ADDIS ABABA UNIVERSITY

COLLEGE OF DEVELOPMENT STUDIES

CENTER FOR RURAL, LOCAL AND REGIONAL DEVELOPMENT STUDIES

MASTERS PROGRAM OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

ASSESSING THE PERCEPTIONS AND EFFECTS OF THE SINGLE USE PLASTIC BAN MEASURES ON SOCIO-ECONOMIC AND ENVIRONMENTAL DIMENSIONS IN NAIROBI, KENYA

BY MAHLET TAREKEGN

ADVISOR: EPHREM ASSEFA (PHD)

JUNE 2025

NAIROBI, KENYA

Declaration

I, the undersigned, declare that this thesis entitled Assessing the perceptions and effects of the single use plastic ban measures on socio-economic and environmental dimensions in Nairobi, Kenya is my original work and to the best of my knowledge has not been presented for the degree by any other person, and all sources of materials used for the thesis have been duly acknowledged.

Declared by:

Mahlet Tarekegn

Thesis Approval

Addis Ababa University

College of Development Studies

Center for Environment & Development

Master's Program of Environment and Sustainable Development

This is to certify that the thesis carried out by Mahlet Tarekegn, ***"Assessing the perceptions and effects of the single use plastic ban measures on socio-economic and environmental dimensions in Nairobi, Kenya"*** submitted in partial fulfillment of the requirement for the Master of Arts in Environment and Sustainable Development complies with the regulation of the University and meets the accepted standards with request to originality and quality.

Examining Committee:

Advisor: _____ Signature: _____ Date: _____

Examiner: _____ Signature: _____ Date: _____

Examiner: _____ Signature: _____ Date: _____

June 2025

Addis Ababa, Ethiopia

Acknowledgements

I would like to thank my advisor Dr. Ephrem Assefa for his guidance and support throughout the preparation of this thesis. I would also like to thank manufacturing companies operating in Nairobi and there stuffs. Officers working in NEMA (National Environment Management Authority), Nairobi City County and KAM (Kenya Association of Manufactures) who supported me in getting and providing me genuine information and data used for the thesis and also resident of Nairobi who has taken the time and effort in focus group discussion. Finally, would like to give my great thanks to my husband and children who has love and supported me though out this journey. This achievement would not have been possible without you.

Table of Contents

Contents

List Of tables

List of Figures

List of Acronyms

EI	Economic impact
ENI	Environmental Impact
EMCA	Environmental Management and Co-ordination Act
FGD	Focus group discussion
KAM	Kenya Association of Manufactures
NEMA	National Environment Management Authority
OECD	Organization for Economic Co-operation and Development
PB	Plastic Ban
SI	Social Impact
MSME	Micro, Small, and Medium Enterprises
SPSS	Statistical Package for the Social Sciences
UNEP	UN Environment Program
USD	United State Dollar
WHO	World Health Organization
EPR	Extended producer responsibility
INC	Intergovernmental Negotiating Committee

Abstract

Due to the growing threat posed by plastic packaging and materials, many countries have implemented restrictions since 2010. Despite these efforts, empirical research on public perceptions and the environmental impacts of such bans remains limited, making it difficult to align policy actions with public support. This study aimed to assess perceptions and the impact of plastic ban measures in Nairobi, Kenya. A combination of descriptive and explanatory research designs was used, with data collected from 336 enterprises through questionnaires, as well as key informant interviews and focus group discussions. The data were analyzed using SPSS, applying descriptive statistics and Pearson correlation analysis. Findings revealed that most stakeholders believe the ban has reduced litter, improved environmental aesthetics, and strengthened enforcement. However, uncertainty remains regarding its effects on marine life, drainage systems, and landfill reduction, due to uneven realization or communication of benefits. Additionally, the ban has enhanced community health and safety through improved waste management and public engagement, though awareness of social equity issues remains low in low-income areas. The study recommends targeted support for small and medium enterprises and informal workers through tax incentives, subsidies, and capacity-building initiatives to support the shift to sustainable packaging.

Enforcement and regulatory coordination challenges further compromise the ban's effectiveness. The study identified limited government awareness, inconsistent implementation across jurisdictions, and weak monitoring systems. Although there is positive outcome with EPR regulation stakeholder coordination among government agencies, community groups, manufacturers undermines policy coherence and public trust. These systemic weaknesses necessitate enhanced regulatory enforcement through increased resource allocation, strengthened inter-agency collaboration, and regional cooperation with neighboring countries to address cross-border smuggling. The research emphasizes that successful plastic ban implementation requires a holistic approach encompassing infrastructure development, regulatory strengthening, and comprehensive waste segregation awareness campaigns, particularly targeting younger generations to ensure long-term behavioral change and policy sustainability.

***Keywords**:* plastic ban, social impact, economic impact, environmental impact, single use plastic

Chapter One

Background of the study

1.1 Introduction

Reports are indicating that plastic production is dramatically increasing after 1964. The rise is mainly recorded during the post-World War II era, particularly the 1960s, saw rapid industrialization and economic expansion globally. This growth led to increased demand for materials that could be mass-produced at low cost, where plastics perfectly fit the need (Geyer, Jambeck, & Law, 2017). According to the report of Ellen MacArthur Foundation (2016) the amount of plastics produced from 1964 to 2014 has increased annually from 51 million tons to 311 million tones within these 50 years. Given that, it accounts for the highest percentage of plastic applications roughly 26% of the total volume of plastics used worldwide, where the packaging sector uses plastics extensively. More significantly, up to 95% of plastic packaging worth between USD 80 and 120 billion a year is intended for one-time use, either as packaging or as products meant to be used just once before being discarded or recycled. These consist of, among other things, containers, cups, cutlery, bottles, straws, grocery bags, and food packaging. Additionally, it contains Expanded Polystyrene (EPS) foam, sometimes known as "Styrofoam" (Ten Brink, 2016).

Because of the high treat of a plastic package and plastic materials, starting from 2010, countries are developing restriction on the usage of plastic packages and plastic materials around the world. According to Guru (2022), sustainably has become popular in recent years as a strategy to improve business performance while reducing operations' adverse environmental effects of plastics. Countries around the world develop rules and regulation to force companies and users to act ecofriendly and to make fees for plastic product and packages. Due to an increase in environmental and ecological complexity, there is a universally recognized desire to achieve sustainability by reducing plastic materials and packages (Tamás and Mohamed, 2021).

Studies are showing that, plastic ban in different countries is positively correlated with social and economic improvement of the society. According to the report of United Nations Environment Programme (UNEP, 2021), one of the significant socio-economic benefits of plastic bans is the potential for job creation in alternative industries. The shift away from plastic products has spurred

demand for eco-friendly substitutes, such as paper, jute, and cloth bags, leading to the emergence of new industries and the revitalization of traditional crafts.

Furthermore, governments are highly benefited from banning plastic to reduce waste management cost and cleanup operation costs. According to a report by the World Bank (2022), countries that have implemented comprehensive plastic regulations have experienced significant reductions in municipal waste management costs, enabling the reallocation of funds to other developmental priorities. This underscores the economic efficiency of addressing plastic pollution through preventive measures.

Like other countries, Kenya is taking this restriction by prohibiting plastics in the country, according to the report of Kenya Ministry of Environment and Forestry (2020), on 28th February 2017, the Cabinet Secretary, Ministry of Environment and Natural Resources while exercising powers conferred under section 3 and 86 of the Environmental Management and Coordination Act (EMCA Cap 387), issued the Gazette notice No. 2356, banning the use, manufacture and importation of all plastic bags used for commercial and household packaging. The gazette notice notified the public that this ban will take effect from 6th month from the date of the notice. The plastic bags ban came into effect on 28th August 2017.

However, the plastic ban measure is facing different challenges and there are concerns over its implementation. Specifically, some groups are negatively affected by the ban and the environmental protection also not sufficiently enhanced. As the plastic ban is a recent prohibition it should be investigated from different dimensions for effective implementation and for the correction of unclear problems. Hence, this study is intended to investigate the social, economic and environmental impacts of plastic ban in Kenya.

1.2 Statement of the problem

The main theoretical gap on the studies of plastic ban is a contradicted finding and lack of conclusiveness. Previous literature on the socio-economic impact of plastic bans presents mixed and often contradictory findings. For example, several studies emphasize the positive outcomes of plastic bags, such as job creation in alternative industries, cost savings in waste management, and public health benefits (UNEP, 2021; World Bank, 2022). These studies argue that plastic bans stimulate the development of eco-friendly products and industries, reduce environmental cleanup

costs, and improve health by mitigating micro plastic pollution. Conversely, other studies highlight potential negative socio-economic consequences (which? Pleases give references). Critics argue that plastic bans can disrupt livelihoods in industries reliant on plastic manufacturing and recycling, particularly in developing economies where these sectors employ significant portions of the workforce (Andrews et al., 2019). Furthermore, some research suggests that the costs of transitioning to alternative materials, such as paper or cloth, may be prohibitively high for small businesses, potentially leading to financial strain or closures (Patel & Sharma, 2020). The lack of conclusive result is suggested that there should be a wide range of investigation on it from different case area.

Findings from the pilot study Luzze (2023), also revealed that inadequate infrastructure for the collection, cleaning, and redistribution of reusable packaging remains a major barrier to the effective adoption of sustainable packaging systems. According to the study, experts also claim that there are no reliable logistics systems in the country to ensuring the efficient and hygienic handling of reusable containers. The researcher observed, the plastic ban in Kenya has had negative effects on local businesses, particularly those heavily reliant on plastic packaging such as supermarkets, retail chains, food vendors, and hawkers. Moreover, many consumers believe that the implementation of the plastic ban has not been fully successful, citing a lack of sufficient awareness regarding the benefits of reusable packaging, or a general reluctance to adopt new consumption habits.

