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Assessment of the Environmental and Health Impacts of disposal Plastics in Gode town, Somali regional state, Eastern Ethiopia

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Abstract

The increase production of plastics, generation of high plastic disposals and mismanagement of wastes are the main causes of environmental pollution and human health effects. This study was assessed the environmental and health impacts of disposal plastics in Gode town, Eastern Ethiopia. The necessary data was collected from 265 households from the three *Kebeles* selected by using random and purposive sampling methods. The findings revealed that the waste generates in Gode town was plastic bags (46%), water and soft drink bottles (34%), household utensils (16%) and others (4%). The sources of plastic wastes in Gode town were residential (55%), commercials (32%), industries (9%) and other sources (3%). The poor management of municipality, shortage of resources materials, absence of private waste collectors and absence of legal legislation were identified as main challenges faced in the town. The result of this study also demonstrates that disposed plastic wastes had negative impacts on human health, animal health, blockage of sewage tubes and Environmental pollution which was ranked as 1st, 2nd, 3rd, and 4th respectively. Residents were infected by viral diseases like dengue fever, respiratory disease, lung disease and shortage of breath. In addition to this, domestic and marine animals were infected by disposal plastics dumped everywhere. Furthermore, this study recommended that the municipal should use disposal wastage preventive measures which includes, households level waste reduction methods, increasing public awareness, providing eco-friendly alternative materials and developing restriction policy and legislations in order to improve waste management practices and minimization of waste disposal hazards in Gode town.

1. Introduction

Plastics are organic polymeric materials consisting of a large collection of synthetic organic compounds that are produced by polymerization of many repeating units (monomers) that come together to build copolymers [1]. Plastics enjoy a number of enormously desirable characteristics: inexpensive, lightweight, strong, durable, high strength-to-weight ratio, excellent thermal properties, electrical insulation, and resistance to acids, alkalis and solvents [2].

Over the last decades, worldwide production of plastics have been increased significantly due to increasing demand in developing country as in Asia, Africa and South America [3]. Since 1950 to 2018,

about 6.3 billion tones of plastics have been produced worldwide, 9% and 12% of which have been recycled and incinerated, respectively. The increasing of Human population and steady demand for plastic products were responsible for continuous increase in the production of plastics and generation of plastic disposal wastes [4].

Plastic products and their wastes are a global problem, but with regional inconsistency. Plastic is burnt releasing toxic gases into the atmosphere, liberates hazardous halogens and pollutes air, harmful to central nervous system, carcinogens, heart disease, aggravates respiratory ailments such as asthma and emphysema and cause rashes, nausea or headaches [5]. Hence, a sustainable plastic pollution control is necessary for the protection of human, animals and environment. Most plastic industries are used additive materials like bisphenol A, phthalates, poly-fluorinated, dioxins, brominated flame retardant and antimony trioxide during manufacturing and these materials have unfavorable effects on environmental and human health [6]. Moreover, little efforts were involved in some parts of the world associated to plastic waste collection, recycling and reuse [7]. Recently many researches were indicated that plastics brought miscellaneous effects on environment [8, 9], human health [6, 10], Fishes [11, 12], soil [13], cattle [14], and national parks [15].

In developing countries, least preferred waste management techniques like incineration and landsfilling were practiced and they have poor management decision related with waste control. In order to reduce the problems and control wastes; Ethiopian government made a proclamation and signed international convection about solid waste management (SWM) in 2007 [16]. Unfortunately, the articles of SWM Proclamation were not included legal frameworks about plastic industries if they distributed low quality plastic for consumers and the product that is not labeled how it is biodegradable or not as well as necessary safety instructions [17].

In many cities of Ethiopia the municipality of waste collection, removal and administration were very weak, not enough containers to collect the waste and waste collection push carts were full for long periods of time and very limited effort to recycle, reuse or recover the wastes. The study by Mengist and Assegid [18] in Adama city, Ethiopia revealed that the capability of the containers did not bring all the waste generated by the locality and containers were not picked up by the municipality before the waste overflowed. Some studies have shown that only 43% of waste is collected in the country are properly collected and disposed in open landfills. The remaining waste is indiscriminately disposed in drainage system, open spaces, street sides, rivers, forest or is informally burned [19].

