INDIA'S PESTICIDE MARKET - ECONOMY

NEWS: India's pesticide market is undergoing a structural transformation, driven by shifting pest dynamics, labour shortages, and changing cropping practices.

Definition and Types of Pesticides

Pesticides, also known as crop protection chemicals, are substances designed to kill or repel pests that negatively impact agricultural productivity.

They are broadly classified into:

Insecticides: Used to control insect pests (e.g., white-backed plant hopper in paddy crops)

Fungicides: Target fungal diseases affecting crops (e.g., blast and sheath blight).

Herbicides: Applied to eliminate or control weeds that compete with crops for nutrients and sunlight.

Historical Evolution of Pesticide Use in India

Pesticide usage in India was minimal during the mid-20th century, primarily due to limited awareness and access. The Green Revolution of the 1960s-70s marked a significant turning point, leading to widespread adoption of chemical inputs, including pesticides, to boost productivity. In recent decades, regulatory bans on highly toxic chemicals like DDT and endosulfan, coupled with rising farm labour costs, have encouraged the shift towards herbicides and biopesticides.

Current Composition of India's Crop Protection Market

The organised domestic pesticide market in India is currently valued at approximately ₹24,500 crore. Insecticides constitute the largest market segment, valued at ₹10,700 crore, owing to their widespread use across various crops.Herbicides, valued at ₹8,200 crore, form the second-largest segment and are currently the fastest-growing sub-sector, expanding at a rate of over 10% annually.Fungicides account for the remaining share, valued at around ₹5,600 crore, mainly used in horticulture and paddy cultivation.

Global Trends in Pesticide Usage

According to the Food and Agriculture Organization (FAO), global pesticide usage exceeded 3.7 million tonnes in 2022, which is more than double the usage recorded in 1990. The Asia-Pacific region leads both in the production and consumption of pesticides, with China and India being key players in the global market.

Factors Driving Herbicide Growth in India

Manual weeding is labour-intensive, requiring around 8 to 10 hours per acre, making it both time-consuming and costly. As per Labour Bureau data, the average daily wage for plant protection workers increased from ₹326.2 in 2019 to ₹447.6 in December 2024. Labour shortages, often caused by rural-urban migration and increasing opportunity costs, result in reduced availability during peak crop seasons. Consequently, herbicides have become attractive labour-substitute technologies, similar to tractors and mechanised harvesters, enhancing operational efficiency for farmers.

Regulatory Framework Governing Pesticide Use

The Insecticides Act, 1968 is the primary legislation governing the import, registration, manufacture, distribution, sale, and use of pesticides in India. India has so far banned 46 pesticides deemed unsafe or obsolete. However, some controversial chemicals like Paraquat and Glyphosate continue to be used under scrutiny. The Central Insecticide Board & Registration Committee (CIB&RC) is the statutory body responsible for evaluating and approving pesticides for agricultural use, ensuring

efficacy and safety. The Anupam Verma Committee was established by the Department of Agriculture to review 66 pesticides that are banned or restricted in other countries but are still registered in India.

Government Schemes for Sustainable Pesticide Use

National Mission on Sustainable Agriculture (NMSA): Encourages Integrated Pest Management (IPM), climate-resilient farming techniques, and reduced dependency on chemical inputs. Paramparagat Krishi Vikas Yojana (PKVY): Promotes organic farming, including the use of biopesticides and other traditional crop protection practices. Kisan Drone Scheme (2022): Offers financial incentives and subsidies to farmers for purchasing drones, which facilitate precision spraying, reducing human exposure and chemical wastage. Kisan Kavach Protective Kit: Developed by the Department of Biotechnology, it provides safety gear to pesticide applicators, minimizing occupational health hazards.

Key Concerns Related to Pesticide Usage

Environmental Impact: Overuse and misuse of chemical pesticides cause soil degradation, water contamination, and affect non-target organisms including pollinators and aquatic life.
Health Hazards: Prolonged or improper exposure to certain pesticides can result in acute poisoning, respiratory illnesses, neurological damage, and even cancer among farmers and consumers.
Regulatory Gaps: India lacks a comprehensive, transparent, and independent regulatory body like the US Environmental Protection Agency (EPA) or EU's EFSA, leading to inadequate evaluation and monitoring.
Dependence on MNCs: A significant portion of active ingredients and patented formulations are imported from multinational corporations, limiting India's self-reliance.
Limited Domestic R&D: There is insufficient investment in public-private partnerships, green chemistry innovations, and IPM-oriented product development.

Way Ahead – Strategic Recommendations

Promote Biopesticides: Streamline regulatory approval processes and provide incentives to scale up the production of eco-friendly, low-toxicity alternatives.
Strengthen Enforcement: Enhance the capacity of state agriculture departments to monitor pesticide sales, prevent counterfeit products, and enforce safe usage norms.
Farmer Training & Awareness: Expand agricultural extension services to educate farmers on need-based, crop-specific application, correct dosages, and protective practices.
Digital Traceability Systems: Introduce QR code-based traceability on pesticide packaging to track product movement from manufacturer to end-user, ensuring quality assurance.
Boost R&D Funding: Increase public and private investments in green chemistry, nano-pesticide formulations, and IPM-compatible technologies.Ban Highly Hazardous **Pesticides**: Gradually phase out Class I pesticides, aligning India's policies with FAO-WHO Joint Meeting on Pesticide Management (JMPM) guidelines.

Concluding Remarks

India's pesticide sector is currently at a critical inflection point, where its role in boosting agricultural productivity and food security must be balanced against the growing concerns of environmental sustainability and public health. A forward-looking strategy involving regulatory reforms, technological innovation, and grassroots-level farmer empowerment is essential to ensure a safe, resilient, and sustainable agriculture system.

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