

PLASTIC POLLUTION: SOME INIMICAL IMPLICATIONS ON BIOTIC COMPONENTS OF THE ENVIRONMENT

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Abstract

Advances in Science and Technology have offered greater opportunities for man to manipulate the environment to suit his own need. Plastic pollution is a direct consequence of increase in anthropogenic activities through using the principles of Science and Technology to create products used in packaging and other household items as well as accessories for industrial and domestic utensils. Most plastic wastes do not decompose easily or never at all. Indiscriminate and improper disposal of plastic refuse remarkably leads to the littering of the environment and eventually gets to the ocean where the most resultant effect is felt. Marine animals are directly killed, food chains interfered with and smoke from burning of plastic refuse is inimical to humans and other terrestrial animals. It is a common practice in many African Countries, especially Nigeria, for buyers to demand for plastic bags for whatever they buy from shops even if it is as petty as just a single maggi cube. Millions of plastic bottles, empty water sachets and uncountable tons of synthetic polymers are littered everywhere in virtually almost all the major cities and villages of Nigeria thereby aggravating the menace of plastic pollution. It has been projected that by 2050 there may be more plastics than fish in the oceans. Environmental activists have been agitating against plastic pollution. Recycling of plastic wastes, proper plastic refuse disposal, banning the use of non-biodegradable plastic bags and adequate public enlightenment will go a long way in mitigating the negative consequences of plastic pollution.

Keywords: Plastic, Pollution, Biodegradable, Environment, Biotic component.

Introduction

Scientific and Technological advancements have remarkably improved anthropogenic activities on our planet. Man has developed various ways of tackling everyday problems and as well improving his means of livelihood with relative ease and consequently engaged into large scale production of materials for economic gains. As the population of the world is fast increasing so is the attendant consequences of damage to the environment in terms of pollution and total degradation in some cases. One of such pollution issues that is receiving growing concerns globally is plastic pollution.

Statistics indicate that one million waste plastic bottles are churned out every minute across the world while five trillion plastic bags are generated yearly about 10

million units every minute and it is also estimated that at least eight million tons of plastic end up in the oceans every year. The empirical prediction that by 2050, world's oceans will have more plastic than fishes portends far-reaching dangers and calls for drastic measures to address the menace urgently (Punch, August 11, 2018).

Odogwu (2018) as quoted by Punch Newspapers (May 31, 2018) made the following assertion:

“The science of plastic pollution is clear: We buy one million plastic bottles every minute. Every year, the world uses 500 billion plastic bags. Each year, at least eight million tonnes of plastic end up in the oceans, the equivalent of a full garbage truck every minute. In the last decade, we produced more plastic than in the whole last century. Fifty per cent

of the plastic we use is single-use or disposable. And plastic makes up 10 per cent of all of the waste we generate”.

Plastic pollution is the accumulation of plastic objects (e.g.: plastic bottles and much more) in the Earth's environment that adversely affects wildlife, wildlife habitat and humans (Encyclopedia Britannica, 2013). Plastics that act as pollutants are categorized into micro-, meso-, or macro debris, based on size (Parker, 2018).

Here in Nigeria it has been categorically projected that Lagosians dump 450,000MT plastic wastes into ocean bodies annually. Lagos State Government disclosed that half of the plastic waste dumped into ocean bodies in Nigeria emanated from the state (Vanguard Newspapers, September 6, 2018).

Types of Plastic Debris

Macro-plastic is clearly visible plastic that can be caught, to see it in an easy way, and will not (with a few exceptions) have a direct impact on the food chain (e.g., plastic bags, plastic bottles, fishing nets or styrofoam products). On the other side, we have microplastic, meaning small pieces of 1-5 mm in size floating in our oceans like a soup and finding their way directly or “spontaneously” into the food chain due to their size (e.g. microbeads in cosmetics) (www.planetexperts.com/macro-meso-micro-but-what-about-nanoplastic/)

Mesoplastic are particles of plastic found especially in the marine environment (typically about 5 mm) (<https://en.wiktionary.org/wiki/mesoplastic>)

Inimical Effects of Plastic Debris on Biotic Components of the Environment

The most unfortunate beneficiaries of plastic pollution are living things who constitute the biotic components of the environment most particularly marine animals. Substantial quantity of plastic debris mostly ends up in the oceans, water ways and large water bodies and ultimately end up interfering with the food chain. The most devastating effect of the plastic pollutants is

their recalcitrant nature of being non-biodegradable i.e. they do not decompose easily or never at all, hence causing damage for a very long time. According to Adesanya (2018):

The effect of plastic pollution is enormous because plastic items are non-biodegradable; they cannot be broken down. Used plastic bottles that have decayed are source of health dangers to us. When they are indiscriminately disposed by burning which we see in most cases, chemicals that made up the plastics are contained in the fumes which could be inhaled. The chemicals contribute to health conditions such as lung cancer and asthma. The same plastics end up in oceans and when they get there, the chemicals are released into the water which animals inhale. The chemicals contain toxic substances that cannot be broken down after the animals inhale them. Ultimately, some of the animals get to the man for consumption and unfortunately, cooking cannot destroy those chemicals. Cooking only breaks down microorganisms like bacteria.