In Ethiopia several researches showed that plastic wastes were the major type of solid waste generated in some cities. Yohanis and Genemo [19] were identified that from the total wastes generated in Jigjiga City, 28% of the wastes were plastic bottles and bags from both residential and commercial areas. Tesfaye [20] was identified 64 % of the total solid wastes in Addis Ababa city were non biodegradable organic wastes. In Addition, the study done by Lema *et al* [21] indicated the type of wastes generated in Assela, Ethiopia includes; Plastic (34.8%), Food residual (31.4%), paper (30.3%), metal wastes (1%) and other wastes (2.5%).

Gode town is a station of non- governmental organizations (NGOs), hospitals and industries and generated numerous amounts of solid wastes. The city municipality is not worked friendly with NGOs, private organizations and public groups and has low awareness creation about solid waste management among potential consumers. There is no container (push cart) in the city and consumers transported solid

wastes by donkey cart, disposed unauthorized dumping sites such as river, roads, and forest and as well as informally incinerated. In addition, no comprehensive studies were conducted on the plastic waste management system, techniques and sources of disposal and impacts of plastic wastes in the study area. Based on the above research gaps this study was intended to assess the environmental and health impacts of disposal plastic in Gode town, Somali regional state, Eastern Ethiopia and implicated the possible measures to reduce the negative impacts of plastic disposal in the city. The finding of the study could important for city municipality, policy makers and give baseline information for researchers who could like to conduct plastic and plastics waste disposal related issues (Figure 1).

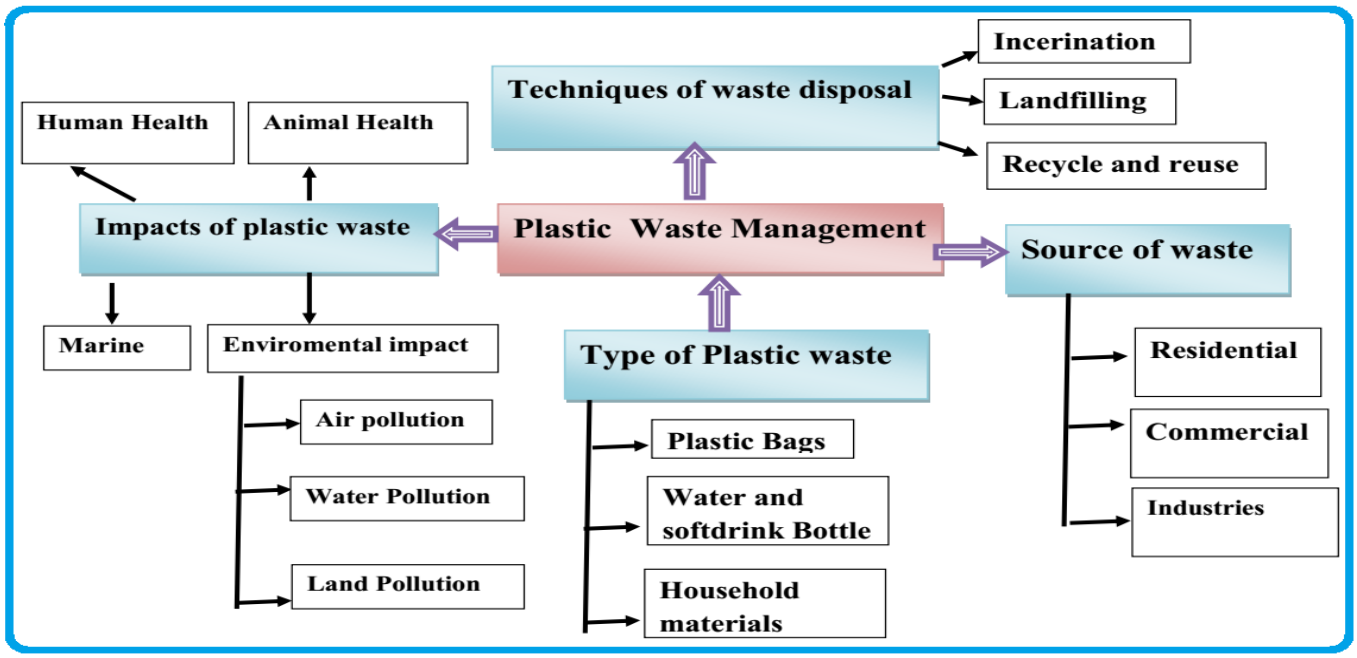

Figure 1 Conceptual framework (Developed by researchers)

