

Exploring the Alternative Solutions and Strategies of Toledo City Government for the Damaging Impact of Single-Use Plastic Bag in the Environment

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ABSTRACT

The improper disposal of single-use plastic bags is one of the major concerns worldwide. This study sought to explore the alternative solutions and strategies of the Toledo City Government in minimizing the threatening impact of plastic in the city. Researchers establish the current level of environmental awareness among the people of Magdugo, Toledo City, Philippines as the health concerns associated with plastic bags. The majority of the participants were aware of environmental and health risks. Participants continue to use it due to its ease of use and durability. However, the preponderance of 3 Rs is the most effective approach for reducing plastic waste production (Reduce, Reuse, and Recycle). Furthermore, this study can help determine the severity, causes, and propose various solutions based on the public's perspective on the targeted area.

Keywords: Plastic waste pollution; Impact on the environment; Alternative solutions; Strategies for plastic bags

INTRODUCTION

Plastic bag contamination is expanding consideration throughout the planet [1-3], with territorial, public, and worldwide systems for relieving the adverse consequences of plastic contamination. The conversation is occurring [4,5]. In both marine and earthbound conditions, plastic bag contamination is unsafe to the climate and genuinely impacts the advantages that people can get from nature (for example, biological system administrations) [6]. Plastic contamination, particularly the high permeability of dispensable plastic sacks, and their developing situation on the political plan have prompted numerous political medications to control their assembling and use for the more practical utilization of assets.

In nations like India, rules for expendable plastic packs have been presented throughout the planet. Plastic bag frameworks are filling quicker in emerging nations than in created nations, and African Landmass is driving the way in plastic bag approaches [7]. Plastic reusing is relied upon to stand out as it influences metropolitan expectations for everyday comforts and human wellbeing during floods. In 2015, a review by Gall and Thompson assessed that almost 700 marine biota species were antagonistically impacted by plastic contamination [8]. As plastic contamination turns out to be more significant at the public and worldwide levels,

further nations are presenting rules for expendable plastic bags. Nonetheless, supposedly, these rules have not been surveyed at the territorial level in southern Africa. This paper studies happening rules for decreasing dispensable plastic bags in Cebu, Toledo City, Philippines.

Description of the study area

The study was conducted in Toledo City, 3rd class component city in the province of Cebu, Philippines. Toledo became a character city under Republic Act No. 2688 on June 18, 1960. Toledo is composed of 38 barangays and according to the 2020 census; it has a population of 207, 314 people. Toledo is about 50 kilometers away from Cebu City and is widely known for its huge mining industry owned by Atlas Consolidated Mining and Development Corporation (now Carmen Copper Corporation). Aside from mining, the city's primary sources of livelihood are fishing, trading, and agriculture (Figure 1).

The study was conducted in Juan Climaco Sr, formerly known as Magdugo, which is a barangay in the city of Toledo, in the province of Cebu. Its population as determined by the 2020 Census was 8,581. However, this represented 4.14% of the total population of Magdugo. The latitude and longitude of Magdugo Toledo City are 10.3506, 123.6676 (10°.21' North, 123°40' East) respectively.

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Figure 1: Toledo city, Cebu, Philippines land area.

Moreover, Magdugo Toledo Philippines is one of the top-rated places listed as a City in Magdugo. Toledo is composed of 38 barangays and according to the 2020 census, it has a population of 207, 314 people. Toledo is about 50 kilometers away from Cebu City and is widely known for its huge mining industry owned by Atlas Consolidated Mining and Development. Aside from mining, the city's primary sources of livelihood are fishing, trading, and agriculture (Figure 2).



Figure 2: Magdugo, Toledo City, Cebu, Philippines land area.

RESEARCH OBJECTIVES

This study aimed to assess the environmental impact of single-use plastic bags, as well as to analyze and propose alternative solutions of Toledo City Government for a cleaner environment and to reduce the amount of plastic in waste streams.

