

## “Designing Zero Plastic Policy and its Implementation: Major Role of Law to Protect Environment, Plastic Everywhere”

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### *Abstract*

*Plastic, hydrocarbon-based material, which has become symbolic of the ‘Plastocene’ throwaway culture, is now perceived as a severe global environmental threat. The threat is linked to its manufacture and disposal. Since most plastics are made from petroleum or natural gas, there is a direct link between over dependence on fossil fuels and climate change. Synthetic plastic does not biodegrade; it accumulates. Microscopic plastic particles are present in the air throughout the world and in all major oceans. Further, plastic packaging is a significant source of landfill waste. As a result, marine and land animals regularly consume plastic in all its forms with fatal consequences for both biodiversity and ecosystems. In addition, there are broader implications for other rights, such as the rights to food and health whose realisation is affected by plastic entering the food chain. The Environmental Protection Act, 1986 is enforced by the Central Pollution Control Board and the numerous state Pollution Control Boards. The National Green Tribunal established under the National Green Tribunal Act of 2010 has jurisdiction over all environment cases dealing with a substantial environment question and acts covered under the water (Prevention acts Control of Pollution) Act, 1974. There have been several policy initiatives banning specific plastic products by state and central governments in India. 17 states have passed legislations banning the manufacture, stock, sale and use of plastic bags. Haryana, Himachal Pradesh, Jharkhand, Meghalaya, Nagaland, Rajasthan, Sikkim, Tripura, Delhi and Chandigarh have enacted total bans on plastic bags. Gujarat, Kerala, Madhya Pradesh, Odisha, Uttar Pradesh and West Bengal have enacted bans in some areas within their states. Now we are more concerned about the uses of plastic and we are implementing it, in various ways to curb the plastic pollutant in the environment, such as using it in the construction of roads, making plastic bricks and making of railways slippers.*

**Keywords:** *Plastic, Reuse, Reduce, Recycle, manufacture, disposal, fossil fuels, climate change, food chain, National Green Tribunal.*

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### **INTRODUCTION**

*Zero Waste: The conservation of all resources by means of responsible production, consumption, reuse, and recovery of all products, packaging, and materials, without burning them, and without discharges to land, water, or air that threaten the environment or human health.*

**Zero Plastic Waste** is a philosophy that encourages the redesign of resource life cycles so that all products are reused. The goal is for no trash to be sent to landfills, incinerators [1], or the ocean. The process recommended is one

similar to the way that resources are reused in nature. The definition adopted by the *Zero Waste International Alliance (ZWIA)* [2] is:

More than 15,000 tonnes of plastic waste are generated across India every day. An increasing fraction of this plastic waste is found in rural areas, as the reach of retail corporations and commercial organisation grows. The estimated 9.5 million tonnes of plastic released into the oceans each year, according to the international union for conservation of nature (IUCN) [3]. Plastic waste disposal methods in rural India are often

basic and uniformed and further exacerbate the challenges. More than 400,000 people around the world die annually from climate change-related causes. Plastic bags have a wide range of usability in our day to day lives. For instance, we use them to carry our foodstuffs from groceries shops; we also use them as gloves to do dirty chores or as knee pads while gardening. We also cover our plants with plastics bags to prevent from frosting at night. Basically, plastic bags can be improved to do so many things and are therefore very handy at home. The reason why plastic bags are so popular is because they are cheaper than eco-friendly bags. Furthermore, plastic they bags are waterproof and very convenient during rainy days. Whilst, there are many advantages we can accure from using plastic bags, the reality of the matter is that they pose serious threats to us and the environment. One reason why plastic bag is bad for the government is that they practically take forever to decay.

Plastics have a very low rate of degradation that it may take thousands of years for a small piece to disintegrate. It goes without saying therefore that since the first modern plastic bags were designed 1965 by the Swedish company [4], cello-plast, virtually all the plastic bags are still in existence today. Manufactured from polyethylene [5] a high-density plastic, these bags can withstand all weather conditions.

