ECONOMIC BARRIER TO THE IMPLEMENTATION OF POLYETHENE BAG BAN IN BANGLADESH: CURRENT POLICY LANDSCAPES

A Thesis Submitted to the Department of Environmental Science, Faculty of Science and Technology, Bangladesh University of Professionals for Partial Fulfillment of the Requirements for the Degree of BSc in Environmental Science

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DECLARATION

I thereby declare that the research work entitled **"Economic Barrier to the Implementation of polyethene bag ban in Bangladesh: Current policy landscapes"** has been carried out under the Department of Environmental Science, Faculty of Science and Technology, Bangladesh University of Professionals in fulfilment of the requirement for the degree of BSc in Environmental Science. I have composed this study based on key informant interviews, survey methods, and research findings. This has not been submitted in part or in full to any other institution for any other degree. I also certify that there is no plagiarized content in this Thesis (Maximum 25%).

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CERTIFICATE OF THE SUPERVISOR

This is to certify that Majharul Islam carried out his thesis under my guidelines and hence prepared the thesis entitled **"Economic Barrier to the implementation of polyethene bag ban in Bangladesh: Current policy landscapes".** So far as I am aware, the researcher duly acknowledged the Key Informant Interview, survey method as well as other researcher's findings used in this work to compare with this study findings. Further, the thesis was not submitted to any other universities or institutions for any other degree or diploma.

It is thus recommended that the thesis be submitted to the Department of Environmental Science, Faculty of Science and Technology, Bangladesh University of Professionals, in fulfilment of the requirements for the award of the degree of BSc in Environmental Science.

…….

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Abstract

In 2002, Bangladesh became the first country to implement a ban on the use of polyethylene bags. However, after 20 years, it appears that the ban has not been implemented. Taking this consideration, this study investigates the Economic barriers to the implementations of polyethene bag ban in Bangladesh. After conducting key Informant Interview, the study found that Low Pricing of polythene bag, no available alternatives of polythene bag, high price of alternatives, lack of financial and infrastructural support for the eco-friendly alternatives are the main economic barrier to the polyethene bag bans. Survey was conducted among university students in Dhaka City from August to September 2023. From the findings it is said that 91 participants (57.90%) think that lack of cheaper alternatives such as polyethene bags is the main barrier to implement of the ban in Bangladesh. The results also indicated that cheaper price (22), easy availability (36), and high price of alternative (27) were the main reasons for preferring polyethene bags among participants. The results also show that among 157 participants, 118 supported the ban. The finding of this study is that a cheaper and environment friendly alternative is needed in our country to implement the ban successfully. Additionally, the public and private sectors should come forward to invest in the alternative bag sector to make it cheaper for consumers. Consumer awareness is badly needed. If consumers do not know about the consequences of using polyethene bags, they use them continuously. It is recommended that the public be aware of not using polythene bags and use alternative bags.

Key Word: *Single Use Plastic, ban, policy, key informant interview, survey, economic barrier.*

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Plastics are extensively used globally because of their light weight, high durability, adaptability, ease of manufacturing, and reduced production costs compared with other comparable materials. The history of plastic spans more than a century. Plastic items, including polythene shopping bags, were extensively introduced in Bangladesh in the early 1980s. Approximately 8 million metric tons of plastic are discharged into the Earth's seas annually. If this trend continues, projections indicate that by 2050, the quantity of plastic in the oceans will surpass that of fish. The overutilization of polythene bags exacerbates a multitude of problems, particularly in metropolitan environments. The non-biodegradable nature of polyethylene shopping bags has detrimental impacts on soil and water. The polymers create a matrix at the interface between water and soil. Consequently, the agricultural land has become infertile, leading to contamination of the crops it produces. The extensive array of applications and uses justifies the substantial increase in its consumption and significant volume as municipal solid trash. The majority of packaging and Single-use plastic bags are manufactured from polyethylene or polythene, which gained widespread popularity during the 1960s. These bags constitute a significant contributor to the global accumulation of plastic waste (Banu, 2020). As to the European manufacturers, there are around 20 different kinds of plastics that are used globally (Hossain et al., 2020). Plastic's affordability, resilience, ease of processing, lightweight, excellent thermal properties, and electrical insulating qualities have rendered it very desirable for a wide range of uses, spanning from food packaging to the electrical industry (Thompson et al., 2009). Every year, the global production of plastics exceeds 300 million metric tons to meet diverse consumer demands (Singh & Sharma, 2016). Approximately 10 percent of the total weight of the municipal trash stream consists of plastic (Thompson et al., 2009). Among the plastics manufactured each year, 25 percent are burned, 20 percent are recycled, and the remaining 55 percent are discharged into the environment (The World Bank, 2021). In 2020, the Dhaka metropolitan region generated a daily waste of 6,646 tons, with plastic accounting for 10 percent of the total (Burke, 2019). Less than 50% of plastic waste is recycled, with 48% being sent to landfills, and the remaining portion being either thrown in rivers or abandoned in drains and other locations inside the city (Burke, 2019). Plastics are classified into two primary categories:

thermoplastics and thermosets. This classification is based on their behavior when heated and their chemical makeup. Thermoplastics are the predominant variety within the plastic category. They are part of a plastic group that may undergo melting and solidification by heating and cooling, respectively. These attributes are also capable of being reversed and may be altered several times. The substances included are polyethylene terephthalate (PET), low-density polyethylene (LDPE), polypropylene (PP), polypropylene (PE), polystyrene (PS), polyvinyl chloride (PVC), expanded polystyrene (EPS), polycarbonate, high-density polyethylene (HDPE), polyhydroxyalkanoates (PHA), and polylactic acid (PLA). Thermostats are a category of polymers that undergo a chemical transformation when exposed to heat, resulting in the formation of a three-dimensional network. They possess distinct characteristics from thermoplastics since they lack the ability to undergo remelting and reforming processes. The compounds included in this list are polyurethane (PUR), phenolic resins, acrylic resins, ureaformaldehyde (UF), epoxy resins, silicone, vinyl ester, and resin (BBC, 2020). The disposal of these polymers poses an ecological concern, since the majority of these bags are non-biodegradable. The hazards posed by single-use plastics are amplified when they undergo degradation, resulting in the formation of tiny particles known as microplastics, which ultimately infiltrate our water and food systems. The use of single-use plastics has significantly surged during the Covid-19 epidemic in 2020. Approximately 96% of the global population utilizes various forms of personal protective equipment (PPE), such as disposable masks and face shields. Unfortunately, these items are often discarded straight into the environment, contributing to the threat of plastic pollution (Mehedi, 2018). A study conducted at four sea beaches in Cox's Bazar gathered a total of 6,705 pieces of plastic debris. Out of these, it was determined that 63% of the collected waste was made of plastic (Vimal et al., 2020). Based on the above explanation, it can be inferred that addressing the issue of single-use plastic is one of the most significant ecological problems in recent times. The collaboration of several parties, including governments, non-government organizations, manufacturers, and consumers, is important in order to effectively address this issue (Xanthos & Walker, 2017). Global governments have implemented several regulation measures aimed at eliminating single-use plastics. The primary objective of the EU regulation 2015/720 is to decrease the quantity of disposable Polyethene bags. In order to do this, some European

countries, notably France and Italy, have implemented a complete ban on the use of Polyethylene bags (Xanthos & Walker, 2017). Throughout Asia and Africa, there have been several restrictions placed on the use of Polyethene bags. In addition, the government of Wales in the United Kingdom has implemented penalties for the use of Polyethylene bags. South and Central America have several national-level policies in place to govern the use of single-use plastic items. Despite the long-standing existence of laws aimed at decreasing the use of polyethylene bags, several nations still lack the effective execution of these restrictions (Hasan et al., 2023). The Bangladesh government implemented a ban on polyethylene bags on March 1, 2002, as a measure to reduce plastic pollution (Padgelwar et al., 2021). Additionally, it offers tax exemptions as an incentive for plastic recycling and discourages the use of single-use plastics. Nevertheless, there has been little progress noted throughout the years. This research examines the economic barriers associated with the enforcement of a ban on polyethylene shopping bags in Bangladesh.

1.2 Problem Statement

Plastic pollution is a significant and urgent global environmental concern on a worldwide scale. Bangladesh, in particular, has been heavily impacted by this problem, mostly owing to the extensive use of polyethylene shopping bags. In 2002, Bangladesh implemented a prohibition on single-use Polyethene bags (SUP) as a measure to protect the environment. Although the initial public reaction was favorable, the sustained effectiveness of this programme was hampered by substantial economic obstacles. The main issues arise from the absence of consistent enforcement, insufficient management of recycling and disposal, and absence of affordable alternatives, all of which have led to a renewed increase in the use of polymer bags. The informal economy, which plays a significant role in Bangladesh, further complicated the implementation of the plastic bag law. Informal businesses, including street vendors and local markets, often operated outside formal regulations and relied heavily on cheap plastic bags. The lack of awareness about the environmental consequences of plastic bag usage in this sector and limited resources for compliance posed significant challenges to enforcing the law effectively. Limited consumer awareness and behavior also hindered the implementation of the plastic bag law. Many consumers were unaware of the harmful effects of plastic bags on the environment or prioritized affordability over eco-friendly options. The lack of demand for sustainable alternatives

reduced the incentive for businesses to invest in such alternatives, slowing down the transition to more environmentally friendly practices. Enforcement challenges further contributed to the economic impediments faced by the plastic bag law. The objective of this study is to identify and assess economic obstacles and provide efficient approaches to improve the implementation of the ban on polyethylene bags, thereby promoting environmental sustainability in Bangladesh.

1.3 Research Gap

Although there is a significant amount of research on the environmental consequences of polyethylene bag bans, there is a clear lack of studies focusing on the unique economic challenges associated with implementing these bans, especially in the context of Bangladesh. Polyethene bag bans have mostly been studied with a focus on environmental consequences, consumer behavior, and policy design aspects (Frias & Nash, 2019). There is study on to point the way for future research into possible options to SUPs that pollute nearby environments and ways to fix the damage they cause (Barnes, 2002). There is another study showed that using polythene bags is becoming more popular every day, even though some of the people surveyed and said that plastic goods are bad for the environment (Staples et al., 1997). The findings from (Banu, 2020) shows that public motives combined with stricter enforcement, self-regulation, and monitoring may help reduce SUP pollution. In another study (Varkey et al., 2021) said that the enormous public interest in SUP reduction and the companies are concerned about identifying sustainable alternatives. It is found that the polyethene ban is appropriate and beneficial for the country since it has more positive effects than negative ones (Staples et al., 1997). In order to reduce the waste of plastics, there is a study looks at the difficulties in replacing natural raw materials and changing industrial methods. Semi-structured interviews reveal that, in order to facilitate easier transitions before taking legislative action, decision makers should step up their efforts to improve consumer knowledge and standardize legislation across jurisdictions (Molloy et al., 2022). One study finds out that in order to decrease the number of plastic bags used in the community, either raise the price of plastic bags or find alternatives that are less harmful to the environment, including using shopping baskets or bags or eco-friendly plastic bags (Angriani et al., 2021). According to a recent research, plastic contaminants were found in 81% of tap water samples collected globally. This

suggests that we may be consuming anywhere from 3000 to 4000 microparticles of plastic from tap water each year (Nadiruzzaman et al., 2022). However, there has been a lack of focus on the economic obstacles impeding the effectiveness of these restrictions in Bangladesh. There is a scarcity of research on the economic obstacles related to the prohibition of polyethene bags. This research aims to address this lack of understanding by conducting a comprehensive analysis of the economic barriers that have hindered the enforcement of the Polyethene Bag ban in Bangladesh since 2002.

1.4 Rational of the Study

Polyethylene bags cause substantial environmental hazards, including as water contamination, obstruction of drainage systems, and damage to animals. The 2002 ban on polyethylene bags was implemented to alleviate these dangers. Nevertheless, it is crucial to understand the economic aspects of the issue to identify viable solutions and formulate suitable policies. This study aims to identify the obstacles hindering the successful implementation of a ban on polyethylene bags in Bangladesh. To facilitate the effective implementation of the ban, officials, researchers, and stakeholders may analyze the economic reasons that impede its execution. This analysis will help identify and overcome the main challenges. The results of this research are essential for the development and enforcement of environmental safety requirements. This would be advantageous for policymakers to establish new policies.

1.5 Research Question

1. What are the Economic barriers to the implementation of the polyethene bag ban in Bangladesh?

2. What are the people's perceptions of the polyethene bag ban in Bangladesh?

3. What are the people's perceptions about the economic barrier to the implementation of the plastic bag ban?

4. What are the gaps in the policies of Bangladesh to implement the polyethene bag ban compared to the other polyethene bag-banned countries?

1.6 Research Objectives

1.6.1 Broad Objective

- To identify the major Economic Impediments to polyethene bag bans.

1.6.2 Specific Objective

- To identify consumer behavior to polyethene bag usage and ban.
- To assess and compare the policies of polyethene bag-banned countries in the world with Bangladesh

1.7 Limitation of The Study

- I could not conduct interviews with a vast number of policymakers, academicians, and practitioners.
- The survey sample size is too small, as university students do not represent the whole country.
- The survey was not conducted with sellers who sell single-use plastic.

1.8 Definitions of Terms Used in Thesis

Single Use Plastic- Single-use plastics (SUP) are defined as plastics that are intended for one-time use and are often discarded or recycled after a single usage.

Microplastic- Microplastics are tiny plastic particles that are less than 5 millimeters in size.

Policy- A course or principle of action adopted or proposed by a government, party, business, or individual.

Key Informant Interviews- Key Informant Interviews are qualitative in-depth interviews with people who know what is going on in the community**.**

Legislation- Legislation is defined as laws and rules made by the government.

1.9 Outline of the Thesis

The Outline of the thesis is discussed below:

Chapter one provides a brief introduction to the background, problem statement, research gap, rationale and objectives of the study.

Chapter two discuss related literature on plastic product classification, single use plastic, Microplastic and Macroplastic, Effect of plastic pollution on the environment and Organizational and Governmental Policies against Plastic Pollution in Bangladesh.

Chapter three discusses the research methodology of the study on the about study area, research design, data collection technique and procedure.

Chapter Four discusses the results and its Explanations.

Chapter five summarizes the study as a concluding remark and recommends for further prospects.

Lastly, reference is attached at the end.

Chapter Two

Literature Review

2.1 Classification of Plastic Materials

According to GESB (2011), the plastic manufacturing business has had rapid growth since 2000, surpassing the growth rates of most other industries. The Society of the Plastics Industry (SPI) created a comprehensive categorization of plastic materials for both plastic consumers and recycling purposes. Table 1 shows that there are seven distinct categories of plastic that are often manufactured or discovered in the environment. It is worth noting that the bulk of the monomers needed to create plastics, such as ethylene and propylene, are derived from hydrocarbons.

Table 2.1.1: The Most Common Plastic Materials Found in environment (Rogers, 2015) (Simoneit et al., 2005) (Atiq, 2020) (Khajuria et al., 2022)

No	Plastic Types	Characteristics	Usage
1	High-density Polyethylene (HDPE)	Lightweight, very durable, long lifespan, weather resistant	trash bags, milk jugs, shopping bags, oil containers, milk containers, shampoo containers, conditioner containers, detergent containers, and soap containers, etc.
2	Low-density Polyethylene (LDPE)	High resistance to impact, moisture, chemicals, as well as exceptional durable and flexible characteristics.	Plastic shopping bags, plastic film, sandwich bags, food covers, and drinking bottles, etc.