MATERIALS AND METHODS

The damage of plastic bags to the environment

Contamination of plastic bags has furthermore been pertained to broadened flooding and spreading of infections through, for instance, hindering seepage frameworks. The executives of waste and openness to natural components (bright radiation and wind) separate plastic into more modest pieces, which have been accounted for in food and beverages, like fish. One of the vital wellsprings of plastic contamination is single-use plastics, those that are planned to be utilized just a single time before being disposed [3]. Albeit the effect of plastic on marine creatures is all the more broadly known, plastic contamination additionally influences earthly creatures [9].

On land, plastic records for around 10% of the mass of the human waste. In the seas, plastic contamination compares to 60-80% of litter. In any case, in metropolitan regions, where untamed life is somewhat restricted, plastic bags cause huge natural mischief. Overflow water gathers and conveys futile plastic bags last, gathers them into storm sewers. Once in these sewers, the pack regularly

shapes bunches with different kinds of squander and eventually block the progression of water [10]. Plastic is additionally liable for the majority of the contamination in the waterway and land, as it horrendously affects both water and land species [11]. On the land, decay of normal magnificence can be noticed. Also, wind can convey plastic waste or litter all through the environment (Figure 3).



Figure 3: The impact of plastic bags on environment.

The usage of plastics has become the main source of plastic pollution. As they are non-biodegradable, they take years to deteriorate, which would result in more crucial problems to our environment. Toledo City Governments implemented a single-use plastic bag ban all over the city. Plastic is everywhere in the place. Many residents were not self-disciplined. They threw away the plastics in canals, seas, rivers, and roadways, among other sites [12].

One severe problem residents of Toledo City encountered is the urban flooding particularly in Barangay Luray II and Don Juan Climaco Sr. According to the report from the residents this happened due to the poorly maintained drains and canals. Moreover, inappropriate ways of throwing plastics are the major problem. Plastics cause flooding by plugging up drains. Clogged storm sewers can disrupt the water flow in local watersheds, ultimately leading to roads [13].

Furthermore, according to our Toledo City fishermen, contemplating the plastic pollution in the oceans, they have had problems finding fish nowadays. They contend that several marine animals, mainly fish, have perished due to this pollution because of the floating plastic they have experienced.

Toledo city Government's implementation to banning of plastic bags

The goal of the city's ordinance is to phase out the single-use plastics, which are defined as "plastics that are only assumed to be used once before being thrown out or disposed of." Single-use plastic goods such as plastic bags, straws, stirrers, cups, plates, equipment, Styrofoam, plastic toothpicks, and binderies or fliers will be prohibited. Plastics will no longer be able to be manufactured, created, or used [14]. The law, on the other hand, states that this does not apply to things that are already wrapped in single-use plastic equipment and are used as standard packaging. These prohibitions are said to be withheld for three years after the Act's enactment.

Toledo City passed amended legislation 2343, which prohibits marketing enterprises, particularly welfare and grocery stores, from securing vital supply components into plastic sacks on Wednesdays and Saturdays. In contrast, to this law, the proposed legislation recommends that the Toledo City of Plastic Ban be implemented every day of the week, as well as in grocery shops, retailers, and

select vendors and cafeterias. Every individual or material that breaks any law is fined 5,000 pesos (PHP 5000) or condemned to a period of incarceration ranging from one to thirty days. Even if trade permissions dispute, exchange institutes that fall well-short of compliance will win out [15,16].

