

## **Solution to Plastic Pollution: Bio Plastics**

#### What is the issue?

Bio plastics are an emerging alternative to plastics but only 2% of global plastic production is bio-based.

#### What is Bio Plastic?

- Bio-plastics mean that these plastics are biodegradable.
- Unlike conventional plastics, these items can be broken down by microbes in industrial composting facilities within six months.
- This makes them a promising, if partial, solution to India's plastic problem.

#### What are the raw materials used to manufacture?

- Bio-plastics can be made out of dozens of different feed stocks.
- Polylactic acid is one of the commonest bio-plastics in use (PLA).
- PLA is extracted from food crops starch like corn and cassava.
- This PLA is then imported by Indian companies, who blend it with other ingredients to make carry bags, bin liners or cutlery.
- Polyhydroxyalkanoates, or PHA, is another feedstock that is synthesized by having bacteria feed on vegetable oils or sugars from food crops.

## What are the challenges and concerns regarding Bio-plastics?

- The obvious roadblock in the way of bio-plastics fulfilling their eco-friendly purpose is that most of them require industrial composting facilities to be disposed of.
- But most cities lack an adequate number of such facilities.
- This means the bio-plastics end up on the streets, harm the environment and defeat its very purpose of tackling plastic pollution.

# What are the major concerns in expanding the market for and manufacturing bio-plastic?

- **Customers** The **big challenge** for the firms manufacturing bio-plastics is in finding customers.
- The main reason is that **they are expensive** because most bio-plastics produced globally are made from the byproducts of food crops.

- Compared to conventional plastics, which are derived from fossil fuels, a bioplastic carry bag could cost almost thrice as much.
- With only a few municipal corporations implementing the 2016 countrywide ban on conventional plastic carry bags of less than 50 micron thickness, there has been no economic reason for most people to switch.
- Raw material The reliance on food crops itself presents a key challenge for bioplastics, because these crops are simply not a cost-competitive alternative to fossil fuels.
- PLA cost  $\[ \in \]$  per kg in 2016, conventional low-density polyethylene (LDPE) cost between  $\[ \in \]$  1,450 per tonne (1,000 kg) that year.
- If food crops are already a costly way to make plastics, throw in the fact that almost all raw material for bioplastics, like PLA pellets, is imported by Indian manufacturers today.
- China is also a huge seller of compostable plastics.
- This means that import duties and transport costs get tacked on to the already high feedstock prices.

## What can be the factors that will make the manufacturing of bio-plastic a win-win situation for the producers and environment?

- Indian firms manufacturing raw material locally in the coming years, which would reduce the price difference between bio-plastics and conventional plastics.
- Internationally, too, a wave of innovation is expected to drive down raw material costs.
- The most important innovation is the use of non-food crops.
- For example, the U.S.-based Company has developed an inexpensive method to use biomass willow plants, switch grass, and sawdust as raw material.
- Another American company has developed a technology to synthesize PLA from organic mixed-waste.
- Such innovations will drive expansion of the global bio-plastics industry from 4.2 million tonnes to 6.1 million tons in 2021.

### What can India do in this regard?

- Much of the innovation in this field is being driven by policy, such as the European Union's 2015 action plan towards a circular economy.
- The high cost and technological barriers are the major roadblocks for the bio-plastics industry.
- This means that if India needs its own policy framework.
- Subsidies for electricity consumption, lower rates of Goods and Services Tax and lower import duties can aid the manufacturers. ".
- Municipal authorities have a big role to play too.

- They must set up composting infrastructure and impose bans more stringently.
- This will push up demand, a critical driver for efficiency in the industry.
- Small nudges could lead to big cost savings, because some bioplastic applications inherently need less material.
- For example: Mulch films— large sheets of conventional plastics spread on farms to conserve water and suppress weeds.
- Conventional plastic films are typically thick to allow farmers to peel them off after use.
- But bio-plastic films can be thin if they can break down in place, Further; not having to peel off the film can save on labor costs.

### Is bio-plastic a silver bullet to all our plastic pollution related problems?

- Bio-plastics, while useful, are no panacea for pollution.
- This is because the key issue at present is the lack of awareness among people, who don't segregate their waste.
- A large amount of the discarded plastic wouldn't be an environmental hazard in the first place, if it were properly recycled.
- With most bio-plastics, degradation is fast in industrial composting facilities, but takes years in the natural environment.

**Source: The Hindu** 