Secondly, they contribute to climate change. All the polymers and compounds used in the creation of plastic bags such as polypropylene and polyethylene are derived from petroleum and natural gas. The process of exerting fossil fuel and then the processing it to produce plastic releases greenhouse gases in the

atmosphere. This has resulted t degradation of the ozone layer, which has subsequently led to global warming. It is also not economically viable to use non-renewable resources like petroleum and natural gas to produce a commodity that has a very short lifespan. Moreover, plastic bags pollute the environment. They pollute our land making them look ugly and untidy. And since they are very light, they are easily carried by wind and water to various places of earth. They lighter our pathways, fences, houses and trees and make them look ugly. All the plastic waste eventually ends up in the oceans and other water bodies. Look at the great pacific garbage patch [7], which located between Hawaii and California.

Naturally, thermal treatment methods can only be performed on thermoplastics. Thermosetting plastics are harder to recycle but can be broken down using chemical and mechanical processes. Across the country, 80% of post-consumer plastic waste is thermoplastics, the remaining being thermosetting.

The production of plastic materials is done in more than 30,000<sup>2</sup> units across India that are estimated to employ 4 million people [9]. Approximately 90% of these units are small and medium-sized enterprises, often producing low-grade plastics in unorganized and informal ways. It is particularly difficult to monitor and regulate production of plastics in these enterprises. 35% of plastic consumption is in packaging, and 23% is in building and construction. Other relevant categories are transport (8%), electronics (8%) and agriculture (7%). Consumption of plastics in consumer goods is growing at an alarming rate, and much of this growth is likely to be rooted in rural areas.

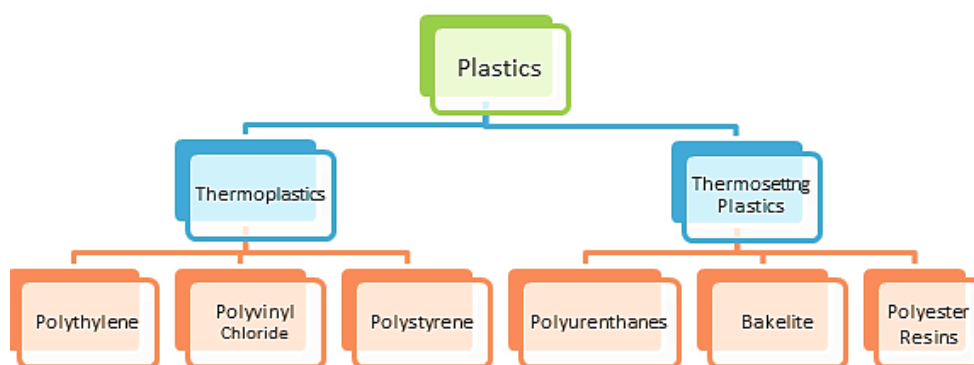
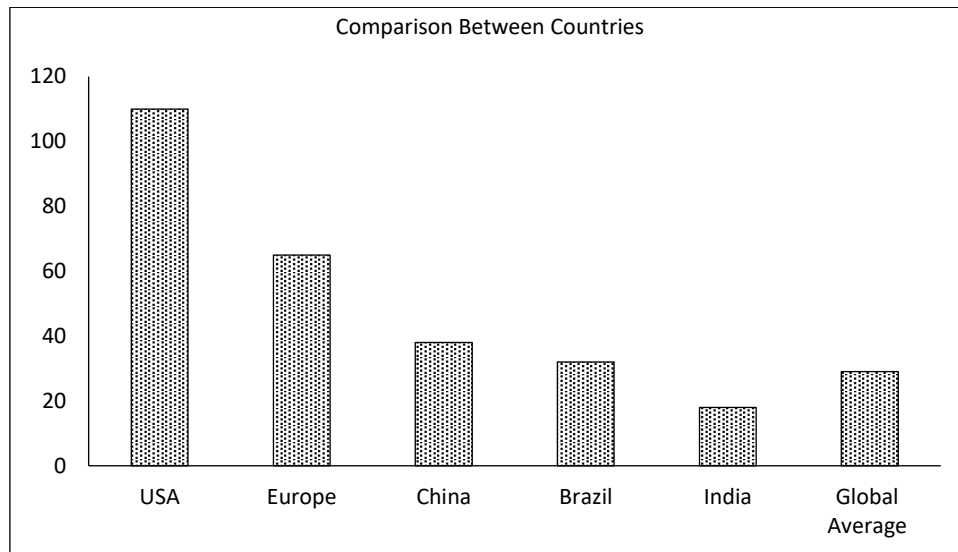