Alternatives to plastic bags, (Tanguay 2019)

1. Recycled foldable shopping bag-Environmentally friendly bags are available. One of the best things about foldable shopping bags is that they can be used over and over again.
2. Cotton shopping bags-Are robust; a single cotton shopping bag can withstand more weight than a paper or plastic bag. Cotton shopping bags are the trendiest bags to use when you go shopping.
3. Reusable plastic bags-It's possible to make it out of post-consumer recycled stuff or post-industrial waste.
4. Non-woven polypropylene bags-Polypropylene plastic is used to make them.
5. Compostable bags-Are manufactured from renewable natural resources. They have been certified to decompose in a composting facility or a home composting environment [17].
6. Jute bags-Are arguably the oldest and most powerful plastic bag alternative. In comparison to alternative options such as cotton bags, hessian bags are noted for their excellent strength and exceptional longevity.
7. French Filet Bag-Is bang on-trend, conjuring up images of fresh vegetables and baguettes wandering around Paris. Before going to the store or out on the town, sling this over your shoulder – the crocheted cotton can stretch to fit just about anything you choose to put inside. These bags are created with lead-free dyes and are extremely eco-friendly. You can also choose to have yours made using organic cotton for an additional \$4.
8. Cotton bags-They are biodegradable and reusable. It's also a benefit because they're manufactured from natural and renewable resources. Cotton bags are more expensive to create and are not as robust as plastic bags, but despite these drawbacks, cotton bags are still a wonderful alternative to plastic bags.
9. Basket bags-Basket bags, if you choose to go to an old school, are also a terrific option with an indefinite functional life. They have a rustic look and are a great alternative for some people, which is why they have remained popular over time.
10. Paper bags-When opposed to plastic bags, they are 100 percent biodegradable. They're also reusable and recyclable. Paper bags may handle greater, if not the same, pressure or weight as plastic bags, in addition to being more environmentally friendly [18].

Toledo city LGUs action: Eliminating single-use plastics

Toledo City, Cebu's municipal government, authorized a constitution in 2019 restricting the usage of single-use plastics in the community. Disposable utensils, silverware, plastic bags, and Styrofoam existed among the commodities banned. Moreover, Mr. Cavan clarified that one of the driving forces for the regulation's authorization occurred in the city's drainage systems living largely restored with single-use plastics, occurring in continual flooding in low-lying provinces. Furthermore, another justification for the prohibition was that single-use plastics turned out in the water, resulting in some fishing industries in the country's coastal barangays suffering.

The ordinance's enactment started in 2020 and gained progressively. It commenced as a partial prohibition that was deliberately broadened to comprise every day of the week. Since the prohibition on single-use plastics affects people's lifestyles and habits, the city has had its share of problems implementing and legislation. 455 violators were found out using single-use plastics in the early few months of the law's implementation, primarily in market areas. Another problem is people who bought single-use plastics from Cebu LGUs that do not restrict the usage of single-use suffering [19].

Citizens of Toledo City were instructed to transmit their plastic bags, net bags, reusable containers (whenever they shop at the market), and tumblers as alternatives to single-use plastics (whenever they use the automatic tuning machines). Mr. Cavan, moreover, indicated that during the peak of the pandemic last year, the city government used to store the maintenance packages it issued to its citizens. Consequently, the municipal government aims to eliminate CENRO certification fees for businesses that entirely comply with the code, a move that it believes will not only motivate other businesses to follow suit but also protect the environment.

RESULTS AND DISCUSSION

Data collection and analysis

As reported by certain estimates, countless plastics exist each week. Toledo residents lawfully dispose of plastics through methods such as isolation and reuse. According to a few respondents, they consume 5-15 plastic bags per week, and some estimates, 200 plastic bags each week.

Out of the 30 people we interviewed, 28 agreed with Toledo City's plastic bag ban because it reduces plastic waste, saves mother Earth, reduces plastic waste contamination, and keeps our current situation clean, green, and safe. The two disagreed because standards and guidelines on proper garbage disposal should be established first in all barangays.

Plastic is genuinely necessary, as opposed to paper sacks, suitable for light items. Restricting plastic bags is effective in lessening or limiting our current issue of plastic waste contamination to reduce plastic waste. Moreover, prohibiting plastic sacks has significant advantages in limiting the problem and reducing the amount of plastic used. Furthermore, every respondent stated those plastics were toxic or are wreaking havoc on our health.