2. Materials and Methods

2.1 Study Area

The study was conducted in Gode town, a capital city of Shabelle zone, Somali National Regional State of Eastern Ethiopia (Figure 2). It is located about 1225 km far from Addis Ababa, the capital city of Ethiopia and 600 km from Jigjiga, the capital city of Somali regional state. The climate of the town is scorched to semi-scorched marked by drought, seasonal variations and an average rainfall between 150-250 mm. Imi *woreda* in the north, Kelafo *woreda* in the south, Adadley *woreda* in the west and Denan *woreda* in the east bound Gode *town*. The altitude of Gode town is 260m above sea level. The minimum and maximum temperature of the town is 28° C and 40° C respectively. The mean annual rainfall is about 200 mm scattered in two rainy seasons *gu* (April-June) and *dayr* (October to December). According to the 2007 Population Census, the total population of the town were 43,234 (24,223 male and 19,011 females) and the population has enlarged by both returnees from Somalia and dropouts from pastoral economy. The main economic activities in Gode town includes among others trading, agro-pastoralist and manufacturing enterprises [22, 23]

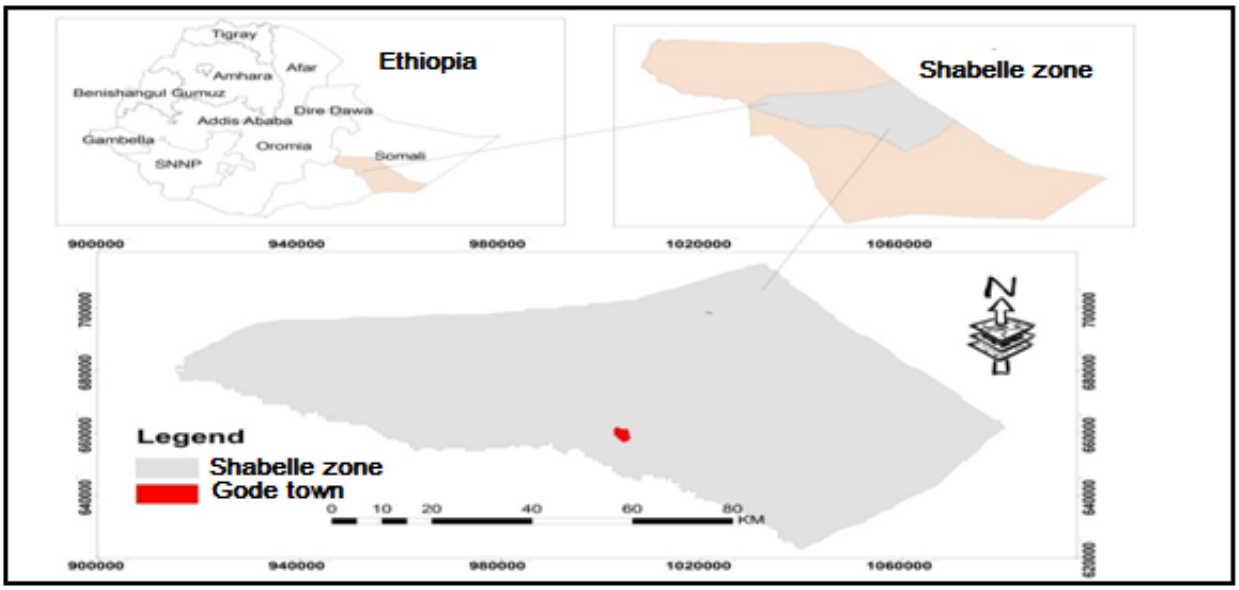

Figure 2 Geographical location of the study area

2.2 Sources of Data

Both primary and secondary data sources were used to conduct this study. Primary data was collected by using questionnaires, key informant interviews and filed observation methods of data collection. Secondary data was collected by reviewing annual reports of water bottling factories, published and unpublished articles and city municipality documents.

2.3 Sample Size and Sampling Techniques

Table 1. Demographic characteristics of the respondents of Gode town (N=265)

	Variable	Frequency	Percentage
Sex	Male	183	69.06
	Female	82	30.94
Educational status	Illiterate	7	2.64
	Read and write	51	19.25
	Primary Education	78	29.43
	Secondary Education	109	41.13
	Higher education	20	7.55
Occupation	Agro-pastoralist	12	4.53
	Municipality worker	9	3.40
	Informal waste collectors	5	1.89
	Merchants	85	32.08
	Government employees	109	41.13
	students	42	15.85
	other	3	1.13

The target population of the study includes agro-pastoralist, municipality workers, households, health extension workers and informal waste collectors. The data were collected using both random sampling and purposive sampling techniques. Required data collected from households from the total eight *kebles* of the town only 2 *kebles* were selected using random sampling technique and one *kebele* (*Kebele 05*) was selected purposively, because it is the site of waste disposal in the city and has discriminate management of wastes. The sample size of respondents was considered as 265 (183 males and 82 females) and based on 95% confidence level and 5% margin of error was calculated. The sample sizes of male respondents were larger (69.06%) than females (30.94%), because of these participated in plastic related issues workers dominated by males in the study area.