Fig. 1: Categories of Plastic Waste and Illustrative Examples; Source: Manorama YearBook [6].



**Fig. 2:** Consumption of Plastics Per capita (kg/person) [8].

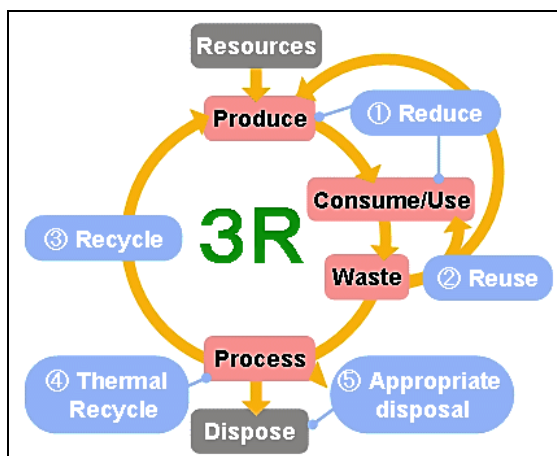
**ZERO WASTE HIERARCHY**

For the most part, "Zero Waste" is a way of thinking of taking out the age of materials that have no suitable or financial choice for end-of-utilization the executives. In all actuality, there are fluctuating understandings for when (and on the off chance that) it is accomplished. Does zero waste truly mean zero waste? Does it consider the waste that is created in the generation of materials upstream? Is a modest quantity of waste worthy toward the finish of a material's finish of life? Shouldn't something be said about Waste-to-Energy? The meaning of zero waste fluctuates generally, with different associations characterizing zero waste in an unexpected way, each with their own elucidation regarding the stuff to get the opportunity to "zero."

It aims to provide more depth to the internationally recognized 3Rs (Reduce, Reuse, and Recycle); of waste management, this waste hierarchy is the guidance suggested for creating a sustainable life. You might be wondering as to how you can incorporate these principles in your daily life. They are not hard to implement. All you need is to bring a small change in your daily lifestyle to reduce waste so that less amount of it goes to the landfill that can reduce your carbon footprint.

**As per Mussoorie Department of Natural Resources,**

*"The three R's – reduce, reuse and recycle – all help to cut down on the amount of waste we throw away. They conserve natural resources, landfill space and energy. Plus, the three R's save land and money communities must use to dispose of waste in landfills. Siting a new landfill has become difficult and more expensive due to environmental regulations and public opposition".*



**Fig. 3:** 3R [10].

**STATE LEGISLATION BANNING THE USE OF PLASTIC BAGS**

The Environmental Protection Act, 1986 [11] is enforced by the Central Pollution Control Board and the numerous state Pollution Control Boards.

It was enacted under the provisions of article 253 [12] of the constitution with a view to

implementing the decisions of United Nation Conference on Human Environment.

The National Green Tribunal established under the National Green Tribunal Act of 2010 [13] has jurisdiction over all environment cases dealing with a substantial environment question and acts covered under the water (Prevention acts Control of Pollution) Act, 1974.