3	Polyvinyl Chloride (PVC)	The material has characteristics such as being lightweight, strong, economical, resistant to corrosion, and easily handled. It is made mostly of chlorine, making it highly resistant to biological and chemical factors.	Bottles, packing, containers, drainage and sewage pipes, flooring and furniture coverings, pipes, tiles, and electrical components, etc.
4	Polyethylene Terephthalate (PET)	Low weight, high level of hardness, toughness, and resistance to grease, oil, and heat. Additionally, it is non-biodegradable and prone to oxidation.	Drinking bottles, garments, carpet fiber, medicinal pots, ropes, sleeping bags, pillows, and containers, among others.
5	Polystyrene (PS)	versatile thermoplastic polymer often used for the production of solid plastic and stiff foam materials. Typically, it takes many centuries for items to break down naturally if they are not recycled.	Hot drinking cups, such as coffee cups and tea cups, thermal insulated take-home boxes, food containers (including trays for holding meat and eggs), insulating materials, plastic boxes and cutlery, egg cartons, and packing foam.
6	Polypropylene (PP)	The strength and longevity of the material are enhanced by its resistance to water, soap, detergent, acid, and base. Due to its great thermal resistance, it may be used for many purposes. Throughout the production process, it has the capability to be rendered	The items mentioned include yogurt containers, diapers, straws, wrapping films, butter tubs, special bags for constructing lunch boxes, butter containers, sauce bottles, pharmaceutical packing. Recycled materials may be repurposed into

		transparent, opaque, or exhibit a diverse range of hues.	various items such as automobile battery casings, timber, and manhole stairs.
7	Others	Code 7 represents the remaining categories of plastic. This category comprises two distinct kinds of acknowledged plastics: polycarbonate and bioplastic polylactide. These kinds of plastics are seldom recycled.	Plastic lenses are often used in many applications such as eyeglasses, medical equipment, automobile components, protective clothing, greenhouses for cultivation, multimedia disks (CDs, DVDs, and Blu-ray), and external light fixtures.

2.2 Single Use Plastics

Single-use plastics (SUP) are defined as plastics that are intended for one-time use and are often discarded or recycled after a single usage (Barnes, 2002). Single-use plastics include items such as drinking straws, plastic cotton buds, sachets, food packaging, and polyethylene bags. During the gradual disintegration of plastics, they emit harmful compounds that are now being identified in human bloodstreams and have the potential to induce cancer, infertility, birth abnormalities, and several other illnesses. The SUP (Single-Use Plastics) should be used just once and should not be reused. Reusing them increases the danger of leaching and bacterial development. Additionally, decontaminating SUP is challenging and involves the use of very toxic chemicals. Their composition mostly consists of polyethylene terephthalates, which have the potential to be carcinogenic when exposed to heat (Kapinga & Chung, 2020). They fall under recycling code 1, indicating that they may be recycled but not reused. Initially, the SUP trash is subjected to crushing and shredding processes to reduce it into smaller flakes. These flakes are then reprocessed to manufacture new PET bottles. Additionally, the recovered fibers may be spun into polyester fiber. However, it is worth noting that less than 40% of SUP waste undergoes recycling, while the remaining portion contributes to

environmental pollution by polluting both land and ocean areas (Zylstra, 2013). Single-Use Polyethene bags (SUPBs) have diverse economic, social, and environmental consequences. The challenges in tackling this problem are mostly derived from globalization, prevailing economic frameworks, and levels of consumption, among other factors. The rise in economic influence across many worldwide marketplaces has led to a surge in individual consumers opting to buy products from large-scale retail establishments. Consequently, these acquired items are often transported back home using sizable plastic shopping bags. The ease with which consumers can obtain SUPBs at no cost from stores, and the low cost for distributors to provide them, has led to a widespread availability and usage of Polyethene bags for shopping. This has resulted in the use of Polyethene bags becoming a habitual behavior rather than a deliberate choice. Inadequate waste management practices and poor rates of recycling contribute to a higher probability of Single-Use Plastic Bottles (SUPBs) seeping into the environment. The primary issue lies in the fact that once discarded in the environment, SUPBs possess the ability to effortlessly disperse through the air and water owing to their lightweight and parachute-like configuration. Bottles, bags, packing, wrapping, fliers, food storage, and household items are all instances of disposable plastic that we encounter in our daily routines. Figure 1 illustrates that fast-moving consumer goods (FMCG) firms have a substantial role in contributing to the pollution caused by single-use plastic. This is mostly due to the prevalent use of plastic packaging, such as food wrappers and sachets, in their products. The service industry mostly generates plastic waste from restaurants, airline companies, hotels, and groceries. Irrespective of the specific kind of plastic, Stand-Up Paddleboards (SUPs), including packaging materials, make a substantial contribution to environmental pollution, representing around 36% of worldwide plastic use (Hossain et al., 2020).

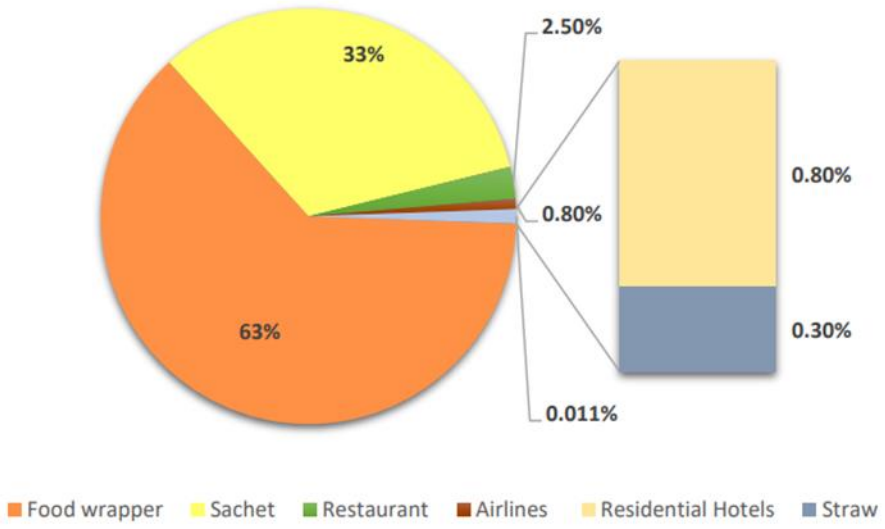


Figure 2.2.1: SUPs Generation Scenario in Bangladesh, 2020 (Source: ESDO)

2.3 Microplastic and Macro-plastic

Microplastic and macroplastic refer to two different sizes of plastic particles. Microplastics are tiny plastic particles that are less than 5 millimeters in size. Plastics are categorized into two main types: microplastics and macroplastics. Microplastics refer to plastics with a thickness of less than 5 mm. They exist in two forms: primary microplastics and secondary microplastics. Primary microplastics refer to plastics that are intentionally manufactured at a small scale for specific purposes like industrial scrubbers or cosmetics. On the other hand, secondary microplastics are tiny pieces that are formed when bigger plastic items break down. Microplastics are now extensively used in many sectors, such as the beauty industry, where their detection is challenging. Unlike metals, plastics do not erode or rust and are not affected by borders. However, they undergo a process called photodegradation, when they gradually break down into little bits known as microplastics (Kapinga & Chung, 2020). Macroplastic consist of bigger plastic items and are a significant contributor to global littering (Valavanidis et al., 2008).

2.4 Effect of Plastic Pollution on Environment

Plastic goods are mostly made from derivatives of raw oil and have a cheap production cost owing to significant advancements in technology in this industry. In addition to their

affordability, the lightness and excellent durability of plastic items have established their dominance over other building materials, such as wood or metal. These characteristics are the primary reasons for their widespread appearance in our everyday lives. The plastic manufacturing business in Bangladesh has been seeing an average annual growth rate of 20 percent, which is currently ongoing. The widespread availability of plastic items made humans' lives simpler and smarter on the one hand and on the other hand, led them to meet long-term environmental degradation from growing garbage creation due to excess production and consumption. Due to their non-biodegradable and disposable nature, regularly used plastics tend to collect in landfills and the natural environment when not properly managed, leading to contamination of various environmental components such as air, soil, and water. The contamination of natural ecosystems resulting from the excessive and unregulated use of plastic, as well as its improper disposal, not only impacts human existence but also poses a threat to other living organisms, eventually endangering humanity. Plastic materials are extensively used in several industries, including packaging, consumer goods, domestic applications, construction, textiles, transportation, and electrical and electronics equipment. However, only a small proportion of the plastic components generated are recycled, while the majority are either incinerated or disposed of in landfills or the natural environment. Bangladesh is not exempt from the worldwide predicament of plastic garbage disposal. In our county, the majority of spent plastic goods are disposed of after their first use. Unfortunately, owing to inadequate management, these items end up in roads, drains, canals, rivers, and open landfills located beside roadways. A study carried out by Waste Concern, a Bangladeshi social business company focused on resource recovery from waste, found that Bangladesh generates approximately 0.8 million tons of plastic waste annually. Out of this, 36% is recycled, 39% is disposed of in landfills, and the remaining 25% is unaccounted for and ends up in the marine environment (Hossain et al., 2020). The discarded garbage contains a variety of plastics, with the most common categories mentioned in Table 1. Irrespective of the specific forms of plastic, the primary cause of environmental pollution is from those that are designed for single use, such as packaging materials. These products alone account for around 36% of the total worldwide plastic consumption (José & David, 2007). Primarily Polyethylene bags, composed of polyethylene, are attributed to the present increase in plastic trash

production. Approximately 14 to 15 million polythene bags are used daily in Dhaka city and then disposed of in trash, waste, or litter following their first usage (Staples et al., 1997). Furthermore, the introduction of microbusinesses has resulted in a rise in the manufacturing of customized items, thus leading to an increasing use of plastic packaging. Nevertheless, these plastic materials consist of more than just polymer; instead, a variety of additives are incorporated into them using distinct polymerization techniques to enhance their physical and chemical characteristics. Additives such as crosslinking agents, antistatic agents, antioxidants, flame retardants, UV and visible light stabilizers, heat stabilizers, plasticizers, and coloring pigments are used in plastic manufacture (Rhodes et al., 1995). When exposed to repeated abrasion or prolonged exposure to sunlight in municipal garbage sites and roadsides, these additives and degraded plastic products may gradually be released into the environment, potentially causing harmful consequences. One specific molecule that is of particular concern is diethylhexyl phthalate. This compound has been widely utilized as a plasticizer and is known to be a source of human carcinogens and endocrine disruptors for numerous creatures (Pinto et al., 1999) (Wagner & Caraballo, 1997)

2.4.1 Air Pollution

The primary detrimental impact of plastic trash on the surrounding atmosphere may be ascribed to deliberate or accidental combustion in open fires. Typically, plastic garbage is incinerated to decrease its bulk. However, this process leads to both environmental damage and energy loss, since valuable fuel that might be obtained from plastics by pyrolysis is wasted (Michelle et al., 2001). Air pollution arises from the emission of harmful gases into the environment when plastic is burned. The process of burning plastic produces a range of highly hazardous gases, including hydrogen chloride, hydrocyanic acid, carbon monoxide, carbon dioxide, and sulfur dioxide. It also releases volatile organic compounds such as toluene, xylene, benzole, and benzaldehyde. Additionally, heavy metals, polycyclic aromatic hydrocarbons (PAHs), sulfur and nitrogen-containing PAHs, polychlorinated dibenzodioxins, polychlorinated biphenyls (PCBs), polychlorinated dibenzofurans, naphthalene, phenanthrene, and dioxins are emitted during this process (Valavanidis et al., 2008). Polyhalogenated dioxins and furans are regarded as very dangerous pollutants caused by human activity (Wagner et al., 1992). However, the

composition of the combustion byproducts is heavily influenced by the specific kinds of plastics, additives, and fillers used, as well as the parameters of the polymerization process, the temperature at which combustion occurs, and the presence of oxygen. Furthermore, the burning of plastic trash not only emits toxic gases but also produces charred ash and soot in the form of minuscule particles (Agnes & Rajmund, 2016). Controlled combustion of different plastic materials was used to simulate open-air burning in certain studies. The findings of these studies verified the presence of toxic heavy metals like Pb, Cd, Cr, Ni, Zn, Cu, as well as lithophilic metals such as Ca, Si, Na, Mg, Al, P, and Fe in both particulate soot and bottom ash, to varying degrees (Agnes & Rajmund, 2016). The release of hazardous metals is mostly caused by plastic additives that consist of organometallic compounds (Mohammad Al-Masum, 2018). Of all the many forms of plastic trash, the combustion of PVC presents the most significant hazards. On average, the burning of PVC produces up to 2 mg/g of phosgene, a very dangerous substance that was also utilized as chemical weapon in World War I (do Sul & Costa, 2014).

2.4.2 Water Pollution

The most evident impact of plastic contamination has been noticed on aquatic ecosystems. A significant portion of improperly handled plastic debris originating from exposed landfills and roadsides becomes ensnared in sewers and waterways, where it is dumped by airborne means, rainfall, and even deliberate dumping. In addition, plastic garbage that is disposed of by visitors during recreational activities along the riverfront, as well as by travelers on river transport systems, has the potential to collect on both the surface and the bottom of the river. The primary danger arises from the use of disposable plastic, namely bags, packaging, and bottles, which are promptly discarded after a single use, as well as the many forms and dimensions of unprocessed plastic materials that are not recycled. The presence of plastic garbage has resulted in the deterioration of sewage systems due to the obstruction of water flow and the congestion of drainage systems. Dhaka city previously possessed a total of 65 canals, which served the purpose of channeling rainwater into nearby rivers such as the Buriganga, Turag, and Shitalakhya. However, the current count has dwindled to a mere 43 canals. The decline can be attributed primarily to the conversion of these canals into dumping areas (Cole et al., 2013). Additionally, some of the remaining canals are gradually becoming narrower as a result of the accumulation of plastic waste.

The obstruction of the drainage and sewage system is accountable for waterlogging and man-made inundation during the monsoon season. Following severe rains, a significant portion of the streets in Dhaka and Chottogram city experience prolonged flooding. This leads to unsanitary living conditions for residents, an upsurge in mosquito-borne illnesses including dengue and malaria, vehicle congestion, and damage to roads and roadside infrastructure. Furthermore, the plastic garbage may amass on the river's surface, creating hindrances for the navigation of commonly used transportation vessels in the nation, such as vessels, steamers, and launches. Additionally, they have the potential to impair navigability when they are dumped on the river bed. Due to the escalating use of plastics, the concentration of microplastics in the aquatic environment is steadily expanding, posing a growing menace to marine life. Microplastics have been found on seashores and sea bottoms across six continents, with fibers being the most common kind (Nizzetto et al., 2016). Regardless of their origin, microplastics encounter the same outcome in the aquatic environment and inflict a comparable and equivalent level of harmful impact on marine organisms, eventually affecting human life as well. As microplastics break down into smaller pieces, they become more easily consumed by a variety of marine organisms. Studies have shown that a significant amount of plastic has been found in various marine creatures such as fish, seabirds, decapod crustaceans, amphipods, lungworms, and barnacles (Gautam & Faruqee, 2016).

