



*Research article*

## **Greening through taxation: assessing the potential opportunities and challenges of plastic products in Ethiopia**

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**Abstract:** The purpose of this study is to investigate the potential opportunities and challenges of plastic products in Ethiopia. The study is qualitative in nature and a descriptive research design with the in-depth interview was used. The study employed both primary and secondary sources of data to investigate the study on hand. More specifically purposive sampling techniques were used to select the respondents for the interview. Discourse analysis was used in the study to recognize discursive interaction as a valuable tool for determining opinions, ideas, and facts about plastic products in Ethiopia. The study developed two different storylines regarding the opportunities and challenges of plastic products. As a result, the first storyline (S1) used taxing plastic products as an alternative strategy. The second storyline (S2) used banning plastic products as opposing strategy. The study finding implies that having a tax on plastic products could provide more opportunities for the country than banning them. More specifically, taxing plastic products will be more appropriate for the generation of revenue, employment, industrial process, construction process, and recycling in Ethiopia. On the other hand, a lack of proper collection systems, separation of the source of disposal, a properly designed operating system, clear authorities and sanitation rules, organizational capacity, and unreliable collection services were found to existing challenges of plastic products. Governments and policymakers shall play a critical role in developing the necessary legislative framework to encourage mitigation actions that contribute to the reduction of plastic waste at the source, as well as encouraging the cleanup of plastic pollution on coastlines. Public discussion on alternative packaging than the one-time use of plastic

products is also needed. Public awareness is required to change customer attitudes, and separation of organic and non-organic waste across the cities.

**Keywords:** greening through taxation; plastic products; opportunities; and challenges

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## 1. Introduction

The issue of environmental crises is currently a hot topic around the world, with several research attempts to identify and understand the major causes of environmental change. Outdoor air pollution is one of the most serious environmental issues today. According to WHO research, an estimated 4.2 to 7 million people die each year as a result of air pollution, and nine out of ten individuals breathe polluted air. The overuse of resources and the production of plastics have resulted in a global waste disposal crisis. Every day, households produce hundreds of tons of domestic waste, contributing to the world's massive environmental concerns. Plastic goods are among these wastes. Plastic products are used for a variety of services and dumped into the earth after use. The dumped plastics on earth affect our health, our socio-economic conditions, our coastal and marine environment as well as our climate [1].

Emerging studies imply that; people started using plastic products to carry groceries and goods by hand in the late 1950s, and these products gained popularity quickly in the last quarter of the twentieth century [2]. These Plastic products are more than doubled between 1950 and 2015, with an annual output of 322 million metric tons (Mt) every year, and are expected to double by 2035, and nearly quadruple by 2050 [3]. To that end, producing these plastic products consumes a lot of natural resources. According to the study conducted by [4], producing a kilogram of the plastic product almost takes 185 liters of water. The production of these plastics is highly dependent on virgin fossil feedstocks (mainly natural gas and oil), it uses up to 6% of global oil production to produce plastic products, and this is expected to increase to 20% by 2050 [5]. After they are manufactured, and used, these plastic items are poured into the ground both in urban, and rural areas preventing the soil from producing nutrients. As a result, soil fertility is reduced, which has an impact on agricultural productivity. According to a study conducted by [4], around 4900 Mt of the projected 6300 Mt total of plastics ever manufactured were dumped in landfills or elsewhere in the environment on average. Unless action is taken, this is predicted to rise to 12,000 Mt by 2050. Furthermore, they release harmful chemicals when they are used, recycled, disposed of, or left in the environment as litter. For all their benefits, though, plastics also present challenges. Under these scenarios, the circular economy is found as an alternative to mitigate the impact of plastic products, as it is more related to making, using, and disposing of the economic model, keeping resources in use for as long as possible, extracting the most value from them while in use [6].