Residents should have a greater responsibility to ensure the cleanliness of their surroundings to reduce plastic contamination. People must take responsibility and dispose of their plastic garbage to reduce the negative consequences of plastic pollution. Citizens must be environmentally conscious and address the issue with care and discipline. Moreover, the government should have the authority to strictly enforce the reduction, reuse, and reusing of plastic sacks on the public.

The Data has been collected from (n=30) respondents of Toledo City, Cebu Philippines. The researchers purposely selected Thirty (30) residents of Toledo City, Ten (10) from government employees, 10 from ordinary consumers, 5 from vendors, and another 5 from the students. The 30 respondents voluntarily participated in the study and agreed on the interview processes. Furthermore, they were verbally informed that they have the right to withdraw from the study at any time without any adverse consequences. Lastly, the researchers ensured the anonymity and confidentiality of the

respondents' responses.

The researchers used several tools and techniques in the collection of data. The data were analyzed using the thematic analysis following the six-step process, namely: 1.Familiarization 2.Coding 3.Generating themes 4.Reviewing themes 5.Defining and naming themes 6.Writing up [20].

The summary of the questions are as follows:

Question No 1: Before the city's ordinance on plastic bag bans, how many plastics did you think you consumed and thrown away every week?

Answer summary: In Toledo City, Cebu, plastic bags are used for transporting goods such as rice, canned goods, fish and poultry products, etc. In short, a plastic bag is one of the easiest and most convenient. The majority of respondents stress that they use an average of 10 plastics per week. Few answered that sometimes they exceed 100 plastics a week.

Question No 2: Based on your observation, how do plastics pollute our land and water?

Answer summary: Without a doubt, plastics are polluting our water and soil. People in Magdugo, Toledo City, have witnessed how plastic pollutes the canals and rivers. Plastic bags can be seen everywhere, in the market, roads, school, parking lot, church, etc. Plastics are visible everywhere.

Question No 3: Before the banning of plastic bags in our city, how do you usually dispose of plastic waste?

Answer summary: More than half of the respondents said that they properly segregate and throw their plastic in the right place. The rest claimed that they often just burn it or throw it away in the river, canal, or even alongside the road.

Question No 4: Do you agree with Toledo City's banning of plastic? Why?

Answer summary: Almost everyone agreed with the implemented city ordinance of the Toledo City Government in banning single-use plastic bags. They said that in the last few months, they have observed less plastic bags in the city road and even in the parking lot. They also believed that it has a huge impact on solid waste management.

Question No 5: Do you think that the banning of plastic bags is effective in reducing or minimizing our current problem of plastic waste pollution?

Answer summary: One of the respondents said: "It has so much effective use it shows in controlling proper waste management of the people. Through banning it lessens the tendency to pollute the land and the water area which are most being affected." Almost everyone agrees that banning plastic bags helps reduce plastic waste pollution. They believed that implementing this kind of system will help people to minimize their interest in using plastics.

Question No 6: How do you think plastic waste affects your everyday living?

Answer summary: As we already taught before, plastics have a lot of chemicals robbing them. So, when it becomes a waste, and we neglect it, our health is not the only one to be put at risk but to our environment as well. Plastic waste affects a person's mental/physical health if it is not disposed of properly. During the rainy season, people of Toledo City experience urban flooding, and one

of the principal causes is the garbage stock in the drainage.

Question No 7: Do you think plastic pollution is dangerous for one's health?

Answer summary: Plastic pollution or pollution, in general, is lethal. Plastics are made environment friendly but it doesn't mean that it is that environment and health-friendly. Plastic materials contain chemicals that can kill not just animals but the environment itself. When micro plastics enter the human body via direct exposures through ingestion or inhalation can lead to an array of health impacts, including cancer, cardiovascular diseases, and many more.

Question No 8: What do you think is the role of the citizens in the reduction of plastic pollution?

