Agrochemicals: Boon or Bane

This editorial is based on **"Let The Land Heal: Why minimising chemical farm input has become an urgent necessity"** which was published in The Indian Express on 01/10/2022. It talks about the need to minimise the use of chemical fertilisers and pesticides and related solutions.

For Prelims: Urea Subsidy, Insecticides Act, 1968, Rashtriya Krishi Vikas Yojana (RKVY), Liquid Nano-Urea Fertiliser, Biomagnification, Eutrophication, Dead Zone, Soil acidification, Biofertilizers, Organic Farming

For Mains: Current State of Synthetic Fertiliser and Pesticide Usage in India, Issues Associated with Chemical Fertilisers and Pesticides, Recent Government Initiatives for Sustainable Farming.

Agriculture remains the **principal source of livelihood** for the majority of the population in India and **agrochemicals** (Chemical fertilizers and pesticides) contribute significantly to its growth. However, use of **synthetic** fertilisers and pesticide has drastically increased several folds since the **Green Revolution.**

India is now one of the leading producers of agrochemicals **in the world. But non-scientific and excessive application** of synthetic fertilisers and pesticides damages not only the environment and **life of agricultural land** but also have entered into the food chain thereby affecting **plant, human, and animal health.**

In order to reduce the negative impact on the **ecological dynamics**, use of fertilisers and pesticides should be reduced and **sustainable alternatives should be explored.**

What is the Current State of Synthetic Fertiliser and Pesticide Usage in India?

- **Fertilisers:** During **FY20**, India consumed about **61 million tonnes of fertiliser,** of which **55% was urea**, in FY21, this figure is estimated to have risen to 65 million tonnes.
  - Currently, the fertiliser **production** of the country is **42-45 million tonnes, and imports are at around 18 million tonnes.**
  - A **subsidy is paid by the Centre for urea fertiliser,** based on the cost of production at each plant. Fertiliser manufacturers are required to sell the product at the government's **Maximum Retail Price (MRP).**
- **Pesticides: Pesticides** are regulated in India through the **Insecticides Act, 1968** and **Insecticides Rules, 1971.**
  - **Insecticides, herbicides, rodenticides, and fungicides** are examples of well-known pesticides.
  - The Indian pesticides market reached a value of around **INR 212 billion in 2021 a**nd is expected to reach **INR 320 Billion by 2027.**

What are the Recent Government Initiatives for Sustainable Farming?

- **Promotion of Alternate Nutrients for Agriculture Management Yojana(PRANAM)**
- **Rashtriya Krishi Vikas Yojana (RKVY)**
- **Liquid Nano-Urea Fertiliser**

What are the Issues Associated with Chemical Fertilisers and Pesticides?

- **Inappropriate Use of Fertilisers: 292 out of the 525 districts (56%)** in the country account for **85% of its fertiliser use**. In addition, the ratio of consumption of fertiliser has been **skewed towards urea.**
    - Since, there are no restrictions on who can buy subsidised fertiliser, or on how much they can buy, overuse of fertilisers in cultivation is increased, as well as the **urea is getting diverted to other industries (like dairy, textile, paint, fisheries, etc.)**
        - Overuse of urea has led to **falling crop response to fertilisers,** which, in turn, has **decreased farm productivity and farmers' profitability adversely.**
- **Biomagnification:** The chemicals used in the synthetic fertilisers contain highly toxic substances resulting in **accumulation of toxic substances (biomagnification)** in the tissues of organisms at successively **higher levels in a food chain** deteriorating their health.
- **Creating Dead Zones:** Chemical fertilisers contain **phosphates, nitrates**, when left unused in soil can **run off into coastal waters,** lakes and streams, resulting in **eutrophication** (addition of excessive amounts of nutrients).
    - It also catalyses the growth of algae. The algae deplete the water of oxygen before decomposing, **suffocating species that live in the area aids the creation of** dead zones.
- **Deteriorating Soil Health:** Agrochemicals overuse can contribute to **soil acidification**, thereby reducing the content of organic matter (humus content) **stunting plant growth** and even leading to the release of **greenhouse gases** in the atmosphere.
- **Disproportionate Usage of Pesticides:** Due to lack of scientific awareness regarding the proportionate use of pesticide, a large number of farmers in India end up using **excessive amounts of pesticides**.
    - Also, **pesticide licensing and marketing lacks proper regulation** in India including interdepartmental cooperation and coordination. It is estimated that over **104 pesticides that are still produced/used in India,** have been banned in two or more countries in the world.

What Should be the Way Forward?

- **Inclusion of Bio-Fertilizers:** Use of **biofertilizers** (like **Rhizobium**) should be promoted as they are **cost effective, eco-friendly** and when they are required in bulk can be generated at the farm itself. They **increase crop yield up to 10-40% and fix nitrogen up to 40-50 Kg.**
- **Ensuring Year-Round Ground Cover: In erosion-prone regions,** farmers can plant **cover crops or perennial species to prevent periods of bare ground on farm fields** when the soil (and the soil and nutrients it contains) are most susceptible to erosion and **loss into waterways.**
    - Also, trees, shrubs and grasses can be planted along the edges of fields, especially important for a field that borders water bodies.
        - **Planted buffers** can help **prevent nutrient loss from fields** by absorbing or filtering out nutrients before they reach a water body.
- **Rural Fertiliser Banks:** Fertilisers can be **regulated by setting up rural fertiliser banks.** Aadhaar-linked accounts should be required for fertiliser purchases, and digital records of sales can be kept that can be used at the time of **crop surveillance.**
    - In addition, **nano-urea** should be promoted as well.
- **Crop Audit and Farmer Awareness:** Panchayat level **crop audit** can be conducted by experts from time to time to trace the content of fertilisers and pesticides. Also, **multiple awareness programmes** are needed to inform farmers about **proportionate use of fertiliser and pesticide.**
- **Towards Organic Farming:** A **slow but significant shift** towards chemical-free agriculture is required, as well as **promoting natural and organic methods** like using manure, crop rotation,

intercropping, biological pest control, which consumes less energy, **reduces nitrogen runoff induced pollution**, and is a **frontline fighter to tackle** global warming.

Drishti Mains Question

Highlighting the impacts of agrochemicals in farming, suggest measures on how India can attain sustainable farming.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q. How is permaculture farming different from conventional chemical farming? (2021)

1. Permaculture farming discourages monocultural practices but in conventional chemical farming, Monoculture practices are predominant.
2. Conventional chemical farming can cause an increase in soil salinity but the occurrence of such phenomenon is not observed in permaculture farming.
3. Conventional chemical farming is easily possible in semi-arid regions but permaculture farming is not so easily possible in such regions.
4. Practice of mulching is very important in permaculture farming but not necessarily so in conventional chemical farming.

Select the correct answer using the code given below.

(a) 1 and 3
(b) 1, 2 and 4
(c) 4 only
(d) 2 and 3

Ans: (b)

Mains

Q. What are the major factors responsible for making the rice-wheat system a success? In spite of this success, how has this system become bane in India? **(2020)**