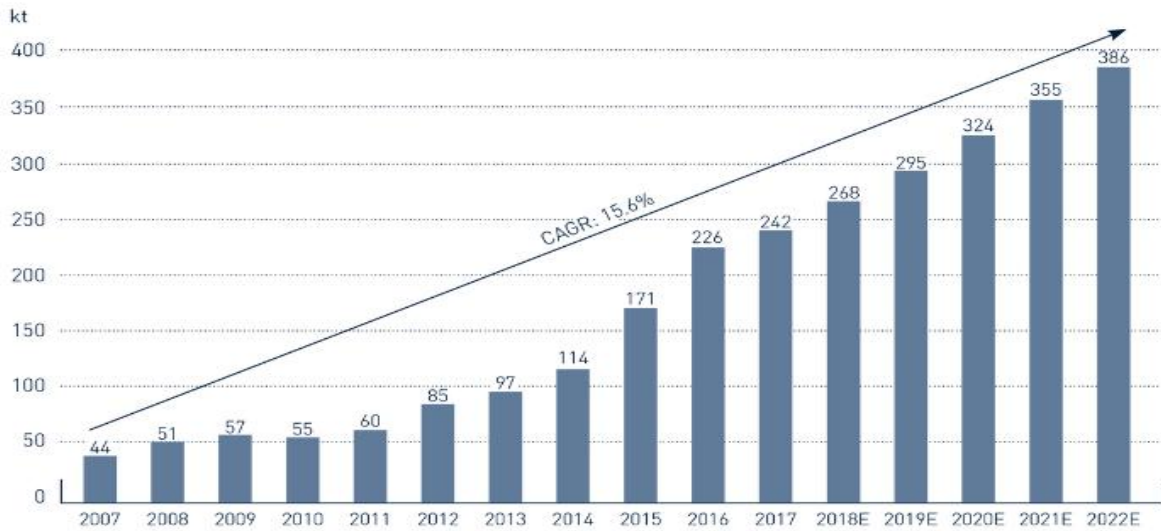
Under the concept of circular economy, one of the emerging mechanisms to mitigate this problem is environmental taxes. Environmental or green taxes are levied on activities that are harmful to the environment [7]. As a result, green taxation policies at all levels are viewed as encouraging to achieve global environmental goals and lead us to a cleaner environment and a more sustainable way of life [8]. At the same time having a green taxation policy could benefit society by establishing a price for social costs and incentivizing behavioral changes by businesses and individuals [9]. This action helps to provide a framework for assessing the appropriateness of the instruments for a plastic policy and

provides an opportunity to reduce the negative effects of plastics while maximizing the benefits of plastics and their products, resulting in environmental, economic, and societal benefits [10]. Hence, green taxation must be part of a larger policy framework that incorporates several measures like price mechanisms, subsidies, standards, and public infrastructure investment [11]. In this process, green taxation is expected to have the greatest impact on the social actors that consume the most to ensure social fairness [12]. Besides, significant behavioral change from society is also required to achieve climate neutrality [13].

To mitigate the impact of plastic products, countries adopted different strategies including taxes, bans, or a combination of both. Most developed and developing countries (Germany, Denmark, Ireland, Romania, Wales, Portugal, Netherlands, and Sweden) used the strategy to tax plastic bags. On the other hand, the majority of African countries (Eritrea, Somaliland, Tanzania, Republic of Congo, Niger, Cameroon, Rwanda, Ivory Coast, Gambia, Madagascar, Senegal, Malawi, Papua New Guinea, Morocco, Benin, Tunisia, and Ethiopia) have chosen to ban plastic products than taxing them. However, the study conducted by [14] suggested that blanket bans are not the best policy for developing and poor countries to reduce the effect of plastic products, instead of turning to fees, consumer awareness, and campaigns plans are more suitable. Furthermore, the study conducted by [15] shows that several African countries are struggling to reduce the harmful consequences of plastic bags even after banning them because of policy ineffectiveness. This could raise the main question among scholars as to why most African countries select to ban than convert to tax.