The other serious problem associated with the plastic ban is the loss of jobs for peoples. As the Kenya Association of Manufacturers (KAM) reported that the plastic bag ban in Kenya led to significant job losses in the manufacturing sector, particularly in the plastic and related industries. While the exact number of job losses varies across different sources, it is generally estimated to be around 60,000 (give references). Although here has been considerable discourse surrounding the plastic bag ban in Kenya, there is a lack of comprehensive studies assessing it’s from socio economic dimensions. Existing literature primarily focuses on environment, for instance, a study by Omondi and Asari (2021) explored consumer consciousness and behavior in response to the plastic bag ban in Kenya. The research indicated that the ban received favorable support from approximately 67% of consumers. Research by Kioko and Obonyo (2022) highlighted a notable reduction in plastic debris on beaches and marine ecosystems, demonstrating the ban's success in

minimizing marine pollution leaving a gap in understanding how the ban affects local economies, community behavior, and waste management practices. Hence, to fill all theoretical, practical and knowledge gap the current study is intended to investigate the socio-economic and environmental impacts of plastic ban in Kenya.

The goal is to understand strategies for effective implementation that minimize adverse effects on society and businesses after identifying the implementation effects in Nairobi, Kenya.

1.3 Research questions

1. What is the perception of key stakeholders whom the researcher reference are manufacturing company employees, resident of Nairobi as well as the authorities setting the ban regulation.
2. What are the socio-economic impacts of plastic ban in Nairobi, Kenya?
3. What is the contribution of plastic ban measures on environmental conservation (waste management) practices, Nairobi, Kenya?
4. What are the challenges of implementing plastic ban measures in Nairobi, Kenya?

1.4 Research objective

1.4.1 General Objective

The main objective of this study was to assess the perceptions of stakeholders about impacts of plastic ban measures on socio-economic and environmental dimensions in Kenya.

1.4.2 Specific Objectives

The study is proposed to address the following objectives specifically.

1. To investigate the perception of key stakeholders towards plastic ban measures in Nairobi, Kenya
2. To identify the socio-economic impact of plastic ban in Nairobi, Kenya
3. To investigate the contribution of plastic ban on environmental conservation (waste management) practices in Nairobi, Kenya
4. To assess the challenges of implementing plastic ban measures in Nairobi, Kenya

1.5 Significance of the study

It is intended that, the findings of this study will be used to guide government officials, business organizations, and the general public. Government officials and policy makers can take insights in ways such as by comprehending regional east African level of understanding for the ban to work effectively, by avoiding manufacturing of single use plastic and having a regional approach to it to eradicate corruption and trade with the neighboring countries. This study can also be a tool in providing suggestions for designing and implementing effective plastic regulation strategies for example giving more infancies on building an infrastructure for waste collection and recycling outlets then sequentially regulating the plastic ban. By understanding the socio-economic trade-offs will enable policymakers to balance environmental sustainability with economic stability, ensuring the equitable distribution of benefits while mitigating potential disruptions to industries and livelihoods. Theoretically, this study helps to advance the academic discourse by reconciling contradictory findings from previous literature. By analyzing the conditions under which plastic ban are most effective, it provides insights into the factors that influence their socio-economic outcomes, such as economic context, regulatory frameworks, and the availability of alternative materials. This can inform future research, opening pathways for studies on sustainable material transitions and their broader impacts.

1.6 Scope of the study

Conceptually, the scope of study is delimited to investigate the perceptions, challenges and impacts of plastic ban on socio-economic and environmental dimensions in Kenya. Profoundly, this study addressed the impact of plastic ban from the social, economic, and waste management aspects. Time wise, the study conducted starting from October, 2024 up to February 2025 -time frame. Methodologically, the study applied mixed research (a combination of quantitative and qualitative method) approach, and data gathered using questionnaire survey, key informant interviews and document review. Descriptive and inferential statistics were used to analyze survey data and thematic analysis applied to analyze qualitative data. Geographically, the study is delimited to manufacturing organizations, government officers, and public representatives in Nairobi, Kenya.

1.7. Organization of the thesis

This thesis composed of five chapters. The first chapter deals with the problem analysis and its questions to be answered including background of the study, statements of the problem, research

questions, and objectives, significant of the study, scope of the study, definition of terms used, and organization of the study. The second chapter reviews related literature containing conceptual, theoretical, empirical literature and conceptual frame work of the study. The third chapter focus on the research methodology and the fourth chapter deals with the data presentation, analysis and interpretation. Finally, the fifth chapter discussed the summary, conclusion and recommendation of the study.

Chapter Two

Literature review

2.1 Conceptual Reviews

2.1.1 The concept of pollution

Pollution is broadly defined as the introduction of harmful substances or energy into the environment, leading to adverse effects on ecosystems, human health, and the natural balance. According to Smith and Williams (2020), pollution disrupts environmental equilibrium by contaminating air, water, and soil. The World Health Organization (WHO, 2019) categorizes pollution as a leading global concern due to its profound impact on climate change, biodiversity, and public health.

Pollution can be categorized into several types based on the affected medium: Air Pollution: Caused by emissions from vehicles, industrial processes, and burning of fossil fuels, leading to respiratory issues and climate change (Jones & Carter, 2021). Water Pollution: Originating from agricultural runoff, industrial waste, and plastic debris, which harm aquatic life and contaminate drinking water (Brown et al., 2018). Soil Pollution: Resulting from improper disposal of waste, excessive use of pesticides, and chemical spills, affecting agricultural productivity and food safety (Nguyen et al., 2020).

2.1.2 The concept of plastic pollution

Plastic Pollution: An emerging global crisis attributed to the improper disposal of plastic materials, particularly single-use items such as plastic bags (UNEP, 2021). Approximately 20 million informal workers already recover plastic waste from the garbage in the Global South, usually working under precarious, risky and poorly paid conditions

In particular, the impacts of post-consumer plastics that are mismanaged, littered, and have escaped into the terrestrial and aquatic environment have become of topmost concern. When plastic waste is not correctly disposed of or recycled, it turns into plastic pollution which enters

different life systems; affecting food chains and ultimately also humans and animals in a variety of different ways (Thushari and Senevirathna, 2020;

The current prognosis for annual plastic production is project to grow four times until 2050 (New Zealand Ministry for the Environment, 2022). Plastics in the environment are not just an issue of introducing different types and scales of non-biodegradable material into soils, water and food chains. Plastics also account for 3.4% of global greenhouse gas emissions (OECD, 2022). It is estimated that 40% of the global plastic waste is generated by the packaging industry. Those plastics that are not collected most often end up in rivers and are carried into the oceans where they are transported with the ocean currents. Smaller pieces finally settle as microplastics and nano plastics on the ocean floor. According to the OECD, an estimated 30 Mt of plastic waste has already accumulated in oceans and seas and another 109 Mt in rivers, which suggests the continuation of plastic leakage into the oceans for years to come, even if we were to halt plastic leakage now (OECD, 2022).

The human-induced global environmental change, but are also contributing to greenhouse gas emissions during production and manufacturing processes as well as when incinerated. The global scale of plastics entering the environment (soil, rivers, lakes and oceans), as well as different life forms (including humans), is another crisis aspect related to plastics and plastic pollution.

We have learned that plastic waste pollution is a global problem which involves complex networks of actors (the industry and business sector, different layers and offices in Government, academics, community and grassroots organizations), different power structures in decision-making, as well as diverse social and technological innovations with experiences from the grassroots and the establishment, considering global value chains and trade and management of plastics. Hence, a global approach to waste management, specifically with regards to plastics, is required, where sources of financing made available, to integrate and expand the current capacity of the informal waste collection and recycling sector for a strong coproduction in waste management, The next stage before plastic arrives at the shelf for consumption and before turning into discard refers to the plastic manufacturing, with product-specific impacts, GHG emissions and wastes being generated along the transformation process (UNEP, 2021).

Plastic waste has also globally doubled within the period of almost 20 years. In 2019, only approximately 9% of the plastic waste was recycled, 19% was incinerated, 50% went to sanitary landfills and the remaining 22% were dumped, burned or escaped into the environment (OECD, 2022). Due to its singular properties of malleability and flexibility no other manufactured material has grown as much as plastic production. The largest market for plastic is packaging, which has further increased with the relatively recent global shift from reusable to single-use (Geyer et al., 2017).

The world's poorest region Sub-Saharan Africa (covering 50 different countries in the south of the Sahara) has been reported as a region where plastic littering and leakage into the environment is fast growing. In Sub-Saharan Africa, the total solid waste generation is likely to triple by 2050 (UNEP, 2018), based on population growth and rural to urban migration rates, which also presupposes an increase in mismanaged waste if no immediate measures are taken (Browning et al., 2021).

According to UNEP (2018), over 90% of waste generated in Africa finds its way into uncontrolled dumpsites and landfills, often associated with open burning (Velis and Cook, 2021). Furthermore, 19 of the world's largest unregulated and unsanitary dumpsites are located in Sub-Saharan Africa. Plastic waste pollution also challenges rural communities due to illegal dumping (Mihai et al., 2022). This is an obvious issue and the volumes and hotspots of informal dumps often remain unknown, making it difficult to mitigate (Chanakya et al., 2015).

The accentuated quantity of mismanaged plastics is also linked to the waste trade from high-income to low-income countries. For example, in 2019, countries in the European Union have exported around 1.5 million MT of plastic waste, almost exclusively to Asian countries (Browning et al., 2021).

2.1.3 The concept of plastic Bans

Plastics have gone from being largely unknown to becoming the most common material ever made by humans in just 70 years. In 1950, just 1.5 million tonnes (Mt) of plastic were produced annually worldwide. Production surpassed 100 Mt annually in just forty years, reaching 335 Mt yr−1 in 2016 (Plastics Europe, 2017). Plastic is a ubiquitous presence in contemporary life, appearing in

thousands of items ranging from phones, automobiles, and aero planes to bags, straws, and food packaging.

Given the complexity, addressing plastic pollution necessitates the implementation of both subnational and international strategies in order to achieve successful results (Hardesty et al., 2021). Interventions in policy have frequently Instead of focusing on pollution sources throughout the lifecycle of plastic products (from lowering production to end-of-life solutions), consumer-oriented reduction measures were implemented to target fast-moving consumer items and littering (Pathak, 2022). With the introduction of the circular economy and extended producer responsibility (EPR) concepts, this narrative is changing to emphasize more holistic life-cycle methods (UNEP, 2022a).