In another instance, some of the major long-term effects of plastic pollution are:

i. It upsets the food chain and causes

a) Groundwater pollution

b) Land pollution

c) Air pollution

ii. Also plastic pollution kills animals

iii. It is poisonous, and

iv. It is expensive

(<https://www.conserve-energy-future.com/causes-effects-solutions-of-plastic-pollution.php>. Retrieved on 30th December, 2018)

Another scenario on the negative effect of plastic pollution was painted by Howard, Gibbens, Zachos and Parker, (2018):

Each year, an estimated 18 billion pounds of plastic waste enters the world's ocean from coastal regions. That's about equivalent to five grocery bags of plastic trash piled up on every foot of coastline on the planet. All that plastic is causing harm to the creatures that live in the ocean, from coral reefs smothered in bags, to turtles gagging on straws, to whales and seabirds that starve because their bellies are so jammed with bits of plastic that there's no room for real food...

New research is emerging apace about the possible long-term impacts of tiny pieces of plastic on the marine food chain-raising fresh questions about how it might ultimately impact human health and food security.

(<https://www.nationalgeographic.com/environment/2018/07/ocean-plastic-pollution-solutions/> retrieved on 30th December, 2018)

Ways to Reduce Plastic Pollution

Various scientists and environmental activists have proffered ways to reduce Plastic Pollution. One of such is Engler (2016) who suggested the following:

1. Wean yourself off disposable plastics.
2. Stop buying water: Each year, close to 20 billion plastic bottles are tossed in the trash (always where possible carry a reusable bottle).
3. Boycott microbeads.
4. Cook more.
5. Purchase items secondhand.
6. Recycle (duh).
7. Support a bag tax or ban.
8. Buy in bulk.
9. Bring your own garment bag to the dry cleaner.
10. Put pressure on manufacturers.

(<https://www.nrdc.org/stories/10-ways-reduce-plastic-pollution> retrieved on 30th December, 2018)

Global Agitation against Plastic Pollution

Various Non-Governmental Organizations (NGOs) and Environmental activists worldwide have been actively agitating for the mitigation of plastic pollution. One of such pressure groups is Plastic Pollution

Coalition (PPC). This is a growing global alliance of more than 700 organizations, businesses, and thought leaders in 60 countries working toward a world free of plastic pollution and its toxic impact on humans, animals, waterways, and oceans, and the environment.

(<https://www.plasticpollutioncoalition.org/the-coalition/>).

Is Plastic Pollution a Blessing in Disguise or Curse?

It all depends on how the plastic pollution is handled. If effectively managed, huge wealth and job opportunities can be created from Plastic Pollution. The most potent weapon to be used in managing plastic pollution is "Recycling". The Deputy High Commissioner, British High Commission in Nigeria, Ms. Laure Beaufils, was quoted by Punch Newspapers (August 11, 2018) to have said that:

Recycling of plastic and other waste would boost the economic status of Nigeria. The envoy said, "It (waste) is a global issue and it is fantastic that Nigeria is also stepping in on issues bordering on eradicating plastic waste. A lot more needs to be done and it is fantastic that even by tackling the issues, the communities and individuals can make money from recycling."

Adding another recipe to the effective management of plastic pollution, a lecturer at Department of Employment Relations and Human Resource Management, University of Lagos, Dr. Dumebi Ideh, quoted by Punch Newspapers (August 11, 2018) suggested that:

Recycling is a big industry because most of the things produced now are plastic-driven. Plastic is used for packaging goods and it cuts across the length and breadth of this country. If there are recycling firms in every state and local government,

the number of people that will be employed directly and indirectly will be large. Once people know there are places they can take plastic to, more people will get engaged in the picking.

Conclusion

Despite the portending dangers of plastic pollution on living things, particularly marine animals, it seems many plastic companies are making millions of dollars and naira in this brisk business as it is a common custom here in Nigeria for buyers and sellers to supply and or ask for plastic bag to wrap items purchased even as petty as a single maggi cube! Nigerians have also become so much addicted to sachet water popularly known as “pure water” and this habit is wreaking havoc on the premises of market places, motor parks and play grounds in virtually almost all the cities and villages of Nigeria where it becomes an eyesore for one to see tons of empty water sachets littered all over the place. Plastic pollution is very much on the increase despite the agitations by some concerned environmental activists.

Recommendations

There is no problem that has no plausible solution. The following measures are hereby

recommended to help curtail the menace of plastic pollution in Nigeria:

1. Banning the use of non-biodegradable plastic containers/packs. While Nigeria tarries, other countries and regions are moving forward in the fight against plastic pollution. Botswana, Eritrea, Rwanda, Kenya, Morocco, Senegal, Mauritania, Cameroon among other African countries have already banned plastic bags (Odogwu, 2018).
2. Adequate environmental education through print and electronic media, town hall engagements, schools, hospitals, motor parks, market places and other joints of social gatherings.
3. Proper refuse disposal of plastic garbage and subsequent appropriate sorting of the waste.
4. Establishment of functional recycling plants that will process the plastic debris into other useful products. This will definitely provide employment and business opportunities for the recyclers and scavengers.

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