To be more specific, Ethiopia is among African countries that adopted a banning plastic product policy. The Ethiopian government issued new legislation in 2020 that prohibits the sale of plastic products. In Proclamation No. 513/1999, Ethiopia bans either producing or importing of easily decomposable plastic bags with thickness of less than 0.03mm or any indecomposable plastic bag. However, both indecomposable and decomposable plastic bags with less than the mentioned thickness have been found almost everywhere in the country. Despite the existence of this regulation, there has been little practical change in the use and management of plastic items. Besides, the number of both foreign and domestic investors in the plastic manufacturing industry is growing ever [16]. The recent (Report 2021) provided by EUROMAP-European Plastics and Rubber Machinery shows that the country's per capita plastic consumption increased by 13.1% between 2007 and 2018 each year. The rise of this consumption puts the country as the second-largest importer of plastic raw material in central and eastern Africa and the fastest growing plastics industry in the continent. The report further predicts that Ethiopia will produce 386,000 tons by 2022 and the per capita consumption will rise by 15.6%. These plastic products are dumped everywhere in the country's urban and rural areas affecting soil fertility. Regarding the issue, there are no officially conducted studies to show the way forwarding between the selection of the policies as well as mitigating the impact of the plastic products in Ethiopia. As the result, further academic investigation is needed to see which policy is practically helpful in minimizing the effect of plastic products. As evidenced by the study conducted by [2], taxing plastic products is a non-alternative method for the poor and developing countries as they can generate more revenue from the taxation. As the result, this study attempts to answer the proper policy selection that would help the Ethiopian government to mitigate the impact of plastic products by reviewing the potential benefits and challenges of both policies. Hence, the main purpose of this study is to investigate the potential benefits and challenges of plastic products under the umbrella of taxing or banning plastic products. In line with

the theoretical justification on the impacts as well as consumption level of plastic products, the following Figure 1 of the study shows an increasing level of consumption of plastic products in Ethiopia.



**Figure 1.** Plastic consumption volume in Ethiopia from 2007 to 2022 (in 1,000 tons).

## 2. Material and method

To conduct this specific study, discourse analysis was used to recognize discursive interaction as a valuable tool for determining opinions, ideas, and facts about plastic products in Ethiopia. Currently, academic scholars are becoming increasingly interested in the concept of discourse analysis. According to [17], discourse analysis is a collection of ideas, thoughts, and perspectives that shape the overall meaning of physical phenomena by framing storylines.