Answer summary: All citizens should pay attention since plastic is a terrible material because it does not decompose on the earth. As a result, I recommended that all citizens refrain from using plastic. Please bring a bag to the market to transport your fruits and vegetables. One of the respondents remarked that citizens have a great role in reducing plastic pollution by first being aware of the harm that pollution can cause to the ecosystem and then developing strategies to address the existing pollution issues. Citizens are accountable for developing broader solutions to trash reduction, such as waste management, because they are the primary contributors.

Question No 9: Do you think the government must strictly impose the reducing, reusing, and recycling of plastic bags on the public?

Answer summary: The majority strongly agree that the government must strictly impose the banning of plastic bags.

Question No 10: What recommendations can you share to minimize or reduce plastic waste pollution?

Answer summary: The majority of the respondents give similar opinions on the question above [21,22]. To sum up:

- Never leave any waste on the street, in nature, on the beach.
- Avoid pre-packed fast food or dispose of the packaging in the waste bin.
- Bring your water bottle.
- Use reusable bags and pouches
- Avoid the use of plastic disposable materials.

RECOMMENDED SOLUTION

A preponderance of people living in Toledo City is aware of the pollution issues that plastic bags generate. Consequently, plastic bags are resulting in environmental problems in Toledo City. As a result, the city commission is considering enacting a plastic bag ban, which the residents agreed with its implementation and remembered that we exist all to be blamed for the rising in plastic pollution. Nonetheless, there would theoretically exist no plastic in the environment. We use compacts in the same way as our city does to avoid contamination. 3 Rs are the most efficient way to cut down on plastic waste production (Reduce, Reuse, and Recycle).

CONCLUSION

The successful reduction of plastic trash can help individuals to decrease their consumption choice of plastic. This entails altering

their continual routines, like the constant use of plastic when a better alternative exists, along with using plastic when it is required. The respondents deemed that plastic bags bring a big concern and suggested remedies in the shape of alternative bags made of cloth, paper, and fiber. However, the total participants agreed that raising awareness of the situation would assist in solving it. Therefore, plastic bags can be reusable for a variety of uses. It is vital to consider how quantities of things have service onwards of discarding them.

Keeping the community's exposure to plastic toxic wastes to a minimum will increase the odds of a healthy environment and society. Government agencies and health permissions instantly needed to establish and implement environmental regulations that would monitor the manufacturing use and disposal of plastic. Plastic waste management researchers have utilized several types of waste plastic and renovated them into valuable items. Nevertheless, this is crucial since plastic bags are used all over the world and thrown away, so we are damaging ourselves by continuing to use them.

When it comes to dealing with plastic garbage, it has five basic solutions, recycling, and disposal in landfills, incineration, microbiological deterioration, and conversion into valuable materials. All strategies have drawbacks, necessitating further research into the most effective ways of the management of plastic trash. Moreover, plastic bags have an impact on multiple people, shoppers, and the environment, and animals. The environmental effects of plastic bags are important since they solely affect the environment, but they affect humans too. Plastic bags have significant environmental consequences for humans and animals.

Moreover, the source of plastic bags remains to produce plastic bags for its clients. Citizens can persuade refraining from using or accepting plastic bags from shops that can prevent them from purchasing them. Furthermore, participating in cleanup activities, voluntary recycling of household waste, avoiding littering, and unlawful dumping of plastic shopping bags are all measures that can reduce the environmental impact of plastic bags. Consequently, it will take an extensive public awareness campaign to discourage the usage of plastic bags and the local administration from monitoring the sale and production of plastic bags.