2.4. Data Collection Instruments

For this study data was collected using questionnaire survey, key informant interviews, Field observation and document analysis were treated to support the findings of the study. A questionnaire was prepared by English and translated in to local language (Af- Somali) to clarify the questions and to reduce misunderstandings of respondents. The questionnaires were used to collect information about source of wastes generation, methods of waste management, impacts of plastic disposal and possible techniques to handle waste disposal in the city. Survey observation was engaged for collecting of data about waste management system of the town, discharging site of wastes and health and environmental risk implication of events. The annual productions of plastic water bottles were collected using document analysis of the factories. Poor waste handling of stakeholders and absence of legal frame works in municipality were collected by key informants and it was analyzed mixed with secondary data.

2.5. Method of Data Analysis

Descriptive statistical (mean, frequency and percentage) was used as data analysis techniques and each data was analyzed using Microsoft Excel 2007. The data was tabulated and the necessary charts and graphs were prepared using Origin pro version70 computer software. Analysis of statistical significance tests were carried out using analysis of variance (ANOVA) at p value less than 0.05.

3. Results and discussions

3.1 Types of Plastic Waste Generation

Several types of plastic wastes were generated in Gode town. As shown in Figure 3, the major generated plastic wastes in the study area were plastic bags/festal (46%), water and soft drink bottles (34%), household utensils (16%) and others (4%) including plastic shoes, cooking oil and detergent containers. Plastic bags from different sources were presented in massive numbers and surplus as wastes most probably after a single use. The field observation of the researchers indicated that plastic bags were easily available materials and consumers get it as a bonus when buying of other goods from supermarkets and informal wholesalers (locally known as "*Liwach*" *in Amharic* or *"Celis" in Somali*) were exchanges plastics household utensils by used clothes and shoes.

Manufacturers of water bottling and soft drink were identified as chief suppliers of polyethylene terephthalate (PET) plastic bottles to the environment which have toxic additives and causes cancer, impaired immunity, and endocrine disruption, developmental and reproductive effects [24].

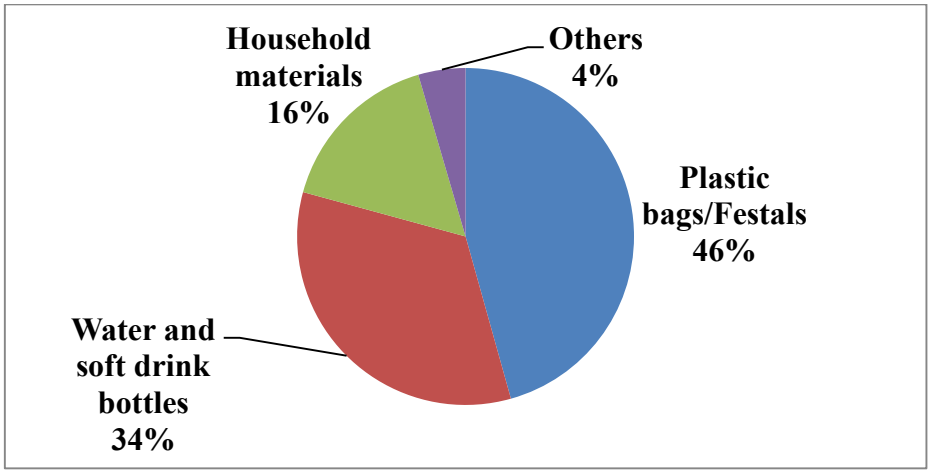

Figure 3 The type of plastic waste generation in Gode town (Researchers survey)

The bottled water consumers gradually increased at home, work places and recreation centers as a replacement for of tap water regardless of careless on environmental effect after use [25]. The study conducted by Ostby [26], investigated because of the climate condition and lack of tape water availability in the area people are mainly used packed water bottles in refugee camps of Somali region Ethiopia. The field survey indicated that in Gode town two bottling water plants are available and people consumed large amount of water due to hot climate conditions. These plastic products reused by some communities and discharged on the environment without any safety. Even though Gode spring water enterprise was prepared re-use 20L PET water bottle to minimize plastic waste in the town, still water bottles and other plastic waste disposals are crucial indicator for pollution problems.