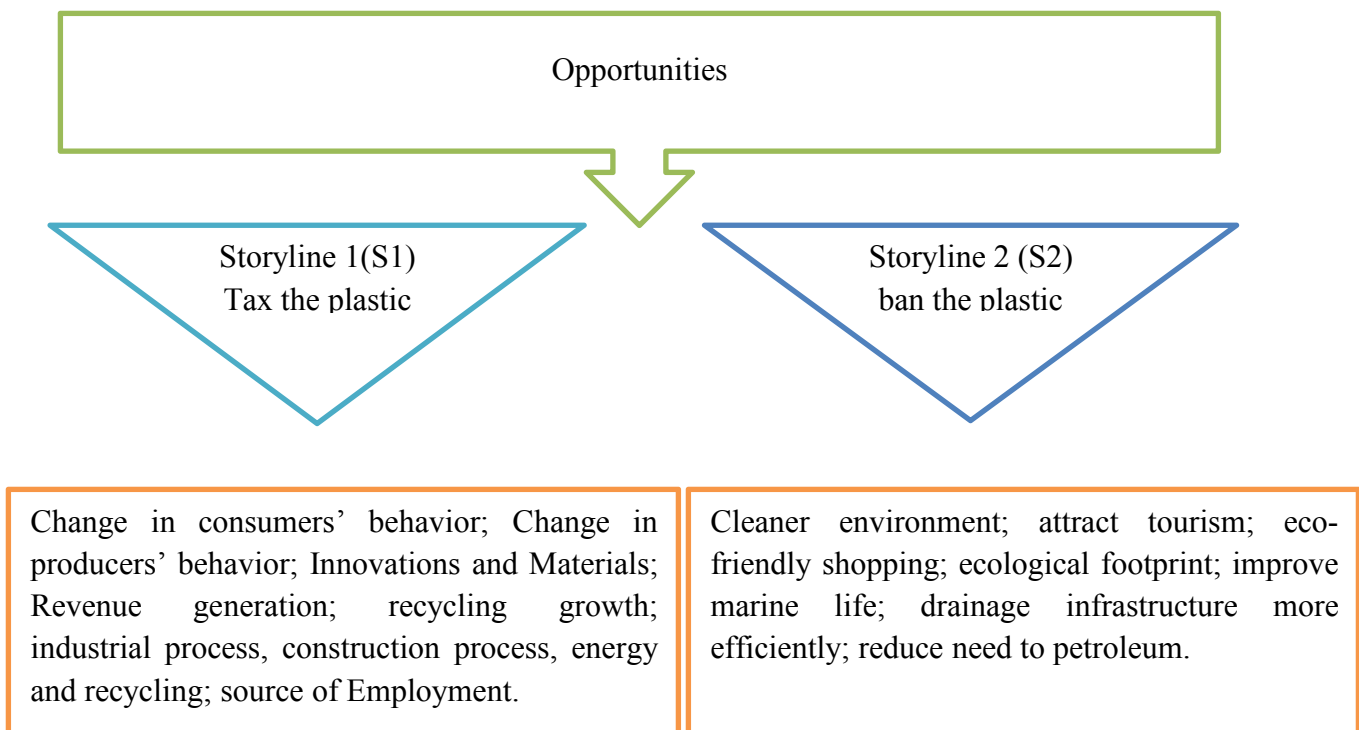
The study developed two different storylines regarding the opportunities and challenges of plastic products. As a result, the first storyline (S1) used taxing plastic products as an alternative strategy. The second storyline (S2) used banning plastic products as an alternative strategy. Storylines are the medium through which actors attempt to persuade others of their points of view, suggest specific practices, and criticize alternatives. As a result, study participants strive to frame their perspectives using competing storylines developed to relate to the study's content and context [18]. Furthermore, the study used a survey-based research technique, using experts' knowledge and experience to provide a baseline for the prospects and challenges of plastic tax products in Ethiopia. Following that, utilizing a survey-based methodology and building on the identified narratives, a deeper understanding of the challenges and opportunities of plastic products are studied. In doing so, the study reviewed deeply the pieces of literature written on the study area from different databases (Scopus, web of science, science direct, and google scholar). More specifically, In-depth interviews with key informants from various organizations were conducted (Ministries, academicians, companies, and researchers). For the in-depth interview, 30 respondents were interviewed in the study. The respondents are chosen purposively by the researchers. In doing so, the study considered the educational level, experiences, and knowledge background in the subject area. Document reviews were carried out using both published and unpublished documents, which could be in the form of a proclamation or a regulation.

### 2.1. Ethics Approval of research

Ethical review and approval were waived for this study due to the fact that we used anonymous data that were not traceable to individuals at any time. Hence, informed consent was obtained from all subjects involved in the study

### 3. Results

In this study, discourse analysis is used based on two distinct storylines concerning the debate over plastic products. The actors for both storylines are given special treatment to recognize both the opportunity and criticize both storylines. The first storyline recognizes plastic bag taxes as an opportunity for sustainable development (S1), while storyline 2 recognizes banning plastic products from the market as an opportunity for sustainable development" (S2). The actors who are actively involved in both storylines combined from different organizations. The following Figure 2 shows the content details of storylines 1 and 2 opportunities followed by a discussion.



**Figure 2.** Opportunities for storylines 1 and 2.

The processes of the first and second storyline formation are depicted in Figure 2 of the study. Actors, in particular, express ideas and claims about the opportunities and challenges of taxing or banning plastic products. The first storyline's legitimacy is based on the potential capacity of a plastic tax to promote sustainable development, and environmental protection. The second storyline is based on the legitimacy of banning plastic products from the market. Regarding the first storyline, the participants of the study highlight opportunities of implementing a tax on plastic products could provide

opportunities for the generation of revenue, employment, industrial process, construction process, change in customers behaviors, change in producers' behavior, innovations, and materials, and recycling.