2.4.3 Soil Pollution

Approximately 79% of the world's plastic waste is disposed of in landfills, posing a significant threat to the soil compartment as it becomes a repository for plastic pollution. Single-use plastics contribute to the extensive pollution of soil with large plastic pieces or small fragments, which then contaminate municipal solid waste. This waste can end up in streams, rivers, and eventually the ocean, as it takes many decades to break down. It is estimated that the decomposition process may take approximately 1,000 years (Varkey et al., 2021). A recent study conducted estimated that the annual influx of microplastics into agricultural land in Europe ranges from 63 to 430 thousand tons, while in North America it ranges from 44 to 300 thousand tons. Notably, this amount exceeds the release of microplastics into the ocean surface (Varkey et al., 2021). The interaction of microplastics and soil may have significant consequences for the well-being of soil, crops, and soil

organisms, eventually posing a hazard to human health. Given the deleterious impact of microplastics on soil fertility and enzymes, it is anticipated that microplastics will have a harmful influence on plant communities. Microplastics have a substantial impact on the functioning of important soil enzymes, including urease, fluorescein diacetate hydrolase, and phenol oxidase. These enzymes play a crucial role in regulating the levels of dissolved carbon, nitrogen, and phosphorous in the soil, which are essential for maintaining soil fertility. Therefore, the presence of microplastics can undermine the fertility of the soil. Agriculture in Bangladesh accounts for around 16.5% of the country's GDP, and over 87% of the rural population earns their livelihood from agricultural activities, either directly or indirectly (Zubris & Richards, 2005). The fisheries and livestock industries together account for 30 to 40% of the agricultural sector, which in turn contributes around 7 to 8% of the country's GDP. Specifically, fisheries provide 3.57% and animal husbandry contributes 1.53% to the GDP (Muposhi et al., 2022). Bangladesh's agricultural land spans over 9.1 million hectares, accounting for 70% of the nation's total land area. The agricultural, fisheries, and livestock industry in Bangladesh significantly contribute to the country's socioeconomic development by guaranteeing food security, fostering economic growth, and generating job opportunities for impoverished and marginalized individuals. Given the established worldwide influence of microplastics on ground and plants, it is reasonable to anticipate the presence of microplastics in our soil, providing a comparable risk to soil organisms and plants. If the issue remains unaddressed for an extended period, agricultural yields will see a decline, posing a significant risk to the food security of our nation's large population and severely compromising the country's economy. Furthermore, livestock and aquatic organisms may encounter microplastics in their feed supplies found in soil and water environments, leading to harmful effects that might potentially jeopardize their productivity and thus impact the nation's economy.

2.5 Organizational and Governmental Policies against Plastic Pollution in Bangladesh

Notably, Bangladesh became the first nation in the world to prohibit the use of thin Polyethene bags in 2002. However, after a span of 20 years, it appears that the prohibition is not being properly implemented. In order to comprehend the main cause for the insufficient implementation of the polythene prohibition, it is necessary to thoroughly

examine the ban's historical background and several underlying factors. ESDO is the leading group in Bangladesh that initiated the ban on polyethylene bags. In 1990, a campaign was undertaken to publish articles in national newspapers about the perils of plastic pollution. The aim was to capture the attention of the general people and enhance their understanding of its gravity. In 1993, the Ministry of Environment and Forest (MOEF) acknowledged the campaign against plastic pollution and made an effort to prohibit the production and use of polythene bags. However, this proposal was not approved by the parliament. In 1997, ESDO once again vocalized their concerns and launched the "Polyethene bag-free day" campaign. In 1999, the Ministry of Environment and Forests (MOEF) launched the Sustainable Environment Management Program with the objective of devising a strategy to eliminate the use of polythene shopping bags via an anti-campaign. The program's authorized members proposed doing a comprehensive analysis of the production, promotion, and use of polythene shopping bags. They also advised taking into account the socio-economic consequences before reaching a final conclusion. The Ministry then encouraged the general populace via widespread advocacy to cease the use of polyethylene bags. They also announced that January 1, 2002, would be the deadline for both the production and use of polyethylene shopping bags in Bangladesh. The legislation pertaining to section 1 of the Bangladesh Environment Conservation Act was updated in 2002. Pursuant to Rule 6ka of Clause-5 under Section-9 (Lu et al., 2018), the manufacture and use of polythene shopping bags have been prohibited. As to rule 6ka, the penalty and punishment for manufacturing, import, and selling are as follows: a 10-year term of rigorous imprisonment, a fine of 1 million takas, or both penalties concurrently. Engaging in the sale, display, storage, distribution, transit, or commercial use of the item is punishable by a jail term of 6 months or a fine of 10 thousand takas, or both penalties combined (The World Bank, 2021). In 2018, Transparency International Bangladesh advocated for stricter enforcement of legislation to hinder illicit production, promotion, and use of plastic in order to combat environmental degradation. The Ministry of Environment and Forests launched the National 3R plan for trash management with the aim of reducing the volume of waste material, particularly plastic waste, by promoting the reuse and recyclability of old plastic (Uddin et al., 2018). The implementation of the 3R strategy, namely reduce, reuse, and recycle, may effectively

mitigate plastic pollution. Nevertheless, the Bangladesh government continues its efforts to implement the legislation by deploying mobile courts in various markets throughout the year. In 2020, the High Court issued a mandate to strictly implement the nationwide ban on Polyethene bags. Enforcement measures may include regular monitoring of the market, shutting down companies that produce polythene bags, and confiscating their equipment. The High Court has imposed a prohibition on the transportation, sale, and promotion of plastic carrier bags and other disposable plastics, including straws, cotton swabs, cutlery, bottles, food containers, and plastic plates at hotels and restaurants located in coastal regions (Writ Petition, 2020). The Mandatory Jute Packaging Act was implemented in 2013 to discourage the use of Polyethene bags and encourage the use of alternative packaging options. The primary objective of this act, proposed in 2010, was to promote the Jute industry and decrease reliance on plastic packaging. Initially, the administration of Bangladesh mandated that six agricultural items be packed using jute. However, this number ultimately expanded to 17 products (Giacovelli, 2018). As a result of insufficient enforcement and poor institutional infrastructure, the majority of families fail to separate their garbage, posing a challenge for waste pickers in recycling efforts. In 2015, the Plastic Park Project was implemented to transfer outdated plastic manufacturers from old Dhaka to a new site. The objective was to enhance the environment, foster sustainable development in the plastic sector, and minimize trash in urban areas (Giacovelli, 2018). In addition, the Clean Dhaka Master Plan (2018-2032) was introduced, enabling the DNCC and DSCC to develop a comprehensive strategy to tackle the increasing urban population and the resulting surge in urban garbage. The master plan incorporates the three components of the 3R approach, which include the efficient gathering of garbage, appropriate disposal methods, and waste reduction by implementing treatment and incinerator facilities (Giacovelli, 2018). In 2020, the Ministry of Industries implemented a strategy called the "National Plastic Industry Development Policy 2021 (Draft)" that emphasized the significance of reducing the effects of plastic waste on the environment. The policy emphasized the need to attain the complete elimination of plastic and packaging waste by 2030, standardizing recyclable items, and guaranteeing the efficacy of recycling processes (Ministry of Industries, 2021). In addition to these norms and guidelines, Unilever implemented a program in 2020 called "Create a Circular Economy

Model for Plastic Waste" in collaboration with the United Nations Development Programme (UNDP) to address the issue of plastic waste in Bangladesh. The program's primary objective is to decrease the use of HDPE and LDPE in NCC. This will be achieved via several actions such as raising awareness, enhancing the informal recycling system, and promoting stakeholder involvement in policy lobbying (Giacovelli, 2018). The government has implemented measures to enhance the participation of private stakeholders. These measures include improving pricing policies to encourage efficient waste management, imposing penalties for improper domestic waste disposal, implementing co-financing mechanisms through public-private partnerships (PPP), and introducing an Extended Producer Responsibility (EPR) strategy, specifically for managing plastic waste (GED, 2020). Only a limited number of stakeholders in Bangladesh have expressed their concerns over the significance of plastic pollution and its consequences. Consequently, there is a dearth of knowledge and comprehension, as well as legislation that specifically pertains to plastic pollution. The existing regulations in Bangladesh pertaining to the control of plastic pollution are inadequate and inefficient. The first ban on Polyethylene bags, for instance, was not enforced. Authorities have banned the use of polythene bags without specifying any limitations on the origins of polyethylene bags or the manufacturing techniques used. In FY2022, the government removed the 5% extra charge on plastic or polythene bags, notwithstanding the existing limitation on their use (MoF, 2022). This weakens the rationale for a circular economy and exacerbates the challenge of mitigating plastic pollution. In addition, Bangladesh has implemented the National 3R Strategy for trash Management in response to the increasing significance of the circular economy. However, it lacks a specific action plan to address the difficulties associated with plastic trash along its whole value chain. The Eighth Five-Year Plan does not specifically address any measures for plastic trash, but instead focuses on broader problems with solid waste. Furthermore, electronic waste also includes a substantial quantity of plastic. Hence, legislative measures should be developed to effectively segregate the plastic components and facilitate the convenient recycling of electronic items.

Chapter Three

3. Methodology

3.1 Study Area

Primary study area is Bangladesh, as the topic focuses on the national implementation of a polyethene bag ban. However, in Bangladesh the specific study area is Dhaka City.

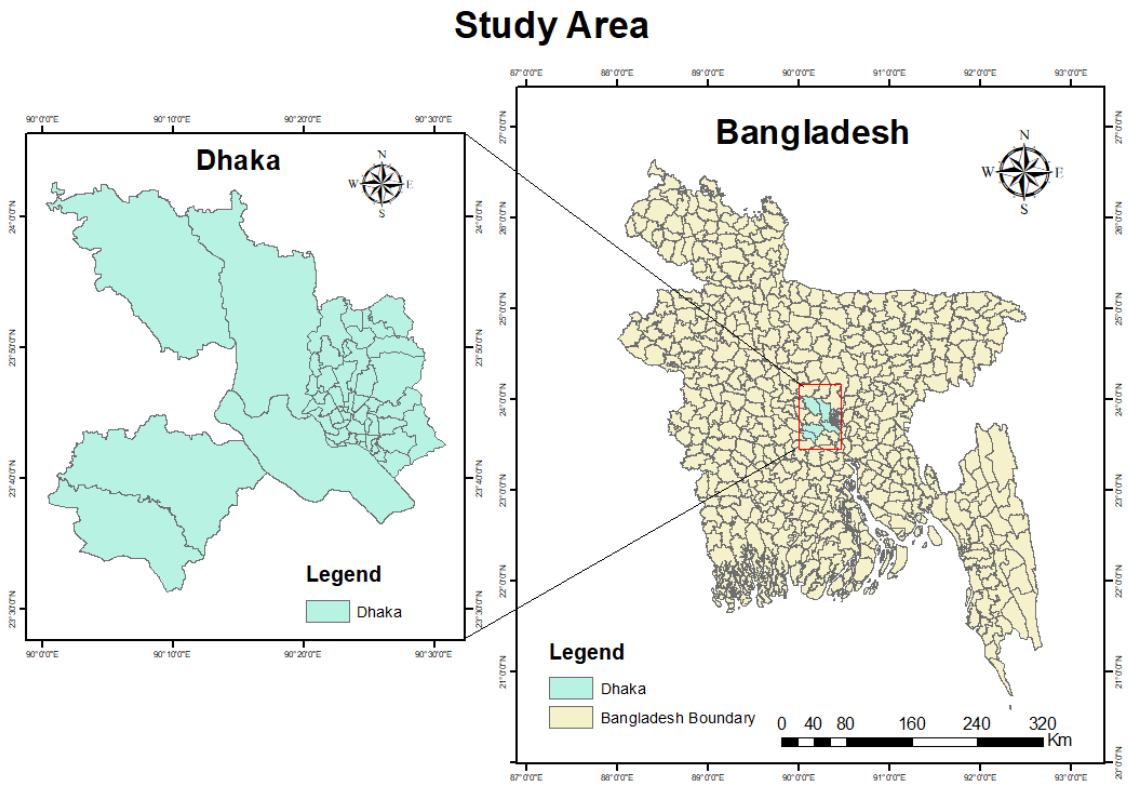
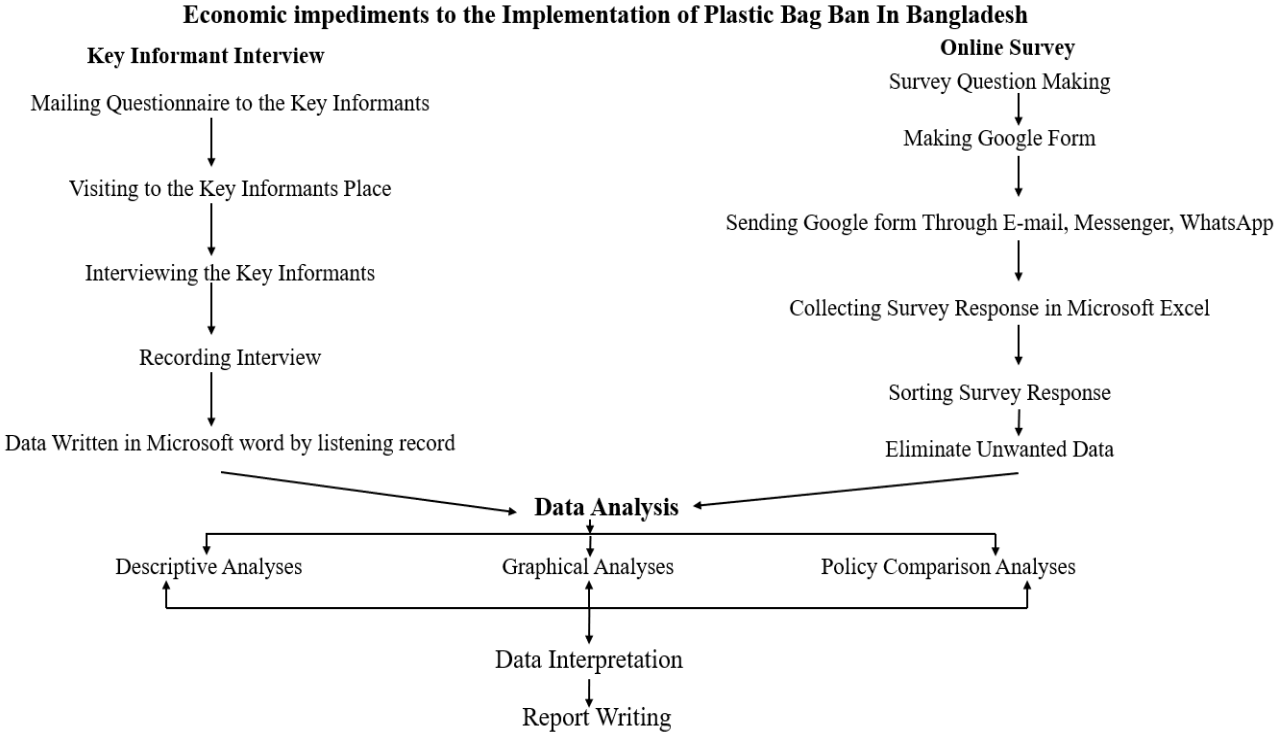


Figure: Study Area

Key informant interviews were conducted with reputed NGO executives in Dhaka City. The insights and information I gathered from these interviews can be considered representative of the perspectives and experiences related to the Polyethene bag ban across Bangladesh, and they form a vital part of my study.

The survey respondents were university students in Dhaka City, Bangladesh. The data collected from the online survey (Google Forms) helped me analyze the general perceptions, attitudes, and experiences of a broader group of consumers.

3.2 Research Design



3.3 Data Collection

3.3.1 Key Informants Interview:

Key informant interviews were conducted with reputed NGO executives in Dhaka City. Five key participants were interviewed. Key informant interviews were conducted formal to collect an in-depth view of the major impediments to the ban on Polyethene bags in Bangladesh. I completed the questionnaire, visited different NGOs in person and interviewed them. There were seven sections of the questionnaire. The first section contained information about the date of KII, place, interviewer position, start time and Interviewer name. The second section contained questions regarding the questionnaire. The third section contained questions about Awareness of plastic pollution and plastic waste management. In fourth section there were question about law Compliance. On the fifth section the questions were about Economic Barrier which is the main part of the questionnaire. Then in the sixth and seventh section the questions were about feedback and observations of the interviewer. The review from them was recorded in the recorder, and other data were noted in the note. Questionnaires were sent to interviewers before the

interviews. After obtaining approval, I visited them and interviewed them. According to the question, they delivered their valuable view, and sometimes they added their perspectives and suggestions.

3.3.2 Survey:

A survey was conducted online (Google Forms), and sent to various different university students. There were 20 questions, including participants name, age and sex. The question was about the Polyethene bag ban, Polyethene bag usage, supporting or opposing the Polyethene bag ban, impediments to the Polyethene bag ban implementations, awareness about Polyethene bag alternatives and their usage, and preference for using plastic products. A total of 157 participants participated in this survey, and provided valuable insights.