Table 2 Total annual consumptions of water bottles in Gode town

Bottling factory	Size of bottle	Total production			Total consumption per year
		Per day	Per month	Per year	
Gode spring	0.5L	1325	39750	477000	1371600
	1.0L	2400	72000	864000	
	20L	85	2550	30600	
Aqua Shebelle	0.5L	865	25950	311400	945000
	1L	1760	52800	633600	

Source: Document analysis of water bottling factories

3.2. Sources of Plastic Wastes

As indicated in Figure 4, the majority of the sources of plastic wastes in Gode town were residential (55%), commercials (32%), industries (9%) and other sources (3%). The households source of plastic waste in this area is less than Addis Ababa (76%), the study conducted by Regassa *et,al.* [27]. Mostly more plastics debris was available from commercial and domestic sources in developing countries [28].

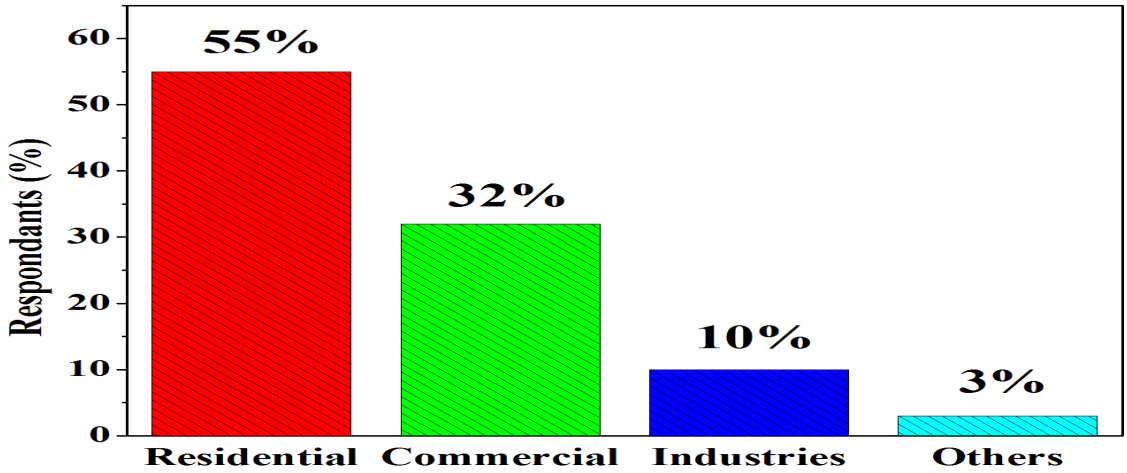

Figure 4 Sources of plastic waste generated in Gode town (Survey result).

3.3 Techniques of Plastic Waste disposal

In Gode town different methods of plastic waste disposal techniques such as Landfilling, incineration and waste reuse were practiced at household's level. Although landfilling is the commonest waste management conventional approach in many countries, it was found that scarcity of space for landfills and lack of proper management is became a major challenges for environmental, animal and human health. In case of rubbish plastic bags fail to reach landfills, escape from the containers and landfills by wind and become scattered inserted in rivers and lakes [29]. The filed observation and key informant interview revealed that the disposal site of Gode town is nearest to Shebelle river and residents were disposed plastic wastes in the area, and then plastic debris were inserted in the river and affected the fishes and other marine animals.

According to table 3 the other common waste disposal techniques practiced in Gode town was incineration. Burning of plastics became serious burden on the human and natural environment if the process is not properly controlled and monitored [30]. The data collected from interviews and field observation showed that due to absence of garbage container and lack of door to door collector of wastes for the city municipality, households were incinerating plastic wastes in unsecured places. This is the most unfavorable ways of waste management which leads to serious environmental and health impacts included greenhouse gas emissions and cause different health risks [30]. In most developing countries incineration of wastes were the sources of heat, electricity, or fuel, higher energy savings than recycling, and energy source for industries, since plastics are modified from petrochemicals like petroleum or natural gas [31]. Conversion of waste to energy technology was not developed in Ethiopia as well as the study area domestic and commercial plastic wastes were incinerated manually around road, between homes and in any free spaces (Figure 5B). According to Table 3 below, Incineration, landfilling, and wastes reuse were significant waste management technique that used in the study area. But, this study found that waste reuse was little practice in Gode town. As collected information from interview, informal waste collectors (locally known as "*Korales*") buy few recyclable plastic products in the city, the other plastic wastes like plastic bags, water and soft drink bottles, food packaging plastics did not reuse at households level. Therefore, the study results in line with that of [29, 32].