China, South Africa, Kenya, Botswana, and Mozambique are among the countries that have combined levies and prohibitions (Hasson et al., 2007; Zho, 2011; Dikgang et al., 2012; Nielson et al., 2019). Few jurisdictions have also enforced the required minimum bag costs or banned the free distribution of plastic bags (Xanthos and Walker, 2017; Steensgaard et al., 2017). A wave of regional and national policy initiatives and regulatory measures, which typically target the production and use of problematic types of plastic waste, such as Single Use Plastic Products (SUPP), have followed the relatively recent emergence of plastic pollution as a priority area in international development (UNEP, 2018; EC, 2021; Diana et al., 2022). While some studies have focused on the negative effects of SUPP bans on the environment (Herberz et al., 2020; Gomez et al., 2022), others have emphasized the social and economic effects of prohibiting straws (Jenks and Obringer, 2020) and single-use plastic (SUP) bags (El Mekaoui et al., 2021), as well as the difficulties faced by MSMEs and informal workers (Nagarajan, 2022).
For conducting the survey, consumers of retail shops in urban and rural places were chosen as target respondents.

2.2 Environmental conservation theories

2.2.1 Social Norm Theory

This theory states that the way that societal expectations influence people's behavior makes the connection between plastic ban and social norm theory clear. Descriptive norms, or what people

believe others usually do, and injunctive norms, or what people believe others approve or disapprove of, are distinguished by social norm theory. Both have an impact on compliance with environmental regulations, like those pertaining to plastic bans (Cialdini, Reno, & Kallgren, 1990).

According to research, injunctive norms like the social rejection of onetime used plastic and package and descriptive norms like witnessing others use reusable bags—are crucial in encouraging compliance. Borg et al. (2020), for example, discovered that descriptive norms strongly predict intentions to avoid plastics. These intentions are frequently motivated by social rewards or sanctions and societal expectations of effective acts. Public perceptions of plastic avoidance are shaped by communication, especially through the media, which reinforces these standards (Lapinski & Rimal, 2005; Bandura, 2009). Media campaigns are particularly effective in shifting injunctive norms. Exposure to documentaries and news that highlight the environmental consequences of plastic waste fosters a sense of collective disapproval, leading to behavioral change (Holbert, Kwak, & Shah, 2003).

2.2.2 Behavioral Theory

In recent years, this behavioral theory is highly used to investigate factors associated with plastic use and waste management. This theory highly concentrated on that individuals' intentions to reduce plastic usage are influenced by their attitudes, subjective norms, and perceived behavioral control. Interventions targeting these components, such as social campaigns and better infrastructure for alternatives, can enhance compliance with plastic bans (MacDonald et al., 2023). Behavioral nudges, such as making reusable bags more accessible or charging for single-use plastics, effectively guide people toward sustainable choices without restricting their options. Research shows that small environmental cues, like labeling biodegradable items, can significantly influence behavior (Tackling Plastic Problem, Heliyon, 2022).

2.2.3 Sustainability Theory

The main argument of sustainably theory is that of current generation should utilize the research and Environment without affecting the wright of future generation. From this aspect, governments are proclaiming plastic bans for the purpose of reducing environmental pollution, especially in the water Environment. A study assessing the lifecycle impacts of single-use plastics versus their alternatives found that while banning plastics can reduce marine pollution, it might inadvertently

increase other environmental issues, such as emissions contributing to aquatic toxicity. This underlines the importance of carefully evaluating the broader environmental trade-offs of bans to avoid unintended consequences (Herberz et al., 2020).

2.2.4 Environmental Justice Theory

Because it places a strong emphasis on equitable distribution of environmental benefits and costs, Environmental Justice (EJ) Theory provides a useful lens through which to view the effects of plastic bans. The thesis emphasizes how underprivileged groups frequently suffer the most from environmental risks, such as those caused by plastic pollution, and have little say in how decisions are made. Communities near plastic production facilities or waste dumps face higher exposure to toxins and environmental degradation, underscoring a need for bans that address these injustices. EJ theory highlights the importance of reducing these impacts equitably (Álvarez & Coolsaet, 2018; Fraser, 2018; Temper, 2019).

2.2.5 Theory Applied in This Research

The four theories are applied in this research study given social norm theory is applied through the assessment of public perceptions and social acceptance of plastic ban measures, examining how societal expectations influence compliance behavior. On the same manner behavioral theory is also applied in analyzing stakeholder attitudes, subjective norms, and perceived behavioral control regarding plastic use reduction and alternative adoption. In evaluating the environmental impacts of plastic ban measures and their contribution to sustainable development goals, particularly in waste management and pollution reduction sustainability theory it is used. Lastly environmental justice theory is smeared in examining the differential impacts of plastic bans on various socio-economic groups, including small and medium enterprises, informal workers, and low-income communities.

2.3 Impact of Single Use Plastic Ban

2.3.1. Social impact

According to scholars argument plastic bans main contribution is increasing the knowledge and awareness level of the public about the environmental concern. Publics are encouraged to highly adopt reusable alternatives, such as cloth bags and biodegradable products. *For instance* in the developing countries from Africa like Kenya and from Asia like Bangladesh, plastic bag bans have

led to a marked increase in the use of sustainable packaging. However, bans may also face resistance due to convenience and habit. An investigation conducted by Xanthos & Walker (2017) indicated that for the startup of plastic ban prohibition time there are different social related challenges, particularly in areas with limited access to substitutes. The main group impacted by plastic ban is peoples working in plastic manufacturing who lost their Job because of such issue causing job losses and economic challenges for businesses in the supply chain. *For instance* In India, bans led to a decline in employment for workers in the plastic recycling and manufacturing sectors (Dikgang & Visser, 2012). Conversely, bans can drive innovation and create jobs in industries producing eco-friendly alternatives, such as paper and jute bag manufacturing.

Low-income groups may be disproportionately impacted by the expense of recyclable or biodegradable alternatives because they are frequently more costly. Accessibility disparities result from this. For instance, a South African study found that low-income groups adopted alternatives at lower rates when their costs were higher (Adeyanju et al., 2021). By offering free or subsidised alternatives and informing the public about long-term cost reductions, public education initiatives have played a critical role in addressing equality issues. A decrease in plastic-related pollution, improved trash management and cleaner public areas all result from less plastic use, which enhances quality of life. For instance, research from Rwanda indicates that prohibiting plastic bags enhanced trash management and reduced flooding brought on by blocked drainage systems.

While biodegradable plastics are seen as eco-friendly, some alternatives can still release harmful chemicals or micro plastics, impacting community health (UNEP, 2020). Plastic bans often promote a cultural shift toward sustainable practices and environmental stewardship. *Example*: In Europe, the bans have integrated environmental consciousness into daily life, with communities adopting communal strategies like shared composting for biodegradable packaging.

2.3.2. Economic Impact of Plastic Ban

Prohibiting plastic product and package more concentrated on a one time package, significantly impacts industries involved in their production, highly reducing employment opportunities anf reducing household income. On of a well-known country in in the world on plastic banning is India, as Dikgang & Visser (2012) reported that a lot of peoples are reduced of jobs were lost in

small-scale plastic manufacturing and recycling businesses after the government adopt the prohibation. There is a sharp decline in demand for plastic products, while industries producing eco-friendly substitutes (e.g., jute, paper, or cloth) benefit from increased market share.

In the opposite direction after the bans are introduced the demand for sustainable industry is increased. It was reported that after it was introduced ban different companies are introducing innovation and new products which are suitable for sustainable strategies. *Example*: In Bangladesh, the ban on polythene bags catalyzed the growth of jute-based products, revitalizing the struggling jute industry. Eco-friendly alternatives, such as biodegradable plastics or paper products, often have higher production costs, increasing prices for businesses and consumers.

Consumers typically face higher initial costs when switching to reusable bags or biodegradable products. *Example*: A study in South Africa highlighted that consumers paid up to 10 times more for biodegradable bags than for conventional plastic ones (Adeyanju et al., 2021). In the long run, reusable alternatives can lead to savings, but the upfront costs may deter low-income consumers. Plastic bans encourage the adoption of circular economy practices, such as recycling and sharing reusable items, which can foster long-term cost efficiency.

Governments experience significant savings in waste management due to decreased plastic waste in landfills and drainage systems. For instance in Rwanda, the government reported improved waste disposal efficiency after implementing a nationwide plastic ban. Implementing plastic bans requires significant investment in public awareness campaigns, enforcement mechanisms, and subsidizing alternatives (UNCTAD, 2023). In some regions, partial bans or levies on plastic use generate revenue for governments, which can be reinvested in environmental initiatives. Ireland's plastic bag levy in 2002 raised substantial funds and simultaneously reduced plastic bag usage by 90% (Greenrock.org).

Plastic bans affect global supply chains, especially in developing countries that export plastic products or import cheap alternatives. Countries reliant on importing cheap single-use plastics face challenges in transitioning to sustainable imports (UNEP, 2018). Local industries producing biodegradable alternatives often benefit from reduced competition with cheap imported plastic products (NEMA, 2019).

More tourists are drawn to cleaner areas because of less plastic litter, which strengthens local economy. Thailand increased ecotourism earnings by prohibiting single-use plastics in its national parks. Cleaner drainage systems and streams lower the frequency and expense of floods brought on by plastic obstructions, saving millions of dollars in disaster relief expenses. Finding alternatives to plastic packaging is expensive for small firms, especially those in developing nations. Because biodegradable packaging is more expensive, Ghanaian street merchants reported lower profits (Akrofi et al., 2021). The increased cost of sustainable alternatives may cause businesses that depend on inexpensive plastic items to lose their competitive advantage.

2.3.3. Environmental impacts of Plastic Ban

Plastic bans have emerged as a key policy instrument for addressing the environmental and other externalities that arise from plastic pollution. This review assesses the literature focusing on the impact of such bans on waste management, including the positive effects and challenges of their implementation. Plastic bans directly decrease the weight of plastic waste being introduced into municipal waste streams. Single-use plastics, a sizable cross-section of waste around the globe, are particularly in the crosshairs. For example in Rwanda since the nation-wide plastic bag ban was implemented in ban in 2008, the country has observed cleaner streets and reduced pressure on its waste management systems (Mwesigye et al., 2019). The United Nations Environment Programme (UNEP, 2021) noted that countries implementing plastic bans have reported significant reductions in litter, particularly in urban and coastal areas.