*Fig. 4: Plastic Polythene Bag [14]*

There have been several policy initiatives banning specific plastic products by state and central governments in India. 17 states have passed legislations banning the manufacture, stock, sale and use of plastic bags. Haryana, Himachal Pradesh, Jharkhand, Meghalaya, Nagaland, Rajasthan, Sikkim, Tripura, Delhi and Chandigarh have enacted total bans on plastic bags. Gujarat, Kerala, Madhya Pradesh, Odisha, Uttar Pradesh and West Bengal have enacted bans in some areas within their states. Most of these bans have been in place since the mid2000s. Additionally, the 2016 guidelines have raised the minimum thickness of plastic bags from 40 microns to 50 microns.

Street vendors and retailers providing plastic bags in both rural and urban areas are mandated to pay a waste management fee of Rs. 4000 per month. The National Green Tribunal also placed a ban on plastic cutlery in 2017, but it is yet to be implemented in earnest. Several manifestations of bans these have been attempted across the country over the last ten years. Delhi, for instance, has seen versions of bans on plastic bags in 2009, 2012 and most recently, in 2017. Both the Delhi government and the National Green Tribunal have directed these bans.

A rigid ban on the use of polythene bags below 40 microns was enacted in Uttarakhand complying with the 2012 solid waste management rules [15]. The state still saw copious amounts of plastic bags infiltrating from neighbouring states. The mobility of plastic waste makes state-wise bans particularly challenging to implement.

#### **Plastic Based Management System within Sweden, France is Particularly worth Attention.**

Sweden has perhaps the most robust waste management system in the world, with less than 1% of its household waste ending up in the landfill. The success of their plastics waste management system is rooted in the following factors: Producers and importers of plastics in Sweden are mandated to create recycling stations at optimal locations so that effective collection of plastic waste can take place. The omnipresence of recycling stations, that are no more than 300 m away from any residential area Strict segregation at the household level into recyclable and biodegradable waste of application of high environmental standards. Even as 50% of the household waste is burnt in energy recovery systems to generate electricity, the smoke from these plants is said to be 99.9% nontoxic and is filtered through dry filters and water. This contributes to a near-perfect collection and disposal rate across the country.

**French**, policy can be summarized as follows: get rid of the unnecessary, recycle the rest and an empty bottle should never be considered as waste. The pledge is to recycle 100% of plastic

by 2025. President Macron promised during election time to recycle 100% of plastic by 2025. Current recycling rates are around 20% and France is probably the worse country in Western Europe when it comes to recycling [16].

### **Right to life and Duty to Protect Environment**

Imposition of Damages on a defoliating industry for causing distribution to water is justify on the touchstone of Right to Life and Duty to Protect Environment. In *Vijay Singh Puniya v State of Rajasthan* [17] imposing 15% of the turnover of the dying and printing industry as damages for causing water pollution the Rajasthan High Court observed.

The imitation of untreated wastewater by industrial unite is depriving the citizens of access to unpolluted ground water which is essential for the existence. Not only the ground water has been affected by the way the industrial unit have been operating, but their working has also affected the quality of vegetables and crops which are grown in the area. The owner of the industrial unite un-mind full of the environmental degradation have caused distribution to the ecological balance for Article 51-a(g) [18], the court exercising extraordinary jurisdiction can impose damages on polluter for the restoration of ecological balance and also for the victims who may have suffered due to the intrusion upon the environment and ecology by the former.

### **ZERO PLASTIC POLICY IMPLEMENTATION**

Squander the executives market contains four portions - Municipal Squander, industrial Waste, Bio-chemical Waste, and electronic waste market. All these four sorts of waste are represented by various laws and strategies as it stands the idea of waste. In India squander the board practice rely on real squander age, essential stockpiling, essential accumulation, optional gathering and transportation, reusing movement, Treatment, and transfer. In India, region partnerships assume a significant job in waste the board in every city alongside the general wellbeing office. City Enterprise is in charge of the administration of the MSW created in the city, among its different obligations. The general wellbeing office is in charge of sanitation, road purging, pandemic control, and nourishment defilement. There is an unmistakable and solid progressive system of posts in the Municipal Corporation. The most noteworthy authority of Municipal Corporation rests with the Mayor, who is chosen for the post for residency of five years.