3.3.3 Paper Review:

There were about 50 papers reviewed, and data was collected about the Polyethene bag ban among 11 countries. The aim was to review existing policies about Polyethene bag bans, their success, and the reasons for those countries where plastic is also banned. After collecting data, it was compared with our country's existing policy. It helps to find out policy gaps, make recommendations, and suggest adopting initiatives to make the Polyethene bag ban successful.

3.4 Data Analysis

3.4.1 Survey

The collected data for this study were analyzed by basic statistics such as number and percentage distribution. The relationship between two variables was also investigated. In addition, a number of graphs were used to clearly focus on the situation.

3.4.2 Key Informant Interview

The collected data from the Key Informants were categorized by the question, they were asked. For every question the view of total eight key informants were compiled together. These interviews were structured such that the data collected from each key informant was categorized based on specific questions. To ensure a comprehensive understanding of the topic, the responses of five key informants were compiled for each question, allowing

for an in-depth view of this study. Subsequently, I precisely analyzed these collective responses, identifying key points and main themes that emerged from the incorporation of views. This methodological approach generated a profound and in-depth understanding of the study, as it provided a comprehensive synthesis of the perspectives shared by the key informants. In this study, I present and discuss the findings obtained through this process across eight distinct questions, focusing on the Economic impediments to the Polyethene bag ban Implementations, the subject matter as explained by these knowledgeable key informants.

Chapter Four

4. Result and Discussion

4.1 Survey

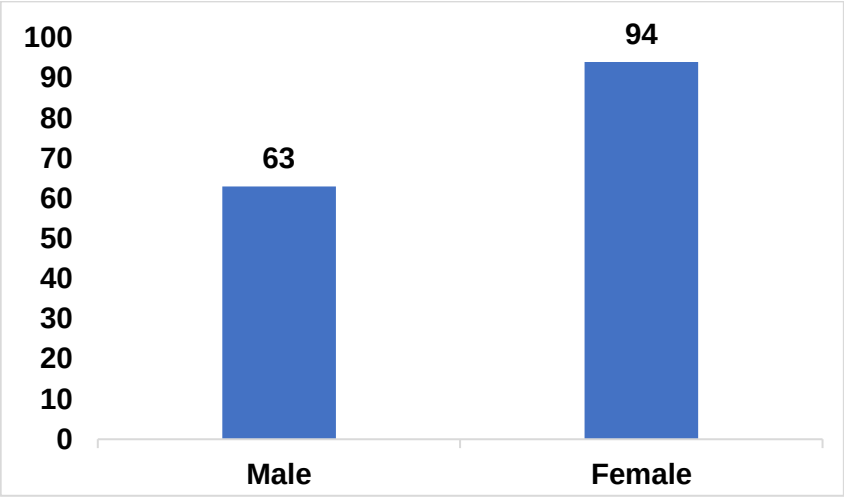


Figure 4.1.1: Data regarding the gender distribution of survey participants

The study gathered data from a diverse sample of consumers, consisting of 63 (41%) males and 94 (59%) females. It is worth mentioning that most participants in this survey were female.

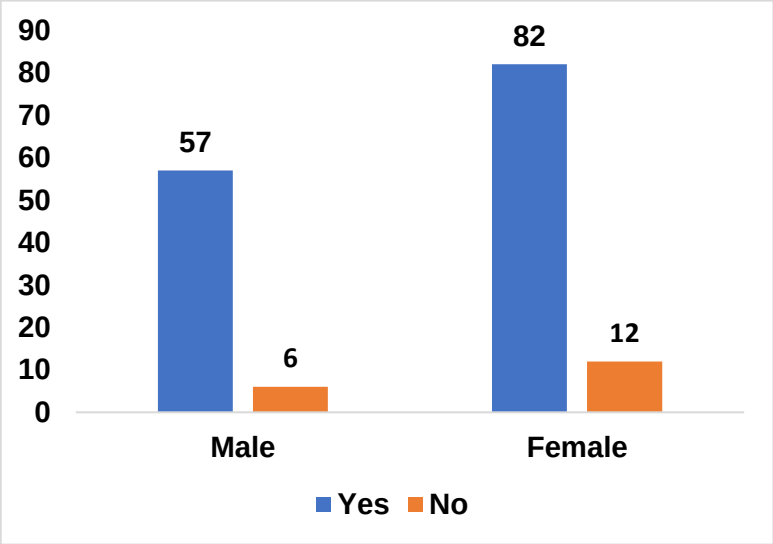


Figure 4.1.2: Aware of Polyethene bag ban Among Survey Participants by Gender

The survey participants were asked about their knowledge of the polyethylene bag ban, and their replies were divided into two separate categories: "Yes" indicating an understanding of the plastic ban, and "No" indicating a lack of awareness. The replies were categorized based on gender, explicitly dividing them into male and female

respondents. Of the 63 male participants surveyed, 57 acknowledged their awareness of the polyethene bag ban, whereas six admitted to being unaware of the prohibition. In contrast, out of the 94 female responses, 82 confirmed their awareness of the polyethene bag ban, while 12 acknowledged their lack of information about the restriction. Analysis of these data indicates that a substantial majority of both male and female participants were absolutely aware of the plastic prohibition. Approximately 91% of the male individuals exhibited awareness, while the remaining 9% lacked this knowledge. Similarly, around 88% of the female participants demonstrated awareness of the ban, while the remaining 12% lacked such information.

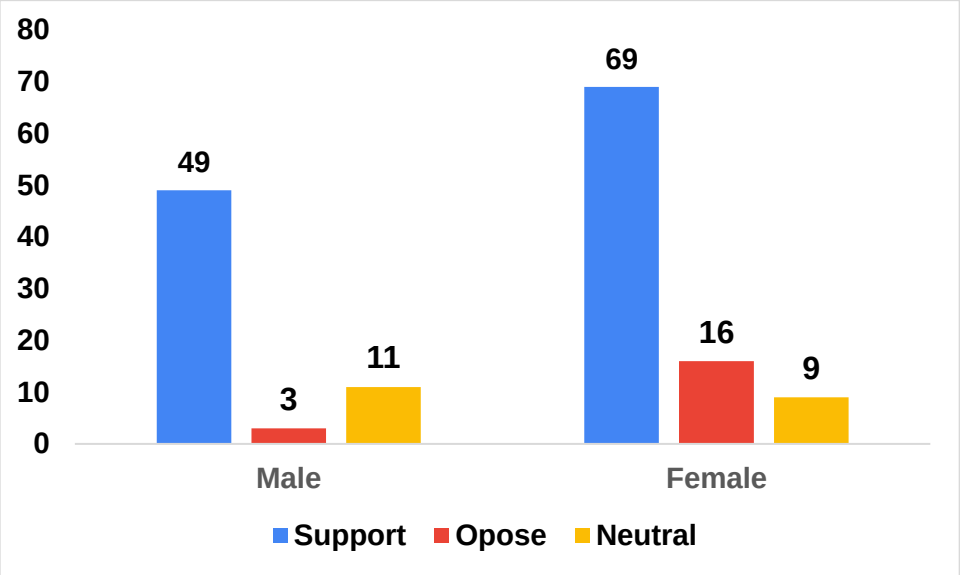


Figure 4.1.3: Analysis of Support for the Polyethene Bag Ban in Bangladesh by Gender

A survey was conducted undertaken to evaluate the extent of support for the prohibition of Polyethene bags in Bangladesh. A total of 157 individuals participated in the study, consisting of 63 men and 94 females. Of the male responses, 49 individuals (77.8%) showed their support for the ban, whilst three individuals (4.8%) indicated that they did not support it, and 11 individuals (17.5%) stayed impartial. Of the female participants, 69 (73.4%) supported the ban, 16 (17%) were against it, and nine (9.6%) had no opinion. When considering replies from both male and female participants, it is clear that 75.2% of the whole sample was in favor of the polyethene bag ban, 12.1% were against it, and 12.7% were neutral. The results provide useful insight into the distribution of attitudes

towards the ban on polyethene bags, demonstrating a greater overall degree of support among the people surveyed.

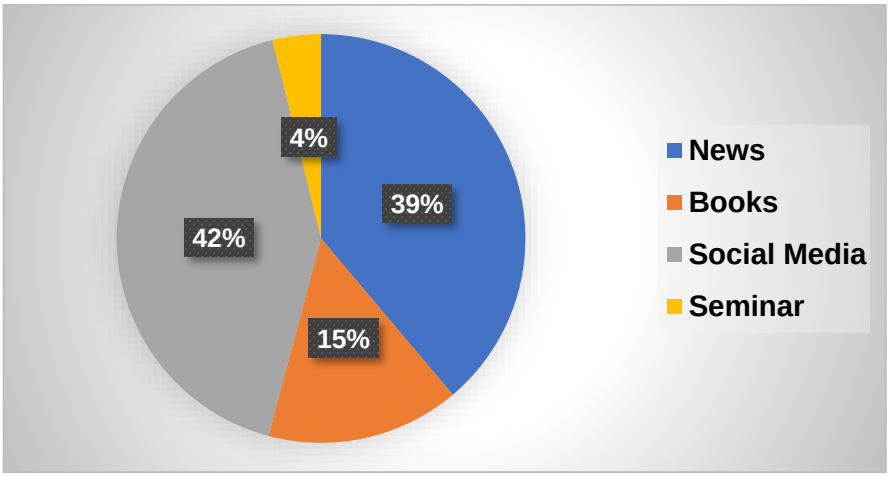


Figure 4.1.4: Sources of Information About the Polyethene bag Ban in Bangladesh Among Survey Participants

Through the survey, I aimed to comprehend the ways in which participants acquired information on the ban on Polyethene bags in Bangladesh. Out of the 157 participants, 61 people, representing around 38.9% of the whole sample, said that they became aware of the ban via the news outlets. A total of 24 participants, or approximately 15.3% of the respondents, chose books as their source of knowledge. Furthermore, a significant proportion of 66 (42%) participants, said that they received information about the ban via social media platforms. Finally, six participants (3.8%), said that they were aware of the restrictions via seminars. This research offers useful insights into the many ways in which people were informed about the ban on Polyethene bags in Bangladesh, emphasizing the importance of news and social media as major sources of information.

Table 4.1.1: Major Economic Barriers to Implementing the Polyethene bag Ban in Bangladesh as Identified by Survey Participants.

Reasons	Frequency	Percentage
Lack of Financial support for developing alternatives of single use plastics like investment, loans and tax exemption	57	36.30%
Lack of cheaper alternatives like polyethene bag	91	57.90%
Lack of Investment to meet the production demand of biodegradable bags	58	36.90%
Customer dependency on polyethene bags	38	24.20%
Fear of losing customers	12	12.00%

In this survey, including 157 participants, I aimed to identify the primary economic obstacles hindering the adoption of a Polyethene bag ban in Bangladesh. Participants were provided with the opportunity to choose multiple reasons, and the findings revealed a complex variety of concerns.

The primary economic obstacle, as indicated by the participants, was the "Lack of Financial Support for Developing Alternatives to Single-Use Plastics" (57 participants, 36.30%), which identified this difficulty and emphasized the need for financial support, such as investments, loans, and tax exemptions, to promote the development of sustainable alternatives to single-use plastics. The second most significant obstacle identified was the "Lack of Cheaper Alternatives like Polyethylene Bags" chosen by 91 participants, accounting for 57.90% of the total responses. This finding underscores the significance of affordability when alternative bag options are considered. The third major obstacle was insufficient investment to meet the production requirement for biodegradable bags. This barrier was emphasized by 58 participants, accounting for 36.90% of the total participants, who stressed the need for more investment to keep up with the rising demand for biodegradable bags. "Customer's Dependency on Polyethylene Bags" ranked fourth on the list, with 38 participants, accounting for 24.20% of the responses. This finding highlights

the difficulty of changing customer habits and preferences. The fifth and last obstacle found was the "Fear of Losing Customers," with 12 participants (12.00%) acknowledging it as a legitimate issue, suggesting unease about the possibility of customer loss. These results highlight the complex and interrelated aspects that contribute to the economic obstacles faced in implementing a ban on Polyethene bags in Bangladesh. These factors include financial support, affordability, investment, consumer habits, and retention.

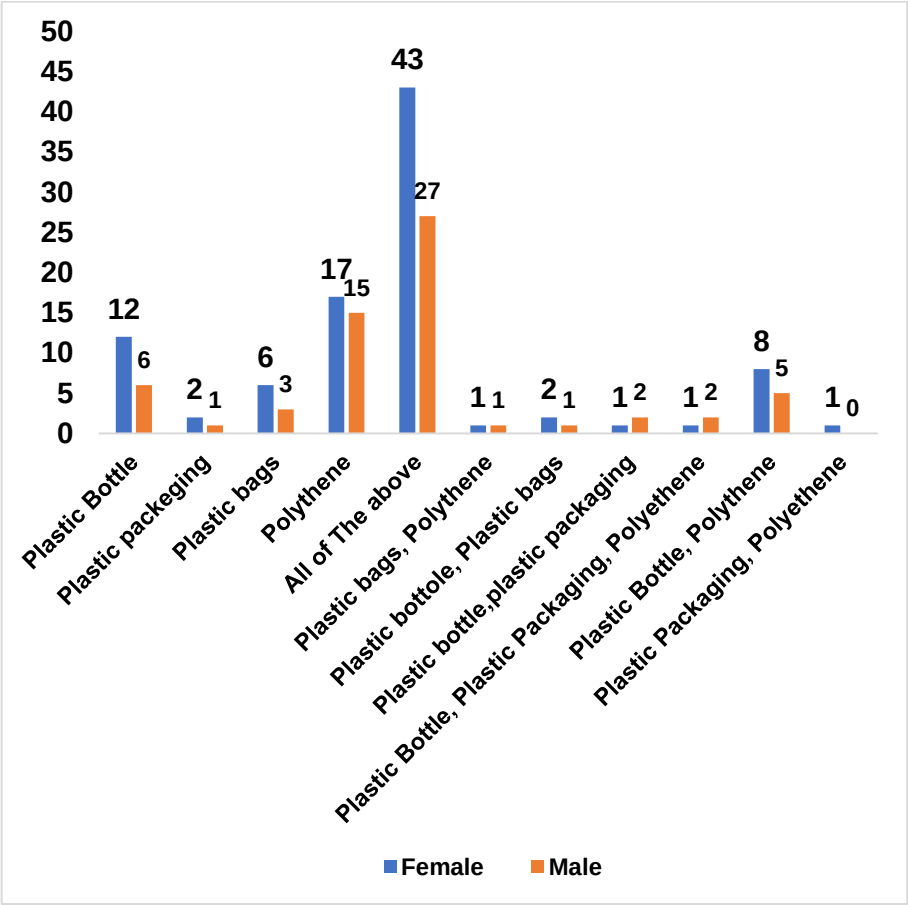


Figure 4.1.5: Prevalence of Plastic Item Usage in Everyday Life Among Survey Participants

The participants, consisting of both male and female respondents, offered important insights into their daily routines and preferences when asked about the plastic items they used most often in their regular lives. Within the group of female participants, the plastic bottle emerged as the most frequently used plastic item, with a total of 12 people selecting it. Similarly, six male participants expressed preference for the same item. In addition, two

female participants indicated plastic packaging as their preferred option, whereas one male participant expressed the same opinion. Six female participants and three male participants routinely used polyethylene bags. Of the total respondents, a significant proportion of 17 females and 15 men included polythenes in their regular activities. Interestingly, both male and female participants demonstrated the simultaneous use of polyethene bags and polythenes. Among the respondents, two females and one male indicated a preference for both plastic bottles and polyethylene bags. Additional variances were noted, as one female used plastic bottles, plastic packing, and polythene simultaneously, alongside two men who made the same selection. In addition, the pairing of plastic bottles and polythene was favored by eight female and five men. Finally, a female participant stated her preference for both plastic packaging and polythene, a preference not shared by male participants. The survey also revealed a cohort of individuals, consisting of 43 females and 27 males, who actively included all of the mentioned plastic products in their everyday routines. This extensive research offers useful insights into the preferences and behaviors of the survey participants, highlighting the predominant plastic goods that they use in their everyday lives and the distinct combinations of these things.

