1. Plastic Waste: A major Concern

1.1 Hazardous Effects of Plastics

Plastic products have become an integral part of our daily life as a result of which the polymer is produced on a massive scale worldwide. On average, the production of plastic globally crosses 150 Million tonnes per year. Its broad range of applications is in packaging films, wrapping materials, shopping and garbage bags, fluid containers, clothing, toys, household and industrial products, and building materials.

Approximately 9.4 million TPA plastic waste is generated in the country, which amounts to 26,000 TPD. Of this, about 60% is recycled, most of it by the informal sector. While the recycling rate in India is considerably higher than the global average of 20%, there is still over 9,400 tonnes of plastic waste which is either landfilled or ends up polluting streams or groundwater resources. While some kinds of plastic do not decompose at all, others could take up to 450 years to break down.

Only 60% of the plastic produced is recycled, a balance of 9400 Tonnes of plastic is left unattended in the environment causing land, air and water pollution.

1.1 - Hazardous effects of plastics

The burning of plastic results in the formation of a class of flame retardants called Halogens. Collectively, these harmful chemicals are known to cause the severe health problems such as cancer, endometriosis, neurological damage, endocrine disruption, birth defects and child developmental disorders, reproductive damage, immune damage, asthma, and multiple organ damage.

2- PLASTIC WASTE GENERATION IN INDIA

According to the reports for the year 2017-18, Central Pollution Control Board (CPCB) has estimated that India generates approximately 9.4 Million tonnes per annum plastic waste, (which amounts to 26,000 tonnes of waste per day), and out of this approximately 5.6 Million tonnes per annum plastic waste is recycled (i.e. 15,600 tonnes of waste per day) and 3.8 Million tonnes per annum plastic waste is left uncollected or littered (9,400 tonnes of waste per day). Out of the 60% of recycled plastic

• 70% is recycled at registered facilities
• 20% is recycled by Unorganized Sector
• 10% of the plastic is recycled at home.

3- PLASTIC WASTE MANAGEMENT

3.1 Recycling and its benefits
Recycling and re-utilization of waste plastics have several advantages. It leads to a reduction of the use of virgin materials and of the use of energy, thus also a reduction of carbon dioxide emissions.

Benefits of Recycling:

- Reduces Environmental Pollution
- Energy saving: 40 - 100 MJ/kg (depends on the polymer)
- Economic Benefits
- Reduces demand for virgin polymer
- Preferred to Land Filling
- Generates Employment
- Reduces depletion of Fossil fuel reserves

Difficulties in Recycling:

- Hard to separate from non-plastics (no ‘magnet’ equivalent)
- Differing composition of plastic resins means they are largely incompatible
- Degradation of polymer chains on recycling
- Recycled polymer is of lower quality than virgin polymer
- Most waste plastics films especially thin plastics films have limited market value, therefore effort is not spent in collecting them
- Identification of reuse and recycling opportunities
- Markets for Plastics; Lack of Infrastructure
- Low value of recovered Plastics
- Subsidies for recycling program

Several factors can complicate the practice of plastics recycling, such as the collection of the plastics waste, separation of different types of plastics, cleaning of the waste and possible pollution of the plastics, the low-value nature of most of the products that can be manufactured from recycled plastics. Reusing plastic is preferable to recycling as it uses less energy and fewer resources however recycling plastic takes less energy than making plastic from raw materials. It has been observed, to reduce the bad effects of waste plastics, it is better to recycle and re-utilize waste plastics in environment-friendly manners. In addition to reducing the amount of plastics waste requiring disposal, recycling and reuse of plastic can have several other advantages, such as:

- Conservation of non-renewable fossil fuels – Plastic production uses 8% of the world’s oil production, 4% as feedstock and 4% during manufacture
- Reduced consumption of energy
- Reduced amounts of solid waste going to landfill
- Reduced emissions of carbon dioxide (CO2), nitrogen oxides (NOx) and Sulphur dioxide (SO2).

Segregation of waste at source is also a very important step in managing plastic waste generated. There are several cities which are excelling in this. In addition to the segregation of waste at source, some cities have set up segregation centers in the entire city to facilitate secondary segregation of plastic waste into 25-27 categories and assist in the recycling of plastic. Many recycling techniques of the plastics have been collected which can be adopted by the “Swachh Bharat Mission” - Urban 19 municipality in dealing with the issue of plastic waste.

It includes technology like –

1. Mechanical Recycling
2. Feedstock Recycling
3. Plastic to Road Construction
4. Plastic to Toilet / Pavement Blocks
5. Recycling of Multi-layered plastic

3.2 - Recovery

Another alternative is recovering the energy stored in residual material. That means turning waste into fuel for manufacturing processes or equipment designed to produce energy. Various mechanical, biological and caloric systems and technologies can convert, reprocess or break up wastes into new materials or energy. Incineration of plastics can also be seen as a recovery method, as plastics could replace the application of other oil-based fuels.
4. Way Forward

4.1 - Viable initiatives that can be done by the government

- **Considering the best actions to tackle the problem** (e.g. through regulatory, economic, awareness, voluntary actions).
- **Raise public awareness about the harm caused by single-use plastics.**
- **Evaluating the prospect social, economic and environmental impacts.**
- **Use revenues** collected from taxes or levies on single-use plastics to maximize the public good.
- **Enforce** the measure chosen effectively, by making sure that there is a clear allocation of roles and responsibilities.
- **Monitor and adjust** the chosen measure if necessary and update the public on progress.

Name - Palak
Regimental number - UK/20/SWF/157735
Rank - Flying Cadet
Sub Unit - College of Technology
           GBPUAT Pantnagar
Unit - 1 UK Air Sqn NCC Pantnagar