the market and apply strict penalties for violations.

Global Case Study – Denmark and the Netherlands successfully phased out highly hazardous pesticides while maintaining their crop yields.

Indian Case Study – Stricter enforcement in Punjab's Bathinda district (e.g., banning specific pesticides, licensing shops) reduced illegal sales and improper use.

2. Promote Safer Agricultural Practices –

Action – Encourage the adoption of Integrated Pest Management (IPM), organic farming, and the use of bio-pesticides, pheromone traps, and crop rotation.

Goal – To reduce the overall dependence on chemical pesticides.

Case Study – Madhya Pradesh's model cotton farms, by using bio-pesticides and traps, reduced chemical pesticide use by over 50% without affecting yields.

3. Enhance Monitoring and Data Systems –

Action – Expand systematic monitoring of air, soil, and water for pesticide residues.

Goal – Maintain public databases of this information to ensure transparency.

Case Study – Yavatmal and Akola districts (Maharashtra) introduced air and water monitoring stations during cotton spraying seasons, helping local authorities take timely action.

4. Raise Farmer and Community Awareness –

Action – Conduct training programs for farmers on safe spraying, the use of Personal Protective Equipment (PPE), correct dosage limits, and alternatives to hazardous chemicals.

Case Study – Awareness campaigns in Andhra Pradesh's Guntur district led to reduced incidents of pesticide drift affecting nearby schools and households.

5. Promote Economic Incentives –

Action – Provide subsidies for bio-pesticides, eco-friendly inputs, and offer insurance schemes for farmers who adopt low-chemical practices.

Case Study – Programs in the Vidarbha region that offered financial support for IPM adoption reduced chemical usage by nearly 40% over five years, benefiting both farmer health and income.

10. Conclusion

The Problem – Pesticide pollution in India is a significant threat to human health, the environment, and rural livelihoods.

The Cause – Overuse of chemicals has led to widespread contamination of air, water, and soil.

Aggravating Factors – The problem is worsened by regulatory gaps and limited awareness among users.

The Solution – An integrated approach is necessary, combining stronger enforcement, safer alternatives (like IPM), better monitoring, and farmer education.

The Goal – Addressing pesticide pollution is essential for achieving inclusive, healthy, and environmentally responsible rural development.

Source – <https://www.downtoearth.org.in/agriculture/pesticides-in-the-wind-how-cotton-sprays-are-polluting-indias-rural-skies>