By lowering the influx of plastic waste, bans enable waste management systems to allocate resources more effectively toward other forms of waste treatment. Plastic bans encourage behavioral changes in waste segregation practices, as consumers and businesses adapt to using alternative materials. Bans often come with regulations that promote the recycling of non-plastic materials. For example, India's plastic ban has been linked to improved recycling rates of paper and compostable materials (Singh et al., 2020).

Governments and industries are incentivized to invest in advanced recycling technologies, shifting focus from plastic waste to recyclable substitutes. In some cases, the alternatives to banned plastics, such as certain types of biodegradable plastics or multi-layered packaging, are not

recyclable or compostable. *Example*: Studies in Kenya show that replacing plastic bags with heavy-duty paper bags has increased waste volumes due to the higher mass of these alternatives (Mwangi et al., 2019).

Additionally it was reported that Bans can lead to illegal disposal of stockpiled plastic, straining waste management systems. In Bangladesh, where polythene bags were banned, instances of illegal dumping persisted for years due to weak enforcement mechanisms (UNEP, 2021). The need to manage new types of waste, such as biodegradable or composite materials, often requires significant investment in updated waste treatment facilities.

Plastic bans contribute to better environmental outcomes by reducing long-term hazards associated with plastic waste. Coastal cities with strict plastic bans, such as those in the Philippines, have reported a noticeable decline in plastic waste in waterways, helping reduce flooding caused by blocked drainage systems (Espaldon et al., 2018). With less plastic waste being generated, there is reduced pressure on landfills. A study in South Africa demonstrated a 20% reduction in landfill use after the implementation of plastic bag regulations (Dikgang & Visser, 2012).

Plastic bans act as a catalyst for transitioning to a circular economy, where materials are reused, recycled, or composted, instead of being discarded. Bans push consumers and businesses to adopt reusable alternatives such as cloth bags and glass containers, reducing overall waste generation. Countries like the Netherlands and Germany have seen a surge in biodegradable and reusable product development due to strict plastic bans and waste management policies (European Commission, 2020). The success of plastic bans in waste management depends on complementary policies and public awareness campaigns. Educating communities about proper waste disposal and the environmental benefits of bans enhances compliance and reduces illegal disposal. Effective monitoring systems are critical to prevent the reintroduction of banned plastics into the market.

We can summarize from all studies mentioned and reviewed indicate in the areas of social, economic and environmental impacts of plastic ban indicate that the impacts differ from country to country and recommend doing a specific study to really understand the level of impact in Nairobi. Therefore, the study intends to fill this gap and fully understand the real impacts.

2.4 Empirical Reviews

Plastic ban policies have been implemented in various regions to mitigate environmental damage, with varying levels of success. Empirical studies have explored the economic, environmental, and social impacts of these bans, providing valuable insights into their effectiveness and limitations.

One of the primary impacts of plastic bans is on plastic waste reduction. A study conducted in Rwanda, one of the first countries to implement a nationwide ban on plastic bags, found that plastic litter decreased significantly within urban areas following the ban (Njeru, 2018). The researchers observed that after the enforcement of the ban, streets and marketplaces showed notable improvements in cleanliness. However, the study also revealed that despite a reduction in visible litter, smuggling of plastic bags from neighboring countries continued, highlighting challenges in policy enforcement. Similarly, Mogaka et al. (2020) examined Kenya's ban on plastic bags and reported a 50% reduction in single-use plastics entering the environment within the first year of implementation.

In terms of economic impact, plastic bans have produced mixed results. *Kumar et al. (2021)* conducted a study in India to evaluate the economic implications of plastic bans on small businesses and informal traders. The findings revealed that while the ban improved environmental conditions, small businesses faced financial hardships due to the high cost of alternatives like cloth and paper bags. Furthermore, *Verma et al. (2020)* found that industries dependent on plastic production experienced job losses and revenue declines, particularly in the early stages of implementation. In contrast, a study in *Europe* by *Marello and Helwege (2019)* indicated that the gradual phasing out of single-use plastics allowed industries to adapt, resulting in minimal long-term economic disruption.

Empirical evidence also demonstrates the impact of plastic bans on consumer behavior and compliance. Hoang et al. (2022) explored the behavioral responses to plastic bans in Vietnam, finding that while urban consumers adapted quickly to the policy, rural communities continued to use plastic bags due to convenience and lack of awareness. The researchers emphasized that behavioral change requires complementary public education campaigns and incentives. Similarly,

Sharma et al. (2021) studied compliance in Bangladesh and observed that households gradually shifted to reusable alternatives when penalties for plastic use were strictly enforced.

The environmental benefits of plastic bans are well-documented. A case study in San Francisco, USA by Wagner (2017) found that the city's plastic ban led to a 72% reduction in plastic bag consumption within three years, resulting in significant improvements in local water quality and reductions in marine pollution. Likewise, Mwenda et al. (2021) examined the effect of a plastic ban in Tanzania and found that rivers and drainage systems previously clogged by plastic waste became more functional, reducing flood risks during the rainy season. These studies illustrate the tangible environmental benefits of implementing plastic restrictions.

On the other hand, some empirical studies highlight unintended consequences of plastic bans. Gupta (2019) investigated the impacts in India and found that the increased demand for paper bags following the ban contributed to deforestation concerns and higher production costs. Additionally, Alemayehu and Gebre (2020) observed that in Ethiopia, consumers often shifted to alternatives such as non-woven bags, which were mistakenly perceived as biodegradable but had similar environmental impacts when disposed of improperly. This underscores the need for sustainable and scientifically vetted alternatives alongside bans.

In terms of policy design and enforcement, studies show that successful outcomes depend on strong governance and infrastructure. For instance, Jambeck et al. (2018) found that bans were more effective in countries with robust waste management systems and clear enforcement mechanisms. The study compared the outcomes of bans in Germany and Nigeria, revealing that Germany's integrated waste recycling infrastructure complemented its ban, while Nigeria's lack of infrastructure undermined its policy outcomes.

2.5. Policy review

The regulations and policy are evolving and refined with time as stated below from plastic ban to extended producer responsibility and waste segregation laws. The question comes down on implementation and there interpretation on the ground. The Waste Management Regulations, 2006 of Kenya, for instance, provide the general guidelines on disposal of waste. The Regulations categorize waste according to origin, that is, it has specific provisions dealing with either domestic

or industrial waste. They further categorize waste according to whether it is biomedical or radioactive. They Regulations also have a whole Schedule dealing with what is considered hazardous wastes. The definition of 'hazardous waste' is given using scientific terms not easily understood by laymen. It is arguable whether even the NEMA inspectors have sufficient knowledge to interpret the scientific formulas (Njuguna, 2018).

In 2017, the Kenyan government issued the Plastic Bags Control and Management Regulations under the EMCA. in exercise of the powers conferred under section 3 and 86 of the Environmental Management and Co-ordination Act, it is notified to the public that the Cabinet Secretary for Environment and Natural Resources has with effect from 6 months from the date of this notice banned the use, manufacture and importation of all plastic bags used for commercial and household packaging defined as follows: These regulations banned the use, manufacture, and importation of plastic carrier bags and flat bags used for commercial and household packaging. The ban aimed to reduce plastic pollution, which had been a significant environmental concern. The EMCA serves as the principal legislation for environmental management in Kenya. It provides a comprehensive framework for the protection and conservation of the environment, including provisions related to waste management and pollution control. Under this Act, the government has the authority to enact regulations to control the use and disposal of plastic materials

The Sustainable Waste Management Bill, introduced in 2019, aims to establish a national strategy to reduce land-based pollution entering the marine environment. The bill emphasizes the importance of waste management practices that minimize plastic waste and promote recycling and sustainable disposal methods. At the county level, the Nairobi City Council Solid Waste Management Act provides a framework for solid waste management within Nairobi County. The Act addresses the management of plastic waste by regulating the manufacture and use of plastic bags, including prohibitions on certain types of plastic bags and the imposition of environmental levies to fund waste management initiatives.

In June 2020, Kenya extended its efforts by banning single-use plastics in protected areas, including national parks, beaches, forests, and conservation areas. This policy prohibits the use of plastic water bottles, cups, disposable plates, cutlery, and straws within these areas to preserve the natural environment and wildlife.

In recent year 2024, establish a framework for the management and control of the use of plastic packaging material; the regulation was made by the cabinet secretary for environment, climate change and forestry, the environment management and co-ordination (management and control of plastics packaging materials) regulation 2024, formed under legal notice no. 181 the environmental management and co-ordination act (cap. 387) it includes "extended producer responsibility" every producer shall bear extended producer responsibility obligations to reduce pollution and environmental impacts of the products they introduce into the Kenyan market and waste arising therefore becomes responsible for meeting the collection and recycling obligations of the individual manufacturers, users and importers; with application of formal license.

The sustainable waste management Act (Cap. 387C) also give infancies on waste classification and segregation, it clearly states that all public and private sector entities shall segregate non-hazardous waste into organic and nonorganic fractions, the segregated waste shall be placed in properly labeled and color coded receptacles, bins, containers and bags and all waste service providers shall collect, handle and transport segregated waste as provided for under this Act (Cap. 387). A licensed materials recovery facility shall be used for final sorting, segregation, composting and recycling of waste generated or transported to the county and transport the residual waste to a long-term storage or disposal facility or landfill.

2.6 Conceptual framework

The underneath conceptual framework of the study presents the impact of plastic ban measures (economic, socio-cultural and environmental impacts) and associated challenges to implement these measures. Based on the review of literature, the challenges affecting the effectiveness of plastic ban measures include low public awareness, limited access or high cost of alternatives to plastic products, weak enforcement, corruption, and logistical constraints.

