# Agricultural Plastic Pollution

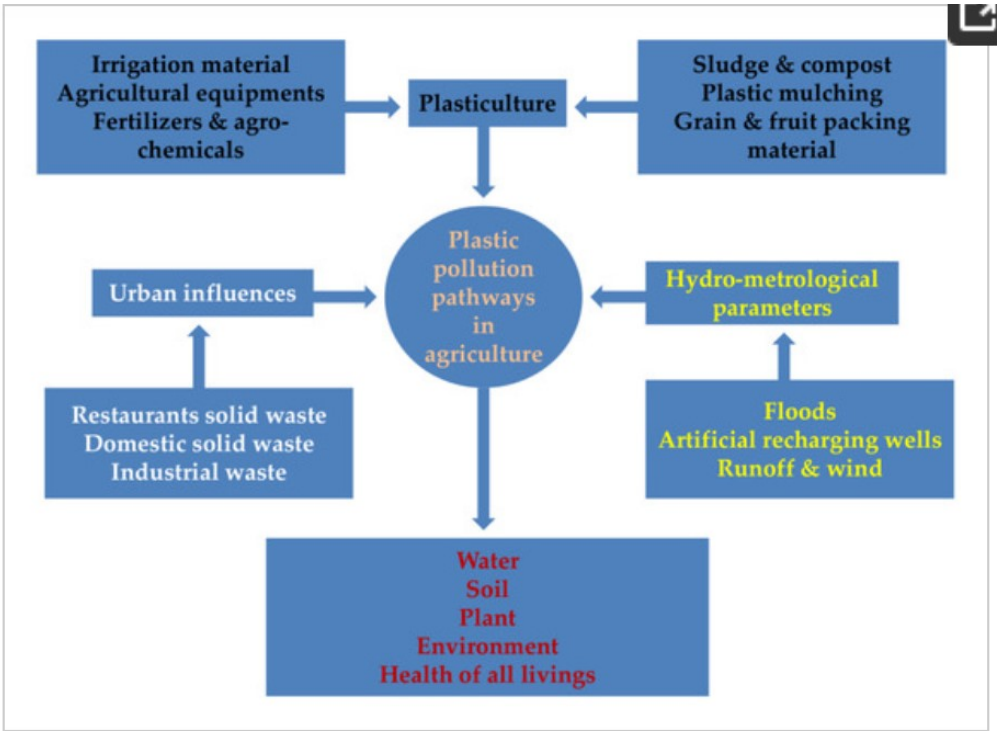
**Mains**: *GS III – Environment pollution and degradation*

## Why in news?

*Recently, there has been a considerable increase of plastic sediments in the agricultural soil across Asia.*

## What is Agricultural plastic pollution?

- **Definition** – Agricultural plastic pollution refers to the *accumulation of plastic materials* in the environment as a result of agricultural practices.
- **Plastic materials** – This includes plastic waste from various sources like *mulch films, irrigation pipes, packaging, and other farming-related items.*




- Asia is estimated to be the largest user of Agri-plastics, constituting almost half of global usage, according to the FAO assessment.

## How plastic is used in agriculture?

- **Modern agriculture** – Plastic has become an integral component of agriculture and this use is increasing with the intensity of modern commercial agriculture.
- **Diverse applications** – Plastic is now used in *mulching, seedling trays, micro-*

*irrigation, pond liners, polyhouses, food storage, packaging, and transportation.*

- **Polyethene film** – It could successfully moderate soil temperature, limit weed growth and prevent moisture loss.
- This method was found to increase cotton, maize and wheat yields by an average of 30% at a relatively low cost.
- Polyethene residue is now increasingly prevalent in treated soils at levels of up to 300 kilograms per hectare.
- Just 1 kg of thin mulching sheets is enough to cover and contaminate as much as 700 square feet of agricultural land.
- **FAO report** – In 2021, the Food and Agriculture Organization (FAO) released a landmark report assessing the use of plastics in agriculture.
- The report calculated that, in 2019, agricultural value chains used *12 MT of plastic products in plant and animal products and 37.3 MT in food packaging.*

## What are the impacts of plastic pollution in agriculture?

- **Harms soil health** – The accumulation of plastic waste in agricultural lands harms soil health, leads to reduced soil fertility.
- **Disrupts ecosystems** – It poses a growing challenge to sustainable farming practices.
- **Hinders air circulation** – Plastic fragments can reduce air circulation and negatively impact microbial communities crucial for soil health.
    - ***For example,*** *Research in Karnataka and Maharashtra on microplastics found evidence of the highest microplastic contamination in soil — 87.57 pieces per kg of soil at a dumpsite in Maharashtra.*
- **Adversely affect root biomass** – It affects overall plant growth and can harm soil organisms like earthworms, affecting their feeding and excretion.
- **Inflow into food chain** – Microplastics can be absorbed by plants, potentially entering the food chain and human bodies.