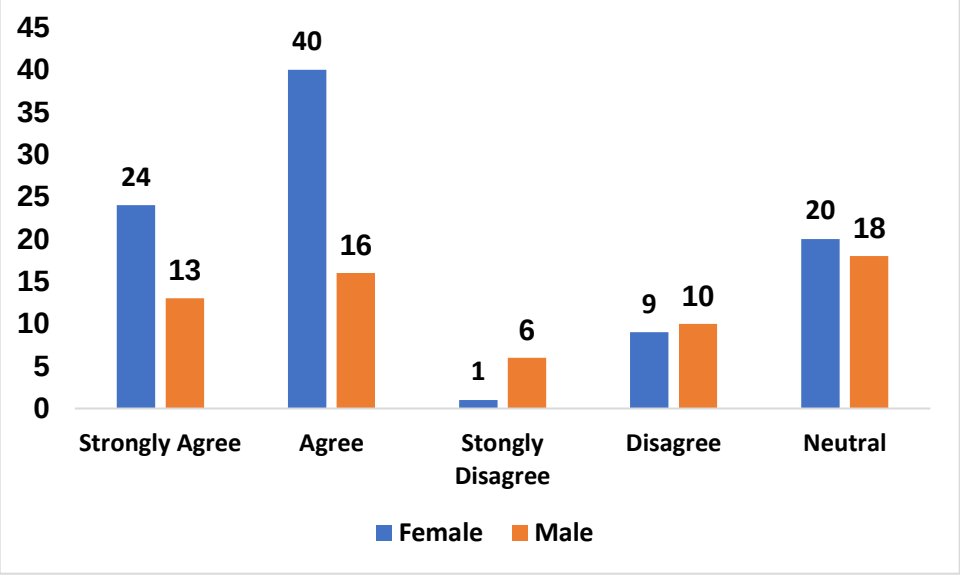


Figure 4.1.6: Consumer Responses on Willingness to Choose Jute Bags Over Polythene Bags while purchasing goods at store

The survey question asked participants whether they would choose to purchase jute bags for 10–20 taka instead of receiving free polythene bags while buying products. A variety of viewpoints and tendencies emerged from participants of both sexes. Of the female respondents, 24 people strongly agreed with the viewpoint, while 13 males also shared this high agreement. Moreover, 40 girls and 16 males indicated their agreement with the idea of acquiring jute bags. In contrast, a single female expressed strong disagreement with the statement, while six males shared the same attitude. In addition, nine girls and ten males disagreed with the idea of purchasing jute bags. Twenty girls and 18 males maintained a neutral stance towards the remark. This extensive research showcases a variety of views and viewpoints among survey respondents, emphasizing the differing levels of agreement, disagreement, and neutrality regarding the choice of purchasing jute bags or receiving free polythene bags when shopping.

Table 4.1.2: Reasons for Preferring Polyethene bag

Reasons	**Frequency**
Cheap	**22**
Light weight and durable	**10**
Easily available	**36**
The lack of alternative materials	**24**
High Price of Alternatives	**27**
Above all	**38**

During the study, individuals were queried about their tendencies toward using plastic items, and their answers unveiled a multitude of justifications. Significantly, 22 individuals said that the cost-effectiveness of plastic items played a crucial role in their selection, highlighting price as a vital consideration. Furthermore, ten people recognized the traits of being lightweight and durable as an additional motivating element, highlighting the practicality and long-lasting nature of plastic objects. In addition, the ease of obtaining plastic items was a crucial factor in the decision-making process, with 36 individuals specifically mentioning their widespread availability as a persuasive argument for selecting them. At the same time, 24 individuals acknowledged the limitation of using alternatives as a motivating factor, emphasizing the difficulties caused

by the lack of alternatives for plastic in certain applications. Interestingly, a significant number of 27 participants highlighted the expensive nature of alternatives as a driving force, underscoring the economic factors that shape their preference for plastic. In addition, 38 people acknowledged the validity of all the listed reasons, indicating that a variety of variables, such as price, durability, availability, the absence of alternatives, and cost concerns, together influence their choice of plastic items. This research emphasizes the complex nature of consumers' decisions regarding the use of plastic products, stressing the practical and economic factors that influence their choices.

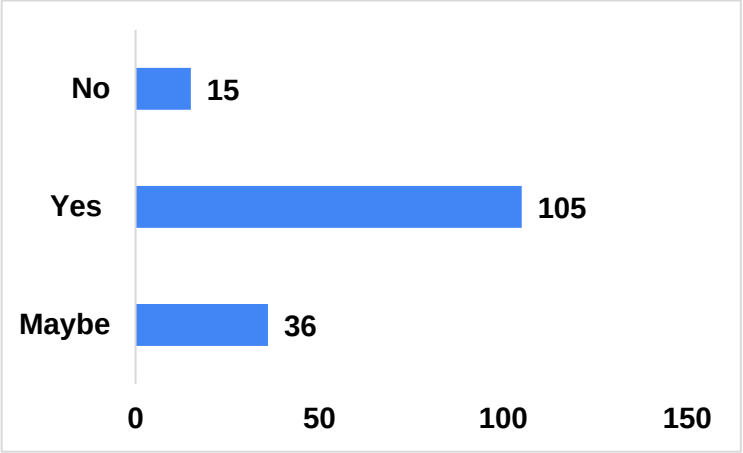


Figure 4.1.7: Survey on Preferences for Recycled polythene bags over Newly Manufactured Polythene Bags

The survey, which sought to assess individuals' preferences regarding the use of recycled polythene bags versus newly produced polythene bags provided by shops at no cost, yielded interesting findings. Among the 157 individuals surveyed, a majority of 105 respondents showed a distinct preference for using recycled polythene bags, highlighting a notable tendency towards sustainability and environmentally conscious alternatives. Nevertheless, 36 individuals maintained their indecisiveness, expressing a "Maybe" response, indicating their tendency to take into account several considerations, such as convenience, cost, or the environmental effect, before reaching a decision. However, 15 individuals chose to use the newly produced polythene bags provided by stores at no cost, highlighting their attraction to save money and their lack of knowledge about the

environmental advantages of recycled alternatives. The findings indicate that a substantial number of people prefer using recycled polythene bags, suggesting an increasing awareness of environmental issues and a desire for sustainable alternatives. However, some individuals still prioritize convenience and costs when making their decisions.

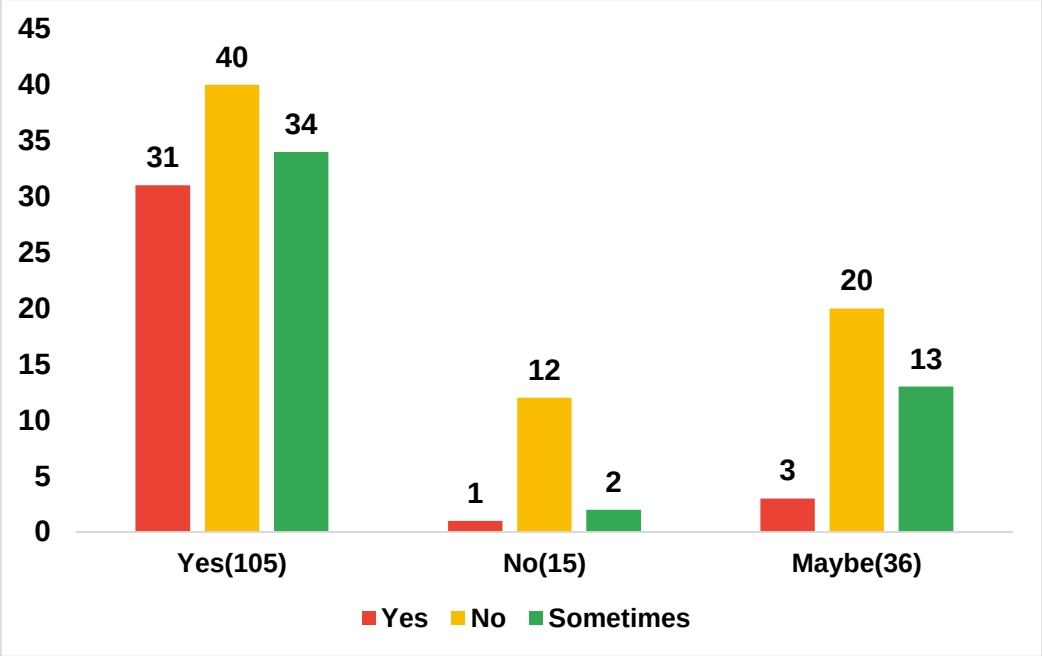


Figure 4.1.8: Relationship between Recycled Polythene Bag Preferences over newly manufactured polythene and their recycling habit

This analysis explores the relationship between two survey findings that provide insight into consumers' attitudes and actions regarding the use of recycled polythene bags versus new ones provided by stores for free. Furthermore, it investigates participants' behaviors regarding the recycling of polythene bags. The first inquiry was to ascertain the preferences of the participants, yielding a significant finding: 105 individuals clearly indicated a preference for using recycled polythene bags. This result demonstrates a notable tendency towards sustainability and the implementation of ecologically sound activities. To gain a deeper understanding, the aforementioned group of 105 individuals was further surveyed about their actual involvement in the recycling of polythene bags. The findings for the second question showed a diverse range of responses. Of the total participants, 31 affirmed their involvement in recycling, 40 said that they did not recycle, and 34 were into the irregular recycling group.

Conversely, 15 individuals from the first sample showed a negative tendency towards recycled bags. Within this specific subgroup, one person actively partakes in recycling, whereas the majority of people (12 participants) did not engage in recycling activities. In addition, two individuals occasionally engage in the recycling of polythene bags. There were 36 individuals who showed indecisiveness by responding with the phrase "Maybe" to the first question. When asked about their recycling practices, three people confirmed their involvement in recycling, whereas 20 individuals said that they do not participate in recycling activities. In addition, 13 participants were admitted to recycling polythene bags. This analysis emphasized the complex characteristics of consumer attitudes and actions around the use and recycling of polythene bags. Although many participants expressed a preference for using recycled bags, the actual practice of recycling varied significantly among this group. In addition, the group categorized as "Maybe" had a wide range of behaviors and a proclivity for indecisiveness, highlighting the complex interaction between consumer preferences, environmental sustainability, and convenience.

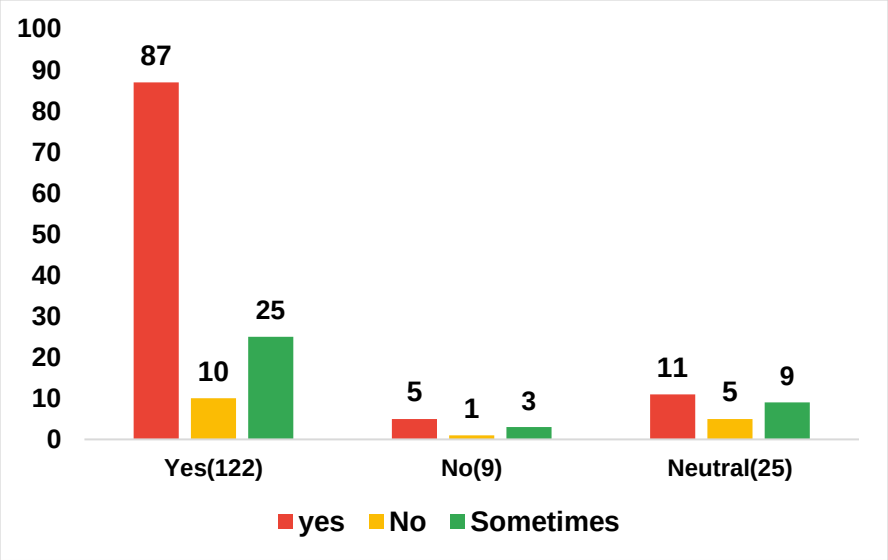


Figure 4.1.9: Analysis of Participants responses on the relationship between switching to polyethene bag's alternatives and their willingness to buy polyethene bag alternatives by paying extra money if polythene bag ban become functional in future

This research explores the interconnected responses to two distinct survey questions, offering useful insights into participants' perspectives and preferences regarding alternatives to plastic and their inclination to pay an additional amount if the ban on polythene bags becomes functional in the future. The first investigation focused on participants' opinions and perspectives about the shift towards plastic alternatives. The results revealed that a substantial number of the participants, precisely 122 people, had a favorable inclination towards accepting these alternative choices. However, following a more thorough examination of the second query about their inclination to provide more money for these alternative choices, a more comprehensive picture emerged. Among the 122 participants in the sample who initially preferred plastic alternatives, the majority of 87 persons consistently showed their readiness to pay an extra amount. Nevertheless, it is noteworthy that 10 persons in this specific group voiced apprehension over the higher charges, while an additional 25 participants were uncertain, indicating a cautious readiness to bear more costs. Conversely, the viewpoints of the first nine people who initially opposed switching to plastic alternatives were shown to be varied with respect to the second inquiry. Among all participants, five persons indicated a willingness to contemplate bearing additional expenses for these alternative choices. In contrast, one person strongly opposed the notion of paying extra, while three others remained undecided, indicating a cautious leaning towards such a readiness. The group of 25 individuals who originally held a neutral stance towards the first inquiry exhibited a wide array of responses when asked about their inclination to accept more costs for plastic alternatives. Among the whole group, 11 people showed a positive inclination towards participating in the specific activity, whereas 5 individuals remained opposed. In addition, 9 participants exhibited a stance characterized by an inconsistent tendency towards engagement. This study emphasizes the complex correlation between individuals' initial attitudes toward plastic alternatives and their inclination to financially invest. This analysis showcases several perspectives, indicating that although there is overall endorsement for alternatives to plastic, there is a spectrum of opinions on the willingness to devote further cash towards these alternatives. The diversity in viewpoint is influenced by factors such as financial considerations, perceived benefits, and individual circumstances.

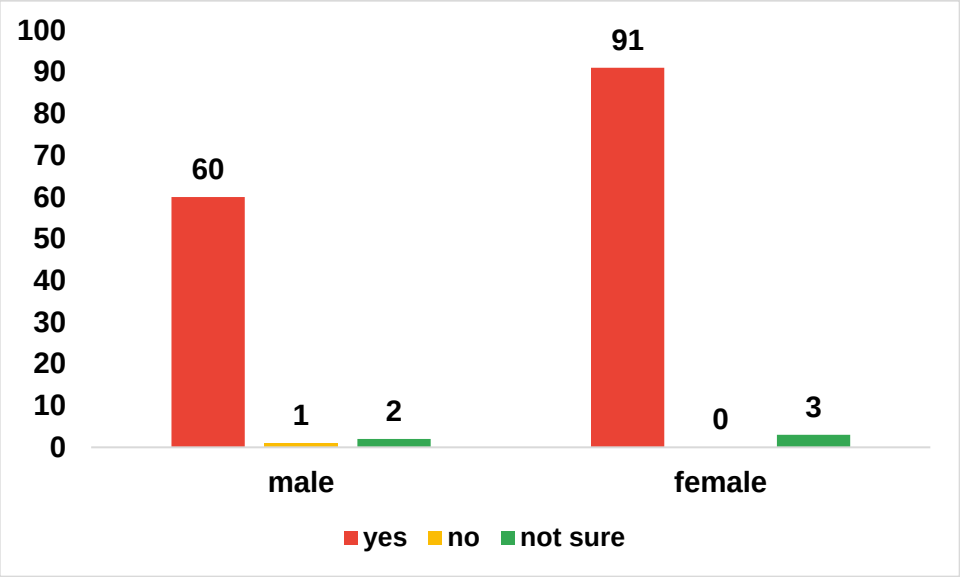


Figure 4.1.10: Gender-Based awareness on Plastic Waste Impact: Health and Environmental Concerns

This survey aimed to investigate the viewpoints of the participants on the problem of plastic waste and its consequences on both health and the environment. The collected data was then analyzed based on gender. Out of the 157 participants in total, it is clear that most males and females showed stress about the adverse impacts of plastic waste. Explicitly, 60 male participants clearly expressed their belief that plastic waste presents a dual challenge to both human health and the environment. However, one male participant had an opposing view, suggesting his lack of concern. Furthermore, two male participants expressed uncertainty on the topic. Ninety-one female participants in the study agreed that plastic waste is detrimental to both health and the environment. Significantly, all of the female respondents agreed with this position, demonstrating a universal consensus among the female participants. Nevertheless, a minority of female participants, namely three individuals, maintained a state of uncertainty or indecisiveness over the matter. Overall, the data reveals a broad concern over the negative impact of plastic waste on both health

and the environment. The disagreement in beliefs based on gender may mainly be ascribed to a small number of male participants who had alternative views or were unclear.