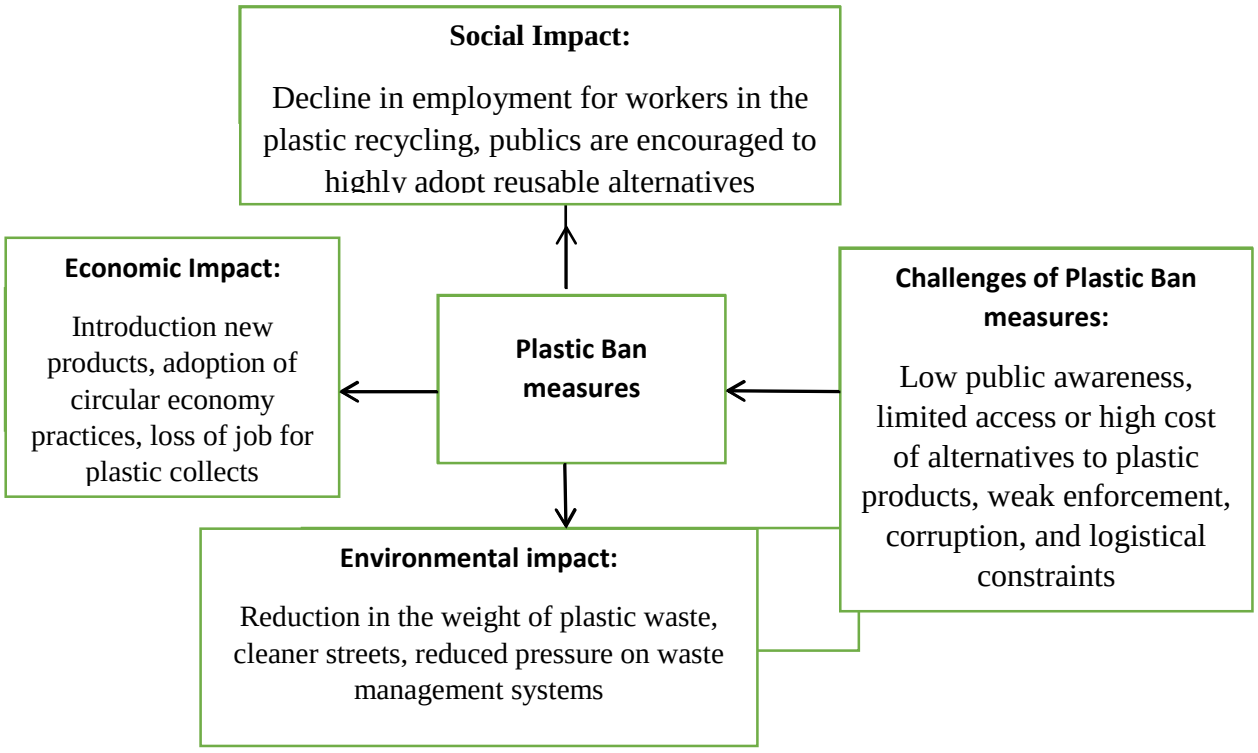

Figure 1 Conceptual Framework of the study

The enhanced conceptual framework for plastic ban measures represents a comprehensive multi-dimensional approach to understanding how single-use plastic bans generate complex impacts across social, economic, and environmental dimensions while facing significant implementation challenges. Drawing from Wagner's (2021). The enhanced conceptual framework guiding this study characterized by inherent scientific, political, and societal complexities. Grounded in four environmental conservation theories, this framework systematically analyzes the multifaceted impacts and significant implementation challenges.

Socially, the framework considers both positive outcomes like increased adoption of reusable alternatives and shifts towards environmental stewardship, alongside negative effects such as employment losses in plastic recycling sectors. It specifically highlights social equity concerns, recognizing the disproportionate burden higher-cost alternatives may place on low-income populations, as evidenced by studies from South Africa. Economically, the framework examines market transformation towards sustainable packaging, circular economy adoption, and job creation in alternative industries. Simultaneously, it accounts for direct compliance costs and potential regressive effects on vulnerable groups, aligning with economic theory on negative externalities and market failure. Environmental impacts are viewed comprehensively, extending beyond simple waste reduction to encompass pollution prevention, ecosystem services, and climate change mitigation, while acknowledging the need for life cycle assessments to avoid unintended consequences.

Implementation challenges are critically analyzed through governance theory, emphasizing the necessity of coordinated enforcement mechanisms (like Kenya's successful multi-pronged strategy achieving 80% compliance), robust institutional coordination to counter the structural power of plastic industries, dedicated market development for affordable alternatives, and sustained public awareness campaigns that drive fundamental behavioral and cultural change. This framework further integrates with broader environmental policy agendas, including circular economy principles, United Nations Sustainable Development Goals (SDG 14, SDG 12), and climate change considerations. Supported by systematic literature reviews (Muposhi et al., 2021) and empirical insights from successful cases like Kenya, this enhanced framework provides a robust foundation for examining plastic ban measures as complex, multi-stakeholder interventions crucial for sustainable consumption and production transitions.

Chapter Three

Research Methodology

3.1 Research Approaches and design

3.1.1 Research Approach

This research employed both a quantitative and qualitative approach (mixed research approach to meet the research objectives. The quantitative data were gathered using survey questionnaire from Micro, Small and Medium Enterprises (MSMEs). The qualitative data were collected through key informant interviews and focus group discussion. The research used the two instruments in such a way that the data would complement each other. For clarity, an in-depth interview conducted with stakeholders, policy makers, and public representatives and as secondary data source document and policy framework was analyzed.

3.1.2 Research Design

Research design is an overall scheme that plans the skeleton structure of an investigation and it is systematically framed to obtain answers to research questions (Kothari, 2004). To address the objectives of the study, a combination of descriptive and explanatory research design employed. In supporting this idea, Abiy et al. (2009) stated that a descriptive survey is used to gather data at a particular point in time with the intention of describing the nature of existing conditions, identifying standards against which existing conditions can be compared, or determining the relationships that exist between specific events.

In this study, descriptive design was applied to identify the current status, perceptions towards plastic ban practices, impacts of plastic ban measures, and, exploring the challenges to implement plastic bans. Questioner survey was used to gather rich, detailed information about the impact of plastic ban on social, economic, and environmental (waste management practices) dimensions. Moreover explanatory research design was used to check the relationship between plastic ban measures on social, economic and environment (waste management practices) dimensions.

3.2 Target Population and Sampling Design

3.2.1 Target population

Target population of this study are companies operating in Nairobi Kenya, the total companies from three category Micro, Small and Medium Enterprises (MSMEs) in the case area are 3216. So, the target population of this study is composed of 3216 companies currently operating in Kenya. Enterprises were selected as reports indicated most impacts were observed firsthand.

3.2.2 Sample Size Determination

The researcher employed the following sample size determination formula to estimate a representative sample from the selected enterprises, totaling 3216, which produce plastic-related products either through packaging or as part of their product.

The formula was developed by Taro Yamane (1973). It was calculated as follows:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n – Is the sample size

N – Is the population size

e – Is the level of precision or sampling error

$n = \frac{3216}{1+3216(0.05)^2}$= 351

n= 351

N= e- 0.05

To select sample from each strata (type of enterprise) the researcher uses the following formula

which was developed by khotari (2004).

$nh = \frac{nNi}{N}$

Where

nh= sample size of strata+

n= total sample size

Ni= population of strata

N= total population

Based on the above formula the sample size from each stratum is shown on the table 3.1 below

Table 1 Table 3.1.Procedure of sample selection with enterprise

No	Strata	No of population (Population)	Sample size
1	Small	1918	209
2	Medium	1003	109
3	Large	295	33
Total		3216	351

Source: Centre for enterprise development and innovation office, Nairobi, Kenya (2024)

3.2.3 Response Rate of the Study

The survey was conducted between February and April, 2025. Questioners were distributed to 351 randomly selected stakeholders. However, in order to reduce the possible errors in the data administration, immediately after the collection of data the researcher has excluded the outlier and

missing values. Finally 336 questionnaires were completely filled, returned and used for analysis in this study that a response rate of 95.7percent. In making conclusions, Mugenda and Mugenda (2008) indicated that response rate of 50% is satisfactory; a 60% is good, 70% and above is excellent. Based on the assertion of those scholars the response rate of this study was 95.7% which considered being excellent.

3.2.4 Sampling techniques

According to Dawson (2007) the sample are stratified by business area and then chooses a random sample of pupils from each area. It is a modification of random sampling in which the population is divided into two or more relevant and significant strata based on one or more attributes. With reference to this statement, stratified random sampling is relevant for selection of population in this study. The target populations for survey are enterprises located in Nairobi Kenya are categorized as Micro, Small, and Medium Enterprises (MSMEs). Accordingly, proportional samples were taken from micro, medium and small scale enterprises.

3.3 Data source and collection method

When assessing impact of Plastic Ban, it important to gather both primary and secondary data. Primary data collected through focus group discussions (FGD) with public and directors. Interviews conducted with government officials working in plastic ban and related sectors (National Environmental Management Authority), the public will constitute business owners and employees of Micro, Small, and Medium Enterprises (MSMEs) businesses. Moreover, questionnaires distributed to experts in sampled enterprises. In addition, secondary data such as relevant documents, reports, and statistical data reviewed to provide a broader understanding of the plastic ban and its impact. Furthermore, three Focus Group Discussions (FGDs) conducted with community representatives, each group consisting of 4-5 members, including local business owners, environmental activists, and residents affected by the plastic ban. Participants selected through purposive sampling, ensuring a diverse representation of stakeholders directly impacted by the ban.

Moreover, the researcher conducted key informant interviews (KIIs) with government officials from the National Environmental Management Authority (NEMA) and Nairobi City County offices. Additionally, Kenya Association of Manufactures (KAM) officials were interviewed to gain industry perspectives on the ban's challenges, opportunities and locate the (MSMEs) manufacturing companies. .

3.4 Data Validity and Reliability

A pretest of the research instrument to establish its validity done. The instrument tested by giving the questionnaire to 20 experts and their opinions on the relevance and understandability of the questions using a 5-point Likert scale of items. Items that found not relevant eliminated and those not found to be understood adjusted for understandability for final research instrument that used. According to Zikmund (2003), pre-testing is essential to ensure that the questionnaire is reliable and that measurements are error-free, resulting in consistent results. The questions are credible if the Cronbach's coefficient alpha for each variable is at least 0.70. If the result is near to 1, the internal consistency and reliability of the questions will be ranked higher. A scale's or object's reliability might vary from 0 to 1. The Cronbach's alpha model has been employed in this study. By using 20 samples.