According to the study participants, having a plastic tax initially helps to influence people to consume less plastic. Their assumption is based that; imposing a tax on plastic products would increase the price of plastics, and people are discouraged to pay a high amount of money for a product that was previously cheap or free. This argument is more extended and explained in that; pushing people into anti-consumption is tricky because anti-consumption is usually a choice that relies on both behavior and attitude. Hence the best opportunity to minimize the level of plastic usage is by mixing plastic tax and encouraging those people who voluntarily stop consuming certain products.

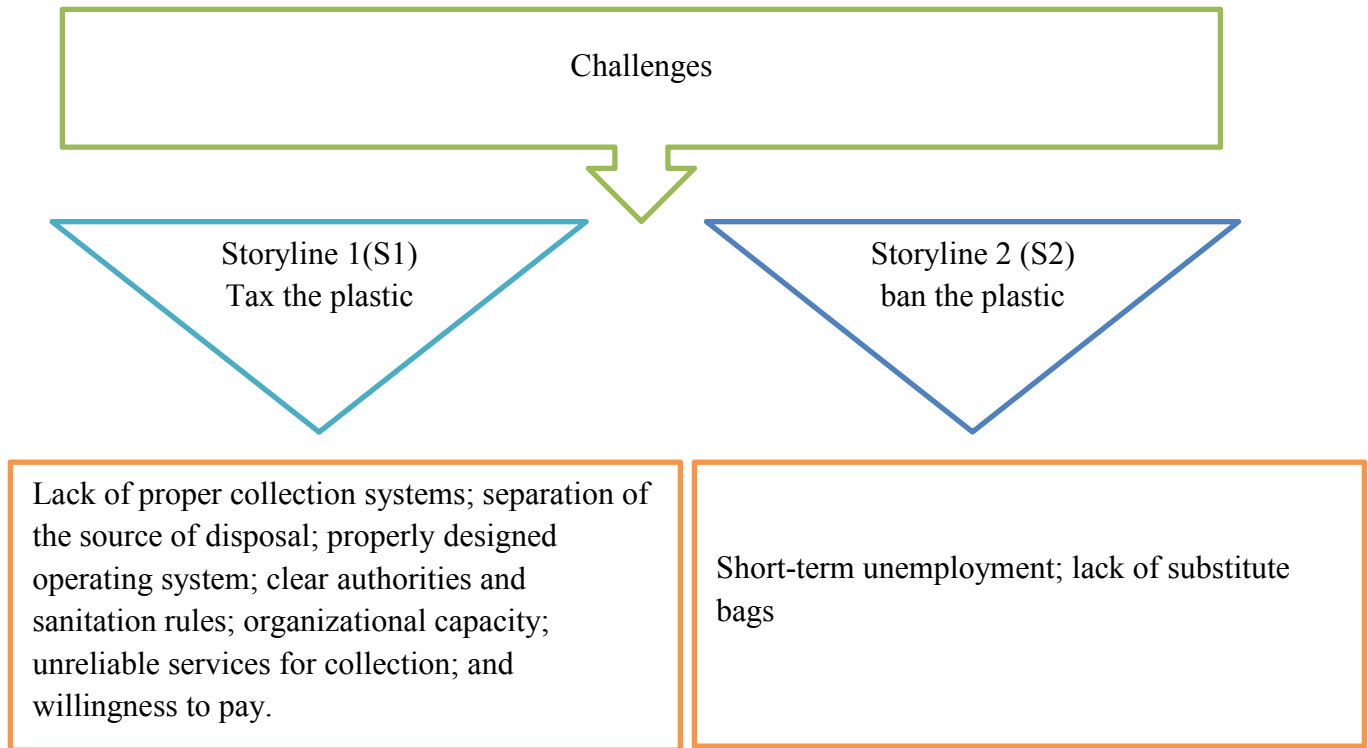
This could be evidenced by the study conducted by [19] as the introduction of the plastic ban policy by the Australian government divided the society into consumers and anti-consumption. This response is further integrated with the issue of innovation and materials for manufacturers. According to the study participant as a price increase, customer demand decrease, and decreasing the demand of customers leads the manufacturing companies to look for other options and indirectly decreases the output level of plastic products. To this end, a tax on plastic could further push manufacturers, scientists, and academic researchers to focus on more research and developments toward innovations to improve the efficiency of plastics.