Figure 5 (A) Unauthorized dumping sites between residential area (B) informal incinerations of plastic wastes in open space (image taken by researchers)

Table 3 Techniques of plastics waste disposal in Gode town (N=265)

Techniques of waste disposal	sex	Degree of practice of households [a]							
		1	2	3	4	5	total	Mean	P value
Incineration	M	47	28	15	42	50	566	3.11	0.00456*
	F	2	8	16	25	32	326	3.93	
landfilling	M	15	19	29	35	84	700	3.85	0.05793**
	F	7	10	12	17	37	316	3.81	
Recycle	M	53	50	44	28	7	432	2.37	0.05793
and reuse	F	39	14	11	8	11	187	2.25	

*significance at p<0.05, ** not significance at p< 0.05

[a] 1 = Never; 2 = rarely; 3=sometimes; 4=frequently ; 5= Always

The analysis of variance indicated that statistically significance difference between sex groups (*p* value0.00456) and educational status of respondents (*p* value 0.03811), incineration was mostly practiced by female and illiterate headed households. During interview, key informants have high academic performance have a good knowledge and awareness regarding about waste management techniques. Absences of awareness and education status were crucial factor for failure of a solid waste management service in developing countries [33].

3.4 Challenges of Plastic waste management in Gode town

Integrated Solid waste management is a challenge for the cities and authorities in developing countries mainly due to financial problems, inappropriate equipment, poor collection and transportation

system, lack of planning and operation, lack of effective legislation as well as lack of public awareness about waste management [34, 35].

The information collected from interviews and field observation indicated that the municipality of Gode town has not adequate materials to manage wastes in the town and had poor coordination between stakeholders. All respondents (100%) indicated that there is no container, transportation service and door to door waste collection practice in Gode town. During interview the head of municipality said that *"due to low financial support and limited funds, the office couldn't provide waste disposal containers and transportation services for the residents"*. Accordingly, private waste collectors were began door to door waste collection with fee in the town, but households have not willingness to pay the collectors services and immediately they stopped the work.

Table 4 challenges of plastic waste management in Gode town (N=265)

Items	Yes		No	
	Frequency	%	Frequency	%
Municipality has garbage container	0	0	265	100
Municipality has transportation services	0	0	265	100
Door to door waste collection is found	0	0	265	100
Municipality has legal punishments	26	10	239	90
Community awareness is presents	133	50	132	50
Disposal wastes are Properly managed	10	4	255	96

In developing countries households mostly refuse private waste collectors due to their charge of money. According to the above table 4, 90% of respondents indicated that there is no legal punishment when consumers disposed wastes in unauthorized places. Half of respondents (50%) have not obtained awareness and training about solid waste management. The municipality waste management of Gode was 96% improperly manage in services, awareness, control and planning. According to health extension workers in interview, there is little awareness creation campaign in the town about waste collection, disposal site, and its adverse impacts on environment and health. However, by poor management of municipality, shortage of resources materials, absence of private waste collectors and absence of legal legislation households were not exercised effective disposal waste management in the town.

3.5 Impacts of plastic wastes in Gode town

Significant accumulations of plastic debris were toxicological effects on animals, humans and the cause of air, water and land pollution. The problems of plastic wastes were varied from place to place as the result of activities of human, availabilities of risked groups and possible measurements to minimize the risks. According to Table 5, the impacts of disposal plastics in Gode town were human health problems, animal health problems, Blockage of sewage tubes and Environmental pollution as a ranked

1st, 2nd, 3rd, and 4th respectively. The mechanism of toxicity of chemicals released from plastic in the human body is not precisely determined but it correlated with endocrine disruption [35].

Figure 6 open dump sites of plastic wastes (A) in forest (B) road side around Shebelle River (image taken by researchers)

In Gode town, dumping waste materials including plastics is common and you see every were, plastic bags with foods in dumpsites released by households were attract rats, flies, birds and other kinds of animals that have a potential to transmit diseases to humans. The result of key interview with health extension workers in Gode town revealed that due to poor waste management system residents were fatalities of viral disease like dengue fever, respiratory disease, lung disease and shortage of breath which agree with the previous reports [36, 37].