Table 1:

Source own survey, 2025

3.5 Method Data Analysis

The collected data were analyzed both qualitatively and quantitatively. The quantitative data gathered using questionnaires were analyzed using descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics (correlation analysis). The survey results were presented using tables and charts. Moreover, correlation analysis considered to check the relationship between plastic ban measures with social, economic, waste management, and environmental impacts. The open ended data coded and analyzed in accordance with the questionnaires, and observation checklist. The qualitative data gathered from different groups of

respondents through Focus group discussion (FGD) and key informant interview were organized and analyzed thematically to supplement the data gathered through questionnaires. Finally, interpretation employed by explaining the findings carefully and fairly the findings.

3.6 Ethical consideration

Research ethics concerns the responsibility of researchers to be honest and respectful to all individuals and researchers will usually governed by a set of ethical guidelines that assist them to make proper decisions and choose proper actions. Before gathering data, the student researcher received ethical clearance certificate from Addis Ababa University, Center for Environment and Development, and submit it to the concerned organizations. Accordingly, the respondents informed about the purpose of the study to get their consent from the respondents and responsible officials of the sampled organization. Therefore, on the basis of these ethical principles (such as getting informed consent, plagiarism, and confidentiality), efforts made and confidentiality assured and kept throughout the process of this research work.

Variables	Reliability coefficient (Cronbach alpha)	NO-of Likert scale Items
Perception of plastic ban practices	.798	7
Economic impact of plastic ban	.830	4
Social impact of plastic ban	.846	4
Environmental impact of plastic ban	.857	4
Effectiveness of plastic ban measures	.870	4
Over all	0.960	23

CHAPTER FOUR:

RESULT AND DISCUSSION

4. 1 Demographic characteristics of the respondents

The below table presented the sex distribution of the survey respondents. From the total number of 336 respondents, 263 (78.3%) were male, and the remaining 73 (21.7%) were female. The result shows that most of the respondents were male, indicating a large number of men are currently working in manufacturing sector than females.

Moreover, the respondents were asked about their age. The findings show that 140 (41.7%) of the respondents were 25 years old or younger, 137 (40.8%) were aged 26 to 35, 47 (14.0%) were aged 36 to 45, and 12 (3.6%) were above 46 years old. This implies that the majority of the stakeholders are relatively young, with over 82% being under the age of 36, indicating active participation from the younger demographic in matters related to environmental policy and sustainability.

Table 2 Demography of the respondents

		Count	Column N %
Sex	Male	263	78.3%
	Female	73	21.7%
	Total	336	100.0%
Age	25 and below	140	41.7%
	26-35	137	40.8%
	36-45	47	14.0%
	above 46	12	3.6%
	Total	336	100.0%
Education	Certificate	45	13.4%
	Diploma	27	8.0%
	Degree	33	9.8%
	Masters	231	68.8%
	Total	336	100.0%

Source own survey, 2025

In terms of educational background, 231 (68.8%) of the respondent held a master's degree, followed by 45 (13.4%) who had a certificate, 33 (9.8%) who were degree holders, and 27 (8.0%) with a diploma. The results indicate that the sampled respondent are highly educated, with over 86% having at least a degree-level qualification or higher, which may positively influence their awareness and perception of the environmental and socio-economic effects of the plastic ban.

4.2. Descriptive Statistical analysis

Descriptive statistics involve summarizing, analyzing, and presenting data collected from either a sample or an entire population. This type of analysis typically includes three core components: frequency distributions, measures of central tendency, and measures of variability. While descriptive statistics offer insights into the structure and characteristics of a dataset, they do not permit generalizations or predictions beyond the data itself; rather, they are intended to describe the observed data.

The current study, various latent constructs were assessed using multiple observable indicators, with responses collected on a 5-point Likert scale. Since participants expressed their agreement with different determinant factors influencing beer consumption, it is more effective to aggregate the responses for each dimension. Researchers often recommend calculating the mean score of a scale comprising multiple Likert-type items instead of analyzing individual items. This is because the scale as a whole tends to demonstrate greater reliability. To obtain the mean score, item values are added together and divided by the total number of items.

Accordingly, this study presents the mean and standard deviation values for each determinant of consumer beer preferences in Table 2. The researcher employed mean and standard deviation as suitable tools for descriptive analysis, following the mean score interpretation guideline suggested by Al-Sayaad et al. (2006). This interpretation framework served as a benchmark for explaining the study variables.

Table 3 Mean range table (Rule of thumb)

No	Mean Range	Response option

1.	[1.00 -1.80]	Strongly Disagree
2.	[1.90 -2.60]	Disagree
3.	[2.70 -3.40]	Neutral
4.	[3.50 -4.20]	Agree
5.	[4.30 -5.00]	Strongly Agree

Source: (Al- sayaad et al. 2006)

4.2.1. Perception towards Effectiveness of plastic ban measures

The overall mean score is 3.26, indicating that respondents held a neutral perception regarding the environmental impact of the single-use plastic ban in Nairobi, Kenya. While some items—such as reduced litter and improved aesthetics—received relatively high agreement, others, such as the effect on marine life, were rated significantly lower. This suggests that while certain environmental benefits of the plastic ban are acknowledged, perceptions about its broader ecological effectiveness remain mixed.

Among the listed statements, only one item fell into the “Disagree” category. The statement "Because of the plastic ban measure, marine life has improved due to reduced contamination of water bodies" received a mean score of 2.15, indicating that most stakeholders do not believe the ban has had a noticeable effect on protecting aquatic ecosystems. This suggests that either the benefits in this area are not yet visible or that awareness of such impacts is still limited among the public.

On the other hand, several items were rated as “Agree” by respondents. These include statements such as "The plastics ban eliminates plastic bags, which equals less litter and less pollution" with a mean of 3.51, "Because of the plastic ban measure, there is improvement on aesthetic beauty on the environment" with 3.59, and "Overall, I perceive that there is good implementation of single use plastic ban measure in Nairobi, Kenya" which scored the highest mean at 4.01. These results suggest that the majority of stakeholders view the plastic ban as effective in improving the city's cleanliness, enhancing visual appeal, and being generally well-implemented.

Meanwhile, other items received "Neutral" responses, indicating that participants were undecided or had mixed opinions. For example, the belief that the plastic ban helps in improving drainage systems scored 3.15, while reducing mosquito breeding grounds received 3.22, and minimizing landfills from plastic waste scored 3.18. These findings show that while there is some recognition of benefits, the perceived impact in these areas is less certain or not as strongly felt compared to other aspects of the ban.

The overall mean score of 3.26 falls within the "Neutral" range [2.70 – 3.40] according to Al-Sayaad et al.'s (2006) guideline. This indicates that, on average, respondents neither strongly agree nor strongly disagree regarding the overall effectiveness of the single-use plastic ban.

This suggests that while there are positive perceptions in certain areas such as pollution reduction, environmental aesthetics, and policy implementation there remains a degree of uncertainty or mixed feelings about the ban's broader socio-environmental impacts. Stakeholders may feel that the benefits are somewhat visible but perhaps not yet fully realized or consistent across all expected outcomes, such as improvements in marine life and drainage systems.

Table 4 Perception towards effectiveness of plastic ban

	Mean	Std. Deviation
The plastics bans eliminates plastic bags, which equals less litter and less pollution	3.51	.871
Because of the plastic ban measure, marine life has improved due to reduced contamination of water bodies	2.15	.977
The ban helps to improve drainage infrastructures as a result of elimination of plastic litter which often clogs drainage systems, causing unnecessary flooding	3.15	1.062
Because of the plastic ban measure, there is a reduction in breeding ground for the mosquito population which spread malaria	3.22	.935

Because of the plastic ban measure, there is improvement on aesthetic beauty on the environment	3.59	.951
The plastic ban measure has contributed towards the reduction of landfills arising from heaps of plastic waste	3.18	.832
Overall, I perceive that there is good implementation of single use plastic ban measure in Nairobi, Kenya	4.01	.943
overall	3.26	

The analysis reveals that while quantitative data shows neutral perceptions of plastic ban effectiveness, the qualitative findings provide crucial context explaining why respondent hold these views by recognizing visible environmental benefits (litter reduction, cleaner streets) while expressing concerns about enforcement gaps in informal settlements, social equity issues affecting Low-income communities, and economic challenges in accessing alternatives. To address this weakness, the section requires comprehensive restructuring using a mixed methods approach that organizes findings around key themes (environmental, implementation, social, and economic effectiveness), integrates respondent perspectives systematically rather than as isolated quotes, and employs triangulation analysis to explain quantitative patterns through qualitative insights. The recommended enhancement transforms the neutral quantitative score from a simple statistical finding into a nuanced understanding of sophisticated respondent recognition of both plastic ban benefits and persistent implementation challenges, significantly strengthening the thesis's analytical depth and policy relevance.

4.2.2. Perceived Economic Impact of plastic ban

The overall mean score for the economic impact of the plastic ban is 3.66, indicating that respondents agree that the plastic ban has brought positive economic outcomes. These include operational cost savings, support for sustainable business practices, encouragement of eco-friendly innovations that enhance profitability, and the promotion of partnerships with environmentally conscious suppliers. For “The plastic ban has led to cost savings in operational activities,” the

mean score is 3.54, showing agreement that enterprises have benefited from reduced operational costs.

The item "Economic benefits are generated through sustainable business practices" has the highest mean of 3.85, indicating strong agreement across enterprises that sustainability brings economic advantages. Yet, the minimum response of 1 (Strongly Disagree) implies that a few enterprises might still be struggling to realize such benefits or have reservations about their economic gains.

Regarding "Our company supports eco-friendly innovations that enhance profitability," the mean of 3.65 reflects a positive view overall, while the minimum score of 1 (Strongly Disagree) shows that some enterprises, possibly due to resource constraints, have not yet embraced or benefited from eco-innovations.

For "The plastic ban encourages partnerships with environmentally conscious suppliers," the mean is 3.60, indicating general agreement. However, with the highest variability and a minimum response of 1 (Strongly Disagree), it is clear that not all enterprises have experienced or prioritized these partnerships equally.

During the interview session, a participant from NEMA's Sustainable Management Department highlighted emerging entrepreneurship and creativity in producing alternatives like banana leaf and bamboo packaging. However, they pointed out that higher cost of alternatives limit adoption among low-income groups.