Taxing plastic products is viewed as a source of revenue for the economy, particularly in poor and developing countries [20]. The revenue generated by taxing plastic products can be used to fund various government projects while also indirectly creating job opportunities for the unemployed. More specifically, when the tax on plastic products is considered, plastic materials are considered valuable and are thus usually sorted out for reuse. As a result, the materials are reused several times before they lose their utility value and are discarded.

Plastic products that have been discarded can be collected and recycled. In this case, the collection of these plastic products from various waste cycles may provide employment opportunities for some low-income individuals. Furthermore, respondents claim that in countries such as Ethiopia, the benefit of having a plastic tax outweighs the benefit of banning it. The rationale is that plastic waste is now used to produce plastic oil, which could be used to lubricate industrial machines, and can generate oil that can be exported to foreign markets, generating foreign exchange and saving millions of dollars in foreign currency that could have been used to import machine oil. In this case, the benefit is greater for countries where agricultural activities account for the majority of the economy. It is also argued that plastic waste contributes significantly to energy recovery because energy recovered from plastic waste can contribute significantly to energy production. As a result, the contribution of energy products obtained can also be used to supplement the country's current shortfalls in energy supply.

Global experience implies that there could be a greater economic benefit from taxing plastic products. The study conducted by [21] implies that several countries, including England, Ireland, the Netherlands, China, the Philippines, and Australia, have demonstrated that a plastic bag fee is effective in reducing the use of plastic bags [22]. More specifically, according to [23] china introduced a plastic product tax with a bag fee of 0.20–0.50 CNY in 2008. After the tax implementation, it is observed that the total plastic product consumption declined by 64%. Furthermore, the study conducted by [24] urges that; in England after the introduction of a plastic bag fee of 5 pence in 2015 on major businesses. There was a 36% decrease in plastic product consumption.

According to Portugal introduced a plastic bag tax of 0.10 Euro on plastic bags in 2015, and following the introduction, there was a 74% reduction in plastic bag usage observed, and reusable plastic products were increased by 64 % after the introduction of the plastic tax [25]. Furthermore, Wales introduced a single-use plastic bag fee of 5 pence (0.07 USD) in 2011 [26]. After the introduction of the plastic tax 70% consumption reduction was observed. Hence it can be observed that the global experience shows that the plastic product tax has shown a significant reduction in plastic bag consumption [21].



**Figure 3.** Challenges of storylines 1 and 2.

The legitimacy of the second storyline (S2) is based on the potential ability to ban plastic products from the market to promote sustainable development and environmental protection. Cleaner environment; attract tourism; eco-friendly shopping; ecological footprint; improve marine life; drainage infrastructure more efficiently; reduce the need for petroleum were found to be the opportunities for plastic banning. Under this assumption, there were a lot of debates among the study participants. The majority of the respondent (24 out of 30) translated to 80 percent, of the respondent argued that the plastic ban is not an appropriate policy for the country struggling to overcome poverty. The logical justification behind their response is that; the country has currently worked intensively to overcome poverty by creating a huge number of employment opportunities, facilitating infrastructures, and promoting industrial, and construction processes. However, the activities of these sectors are highly dependent on plastic products. Hence, banning policy discourages the economic growth of highly dependent plastic products. They further imply that in the long run remedial actions can be taken in the latest stage to reduce its impact. The other rationale they provide is the lack of local substitutes for plastic products.