## What are the challenges in tackling in plastic pollution?

- **Lack of consideration** – Plastic pollution in agriculture unfortunately lacks the required attention at policy and practice levels and is jeopardising the overall sustainability of farming and ecosystems.
- **Absence of holistic plans** – Farm decisions are dominated by economic productivity of a particular crop season.
- It lacks sufficient holistic, environmental, and long-term perspectives.
- Plastics' increased intensity and spread and lack of systematic disposal and management pose disastrous consequences.
- **Uninformed farmers** – Farming communities are ignorant and uninformed about these consequences.
- **Inadequate attention** – The issue of plastic pollution is overshadowed by urban garbage and pollution of water bodies with no serious action on Agri-plastic.
    - ***For example,*** *some of the recent strategic initiatives like the Maharashtra Plastic Action Roadmap too do not adequately recognise the Agri-plastic issue.*
- **Lack of information** – Knowledge and understanding about the damage caused by Agri-plastic pollution is very recent.

- **Lack of recycle facilities** – There is evidence that most plastics are burned, buried, or landfilled, although record keeping is generally non-existent.
- For instance, only nine 9% of plastics produced worldwide are successfully recycled.
- **Absence of waste management system** – A recent sample study reveals that 90%of Indian villages have no waste management systems while 67% of households prefer to burn plastic waste.

## How to tackle agriculture plastic pollution?

- **Informed farm decisions** – There is a need to make the farming community understand the disastrous consequences.
- **Research and development** – Science-based guiding frameworks should be provided for the sustainable use and management of plastics in agriculture.
- **Alternative cost-effective solution** – The Indian Council of Agricultural Research and research centres should engage to develop alternate bio-plastic materials and then incentivise those alternative solutions at the farm level to cope with this transition.
- **Ban on single use plastic** – Putting an immediate stop on the use of single use plastics should be carried out.
- **Promoting circular approach** – It is essential to reduce plastic waste generation through prevention, reduction, reuse, and recycling.


- **Enforcing policy framework** - Policy should check production, use and management of Agri-plastic waste.
- **Appropriate strategy** – A time-bound target-oriented strategy backed by a legally binding framework needs to be in place.
- **Legal enforcement** – The legal framework should hold plastic manufacturers

responsible for the end-of-life management of their products.

- **Village level climate action plan** – The village climate action plan should be integrated with Agri-plastic waste management, adoption of suitable alternatives, and should also be a part of climate-resilient agriculture.
- **Stringent monitoring** – There should be stronger monitoring to penalise irresponsible dangerous practices like burning, burying, or open dumping of plastic waste.
- **Involvement of public** – Community-led initiative for waste management should be incorporated with the village ADP.
- **Adoption of regenerative farming practices** – Practices like conservation agriculture (e.g., cover cropping) that reduce the need for plastic-intensive methods should be adopted.
- **Promotion of sustainable farming practices** – Practices include vermin-composting, bio-mulching, bio-fertilisers, bio-pesticides and soil and moisture conservation should be encouraged.
- These improve soil health, protect soil carbon and regenerate local biodiversity.
- **Guidelines of FAO** - The FAO carried out studies in 2019 and released the Voluntary Code of Conduct on the Sustainable Use and Management of Plastic in Agriculture in October 2024.

## Quick facts

| Plastic Production and Pollution |
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| • **First produced** – The first synthetic plastic was produced in 1907.<br>• By 1950, the world was producing two million tonnes (MT).<br>• **Yearly production** – It now produces over 450 MT annually.<br>• **Plastic pollution** – Every year, 19-23 MT of plastic waste leaks into aquatic ecosystems, polluting lakes, rivers, and seas and 13 MT of plastics accumulate in soil.<br>• Plastic waste is now everywhere, damaging our forests, soil, water, and air.<br>• Microplastics have entered animals, plants, fruits, and even human bodies.<br>• A recent study found a litre of bottled water included about 240,000 tiny pieces of plastics. |

## Reference

Down to Earth| Agricultural Plastic Pollution