Table 5 Impacts of plastic waste using levels of magnitude and Severity (N=265)

Impacts of plastics	Levels of Magnitude and Severity [a]							
	1	2	3	4	5	Total [b]	Mean	Rank
Animal Health	4	28	47	66	120	1065	213	2
Human Health	5	21	47	67	125	1081	216.2	1
Environmental Pollution	9	45	52	77	82	973	194.6	4
Blockage of Sewage tubes	2	45	58	55	105	1011	202.2	3

[a] 1 = Never; 2 = low; 3=moderate; 4=high; 5= very high
[b] summation of levels of magnitude and Severity multiply by number of respondents

Plastic pollutions have severe effects on domestic animals and aquatic ecosystems. The plastic bags along with other foreign bodies in domestic animals affect the health and cause economic loss to the owner. Cows and small ruminant animals (sheep and goats) with polythene materials in their stomach suffer from immune suppression, depression, loss of weight, arched back and grunting, reduction of milk yield, and suspended rumination. The below image shown, severity of waste materials on small ruminants in the study area.

Figure 7 Temporary waste storages and domestic animals were feeds foods from disposal wastes (image taken by researches)

In Gode town the wastes of plastic bags from hotels and restaurants currently had great impacts on life and livelihoods of people as well as on the health of domestic animals. The problem of plastic waste is among that and treated the life and reproduction of fishery species in Shebelle River which is very close to Gode town. Similarly, study by [38] argue that widespread use of plastic and its disposal has become an enormous impact on the marine environment and ingestion of plastics in plastic debris are causes of death in marine organism. Similar problems were attended in fishery area of Shebelle River in nearest to Gode town.

The recent studies showed that the accumulations of persistent plastic products are the causes of environmental pollutions such as air, water and land by change physicochemical properties of water, natural beauty deterioration, reduces soil fertility and decrease the growth of plant, increase the concentrations of greenhouse gases (CO_2, methane, chlorofloro carbons-CFCs, nitrogen oxides) and causing global warming, ozone layer depletion and acidic rain [13, 39, 40]. By exponential increments of unnecessary packaging of household items such as foods, clothes, detergents, beverages, cooking oil and some chemicals, consumers deposit wastes of plastic materials along streets, major roads, and public institutions [41]. During the rainy seasons, unauthorized dumpsites of plastic disposal were disturbed rain water and flood flows by blockage of sewage tubes and servers, which can be a source of mosquitoes habitats other communicable diseases.

3.6 Preventive Measures for Reduction Plastic Wastes

In Gode town the effective solid waste management like collection and transportation of waste disposal, dumping by children, and awareness creation for local communities by Gode city municipals

were mostly used. According to interview with Gode town officials the local government is effectively working to minimize the negative impacts of plastic wastes for protection human health and environment. But, this study found that still the environment, human and animals are in risk. Recently, scholars including [42, 43] Suggested, three term measurements for stakeholders to reduced plastic wastes pollutions on environment and public health includes:-

1. ***Production control:*** reducing consumption through removal of unnecessary packaging, increasing of public awareness, and providing eco-friendly alternatives (non-plastic products);
2. ***Action based Management:*** modernize waste collection systems and avoiding landfilling, legalizing private waste collectors, insuring law enforcement;
3. ***Plastic replacement technique:*** replacing by biodegradable (Bio-plastics) which can be obtained from different plant proteins and implementation of life cycle assessments.

Using Alternative reusable materials

Recently companies of developed countries recommended suitable methods for reduction of usage of plastic products in world wide. Based on Life cycle assessment is petrochemical based plastic products were replaced by low-priced alternative reusable materials made from natural fibers, paper and clothes which have low impact on environment and human health [44]. In India, Myana [45] introduced two types of degradable reusable shopping bags (1) Oxo-biodegradable bags were break down within 6-18 months in water and air (2) Corn-made biodegradable bags were break down in landfills but not in water and air. Bioplastics are other eco-friendly renewable plastic product that made from biodegradable and non-biodegradable materials such as vegetable fats and oils, sugars, wood, cellulose, lactic acid and starch that decreases consumption of non-renewable energy and reduces the emission of toxic gases as well as save our universe's organisms and make the world secure for humans [46].