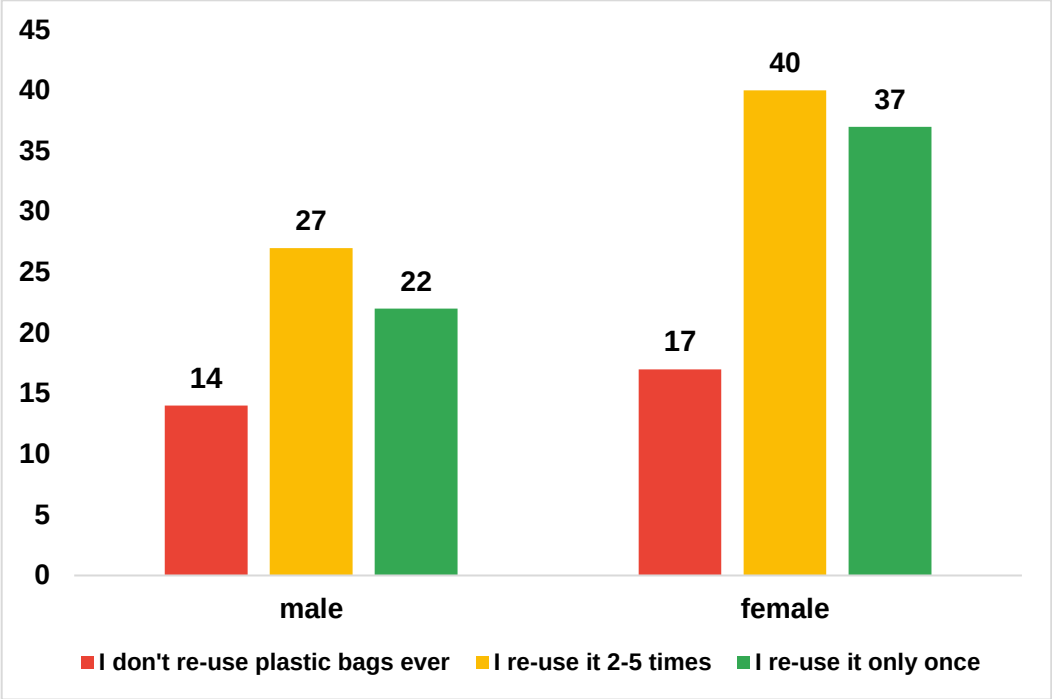


Figure 4.1.11: Polythene Bag Re-Usage Patterns: A Gender-Based Analysis

This study collected data on participants' re-usage behaviors of polythene bags, specifically focusing on gender as a categorization factor. Out of the 157 participants in all, the replies yielded valuable data into the frequency with which people reuse these bags. Out of the male participants, 14 individuals said that they never reuse Polyethene bags, indicating a distinct inclination towards using them just once. Meanwhile, 27 males said that they engage in the practice of reusing Polyethene bags, often between 2 to 5 times, demonstrating a heightened level of environmental awareness. In addition, 22 males said that they only reuse these bags once, indicating a restricted pattern of reuse. Among the female participants in the survey, 17 individuals also said that they refrain from reusing Polyethene bags, mirroring the behavior of their male counterparts. Out of a total of 40 females, a greater percentage responded that they reuse these bags between 2 to 5 times, suggesting a longer duration of reuse compared to males. In addition, 37 females said that they only use Polyethene bags once, which corresponds to a single-use

behavior. This data reveals distinct patterns of reusability, particularly in relation to gender: a greater proportion of females in the survey exhibited a propensity to reuse Polyethene bags on several occasions compared to men. Nevertheless, it is crucial to acknowledge that a subgroup of both male and female individuals still exhibits a preference for single-use Polyethene bags. These results emphasize the need to promote environmental awareness and implement strategies to decrease the usage of single-use plastics.

Table 4.1.3: Participant's Single Use plastic disposal process

Disposal Process	**Frequency**
I don't really pay attention	40
Throwing them away	75
Follow recycling Mechanism	42

This study aimed to investigate the common practices for single-use plastic disposal among 157 people. The findings elucidate a range of disposal practices and perspectives regarding the use of single-use plastic. A considerable proportion of the survey participants, (75 individuals), indicated that they engage in the act of discarding single-use plastics by means of throwing them away. This reaction implies a widespread tendency to dispose of items without giving due regard to recycling or the environmental consequences associated with such behaviors. The method of (SUP) disposal is often seen, although it raises significant concerns owing to its potential contribution to environmental degradation and the buildup of non-biodegradable plastics inside landfills. In contrast, a group of 42 individuals who exhibited a higher level of environmental awareness indicated their dedication to adhering to "recycling mechanisms." This suggests that these people actively participation in recycling and adhere to methods that promote the proper handling of plastic waste. The endeavors made by individuals may play a role in mitigating the environmental impact linked to the disposal of plastic materials, thus aligning with sustainability and eco-friendly attempts. Finally, it is worth mentioning that a significant number of 40 respondents expressed t "I do not pay much attention." The provided

response implies a deficiency in understanding or consideration of the disposal methods of plastics, thereby highlighting a possible need for the dissemination of knowledge and guidance pertaining to the proper management of plastic trash. The study findings underscore the need for enhanced awareness and education on the significance of proper disposal and recycling of single-use plastics (SUP). The frequency with which individuals engage in the act of discarding single-use plastics (SUP) suggests a prevalent behavior that, if effectively targeted, has the potential to make a substantial contribution towards mitigating plastic pollution and its associated ecological consequences. Promisingly, the group of people engaged in the adoption of recycling techniques displayeds the active dedication of some individuals toward embracing environmentally conscious behaviors.

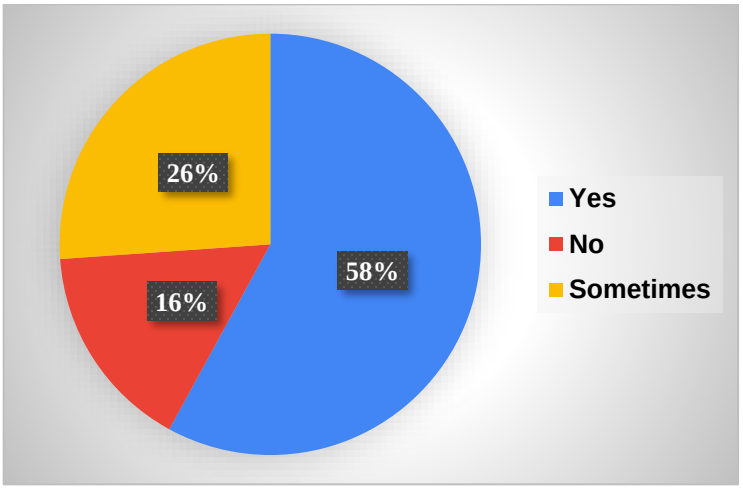


Figure 4.1.12: Willingness to accept further Polyethene bag ban strategy in future

In this study, 157 individuals were surveyed to assess their inclination towards comply with a potential future strategy aimed at implementing more restrictions on plastic use. The comments yielded valuable insights into the attitudes and preparedness of the participants regarding the implementation of the ban. A considerable majority of 91 participants (58%) of the total, demonstrated their readiness to adhere to the suggested plastic ban. This finding suggests a shared sense of responsibility and endorsement for the promotion of environmental sustainability. The user's yes reply indicates their awareness of the environmental concerns linked to plastic use and their willingness to make the required adaptations to conform to a hypothetical prohibition. In contrast, a total of 25 individuals, accounting for 16% of the sample, explicitly expressed their refusal to adhere

to a potential plastic ban. The opposition shown by this particular group to the prohibition might be attributed to a range of causes, including considerations of convenience, dependence on plastic items, and doubts over the efficacy of such regulatory measures. An additional 41 participants, accounting for 26% of the total respondents, expressed a "sometimes" position, suggesting that their compliance with the prohibition would be conditional upon certain conditions. This group exhibits a degree of willingness to adhere to the restriction, although with some conditions or limited to certain things, However their level of dedication is not fully uniform. The survey findings presented herein clarify a diverse array of perspectives pertaining to the prospective enactment of a prohibition on plastic use. While a considerable proportion of individuals express support for upholding the ban, there exists a noteworthy contingent that displays hesitancy or resistance, suggesting the need for effective dissemination of information and educational initiatives on the underlying reasoning and advantages of these environmental measures. The group known as the "sometimes" group argues that in order to accommodate varying individual situations and preferences, it may be required to adopt varied ways of implementation.

4.2 Key Informant Interview

Ques No. 1: What are the most significant economic obstacles that impede the enforcement of the ban on polythene bags in Bangladesh?

Based on insights from key informants, many factors were identified as impediments to the successful implementation of the plastic bag ban in Bangladesh. The results and views exhibit certain levels of similarity. Most of the respondents expressed similar justifications. Several factors contributed to the continued use of polythene bags. Firstly, the affordability of polythene bags compared to other options is a significant consideration. In addition, the lack of viable alternatives to polythene bags further strengthens their popularity. Moreover, there is apprehension regarding the potential job losses that could result from a shift away from the polythene bag industry, which currently employs a significant number of workers. Furthermore, the limited availability of financial resources and infrastructure support for eco-friendly alternatives pose a challenge. Lastly, the comparatively higher cost of alternative options such as jute bags, Sonali bags, and paper bags also contributes to the continued use of polythene bags. According to the

insights provided by key informants, if shops attribute their non-compliance with the plastic bag ban on the absence of suitable replacement bag options. The findings of the analysis indicate that several factors significantly influence retailers' compliance with the enforcement of plastic bag bans. These factors include the frequency of raids conducted by public authorities, absence of alternative products, limited awareness of the detrimental effects of plastic bags on the ecosystem and environment, and possession of a valid business license.

A. Low Pricing of polythene bag:

A single polythene bag was priced to less than 0.5 taka. For customer convenience, sellers and retailers frequently use polythene bags as a cost-effective option. Plastics are often used for packing owing to their cost-effectiveness and durability. Technical advancements make the production of polythene easier. Various types of portable machines are already accessible on the market and require little space and financial commitment. The market offers a broad range of readily accessible raw materials. Anyone is capable of producing polythene bags. As to the findings of Poribesh Bachao Andolan, there are an approximately 1,000 polythene manufacturing facilities dispersed across the nation, with a significant number seen in the old part of Dhaka. The unwillingness of individuals to engage in recycling activities might be attributed to the current low prices. The use of single-use plastics, which are designed for one-time use, may result in significant adverse health consequences when improperly disposed of in the environment. Based on the insights provided by the key informants, it can be seen that the use of new polythene bags tends to be more cost-effective compared to recycling methods. This cost advantage encompasses several aspects, such as the expenses associated with the collection, sorting, and cleaning of the plastic waste. The affordability of plastic bags poses a substantial economic obstacle for the implementation of a plastic bag ban. Plastic bags are often more cost-effective in terms of production and distribution than other bag materials, such as cloth, paper, or jute.

B. No available alternatives to the polythene bag:

Alternatives to polythene and plastic bags include jute polymers, eco-friendly poly bags, paper bags, cotton bags, and jute bags. The responsibility for the usage of polybags cannot be completely attributed to individuals, since polybags are considered low-involvement products and are often delivered to consumers as packing materials. In place of single-use plastic bottles, one may choose several environmentally friendly alternatives. These include paper cups, biodegradable water bottles fabricated from algae, diminutive edible water bottles, biopolymer bottles, bamboo bottles, stainless steel bottles, and metal bottles. Biodegradable polymers have the potential for use in the production of food wrappers and sachets. The following options provide possible alternatives to plastic materials. According to the main source, Sonali bags manufactured from jute fiber have the potential to serve as an alternative to polythene. The appearance and function of this material resemble those of a polythene bag. However, the widespread availability of this bag on the market is limited. The limited output of Sonali bags by the Bangladesh Jute Mills Corporation (BJMC) may be attributed to insufficient investment and the absence of modernized equipment. The present manufacturing capacity is constrained, whereas the existing demand significantly exceeds the quantity being produced. According to the Key Informant, based on statements from authorities at BJMC, it has been indicated that there is now no firm globally that produces the necessary equipment for the extensive manufacturing of this environmentally sustainable bag. Nevertheless, several corporations located in China, Germany, and the United States can produce these devices per specific requests. Although the product has new characteristics, the process of commercialization is now underway, with ongoing research efforts aimed at enhancing its quality and addressing issues pertaining to equipment. Expo Accessories Ltd is engaged in the production of biodegradable bags derived from corn or maize, with the objective of providing a sustainable substitute for polythene bags, which have a decomposition process that may span many centuries. These bags have been specifically engineered to possess environmentally friendly characteristics and are capable of undergoing composting processes. However, these goods are not easily accessible in the market.

C. High price of alternatives:

Based on the statements of the key informants, it has been reported that the Government of Bangladesh (GoB) has implemented the use of jute bags, often known as 'Sonali bags' or 'golden bags,' as a means to encourage environmental sustainability. The environmental acceptability of jute bags has been acknowledged, although their considerably higher price in contrast to polythene bags has deterred a significant number of customers from embracing their use. Because of their unwillingness to spend more money on shopping bags, a considerable number of people chooses more affordable options such as polythene bags. Moreover, a considerable proportion of consumers exhibit a tendency to avoid the use of personal shopping bags while visiting grocery stores or marketplaces, preferring instead the convenience offered by readily available polythene bags. The absence of economically viable alternatives has compounded the existing problem. The price of an individual Sonali bag is between the range of 10-12 Bangladeshi taka, whereas a single polythene bag is priced at less than one taka. The observed discrepancy in pricing highlights the substantial difference in cost between polythene bags and their environmentally friendly Sonali bag alternatives. One informant highlighted the need for more initiatives to enhance the affordability of the 'Sonali bag' or 'golden bag,' which is manufactured using jute fiber. This is crucial due to the general unwillingness of individuals to pay higher expenses when compared to the easily available and less expensive polythene bags.

Figure 4.2.1: Sonali Bag (Source: Jute Man)

D. Lack of financial and infrastructural support for the eco-friendly alternatives:

The present study presents from interview data obtained from key informants that Insufficient financial and infrastructural support for environmentally sustainable alternatives.