Like most environmental laws, the missing key remains implementation. Our lawmakers draft excellent laws, but we are terrible at ensuring their implementation. The reasons cited are lack of adequate infrastructure, absence of trained and adequate staff, overall lack of awareness, information asymmetry, and, possibly, wavering political will.



*Fig. 5: Zero Waste* [19].

Under the Mayor, there is a City Official. Under the city chief, there is Executive Officer who regulates different offices, for example, general wellbeing, waterworks, open works, house charge, lights, projection expense, request, and a workshop, which, in turn, all are going by their area of expertise heads. The staffs in the Public wellbeing office are as per the following: Health official, chief clean and nourishment auditor, Sanitary and nourishment assessors, sanitary director, Sweepers, and so on. The whole activity of strong waste administration (SWM) framework is performed under four headings, in particular, road purging, accumulation, transportation and transfer. The purging and accumulation activities are led by the general population wellbeing branch of city Municipality Corporation, while transportation and transfer of waste is done by the transportation branch of the city District Corporation. The whole city can be isolated into various zones. These zones are additionally separated into various clean wards for the reason for strong waste gathering and transport activities. As of now squander the board in India, for the most part, implies a grabbing waste from private and modern zones and dumping it at landfill locales. The specialists, more often than not civil, are committed to deal with strong waste created inside their particular limits; the typical practice pursued is of lifting strong waste from the purpose of age and pulling to far off spots known as dumping grounds and additionally landfill destinations for disposing of. The treatment is given to squander when consequently exhausted is limited to spreading

the pile over bigger space so as to remove the loss from the open look. Squander gathering is typically done on an agreement premise. In many urban communities, it is finished by cloth pickers, little league temporary workers and regions.

The Plastic Waste Management Rules, 2016 [20], have their critics but many would still agree that the rules are fine. The challenge, as anyone would have imagined, was, and remains, implementation. If only we had strong local bodies with trained staff, implementation would be so much better. The plastic waste management issue has been brought up before the National Green Tribunal (NGT) and various high courts.

This is the irony that Maharashtra government’s ban on plastic being challenged before the Bombay high court. The Maharashtra plastic and Thermocol products (manufacture, usage, sale, transport, handling and storage) notification ,2018 [22], was issued in March to ban the manufacture, transport, distribution, wholesale and retail sale, usage, storage and import of certain plastic products. After it was challenged, the high court provided an extension of here months as it would have been difficult to implement the ban with immediate effect. The NGT has also passed a number of orders reaffirming the plastic ban in various states, prohibiting plastic disposal in rivers and other water bodies, and providing for an imposition of fine on violators. But we fail at enforcing and implementing such orders.

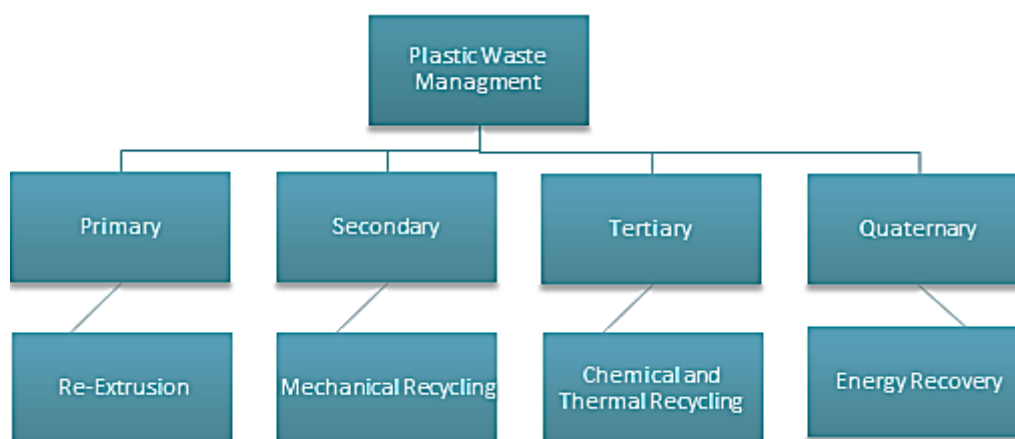


Fig. 6: Pathways of Plastic Waste Management [21].