One participant from the plastic division at NEMA noted that the ban has indirectly created jobs in waste collection, recycling, and material recovery, though industries have not reported major employment losses due to gradual transition. An associate director from Nairobi City County stated that while the county benefits environmentally, it incurs increased costs related to recruitment, enforcement, and legal challenges from court cases against the ban.

During the interview, the participant from NEMA's Sustainable Management Department also mentioned the Extended Producer Responsibility (EPR) framework, which imposes financial responsibility on manufacturers and importers, generating revenue and encouraging sustainability through licensing fees.

Table 5 Perceived Economic Impact of plastic Ban

	Mean	Std. Deviation

The plastic ban has led to cost savings in operational activities.	3.54	.877
Economic benefits are generated through sustainable business practices.	3.85	.865
Our company supports eco-friendly innovations that enhance profitability.	3.65	.738
The plastic ban encourages partnerships with environmentally conscious suppliers.	3.60	1.126
over all	3.66	

Source: own survey, 2025

4.2.3. Perceived Social Impact of Plastic Ban

The overall mean score for the social impact of the plastic ban is 3.53, indicating that respondents agree that the company's plastic ban initiatives positively contribute to community well-being. These include improved health and safety through better waste management, active community engagement, and attention to social equity, although some areas such as increasing community awareness may need further enhancement.

The mean score of 3.83 indicates that respondents generally agree that waste management practices have positively contributed to improving community health and safety. This suggests that the initiatives related to managing plastic waste are perceived as effective in reducing health risks and promoting a safer environment. The relatively high mean value reflects a strong community acknowledgment of the benefits brought by these practices, highlighting their importance in enhancing public well-being.

With a mean of 3.83, respondents also agree that the company actively engages with local communities regarding environmental initiatives. This shows a positive perception of the company's efforts to involve the community in environmental matters, which likely fosters cooperation and awareness. Such engagement is crucial for the successful implementation of the plastic ban, as community participation often leads to better compliance and sustainable environmental outcomes.

The mean score of 3.12 falls within the neutral to moderate range, indicating that respondents are somewhat uncertain or moderately positive about the effectiveness of recycling and waste reduction programs in raising awareness. This suggests that while some awareness has been generated, there may still be room for improvement in educating and motivating the community about recycling benefits and waste reduction practices to enhance the overall impact of these programs.

A mean score of 3.32, also in the neutral to moderate range, reflects that respondents perceive only a moderate level of attention to social equity when implementing the plastic ban measures. This may imply concerns about whether the policy equally benefits all social groups or adequately addresses the needs of vulnerable populations. Enhancing the focus on social equity could help ensure the plastic ban is perceived as fair and inclusive, thereby improving community support and effectiveness.

During the interview session, one participant from NEMA (Director General) stated that plastic bags were a major environmental nuisance, describing how carrier bags were carried by the wind like flower farms and how plastic waste blocked drainage systems. They highlighted ongoing public awareness campaigns through media, schools, and forums aimed at educating the public on the plastic ban. An associate director from Nairobi City County shared that many people have adapted to alternatives, but challenges persist with manufacturers continuing to distribute banned plastics and low-income communities struggling to afford alternatives.

Another participant from NEMA's Sustainable Management Department mentioned that behavioral change varies across Nairobi, with some positive feedback but significant challenges in low-income areas where affordability of alternatives is a barrier. They also noted cultural resistance to change affects acceptance of the ban.

During the session, a participant heading the plastic division at NEMA emphasized improved awareness especially among waste pickers and communities affected by plastic pollution, though informal settlements still face economic and behavioral challenges.

Table 6 Perceived Social Impact of plastic Ban

	Mean	Std. D
Our waste management practices improve community health and safety.	3.8304	.80545

The company actively engages with local communities regarding environmental initiatives.	3.83	.805
Recycling and waste reduction programs have increased awareness in the community.	3.12	.842
Social equity is considered when implementing plastic ban measures.	3.32	1.091
Overall	3.53	

Source; own survey, 2025

4.2.4 Status of plastic ban measures

This section investigate the contribution of plastic ban on environmental conservation (waste management) practices in Nairobi, Kenya which is stated on objective.

The overall mean score is 3.50, which falls within the range of [3.50 – 4.20]. This indicates that respondents agree that the company is actively engaging in efforts to implement policies banning plastic usage, promote alternatives to single-use plastics, comply with relevant government regulations, and conduct awareness campaigns, although the degree of agreement varies slightly among specific items.

Implementation of Policies to Ban Plastic Usage

The mean score of 3.58 suggests that respondents generally agree that policies to ban plastic usage are effectively implemented across all departments. This indicates a moderately strong organizational commitment to enforcing plastic ban policies internally. However, the relatively high standard deviation (1.23) reflects some variability in perceptions, which may point to inconsistencies or challenges in uniform policy enforcement across different departments.

Promotion of Alternatives to Single-Use Plastics

With a mean of 3.71, respondents agree that the company actively promotes alternatives to single-use plastics. This positive perception indicates that efforts to encourage more sustainable options are visible and acknowledged within the organization. The slightly lower standard deviation (0.98) shows more consistent agreement among respondents, suggesting that alternative promotion is fairly well-established and embraced.

This allows Kenya to be member of Plastic convention working towards zero west SDG12. The culture among individuals and as a country has evolved but some bags once they are dirty can't be recycled so some manufacturing shift their targets to biodegradable or compost than recycling option. Head of plastic division in NEMA clearly states: the promotion of alternative bags is evolving with science and they are now promoting biodegradable and compostable bags.

On recent report states Kenya's plastic bag ban, enacted in 2017, has earned global recognition and placed the country under a plastic convention, alongside 78 other nations. The ban, which restricts the use, manufacture, and importation of plastic bags, has led to the adoption of biodegradable and compostable alternatives (National Environment Management Authority (NEMA). It is now actively enforcing the ban and issuing licenses for biodegradable and compostable bags. The head of NEMA's plastic division communicated.

> *"With license, five companies now manufacture Biodegradable and compostable bags. For biodegradable the oxo biodegradable (mineral additive) is used and for the compostable polylactic acid PBAT."*

Compliance with Government Regulations on Plastic Bans

The mean value of 3.51 reflects a general agreement that compliance with government regulations on plastic bans is a priority for the company. This demonstrates awareness and willingness to align with external regulatory frameworks, which is crucial for legitimacy and long-term sustainability. The moderate standard deviation (1.01) again suggests some variation in how strongly different respondents perceive this commitment.

Awareness Campaigns on Single-Use Plastic Ban Measures

The lowest mean score of 3.18 reveals a more neutral or moderate perception of the regularity and effectiveness of awareness campaigns for stakeholders regarding single-use plastic ban measures. This indicates that awareness efforts may not be as frequent, visible, or impactful as other plastic ban initiatives, highlighting an area during the interview session, a participant from NEMA (Director General) described the ban's origin as a last resort after voluntary measures by manufacturers failed. They stressed that the ban targets only single-use carrier bags, not all plastics, highlighting that the core problem lies in misuse and disposal. As there is common wrong

perception between the general public and manufactures that the government is solely responsible for the cleanup.

A participant from NEMA's sustainable management department detailed the legal framework supporting the ban, including gazette notices 196 which is a regulations under the environmental coordination act. The sustainable waste management act *(cap.* 387c*)* the sustainable waste management (extended producer responsibility) regulations, 2024. EPR is a new regulation and from NEMA legal framework, those who produce need to employee people to collect, so any brand owner will create green jobs by employing youth and take it to recycling this document has made the voluntary clean up by manufactures a regulation and monitoring act with collaboration of NEMA and KAM (kenya association of manufactures) they take waste as a resource and with every manufactures is forced to the EPR regulation since 2024. They emphasized the importance of public awareness, stakeholder engagement and enforcement.

During the session, the head of the plastic division at NEMA mentioned that despite a six-month notice period before implementation, strong government enforcement was necessary due to behavioral resistance. They explained enforcement strategies involving whistle-blowers, routine inspections, and collaboration with manufacturers through industry associations.

An associate director from Nairobi City County emphasized that enforcement is a collaborative effort among multiple agencies, though challenges remain, especially with smuggling at borders and in informal settlements. They recommended increasing incentives to make alternatives more affordable and accessible and cross-border cooperation to control smuggling.

Table 7 Status of plastic ban measures

	Mean	Std. D
Policies to ban plastic usage are effectively implemented across all departments.	3.58	1.231
The company promotes alternatives to single-use plastics.	3.71	.979
Compliance with government regulations on plastic bans is a priority in our organization.	3.51	1.007

Awareness campaigns on single-use plastic ban measures are regularly conducted for stakeholders.	3.18	1.217
overall	3.5	

Source; own survey, 2025

4.3. Correlation analysis

When multiple independent variables are involved, multiple correlations and the corresponding equation are used to examine their collective relationship with the dependent variable. In this study, Pearson correlation analysis was applied to determine the strength and direction of the association between variables. The results of the Pearson correlation analysis are discussed below.

According to Bhattacherjee (2012), the strength of the relationship between variables based on the Pearson correlation coefficient can be interpreted using the following rule of thumb: A coefficient ranging from ±0.80 to ±1.00 indicates a very strong relationship. A coefficient between ±0.61 and ±0.80 reflects a strong relationship. If the coefficient falls between ±0.41 and ±0.60, the relationship is considered moderate. A weak relationship is indicated by a coefficient between ±0.21 and ±0.40. Finally, a coefficient between ±0.00 and ±0.20 suggests no significant relationship.

The Pearson correlation analysis shows significant positive relationships among plastic ban practice and its social, economic, and environmental impacts at the 0.01 level (2-tailed), indicating these associations are statistically strong and unlikely due to chance.

Practice and Social Impact ($r = 0.509$, $p < 0.001$). The strong positive relationship between plastic ban practice and social impact aligns with studies showing that effective waste management and plastic reduction policies improve community health and social awareness. For instance, Gutiérrez et al. (2021) found that community engagement and enforcement of plastic bans significantly enhanced public health and social well-being in urban areas. Similarly, Islam et al. (2020) emphasize that participatory plastic ban initiatives improve social equity and local involvement.