The country imports a huge number of plastic products with a low level of local plastic output. More specifically, among the respondents who participated in the study, one local plastic distributor refers that he did not know exactly how many plastic bags he uses per day. However, he refers that he can sell up to \$5000 worth of plastic bags each month. The randomly selected customer at one of the vegetable shops insisted that she would take more than 10 plastic bags every four days for vegetables alone and another 10 bags for other items. Both respondents highlighted banning a plastic product would be not the best policy unless substitute products are mobilized. The result of the respondents and document analysis of the country on the plastic product shows Ethiopia's troubling rise in the use of plastic material when considering the country's non-existing garbage disposal facility and culture, especially the absence of proper sorting in the types of household garbage. The following Figure 3 shows the content details of storyline 1 and 2 challenges followed by a discussion.

The second part of the first storyline dealt with the challenges of imposing a tax on plastic products. In this regard, respondents have highlighted some challenges that are more specific to Ethiopia. The respondents identified the following challenges: a lack of proper collection systems, separation of the source of disposal, a properly designed operating system, clear authorities and sanitation rules, organizational capacity, unreliable collection services, and a willingness to pay.

The majority of Ethiopians disposed of waste in their surrounding open areas in an indiscriminate manner. Residents in both rural and urban areas have adopted the 'use and throw away' habit. Indeed, one of the most important management activities that must be planned is waste disposal. According to respondents, imposing a plastic tax is not a viable solution. One of the most serious issues is a lack of proper collection systems. Because of the high population density and land topography in both rural and urban areas, developing collection systems could be challenging due to a lack of infrastructure, awareness, and illiteracy.

Lack of sorting the waste is also another challenge as supported by the study conducted by [16] which indicated that solid waste created in houses is discarded together at transfer stations with other plastic products, indicating that there is no sorting tendency of organic waste at the household level. The study further suggests that organic materials come from rural areas, depleting nutrients from rural soil to feed the urban population; leftovers after consumption have no way of returning to the source to build the soil; instead, they are lost and cause problems for human health and the environment in the city due to poor management. Another issue with collecting plastic waste is the number of containers in the open area. In this regard, there are insufficient containers to collect waste generated, and some neighborhoods are forced to throw their garbage into an open area. Throughout the study period, respondents strongly agreed on the lack of collection services near their homes and even in their kebele. This could be due to the houses' topographic location or inaccessibility due to a lack of roads. In capital cities such as Addis Ababa, there have been some experiences with waste collection systems and management by individuals rather than government organizations. Typically, the wealthy can facilitate waste disposal through human-powered, and engine-powered mechanisms. In terms of the human factor, waste can be transported to containers using hands and hand-pushed carts. Strategic locations in each Kebele are designated for collectors to prepare for motorized collection. However, this may not be the case everywhere. As a result, implementing a plastic tax may not solve any environmental issues while providing economic benefits. However, some respondents argued that the implementation of the tax may force users to seek other alternatives because the tax raises the price of plastic products, causing



willingness to pay to fall and overall consumption to fall, as evidenced by different countries' experiences.

Currently, Ethiopia is experiencing to introducing a new bill called an eco-tax, a tax levied on activities deemed harmful to the environment, is in the works. The Environment, Forest, and Climate Change Commission drafted the bill, which has been in the works for several months. This tax will be treated separately and used to create the Eco-Fund, which will be used to protect the environment. And the collection will be accomplished through a green tax and an eco-system service fee. The green tax primarily targets pollutants that harm the environment in various ways, and the funds raised will go toward environmental rehabilitation. It will be imposed on, among other things, fossil fuels, petroleum, mining, and pesticide use. Companies and service providers that rely on natural resources will be charged an eco-system service fee. It is used in conjunction with a baseline contract that must be signed with these businesses for them to contribute to the preservation and conservation of natural resources. It applies to national parks, water bottlers, private and public dam owners, genetic resources, and tourism-related businesses. To gain legitimacy, it appears that the actors supporting S1 link such claims to the broader context of plastic product taxation. Thus, a tax on plastic products could represent a possible way out of the country's recent economic difficulties.