### Plastics for Road Construction

The Central and State Governments have endorsed the construction of roads that supplement bitumen with plastics.

The 2016 Solid Waste Management Rules [23] require local bodies to dispose plastics such that they can be integrated into road construction as per guidelines issued by the Indian Roads Congress. Pradhan Mantri Gram Sadak Yojana (PMGSY) guidelines on the use of plastics in roads have also been issued.

### Plastics for Railway Sleeper

Plastic sleepers are typically made of 100% reused plastic. That gives 80-160 tons of high worth reusing for a kilometer of track. After its lifetime, the sleepers can be regained, and the material can be utilized again for the up and coming age of sleepers. Supplements can be evacuated and reused.

Plastic railroad sleepers can be intended for a particular issue. For instance, when exceptionally long sleepers are required for switches, a connectable sleeper can tackle transportation issues of the switch. Sleepers that are utilized on steel brace scaffolds must be estimated sleeper by sleeper to make up for the resistances in the steel supports [26]. The rail sleeper in this image can be acclimated to the correct tallness and edge by mounting inclusion squares of the correct measurements. The inclusion squares are fixed by the screw spikes.

### Plastics for Bricks [27]

They also have several significant advantages over conventional bricks - they're thinner and lighter, have superb heat insulating properties (5 times more than standard bricks) and are just as strong as their stony counterparts. They're also great at insulating against noise and it only takes 20 bottles on average to make one brick.



*Fig. 7: Waste Management for Construction of Roads [24].*



*Fig. 8: Waste Management for Construction of Railway Tracks [25].*



*Fig. 9: Waste Management for Construction of Bricks [28].*

Each brick helps rid the world of discarded plastic and is cheaper and more fuel efficient to manufacture than conventional bricks. It's also less energy intensive than recycling the plastic into other forms.

### **POLLUTION FROM PLASTICS AND POLYTHENE**

Pollution from plastic and polythene bags is a serious problem not only in cities and towns, but also in the villages. There is no specific legislation on the subject. In one case, a state government alleged that even tribal people throw polythene bags into the forest while they go to and fro for fishing in a reservoir within a national park. Large scale use of plastic and polythene bags blocks the normal flow of drain water, causes serious logging problem, danger to public hygiene, and creates environmental pollution as their bags neither melt nor dissolve in the soil [29].

In *Wing Commander Utpal Barbara v state of Assam* [30], the petitioners sought the issuance of an appropriate writ to quash the order of the executive magistrate imposing a ban on the use of polythene bags throughout the state. The Gauhati High Court said that Sec.144 of Cr.P.C [31] could not be used for arriving at a permanent solution to the problem of pollution from plastics and polythene. The provision was used for immediate prevention and as a

speedy remedy in case of imminent danger and was not designed for solutions of either permanent or semi-permanent in character. Use of polythene bags containing toxic element (lead) because of dye used as an ingredient may be dealt with under Sec. 144 of the Cr.P.C for a short period, but not in perpetuity. If any manufacture undertakes the recycling process in violation of any law in force, the problem has to be dealt with that law only.

- Over the last ten years the world has produced more plastic than during the whole of the last century.
- 50% of the plastic we use were used just once and threw away like wrappers.
- With the plastic thrown away each year it can encircle the earth 4<sup>th</sup> times.
- We currently recover only 5% of the plastic we produce.
- Plastic accounts for around 10% of the total waste generated.
- Annually, approx. 500 billion plastic bags are used worldwide. More than one billion bags are used every minute.