Waste reduction methods (5R methods)

Effective waste management was represented by pyramidal shaped waste hierarchy that presents all steps of waste treatments and reduction (Figure 8). The tip illustrates the least desirable solution and the base shows the first step of action of proper waste management. The concept of 5 Rs denoted Reduce, Reuse, Recycle, Recover and refuse, may provide as a guiding standard for consumers, industry, and authorities for suitable measures to controlling impacts of environmental and human health plastic wastes.

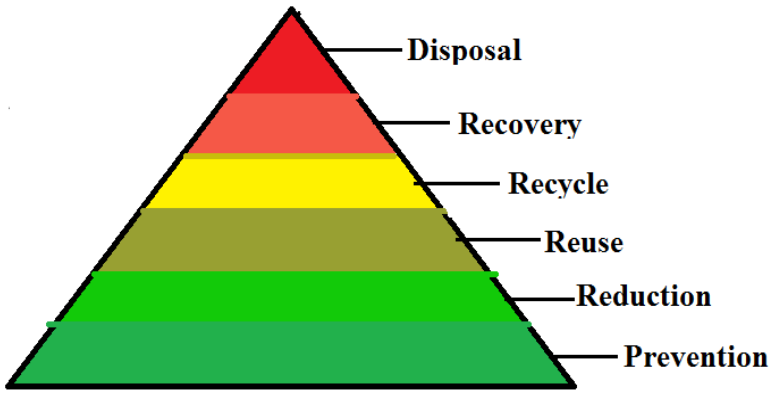

Figure 8 The waste management hierarchy (Adapted from [38]

According to the above diagram, waste control and reduction represent the base of the waste hierarchy. It included avoiding unnecessary packaging or choosing eco-friendlier alternatives is regulation of consumption restriction (taxation) in advertisements, and banning single-use products. On the other hand, waste disposal was identified as the least option of waste handling measurements.

Policy concern of Wastes management

To protect our planet from the accumulation of persistent plastics concerned bodies revised policies which must be properly followed and implemented in plastic industries, contributors and plastic product consumers. Legal punishments of plastic producers and consumers are potential rule for reduction of plastic pollution if they included toxic ingredients in their products and disposed unauthorized places. It is also important for authorities to enforce and implement regulations that help us to check production, consumption, usage and ultimate disposal of plastics, irrespective of their hazardous status. However, the implementation of national policy and local rule and regulations was not practiced at households' level and private institutions in Gode town. Scholars argue that the problem was low punishment of individual who disposed wastes in unauthorized places as compared to the payment of private waste collectors in Ethiopian cities.

4. Conclusion and policy recommendations

Plastic wastes management in Gode town is inauspicious, unacceptable and poor manageable. Due to poor management and improper handling of plastic wastes; environmental pollution, human and animal health problems were observed by releasing hazards substances in Gode town. This study revealed that plastic waste disposal related problems need urgent solution to save life and environment in the study area. There is no container (push cart) in the city and consumers transported solid wastes by donkey cart, disposed unauthorized dumping sites such as river, roads, and forest and as well as informally incinerated. There is no legal punishment when consumers disposed wastes in unauthorized places. Plastic debris inserted in Shebelle River treated the life and reproduction of fishes. Due to poor waste management system residents were fatalities of viral disease like dengue fever, respiratory disease, lung disease and shortage of breath. Domestic animals were infected by plastics that disposed from Hotels and restaurants in Gode town. Unauthorized dumpsites of plastic disposal were disturbed rain water flows by blockage of sewage tubes and servers. Stagnant water in sewage tubes were the ideal habitat for mosquitoes and other parasites. Therefore, this study provides the following recommendations for all stakeholders:-

- ✓ Gode city municipality should seriously work with Gode town operating international and local NGOs, private and public organizations to create awareness about solid waste management for potential consumers;
- ✓ Gode city municipality shall develop strategic plans to manage dramatically increasing waste disposal in the city.
- ✓ Somali regional government shall develop legal documents to protect the environment from plastic waste disposals and promote principal methods of human life and environmental protection.

- ✓ Gode municipality shall provide necessary materials for waste disposal and identify authorized waste disposal spaces.
- ✓ Educational curriculums at secondary and university level shall include ways of plastic pollution reduction and waste management as their education system.
- ✓ Gode community and civil societies shall work on awareness creation and community mobilization against plastic and other wastes disposal in unauthorized places.

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