The second part of the second storyline dealt with the challenges of banning plastic products. In this regard, Short-termism in unemployment is found the main disadvantage of banning plastic products. Furthermore, in Ethiopia, where the level of manufacturing companies is much lower than the level of agricultural activities, the substitution of plastic products will be difficult if plastics are banned. On the other hand, respondents strongly support the idea of banning plastic products from the market, arguing that they contribute to environmental issues such as global warming, ocean acidification, and raw material use, which pose serious problems for agricultural activities because they harm fossil and marine ecosystems, as well as wildlife.

More specifically, these bags are more detrimental to agricultural production because some crops cannot grow in areas where plastic bags have settled. This is especially difficult in Ethiopia, where agriculture accounts for the majority of economic activity. Many countries around the world, particularly in Africa and Asia, are opting for a ban on plastic bags rather than a levy. As evidence, between 85 and 90 percent of plastic bags in Dhaka were discarded in city streets after use in 2001 among Bangladeshi plastic bag users. As a result, the Bangladeshi government prohibited the use of plastic bags in 2002 [27]. Rwanda's experience suggests that after prohibiting the use of plastic products in 2008, the country became the cleanest city in the world [22]. In 2016, the Israeli government implemented a hybrid ban and levy strategy, prohibiting supermarkets from distributing plastic bags less than 20 microns thick and requiring them to charge for the use of thicker plastic bags. As the result, in the following year, plastic bag usage decreased by 80%. Furthermore, Botswana, South Africa, Mozambique, and China, have initially combined the ban and levy approaches into a single strategy. These countries prohibit the use of plastic bags with less than a certain wall thickness and require retailers to charge a fee for thicker plastic bags [22]. Both storylines imply that plastic products have a significant environmental impact as well as an economic benefit. Supporters of Storyline 1 (S1) argue that taxation is more appropriate for poor and developing countries, where the majority of legal frameworks governing plastic products are ineffective [15]. Apart from the policy issue, lack of institutionalized research, the absence of corporate practices in mitigating plastic pollution and waste management, and the absence of viable policy (The absence of a clear strategy and policy by responsible

authorities such as City Administration offices to manage organic and non-organic waste separately is to take a chunk of the blame too) was found the main challenges of plastic product management in Ethiopia.

#### **4. Conclusion**

Under the premise of banning and taxing, this study was conducted to look into the potential benefits and challenges of plastic products in Ethiopia. The narratives were constructed using discourse analysis, and investigations were conducted based on the developed storylines. The result of previously conducted studies implies that taxing a plastic product is the best policy for a country like Ethiopia. This argument is also supported by study participants. The study found having a tax on plastic products could provide more opportunities for the country than banning them. The study summarized that having a tax on plastic products could provide more opportunities for the country if effective plastic legislation is applied. Taxing plastic products will benefit the generation of revenue, employment, industrial process, construction process, and recycling. However, a lack of proper collection systems, separation of the source of disposal, a properly designed operating system, clear sanitation rules, organizational capacity, unreliable collection services, and a willingness to pay found to existing challenges of plastic products as tax keeps the plastics in the market.

To overcome this issue, all stakeholders shall develop an awareness of the usage of plastic products. Plastic manufacturers, as well as firms and individuals who import plastic bags for sale, shall create consumer awareness and campaigns for more plastic bag operations to implement. Governments and policymakers shall play a critical role in developing the necessary legislative framework to encourage mitigation actions that contribute to the reduction of plastic waste at the source, as well as encouraging the cleanup of plastic pollution on coastlines. It is also argued that one way of dealing with the problem is starting a public discussion on alternative packaging than the one-time use of plastic products, hence inclusive public awareness is required to change customer attitudes. Furthermore, the separation of organic and non-organic waste shall be prepared across cities. More specifically, community-based associations found it necessary to overcome this issue. Private businesses, of course, had to rethink their business models to shift their focus to recycling or bag manufacturing. The study suggests future research to conduct on which policy will benefit specific countries from environmental and economic aspects by making comparative analyses among different countries with different policies in the same continent.

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#### **Conflicts of Interest**

The authors declare no conflict of interest.

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