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DAILY EDITORIAL ANALYSIS

TOPIC

INDIA AND THE RISING GLOBAL PESTICIDE TOXICITY

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Context

- A recent Science journal study quantifies India's high contribution to global pesticide risks via Total Applied Toxicity (TAT), urging reforms amid stalled UN biodiversity goals.
  - Also, the study indicates that the world is **not on track** to meet the target of **reducing pesticide risk by 50% by 2030** at **United Nations Biodiversity Conference (COP15), 2022.**

TAT Key Findings

- India joins China, Brazil, and the US in driving 70% of global TAT, mainly from fruits, vegetables, rice, maize, and soy crops.
- Toxicity rose sharply in India, sub-Saharan Africa, and the Indian subcontinent, harming terrestrial arthropods, soil organisms, fish, and aquatic plants most.
- Only Chile nears the UN's 50% risk reduction by 2030 (Kunming-Montreal Framework, 2022); global progress lags.

What is Total Applied Toxicity (TAT)?

- **Total Applied Toxicity (TAT)** is a scientific metric used to measure the *overall toxic pressure* exerted by pesticides on the environment.
- It measures the quantity of pesticides used and their **intrinsic toxicity and lethality** to non-target species, unlike traditional measures that focus only on the **quantity (volume) of pesticides applied**.
- The rise in TAT undermines biodiversity conservation, agroecology, ecosystem services, and long-term agricultural sustainability, impacting pollinators, soil organisms, fish & aquatic life, terrestrial arthropods, and plants.
- Thus, TAT reflects not just 'how much' pesticide is used, but 'how harmful' that use actually is.

Impacts of High Total Applied Toxicity (TAT) on India

- **Impact on Biodiversity: Decline in pollinators,** as India's horticulture sector (fruits, vegetables, oilseeds) depends heavily on pollination;
  - **Loss of Terrestrial Arthropods:** Their decline affects birds, reptiles, and small mammals.
  - **Soil Biodiversity Degradation:** Reduced soil fertility and natural nutrient cycling.
  - **Aquatic Ecosystem Damage:** Pesticide runoff during monsoons contaminates rivers and ponds. Impacts rural livelihoods dependent on fisheries.
- **On Agricultural**: Pest resistance, reduced long-term productivity, and threat to sustainable agriculture.
- **On Public Health**: Acute poisoning, chronic health effects like cancer, neurological disorders, and endocrine disruption; and o**ccupational hazards.**
- **On Economy**: Rising healthcare costs, and impact on fisheries and allied sectors.
  - **Export Rejections:** EU rejection of Indian basmati rice due to banned fungicide residues. Stricter Maximum Residue Limits (MRLs) in developed countries.

India's Legal Framework: Is It Outdated?

- **The Insecticides Act, 1968:** It focused mainly on agricultural use, having limited provisions for domestic and industrial pesticide exposure. It does not adequately address modern toxicity levels, environmental persistence, and liability mechanisms.
  - India reportedly uses **66 pesticides banned in other countries**, including **paraquat (banned in Europe).**
- **Pesticides Management Bill, 2025:** It aims to reduce risks to people and environment, and promote biological and traditional pesticides.
  - However, it lacks expert consultation, and weak liability provisions.

Environmental Governance Challenges

- **Pressure on Regulatory Framework:** The Insecticides Act, 1968 is outdated. Weak enforcement and monitoring mechanisms.

- **Difficulty in Meeting International Commitments: India is a signatory** to Convention on Biological Diversity (CBD), and Kunming-Montreal Global Biodiversity Framework.
  - Rising TAT makes it difficult to meet the 2030 pesticide risk reduction target.
- **Environmental Justice Concerns:** Smallholders face rising input costs, health risks, and debt burdens.
  - Rural and tribal communities near biodiversity hotspots are disproportionately affected.
- **Threat to Biodiversity Hotspots:** India hosts Western Ghats, Himalayas, and Indo-Burma region. High pesticide toxicity in these regions endangers endemic species, and weakens ecological resilience.
- **Global Commitments and Monitoring Gaps:** The UN Biodiversity Framework requires regular reporting of annual pesticide use, data broken down by active ingredient, and real-time monitoring of progress.
  - However, many countries lack robust data systems, undermining transparency and accountability.

Way Forward

- **Policy Measures: Shift to less-toxic alternatives like** Integrated Pest Management (IPM), and biological control methods.
- **Promote Organic and Natural Farming:** Scaling up initiatives like Paramparagat Krishi Vikas Yojana (PKVY), and Natural farming models.
- **Legal Reforms:** Update regulatory framework, incorporate strict liability and compensation, and ban highly hazardous pesticides.
- **Data Transparency:** Mandatory annual reporting, and public disclosure of pesticide residues.
- **Farmer Support:** Incentivize sustainable agriculture, reduce chemical input dependency, and link to climate-resilient agriculture.

Outcomes of United Nations Biodiversity Conference (COP15), 2022

- **Kunming–Montreal Global Biodiversity Framework (KM-GBF):** It serves as the biodiversity equivalent of the Paris Agreement (climate).
- **Time Horizon:** 2022–2030 (with vision for 2050).
- **Core Goals of the GBF:**
  - **Long-Term Goals for 2050:** Protect and Restore Biodiversity; Sustainably Use Biodiversity; Equitable Sharing of Genetic Resources; Close the Biodiversity Finance Gap.
  - **30x30 Target (Flagship Commitment)**: Protect at least **30% of the world's land and oceans by 2030.**
  - **23 Action-Oriented Targets for 2030: It includes pesticide risk reduction (50% by 2030),** directly linked to Total Applied Toxicity (TAT);
    - Restore at least **30% of degraded ecosystems;**
    - Reduce introduction and establishment by 50%
    - Reduce excess nutrients and plastic pollution
    - Identify and phase out **$500 billion/year** in harmful subsidies (e.g., fossil fuels, unsustainable agriculture)

Biodiversity Finance Commitments

- **Financial Mobilization:** $200 billion per year globally by 2030;
  - $20 billion/year from developed to developing countries by 2025;
  - $30 billion/year by 2030;
- **Creation of Global Biodiversity Framework Fund (GBFF)** under the Global Environment Facility (GEF).

Digital Sequence Information (DSI)

- Agreement on sharing benefits from **Digital Sequence Information on genetic resources;**
  - Important for pharmaceuticals, biotechnology, agriculture;
  - Ensures fairness to biodiversity-rich developing countries like India

Monitoring and Reporting

- Countries need to develop **National Biodiversity Strategies and Action Plans (NBSAPs),** align national targets with GBF, and provide periodic progress reports.

Source: TH

Daily Mains Practice Question

[Q] Examine the ecological, public health, and regulatory challenges posed by increasing pesticide toxicity in India.

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