### **Plastic Plastic Everywhere**

Packaged water can be a lifeline for many of the 2.1 billion people worldwide without safe drinking water. Some 4000 children die every day from water-borne diseases. A review of some of the world's most popular bottled water brands found that more than 90%

contained tiny pieces of plastic. According to the WHO [32] in the new study conducted by Orb Media, sampled 259 bottles from 9 locations in 9 countries (US, China, Brazil, India, Indonesia, Mexico, Lebanon, Kenya and Thailand) on 5 continents across 11 different brands. It found an average 325 plastic particles for every litre of water being sold. Plastic was found on 93% of the sample. The contaminants were polypropylene, nylon and polyethylene terephthalate. The global average is 10.4 particles in a litre for plastic particle in the 100 micron, or 0.1 mm size ranges.

### Plastic Endangering Marine Life

According to journal Endangered Species Research, an international study involving 106 experts from the Atlantic, Pacific, Caribbean, Mediterranean and Indian Ocean coasts turtle are dying in large numbers after becoming entangled in plastic debris.

The researchers estimate at least 1000 turtles are dying this way every year [33]. They have found that entanglement in plastic and other pollution poses a long-term impact on the survival of some turtle population which is greater threat to them than even oil spills. Sadly, over 90% of the turtles reported were already dead.



*Fig. 10: The Ocean Plastic Crisis [34].*

### CONCLUSION

Human ways of life have placed pressure on the environment and have caused imbalance in the eco systems by the producing, consuming and wasting of natural resources. Most countries evidently have major effects on the environment due to SW generation [35] with economic development since the natural resources are used, and waste and pollution are produced. Therefore, the concern towards the

management of solid waste as an integral part for sustainable development has increased [36].

It gets the job done to say that we require a progressively stringent incorporated and vital waste avoidance structure to viably address wastage related issues. There is a dire need to expand after existing frameworks rather than endeavouring to supplant them aimlessly with models from created nations. To anticipate any pandemic and to make every city a solid city-financially what's more, naturally, there is an earnest requirement for a well-characterized vital squander the executive's plan and a solid usage of the equivalent in India. To accomplish a money related supportability, financial and natural objectives in the field of waste administration, there is a need to methodically investigate the qualities and shortcomings of the network just as the metropolitan the organization, because of which a viable waste administration framework can be advanced with the support of different partners in India [37].

The general population lack of concern can be modified by mindfulness building efforts and instructive measures. Refinement of the network is likewise basic to accomplish the above targets and we have to act and act quickly as each city in India is effectively a hotbed of numerous infectious illnesses, a large portion of which is brought about by incapable of waste administration. All these above-said recommendations are given in connection to India and will be successful just when we independently feel the duty of making condition clean. As an overall population, we cannot do much in strategy and guidelines plan, reception of more current innovations identified with reusing what's more, other waste administration choices yet we can assume a significant job in this procedure on the off chance that we can receive just a couple of tips. Here are a couple of tips to accomplish this objective [38].

- 1 Keep our self-educated: Significantly, we are up to date about what's going on the earth front. Find out about how untreated sewage is tossed into the waterways, go to open talks about air contamination, and

- stay in contact with new strategies that influence our condition. The more educated we are, the better prepared we are to battle such issues.
- 2 Expand less: Motto: Refuse... ..reduce... ..reuse... ..Recycle. This means expending fewer assets, reusing whatever we can lastly reusing what can't be reused. This procedure extraordinary decreases the trash.
  - 3 State 'No' to plastic packs: One of the greatest wellsprings of contamination in Indian urban communities are the pervasive plastic pack. Decline to acknowledge one. Convey a material shopping sack with us.
  - 4 Separate our trash: India has one of the world's generally proficient reusing instruments. Utilize the administration of our raddiwalla. Papers, bottle jars and other such recyclables can bring us cash and, in the process, we can spare the earth. Cloth pickers, as well, play out a fundamental capacity for the city. Kitchen trash (biodegradable) ought to be isolated from non-biodegradable waste.
  - 5 Quit consuming trash: Ask our neighbours to cease from consuming strong squander. It might appear to be innocuous, yet smoke discharged from leaves adds to air contamination. Likewise, when there is plastic in the stack, it discharges risky dangerous exhaust. Leaves can be changed over to compost through treating the soil and plastic can be reused.
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