The primary outcomes derived from the interview are as follows: The primary source underscored the notable economic obstacles linked to the adoption of environmentally friendly alternatives to plastic bags. The process of developing and marketing such alternatives often requires substantial investments in research, technology, and industrial infrastructure. The initial financial hardship associated with adopting sustainable solutions, particularly due to higher manufacturing costs of eco-friendly materials such as jute compared to typical plastic bags, might discourage companies and manufacturers from embracing these alternatives. The absence of financial incentives and subsidies presents an additional obstacle to the adoption of sustainable alternatives. During the conversation, emphasis was placed on the undeveloped state of the infrastructure for the production and distribution of environmentally friendly alternatives, such as jute bags, and the need for changes in this regard. The lack of sufficient infrastructure is a significant obstacle to the smooth implementation of these alternative options. The establishment of

an effective supply chain for eco-friendly bags is of utmost importance in order to provide convenient accessibility for customers. The absence of efficient logistics and distribution networks may provide challenges for customers in acquiring these alternative options. The primary informant emphasized the need of enhancing consumer understanding pertaining to environmentally friendly choices and their associated ecological advantages. A significant portion of customers in Bangladesh lack sufficient knowledge about these alternatives. It is important to disseminate information on the environmental ramifications associated with the use of plastic bags, as well as to highlight the benefits of adopting sustainable alternatives. This approach is crucial in fostering customer interest and creating a market demand for environmentally friendly goods.

The importance of government policies and assistance in mitigating financial limitations and encouraging the adoption of environmentally sustainable alternatives has been acknowledged. The interview results highlighted the need of government-led initiatives, such as the offering of incentives to encourage firms to adopt sustainable practices, allocation of research funding, and establishment of regulatory frameworks that promote the use of environmentally friendly materials and industrial techniques. The informant emphasized the need of eco-friendly alternatives maintaining competitive pricing in order to secure their sustainability in the market. Nevertheless, this might pose a significant challenge if the expenses associated with manufacturing persist at elevated levels as a result of constrained funding and the absence of efficiencies of scale.

The need of collaboration between the public and private sectors was acknowledged in order to address and overcome these difficulties. Public-private partnerships (PPPs) have the potential to enhance financial resources, promote scientific investigation, and advance the establishment of sustainable alternatives. The primary source underscored the need of prioritizing the long-term advantages linked to environmentally friendly alternatives, such as their less ecological footprint and the possible mitigation of healthcare expenses connected with plastic pollution. The long-term benefits associated with sustainable practices might serve as a rationale for the early expenditures that are necessary.

The identification of engaging with a range of stakeholders, such as corporations, environmental groups, and consumers, was deemed to be a crucial and essential measure. Engaging in such activities may facilitate the identification of precise financial and infrastructural obstacles, hence facilitating the creation of customized solutions. In brief, the primary informant emphasized that effectively tackling the obstacles related to the implementation of a ban on plastic bags and the promotion of environmentally sustainable alternatives in Bangladesh requires an integrated approach including governmental policies, financial institutions, enterprises, and non-governmental organizations. The effective shift to eco-friendly alternatives requires collaboration and coordinated efforts. The informant further observed that the Bangladesh Jute Mills Corporation (BJMC) is encountering significant obstacles in expanding the manufacture of Sonali Bags, mostly owing to financial limitations in collecting sufficient cash for scaling up operations. Commercial manufacturing requires a minimum investment of Tk400 crore.

Ques. No. 2: In your opinion, what are the initial expenses associated with the shift from plastic to environment-friendly alternative packaging materials, such as cloth, paper, or biodegradable bags?

According to data obtained from key informants with expertise in the field, the preliminary expenses linked to the shift from plastic bags to alternative packaging materials, such as paper, cloth, or biodegradable bags, exhibit variation dependent upon several significant determinants. Several variables contribute to the overall impact of packaging on businesses, type of business, the scale of the transition, and the particular materials used for packaging purposes. The key informants have provided an overview of the key point. The process of transitioning to alternative materials sometimes involves a greater initial expense for both enterprises and consumers. For commercial enterprises, this might include procuring fresh stock of alternate bags and perhaps restructuring their supply lines. It is essential for consumers to make an investment in reusable bags or be prepared to pay a little higher cost for each alternative bag. Although alternative bags, such as cloth or jute bags like the Shonali bag, may have greater initial costs, they have the potential to result in long-term financial benefits. These bags possess the capability to be used again, hence diminishing the want for frequent acquisitions of disposable plastic

bags. The assessment of the initial expenses should be conducted in consideration of the substantial environmental advantages. Alternative materials are often seen as being more environmentally friendly and have the potential to mitigate the adverse effects of plastic pollution and environmental degradation. Over the course of time, this change has the potential to result in significant long-term cost reductions in the field of environmental remediation, while simultaneously boosting the image of corporations and governments in relation to their commitment to sustainability. In some instances, governmental bodies may provide incentives or subsidies as a means to promote the use of alternate bags. These incentives have the potential to mitigate the early expenses paid by companies and consumers. The use of alternate bags may need a change in consumer behavior as individuals adapt to using these materials. This adaptation might be seen as a process of acquiring knowledge and skills, accompanied by some expenses, such as the adjustment required to include the habit of carrying reusable bags while shopping. Over the course of time, the rising demand for alternate bags could result in market competition, therefore resulting in price reductions that make them more economically accessible to both enterprises and consumers. The perception of initial costs is influenced by the extent to which individuals comply to government policies or requirements aimed at reducing plastic use. Failure to comply to regulations might result in financial penalties and punishments, so necessitating the implementation of the transition.

In summary, the previous results indicate that although there are indeed elevated initial expenses linked to the shift from plastic bags to alternative packaging materials, it is crucial to consider these costs within the wider framework of long-term cost reductions, ecological advantages, governmental incentives, and alterations in consumer conduct. The process of transitioning towards sustainability signifies a strategic use of resources and may provide favorable and enduring effects on both corporate entities and the broader community.

Ques No. 3: What is your assessment of the potential effects of the plastic bag ban on consumer behavior and purchasing patterns?

As anticipated by the key informant, the implementation of ban on polythene bags is expected to initiate a sequence of significant changes in consumer behavior and patterns of buying. There is an anticipation that customers would increasingly adopt the use of reusable bags, alternative bags produce from jute, or other types of Environment friendly plastic that are more durable. Over the course of time, the convenience associated with single-use plastic bags will probably decrease as consumers develop the practice of carrying their own bags, hence decreasing their need on disposable alternatives. The implementation of a ban on plastic bags is anticipated to significantly enhance environmental consciousness among customers, often supplemented by educational initiatives that emphasize the adverse impact of plastic bags on the environment. The increased level of awareness is expected to motivate individuals to actively pursue environmentally friendly options.

Moreover, it is important to note that the influence of this phenomenon extends beyond customers, as shops are also anticipated to make necessary adjustments. Certain companies may use strategies to encourage the adoption of reusable bags, whilst others may implement fees for polythene bag options, therefore guiding customers towards more sustainable behaviors. Although the adoption of these new standards may present early difficulties and need a time of adaptation, it is expected that these actions will eventually become habitual. The implementation of a ban on plastic bags is expected to promote a more effective approach to buying, encouraging a heightened level of deliberation in consumer choices and perhaps mitigating impulsive purchases. In general, this transition signifies a favorable change in perspective, as individuals are becoming more aware of their impact on the environment and are expanding their dedication to environmental stewardship beyond their decisions about bags. The variation in the effect of the prohibition is worth mentioning, as it is influenced by cultural and geographical characteristics. Certain regions may readily adopt the changes, whilst others may need a longer period of time to adapt.

The effects of implementing a plastic bag ban on small and medium-sized companies (SMBs) in comparison to bigger corporations might exhibit variability, dependent upon variables such as the unique characteristics of the company, as geographical location, and the extent to which they successfully adjust to the evolving regulatory framework.

Ques. No. 4: What possible impacts do you expect for small and medium-sized enterprises in comparison to their larger counterparts?

As per information provided by key informants,

Small and Medium-Sized Businesses (SMBs):

Small and medium-sized businesses (SMBs) are likely to have increased initial expenses while undertaking the transition to comply with plastic bag regulations. These costs mostly stem from the need to procure alternative packaging solutions or reusable bags. These enterprises may also experience financial strain due to any supplementary charges linked to the use of plastic bags, potentially impacting their profitability. Smaller enterprises may have a competitive disadvantage if they lack the financial capacity to cover the supplementary expenses linked to the provision of alternatives to plastic bags, or if they are unable of giving incentives or discounts to consumers who bring their own bags. Small and medium-sized businesses (SMBs) may have considerable difficulties when it comes to adjusting their operations, supply chains, and customer relations in order to adhere to newly implemented rules. The process of adaptation will need a greater allocation of effort and money for these enterprises. Small and medium-sized enterprises (SMEs), which often serve to local communities, may encounter rapid shifts in consumer expectations due to the implementation of new rules. It is conceivable that consumers may develop an anticipation for sustainable and environmentally conscious methods and packaging. One advantage of small and medium-sized businesses (SMBs) is their ability to readily adjust to the preferences of their local communities. This adaptability may foster a closer bond with environmentally concerned consumers, leading to increased support from this group of people.

Larger Corporations:

Larger firms often possess more resources and benefit from economies of scale, so facilitating their ability to effectively respond to new rules and allocate investments towards sustainable packaging alternatives. They might possess a more advantageous position in terms of managing the early expenses and the process of transitioning. Larger firms have the potential to engage in innovative practices pertaining to sustainable packaging and delivery networks. Organizations have the potential to use their size in order to engage in negotiations with suppliers, therefore securing more favorable agreements for the procurement of environmentally sustainable alternatives. Large organizations have the opportunity to use their extensive resources in order to enhance their brand image and marketing efforts, therefore showcasing their dedication to sustainable practices. This strategic approach has the potential to attract and retain environmentally concerned customers, fostering a sense of allegiance towards these companies. This feature may also function as a distinguishing factor from other market participants. Larger multinational firms may already be confronted with a diverse range of environmental rules and standards in their worldwide operations, so potentially mitigating the difficulties associated with responding to new legislation pertaining to plastic bag use.

In brief, plastic bag bans may have varying effects on small and medium-sized enterprises and bigger organizations, with differences seen in the form and extent of these impacts. Small enterprises may have immediate obstacles related to expenses, competition, and adjustment, but bigger organizations often possess more resources and adaptability to navigate the process and perhaps attain competitive benefits by aligning with sustainable patterns. Irrespective of their scale, enterprises that conform to these standards and adopt sustainable practices may be more strategically situated to fulfill evolving customer demands and mitigate their ecological impact.

Ques. No. 5: What impact do you believe a ban on plastic bags could have on the retail price of products as a whole?

According to the information provided by my key informants, the introduction of a prohibition on plastic bags has the potential to impact the general retail pricing of commodities via many significant elements:

In response to the plastic bag ban, businesses are required to modify their practices by substituting single-use plastic bags with alternative packaging solutions, a transition that often faces supplementary costs. The initial expenses related to the acquisition of these alternative options may have an influence on the comprehensive cost framework for retailers. It is possible that alternative packaging materials, such as paper bags or reusable bags, may have higher costs in comparison to single-use plastic bags. The rise in packaging expenditures has the potential to result in increased total costs for retailers, which might subsequently be reflected in retail pricing. Larger retail chains often benefit from economies of scale, which provide them the opportunity to engage in more favorable negotiations with suppliers on the procurement of alternative packaging materials. This measure has the potential to reduce the effects of increased packaging expenses for these enterprises. In contrast, smaller merchants will see a more noticeable increase in costs. The implementation of plastic bag bans often induces a shift in consumer behavior, resulting in a higher prevalence of individuals opting to use their own reusable bags or favoring establishments that provide environmentally conscious alternatives. The decrease in consumer demand for plastic bags has the potential to provide cost savings for retailers, which might help balance the rise in packaging costs and relieve the need for higher retail pricing. In highly competitive retail settings, enterprises may exhibit reluctance in increasing retail pricing due to the potential risk of consumers migrating to other shops offering cheaper costs. In order to maintain competitiveness, certain retailers may choose to absorb a proportion of the increased expenses. Governments have the potential to provide incentives, such as tax exemptions or financial support, in order to encourage firms to use environmentally friendly packaging alternatives. These incentives have the potential to mitigate the financial stress experienced by retailers.

In brief, the effects of implementing a ban on plastic bags on retail pricing are complex and dependent upon several circumstances, including the scale of the business, customer conduct, competitive dynamics, and governmental regulations. Although there may be an initial rise in costs associated with regulatory compliance, sellers often develop strategies to effectively handle these expenditures in the long run. The influence on retail pricing of products may differ among regions and is dependent upon the particular measures used by vendors in reaction to the prohibition.

Question No. 6: Do concerns exist regarding the possibility of illegal or black-market plastic bag sales increasing subsequent to the enforcement of the ban?

Based on feedback received from key informants, concerns have been expressed over the possible increase of illegal or black-market transactions using plastic bags subsequent to the enforcement of prohibitions or limitations on their use. There are other elements that contribute to these concerns.

Certain individuals may exhibit a continued inclination for or dependence on plastic bags, particularly for particular usage such as the disposal of waste or transportation of wet goods. The implementation of legal restrictions on the accessibility of plastic bags has the potential to generate a demand for them, which may subsequently result in the emergence of illegal sales. Not all customers or companies readily embrace and conform to the restrictions. Certain people and small enterprises may exhibit resistance towards the prohibition and persist in employing or supplying plastic bags, hence engendering the emergence of an illegal market. The increasing number of illegal plastic bag manufacture may be seen in locations characterized by insufficient enforcement or regulatory control. Manufacturers that lack a valid license may engage in the production and sale of plastic bags without complying to established quality or environmental criteria. The illegal importation of polyethene bags may occur in regions where they remain allowed, regardless of their prohibition in a particular jurisdiction. This phenomenon has the potential to facilitate the distribution of illegal plastic bags. Stakeholders within the polyethene production sector may possess a strong interest in evading the prohibition as a means to safeguard their financial gains, perhaps leading to secret manufacturing and

distribution activities. The cost of legal alternatives to plastic bags, such as reusable bags or paper bags, is comparatively higher. Consumers in search of more affordable alternatives may elect to engage in transactions inside the illegal market.

In addition, it was emphasized that in order to tackle these challenges, it is imperative to implement efficient enforcement mechanisms and launch extensive public awareness initiatives. It is essential for regulatory agencies to diligently oversee compliance and enforce measures against illegal production and sales. Furthermore, the dissemination of information to customers on the environmental and legal consequences associated with the use of prohibited plastic bags might serve as an obstacle to their usage. The proactive involvement of governments and stakeholders is crucial in the prevention and resolution of illicit plastic bag sales. This is emphasized by the insights provided by my key informants, underscoring the significance of their role in ensuring the success and efficacy of plastic bag bans and limitations.

Question No. 7: What are the main economic sectors that a plastic bag ban would affect (such as manufacturers, retailers, and waste management)?

As conveyed by my key informants, the implementation of a plastic bag law can have significant impacts on various economic sectors, including**:**

Manufacturers of Plastic Bags: The producers of polyethene bags see a direct impact as they confront a decline in demand for their product. This may require a transition in manufacturing practices towards the use of alternative materials that are environmentally friendly, or the expansion of product offerings to provide a wider range of options.

Retailers: Retail firms see a direct effect as they are required to adhere to legal regulations, which include either stopping the use of single-use plastic bags or offering alternative packaging choices. Businesses may experience higher expenses throughout the process of adopting processes that align with regulatory requirements.

Waste Management and Recycling Industry: The waste management and recycling industry may encounter changes in the composition of waste materials. The potential

reduction in the prevalence of polyethene bags might lead to alterations in the composition of items being introduced into waste and recycling systems. This industry may need to adjust to these changes and may see modifications in its sources of income.

Paper Bag Manufacturers: The need for alternative packaging materials, such as paper bags or reusable bags, may increase, hence creating development prospects for manufacturers in this industry.

Retail Packaging Suppliers: Suppliers of retail packaging materials, such as alternative bags and containers, may see a surge in demand due to retailers growing preference towards environmentally sustainable solutions.

Agriculture and Food Production: Indirect consequences may be seen in certain areas of the agricultural and food producing industries. For instance, it may be necessary for producers of fruits and vegetables to modify their packaging techniques in the event that plastic bags were previously used for packing and distribution purposes.

