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 bio-plastic 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 €2 per kg in 2016, conventional low-density polyethylene (LDPE) cost between €1,250 — 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