REFERENCES

1. Adam I, Walker TR, Bezerra JC, Clayton A. Policies to reduce single-use plastic marine pollution in West Africa. *Mar Policy*. 2020;116(1):103928.
2. Besseling E, Foekema EM, Van Franeker JA, Leopold MF, Kühn S, Rebolledo EB, et al. Microplastic in a macro filter feeder: humpback whale *Megaptera novaeangliae*. *Mar Pollut Bull*. 2015;95(1):248-252.
3. Dauvergne P. Why is the global governance of plastic failing the oceans?. *Glob Environ Change*. 2018(1);51:22-31.
4. Ambrose KK, Box C, Boxall J, Brooks A, Eriksen M, Fabres J, et al. Spatial trends and drivers of marine debris accumulation on shorelines in South Eleuthera, The Bahamas using citizen science. *Mar Pollut Bull*. 2019;142:145-154.
5. Ajzen I, Joyce N, Sheikh S, Cote NG. Knowledge and the prediction of behavior: The role of information accuracy in the theory of planned behavior. *Basic Appl Soc Psych*. 2011;33(2):101-117.
6. Beaumont NJ, Aanesen M, Austen MC, Börger T, Clark JR, Cole M, et al. Global ecological, social and economic impacts of marine plastic. *Mar Pollut Bull*. 2019;142(10):189-195.
7. Bezerra JC, Walker TR, Clayton CA, Adam I. Single-use plastic bag policies in the Southern African development community. *Environ Challenges*. 2021;3(1):100029.
8. Gall SC, Thompson RC. The impact of debris on marine life. *Mar Pollut Bull*. 2015;92(1-2):170-179.
9. Arbieu U, Grünewald C, Martín-López B, Schleuning M, Böhning-Gaese K. Large mammal diversity matters for wildlife tourism in Southern African Protected Areas: Insights for management. *Ecosyst Serv*. 2018;31:481-490.
10. Imran M, Abbas J. The role of strategic orientation in export performance of China automobile industry. *Handbook of Research on Managerial Practices and Disruptive Innovation in Asia*. 2020:249-263.
11. Habib M, Abbas J, Noman R. Are human capital, intellectual property rights, and research and development expenditures really important for total factor productivity? An empirical analysis. *Int J Soc Econ*. 2019.
12. Browne MA, Crump P, Niven SJ, Teuten E, Tonkin A, Galloway T, et al. Accumulation of microplastic on shorelines worldwide: sources and sinks. *Environ Sci Technol*. 2011;45(21):9175-9179.
13. Cole M, Lindeque P, Fileman E, Halsband C, Goodhead R, Moger J, et al. Microplastic ingestion by zooplankton. *Environ Sci Technol*. 2013;47(12):6646-6655.
14. Convery F, McDonnell S, Ferreira S. The most popular tax in Europe? Lessons from the Irish plastic bags levy. *Environ Resour Econ*. 2007;38(1):1-1.
15. Derraik JG. The pollution of the marine environment by plastic debris: a review. *Mar Pollut Bull*. 2002;44(9):842-852.
16. Abdul J, Nannu M, Khalilur RM. Using Plastic Bags and Its Damaging Impact on Environment and Agriculture: An Alternative Proposal. *Int J Lear Dev*. 2013;3(4):1-5.
17. Ahsan MU, Nasir M, Abbas J. Examining the Causes of Plastic Bags Usages and Public Perception about its Effects on the Natural Environment. *Int J Acad Res Bus Soc Sci*. 2020;10(10):80-96.
18. Mahmood HK, Hashmi MS, Shoaib DM, Danish R, Abbas J. Impact of TQM practices on motivation of teachers in secondary schools empirical evidence from Pakistan. *J Basic Appl Sci Res*. 2014;4(6):1-8.
19. Mulder KF. Impact of new technologies: how to assess the intended and unintended effects of new technologies. *Handb Sustain Eng*. 2013.
20. Borja A, White MP, Berdalet E, Bock N, Eatock C, Kristensen P, et al. Moving toward an agenda on ocean health and human health in Europe. *Front Mar Sci*. 2020;7:37-39.
21. Asensio-Montesinos F, Anfuso G, Randerson P, Williams AT. Seasonal comparison of beach litter on Mediterranean coastal sites (Alicante, SE Spain). *Ocean Coast Manag*. 2019;181(1):104914.
22. Nielsen TD, Hasselbalch J, Holmberg K, Strippel J. Politics and the plastic crisis: A review throughout the plastic life cycle. *Wiley Interdiscip Rev Energy Environ*. 2020;9(1):e360.