The potential effects on certain sectors may differ based on the exact regulatory measures implemented, the level of compliance to these rules, and the ability of businesses and customers to adjust to the resulting changes. Moreover, my key informants have highlighted that enterprises operating in these sectors may consider investigating novel prospects in sustainability and environmentally conscious alternatives in order to address the obstacles presented by the prohibition of plastic bags.

Question No. 8: Are you aware of the sustainable Sonali bag, which was launched a few years ago? In your opinion, what are the reasons it could not sustain itself in the local market?

According to key informants, the Sonali bag, which was introduced in Bangladesh in 2018 with the aim of promoting sustainability, had difficulties in maintaining its market presence within the local context. Multiple significant events led to the emergence of these issues.

The Sonali bag demanded a higher price compared to conventional plastic bags mostly as a result of the materials used and the complex processes involved in its manufacture. Jute bags, such as Sonali bags, have been developed as a sustainable alternative to traditional bags. However, their widespread adoption is now hindered by a lack of financial resources and infrastructure assistance. Modifying the prevailing preference of customers is a formidable challenge due to the affordability and practicality associated with the use of polybags. Therefore, it can be inferred that the production of jute bags on a big scale has the potential to result in competitive pricing. However, the presence of more affordable alternatives on the market may hinder the widespread use of jute bags. The cost issue often assumes a significant part in consumer decision-making processes and has been an obstacle to the widespread adoption of some products or services. The accessibility of the Sonali bag is somewhat limited in comparison to conventional plastic bags. The restricted availability of sustainable alternatives might impede customers' ability to obtain them and diminish overall convenience. Insufficient marketing and promotional efforts have led to a lack of customer knowledge about the advantages of the Sonali bag. The lack of available information on the benefits of the product may have prevented prospective users from using it. Modifying entrenched consumer behaviors, such as the use of conventional plastic bags, might present an impossible task. Individuals often have a tendency to exhibit a preference for familiar and easy choices, even in cases when they possess an awareness of the ecological advantages associated with sustainable alternatives. There have been observations about the reduced durability of the Sonali bag, especially in situations involving the transportation of large loads and exposure to water. These factors have been shown to render the product useless, perhaps leading to a decline in user satisfaction. The presence of quality concerns might provide a substantial obstacle to the widespread acceptance and implementation of sustainable alternatives. Traditional plastic bags are well recognized for their extensive accessibility, affordability, and convenience. The Sonali bag does not exhibit the same degree of convenience, hence diminishing its attractiveness among customers.

These findings emphasize the significance of considering several factors, including price, distribution, awareness campaigns, product quality, and convenience, throughout the implementation of sustainable alternatives to conventional plastic bags. Potential

strategies for addressing these difficulties might include many approaches such as cost minimization, enhancing accessibility, augmenting product longevity, and deploying impactful marketing campaigns aimed at increasing awareness and educating customers on the advantages associated with environmentally sustainable alternatives.

4.3. Comparative analysis of policies and initiative taken against polyethene bag ban among eleven countries in the world

The implementation of a ban on polyethylene bags in Bangladesh occurred in 2002 as a result of the revision of the Bangladesh Environment Conservation Act. Although the initial response from the general public was favorable, many obstacles began to arise as time went on. The effectiveness of the prohibition was impeded by inadequate enforcement and inadequate management of recycling and disposal processes, resulting in an increase in the use of polymer bags. In 2002, Ireland implemented a prohibition that included a "bag tax" strategy, which entailed the imposition of a fee on the retail sale of Polyethene bags. Additionally, customers were required to remit a tax in relation to this matter. The use of this method led to a substantial decline in the utilization of Polyethene bags, as shown by a drop of over 90% within the first year. The efficacy of the tax may be attributed to its extensive scope, including all stages of production and consumer use, and its progressive tax rates that rise in accordance with levels of consumption. In 2003, India implemented a rule that specifically targeted the prohibition of polyethylene bags with a thickness of less than 20 μm. Nevertheless, the ban's effect has been limited, given that India remains a substantial contributor to the worldwide creation of plastic garbage. The efficacy of the prohibition has been impeded by several factors, including irresponsible individual conduct, inadequate waste management systems, and insufficient enforcement measures. The restriction implemented by Tanzania in 2005 was specifically aimed at prohibiting the use of bags that had a thickness below 100 μm. Subsequently, the prohibition was expanded to include bags with a thickness below 30 μm. The use of continuous monitoring was important in achieving the successful outcome of the ban, as it successfully regulated the manufacturing and utilization of single-use Polyethene bags (SUP). In 2007, the government of Kenya implemented a ban on single-use plastic (SUP) bags that had a thickness of less than 30 μm. Subsequently, in 2017, the country further

reinforced this prohibition by imposing stricter measures, including the threat of jail and monetary penalties for anybody found using such bags. The implementation of a more stringent strategy resulted in a notable decrease in the use and production of single-use plastics (SUPs), mostly due to the imposition of legal consequences and the ongoing surveillance measures in place. In 2007, Canada implemented a policy that included the prohibition of Polyethylene bags with a thickness of less than 30 μm, with the implementation of a financial charge for bags with greater thickness. The implementation of the ban resulted in a notable decrease in the use of single-use plastic (SUP) items, while simultaneously promoting the adoption of reusable bags. This shift in behavior may be attributed to the general public's inclination to address the issue of plastic pollution. The imposition of a prohibition by China in 2008, which placed restrictions on the use of SUP bags with a thickness of less than 25 μm, resulted in an initial decrease in consumption. Nevertheless, the persistence of SUP bags in the nation might be attributed to challenges associated with monitoring and the illicit fabrication of these bags. In 2014, the implementation of a tariff on Polyethylene bags in the United States led to a notable decrease in their use, as shown by a survey. This particular methodology places emphasis on the examination of customer behavior and has resulted in a significant reduction in the use of Polyethene bags. In 2011, Wales introduced a fee on Polyethene bags, resulting in a significant decrease of 96% in the consumption of Single-Use Plastics (SUP). The success of the endeavor may be attributed to the beneficial behavioral influence exerted by the levy. The European Union effectively mitigated the formation and production of single-use plastic (SUP) garbage by the enactment of a legislative measure in 2015. This measure expanded the scope of responsibility to include manufacturers and included a range of activities, such as the installation of clean drinking water fountains. The imposition of a fee on SUP bags by Israel in 2016 garnered significant popular support and led to a discernible decrease in the use of SUPs. The implementation of legislation has served as a catalyst for individuals to transition towards the use of ecologically sustainable reusable bags.

Although Bangladesh took prompt action in implementing its ban, the effectiveness of this measure was hindered by economic obstacles arising from inadequate enforcement and a dearth of appropriate recycling management. In order to enhance its environmental

sustainability, Bangladesh has the potential to allocate resources towards strengthening enforcement mechanisms, advocating for the adoption of cost-effective alternatives, and implementing efficient recycling initiatives. The prohibition implemented in Ireland was effectively enforced by the implementation of a "bag tax" system, which included the imposition of charges on both manufacturers and users. Bangladesh may contemplate adopting a similar strategy in order to promote economic sustainability and discourage the use of polyethylene bags. The prohibition imposed by India has encountered economic obstacles, such as the presence of irresponsible individual conduct, inadequate waste management practices, and insufficient enforcement measures. In order to better its overall performance, India should prioritize the reinforcement of its waste management infrastructure and intensify its enforcement efforts. The success of Tanzania may be ascribed to the ongoing process of monitoring. It is recommended that Bangladesh allocate resources towards the establishment and enhancement of monitoring and enforcement systems in order to effectively implement the prohibition. The implementation of strict penalties, including jail and fines, by the Kenyan government for the use of single-use plastic (SUP) bags with a thickness below 30 μm has resulted in positive outcomes. Bangladesh may contemplate the adoption of more stringent sanctions and the implementation of continuous monitoring mechanisms as a means to discourage the use of polyethylene bags. Canada's approach is indicative of the significance placed on public sentiment. The need for achieving success in limiting plastic pollution in Bangladesh is in the promotion of a favorable public disposition towards this cause. China has a set of obstacles that arise from difficulties in monitoring and addressing concerns related to unlawful manufacturing. In order to guarantee the efficacy of the prohibition, Bangladesh has the potential to enhance its enforcement and monitoring efforts. The United States' emphasis on consumer behavior and implementation of a modest tax had positive outcomes. Bangladesh has the potential to adopt comparable tactics that prioritize the significance of consumer behavior in mitigating the use of polyethylene bags. The success of Wales may be attributed to the favorable influence on behavior resulting from the implementation of the levy. Bangladesh has the potential to foster such constructive behavioral changes among its populace by means of awareness campaigns. The success of the European Union (EU) may be attributed to its expanded accountability towards

producers and the implementation of diverse programs. Bangladesh has the potential to derive valuable insights from these programs and contemplate the adoption of comparable measures. The endorsement of a tax by the Israeli government and the underlying rationale for the use of reusable bags were influential factors. Bangladesh has the potential to foster public endorsement and incentivize the adoption of ecologically sustainable solutions.

Table 4.3.1 Global plastic bag policy interventions and its impact (Banu, 2019) (Muposhi et al., 2022)

Sl. no	Country	Year of ban	Policy framework and products ban	Impact of ban	Reason
1	Bangla desh	2002	The Bangladesh Environment Conservation Act underwent revision in the year 2002. According to Rule 6ka of Clause-5 under Section-9, a prohibition has been implemented regarding the manufacturing and use of thin SUP (polythene shopping) bags. Penalties and punishments include the imposition of incarceration and monetary sanctions.	The first response from the general public was favorable. The increase in the use of polymer bags may be attributed to the reluctance of law enforcement agencies and the limited accessibility of affordable alternatives.	The absence of consistent enforcement and effective management of the disposal of waste materials in recycling facilities, incinerators, and the removal of such waste from landfills.
2	Ireland	2002	The implementation of a "bag tax" included the introduction of a charge on the sale of polyethylene bags at shops, with customers being responsible for paying the associated tax. The levy was only imposed on SUP bags, whereas reusable bags were granted exemption from the taxation.	The implementation of a charge resulted in a decrease of over 90% in the use of polyethylene bags during the first year.	A tax was imposed on the manufacturing of SUP bags, which was then passed on to customers who used them. Additionally, the tax rate was adjusted proportionally to reflect the rise in usage.
3	India	2003	In 2003, a legislative measure was enacted to prohibit the use of bags with a thickness of less than 20 μm. Subsequently, in 2019, the Ministry of Environment and Forests issued new regulations pertaining to the management and processing of plastic waste, superseding the previous laws. As part of these regulations, a partial ban on single-use plastic (SUP) goods was implemented.	Despite the restriction, India remains a significant contributor to the global waste generation.	The presence of irresponsible individual behavior, inadequate waste management systems, and insufficient enforcement of the prohibition are contributing factors to the issue at hand.
4	Tanzani a	2005	A ban was first implemented on bags with a thickness below 100 μm, which was subsequently extended to include bags with a thickness below 30 μm.	A ban has been determined to be an effective measure in regulating the use and production of single-use plastics (SUP).	The effectiveness is enhanced by the use of continuous monitoring.

5	Canada	2007 and 2011	In 2007, a prohibition was enacted on Polyethene bags with a thickness of less than 30 µm, accompanied by the implementation of a financial charge on bags over 30 µm in thickness, with the imposition of a continued financial charge for bags of even greater thickness.	The use of certain measures has shown to be very effective in mitigating the increasing number of single-use plastics (SUP) and promoting the utilization of reusable bags.	The attitudes of individuals towards the mitigation of plastic pollution have a significant role in the reduction of single-use plastics (SUP).
6	Kenya	2007	In 2007, Kenya implemented a ban on single-use plastic (SUP) bags with a thickness below 30 µm, while also introducing a fee on SUP bags above 30 µm in thickness. In response to the perceived ineffectiveness of the ban and fee implemented in 2017, Kenya has enacted one of the most stringent prohibitions on Single-Use Plastics (SUP). This measure entails the imposition of both jail and fines for anybody found in violation of the regulation, specifically targeting the use of SUP bags with a thickness below 30 µm.	Effectively reduced consumption and production of SUP	Imprisonment, financial penalties, and ongoing surveillance was significant.
7	China	2008	Legislation has been enacted by The General Office of the State Council to enforce a prohibition on the provision of free single-use plastic (SUP) bags that have a thickness of less than 25 µm in shops, sales outlets, and supermarkets. Additionally, a charge has been introduced for bags that exceed 25 µm in thickness. However, certain exemptions apply in cases where these SUP bags are necessary for maintaining hygiene standards, such as the storage and handling of fresh food.	At first, there was a decrease in the use of single-use plastics (SUP), but subsequently, an upward trend in their usage became evident.	The prevalent presence of SUP bags in China may be attributed to a combination of inadequate supervision and illicit manufacturing practices.
8	USA	2007	A levy of USD 0.05 has been charged on purchasers of polyethylene bags.	Based on a survey done in 2014, there was a decrease in the average weekly use of Polyethylene bags from 10 to 4.	

9	Wales	2011	The proposed legislation aims to impose a tariff on polyethylene bags.	There was a significant decrease of 96% in the occurrence of single-use plastics (SUP) subsequent to the implementation of the charge.	The study observed a favorable behavioral spillover effect among individuals in their attitudes and behaviors towards the tax, specifically in relation to the reduction in the use of single-use plastics (SUP).
10	European Union	2015	A legislative measure was enacted wherein an amendment was made to Directive 94/62/EC, specifically targeting single-use Polyethylene bags.	The implementation of the ban has shown efficacy in mitigating the generation and manufacturing of single-use plastic (SUP) trash.	The expansion of legal obligations to include producers in the task of waste removal, as well as the implementation of programs such as the installation of complimentary clean drinking water fountains.
11	Israel	2016	Introduce a levy on SUP bags	The implementation of the ban resulted in a significant decrease in the use of single-use plastics (SUP), with over 70% of the general population expressing their support for this measure.	One contributing factor to the increased use of ecologically friendly reusable bags was the implementation of bag charges and corresponding legislation.

Chapter Five

5. Conclusion and Recommendation

The study presents an analysis of the prevailing use of polythene bags, the implementation of polythene bag bans, and the resulting environmental impacts. It offers a comprehensive examination of opinions, perspectives, and actual facts pertaining to these subjects. The use of polythene bags may be attributed to the limited availability of alternative materials and their widespread accessibility. The elevated cost of other options is also a contributing factor. The affordability and widespread accessibility of polyethylene bags contribute to their popularity. The implementation of a substantial tax on single-use plastic (SUP) bags from the outset of manufacturing, along with the promotion of innovative strategies and investments in the development of polyethylene alternatives, as well as efforts to induce changes in consumer behavior, may lead to the eventual success of a ban on polyethylene bags. The practice of individuals bringing their own polythene bags is a widely used method for minimizing the utilization of polythene materials. The objective is to enhance end user knowledge on the negative consequences of plastic use via media advertisements and initiatives conducted by governmental and non-governmental organizations. The implementation of a reward-based plastic collecting program is proposed as a means to incentivize individuals to refrain from indiscriminately disposing of plastic garbage in various locations. The proposed incentives include preferential tax treatments, simplified access to bank loans, and duty-free imports of equipment and machinery for industries and enterprises involved in the creation of biodegradable alternatives to plastics. Leveraging the nation's substantial capacity for jute cultivation to produce economically viable biodegradable substitutes for plastics, while also offering incentives to foster the growth of such enterprises. The proposition entails allocating subsidies to plastic recycling sectors as opposed to plastic production enterprises. The implementation of elevated taxation on enterprises involved in plastic-related industries, spanning from the importation of raw materials to the sale of finished goods. The elevated cost associated with plastic items may deter the general population from using them. The rigorous

enforcement of current regulatory statutes to limit the use of plastic bags. The objective is to establish a comprehensive national action plan for the monitoring and control of plastic trash at its place of origin.

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