The moderate correlation between plastic ban practice and economic impact is supported by findings such as Narayan et al. (2019) who report that plastic reduction policies create economic

opportunities through alternative product markets and recycling industries. Chen et al. (2022) also highlight that plastic bans can reduce costs related to pollution cleanup and stimulate green innovation.

Plastic ban practice and Environmental Impact have positive association ($r = 0.359$, $p < 0.001$). Consistent with this finding, Jambeck et al. (2018) illustrate how plastic ban implementation directly reduces environmental pollution, especially in marine and urban environments. Kaza et al. (2021) confirm that sustained plastic ban practices lead to measurable improvements in waste reduction and ecosystem health. This imply the ban have a positive environmental impact from direct application of waste management to deploying other major policy benefiting the environment.

All correlations are positive and statistically significant at the 1% level, underscoring a strong interrelationship between plastic ban practice and its multifaceted impacts. This highlights that comprehensive plastic ban efforts not only influence environmental outcomes but also generate important social and economic benefits, emphasizing the holistic value of such policies.

Table 8 Correlation Result

Correlations

		Practice	social impact	economic impact	Environmental impact
Practice	Pearson Correlation	1	.509**	.319**	.359**
	Sig. (2-tailed)		.000	.000	.000
	N	336	336	336	336
Social I	Pearson Correlation	.509**	1	.225**	.271**
	Sig. (2-tailed)	.000		.000	.000
	N	336	336	336	336

Economic I	Pearson Correlation	.319**	.225**	1	.268**
	Sig. (2-tailed)	.000	.000		.000
	N	336	336	336	336
Environmental I	Pearson Correlation	.359**	.271**	.268**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	336	336	336	336

**. Correlation is significant at the 0.01 level (2-tailed).

4.4. Challenges facing during Implementation

Plastic pollution has emerged as a critical environmental issue in Kenya, leading to the government's introduction of a nationwide plastic ban aimed at reducing single-use plastics. Despite progressive policies, the implementation of this ban faces multiple challenges, as revealed through interviews with key stakeholders including community elders, government officials, manufacturing managers, and community members participating in Focus Group Discussions (FGDs). The following challenges were extracted from thematic analysis.

4.4.1 Regulatory Enforcement and Institutional Challenges

Government officials acknowledge that although the legal framework banning single-use plastics is comprehensive, enforcement remains a major hurdle. There is a big difference on application of the ban with different settlement of Nairobi residents. One senior environmental officer explained:

"…. *We have clear policies and legal backing, but the enforcement on the ground is weak due to limited resources and manpower. Our enforcement agencies are stretched thin, especially in slum areas*."

This sentiment is supported by manufacturing managers who highlight inconsistencies in regulatory enforcement. They point to disparities in how regulations are applied across counties, creating confusion and unfair competition among businesses. Elders in informal settlement around

slum area FGDs also reported a lack of visible enforcement presence, stating that illegal plastic use continues largely unchecked due to weak monitoring: in line to this, one FGD discussant pointed out the following idea:

"…….Even though the law says no plastic bags, we still see people selling and using by hiding them from authorities because no one stops them. The local authorities do not have enough power or resources around the informal settlement."

This enforcement gap on infrastructure of waste management undermines the credibility of the ban and compliance among waste pickers.

"On slaughterhouses the livestock had a record of 8 out of 10 plastics coming out, now it's 1 out of 10. The infrastructure around management of waste recycling has increased. Even though the law required waste segregation it failed on household waste collection, but institutions are now doing well. For the waste collectors the sorting now a days has come into compliance. In general, the legal framework is there but implementation around household is still a challenge. The sustainable management act force to have a material recovery center. Private entities KIYAMBU and WAGIA counties are doing well with material recovery."

4.4. 2. Economic and Livelihood Concerns

Manufacturing managers and community elders raised economic concerns as key barriers. Manufacturing managers stressed that many local producers rely heavily on plastic products for packaging, which are cheaper and more accessible than alternatives:

"……Switching to environmentally friendly packaging requires investment in new machinery and materials, which many small manufacturers cannot afford."

Community members participating in FGDs shared fears about job losses in informal sectors related to plastic bag production and sales. An elder summarized the economic challenge:

"…….*Many families depend on making or selling plastic bags. The ban threatens their livelihoods, and without alternative income opportunities, resistance is natural."*

Government officials confirmed the difficulty in balancing environmental goals with economic realities, especially in poorer regions where alternatives to plastic are not readily affordable or available.

4.4.3. Lack of Public Awareness and Behavioral Change

All key informants agreed that lack of adequate public awareness and behavior change efforts significantly hinder plastic ban success. Government officials noted that while campaigns exist, they are often irregular and limited in reach, particularly in rural and peri-urban communities.

During FGDs, community members revealed gaps in understanding the environmental and health impacts of plastic waste. Some still perceive plastic bags as convenient and indispensable: in line to this, one informant discussant point out the following ideas:

"…*People use plastic because it's cheap and easy. Many don't know the harm it causes or believe the alternatives are too expensive or unavailable*."

Elders highlighted that cultural habits and resistance to change also slow adoption of reusable bags and alternatives:

"…*The younger generation may accept new habits faster and grow up with the culture of alternatives and taking waste as a resource, but many older people stick to what they know*."

Manufacturers pointed out that without strong, sustained education, many consumers and retailers will continue to demand plastic products, undermining the ban's effectiveness.

4.4.4. Limited Availability and Cost of Alternatives

Manufacturing managers and community members stressed that limited availability and high cost of affordable plastic alternatives pose a significant challenge. Managers explained that local industries producing biodegradable or reusable bags operate at small scale and high cost, leading to higher prices passed on to consumers.

Government officials recognize the need for incentives and subsidies to promote local production of alternatives and make them accessible to the general population, but these programs are still in early stages. One FGD discussant pointed out the following idea:

> "*There is an alternative plastic option used mostly at every grocery store and supermarket around the clock in Nairobi a plastic mesh bag which is intended to be recycled for shower scrubbing but they are still a single use plastic and no different from previous single use plastic bags."*

The director general NEMA pointed out there is a future plans for the plastic mesh bag as it has now discovered less recyclable value.

"The regulation is in place for compostable and biodegradable bags to replace the mesh plastic bags, which will be going to progressively phase out, on May 7th 2025 there was a big discussion. There will be a meeting with the supermarket in near future to transition to the new bags as well. The idea is with manufactures are already on board and will start manufacturing the compostable biodegradable once but for the consumer the supermarkets yet to finish up what they have and move on."

4.4.5. Coordination and Multi-Stakeholder Engagement

Elders and government officials both highlighted strong coordination among the various actors involved in plastic ban implementation. One government official noted collaboration among institution is there but comes with a cost:

> *"….Developing a policy and legal document has a challenge with higher economic cost in terms of budgeting for workshops and for the environment inspector's enforcement. There is also mitigation cost as plastic ban cases move to court and the officers need to attend the court cases."*

Director General of NEMA communicated future implementation plans in terms of country and as forefront of the east Africa continent plan as Kenya is a pioneer in plastic ban with other African countries. On an interview he clearly states the following.

"As a global community the organization is pushing for international binding agreement for plastics there is gone be a plastic treaty yet to come and it's called INC (International Governmental Negotiating Committee)"

The study assessed the effectiveness of plastic ban measures across several dimensions: implementation, economic, social, and environmental impact. Major drawback in terms of expert's interview was the lack of infrastructure for waste management and law and regulation before the ban was reviled to the public as plastic is not an issue, but the waste. Waste management recovery center is still in implementation stage. The waste pickers are complaining about waste segregation when giving service. The ban brought reduction in flow of plastic produce inside the country but lot of money involved with smuggling through borders coming from Uganda and Northeast border of Somalia.

Findings revealed that respondents agreed that policies to ban plastic usage are being implemented effectively. Promotional efforts for alternatives and compliance with regulations were also positively rated. However, awareness campaigns received relatively lower scores, suggesting the need for more stakeholder engagement.

In terms of economic impact, the overall mean score was 3.66**,** falling within the "agree" range. Respondents recognized that the plastic ban led to cost savings**,** enhanced sustainable business practices**,** and fostered partnerships with eco-conscious suppliers. The company's support for eco-friendly innovations was also acknowledged. This highlights that the plastic ban aligns with long-term business benefits.

The social impact dimension had an overall mean of 3.53, also within the "agree" category. Respondents felt that improved waste management contributed to community health and safety**.** There was also consensus that the company engages with communities on environmental issues.

However, the mean for awareness creation remained moderate, indicating a gap in community-level communication.

The environmental impact of the plastic ban scored an overall mean of 3.26**,** placing it in the "neutral" category. While respondents acknowledged improvements in aesthetic beauty and reduced litter, there was skepticism about effects on marine life and mosquito breeding**.** This suggests that while surface-level impacts are visible, deeper ecological benefits are either not widely observed or not well communicated. The item stating that plastic bans eliminate bags, reducing litter and pollution, had a high mean (3.51), showing clear agreement. Additionally, respondents felt positively about the ban's impact on drainage systems and landfill reduction. However, marine life protection scored the lowest (2.15), reflecting low awareness or lack of observable improvement in this area. A finding on waste management of recovery center and bins segregation for the effectives of the ban is key, it stated on regulation but not practiced with household only on private and government sectors.

Chapter Five

Conclusions and Recommendation

5.1 Conclusions

This study was conducted to assess the perceptions and effects of single-use plastic ban measures on socio-economic and environmental dimensions in Nairobi, Kenya. The research addressed four specific objectives: investigating stakeholder perceptions towards plastic ban measures, identifying socio-economic impacts, examining contributions to environmental conservation and waste management practices, and assessing implementation challenges. Through a comprehensive mixed-methods approach involving 336 enterprises, key informant interviews, and focus group discussions, this study provides valuable insights into the multifaceted impacts of Kenya's plastic ban policy.

The findings reveal that stakeholder perceptions towards the plastic ban are moderately positive, addressing the first research objective. The quantitative analysis demonstrated that most stakeholders believe the ban has been implemented effectively, with promotional efforts for alternatives and regulatory compliance receiving positive ratings. However, the study identified gaps in awareness campaigns, suggesting the need for enhanced stakeholder engagement strategies. The Pearson correlation analysis revealed significant positive relationships among plastic ban practices and their social, economic, and environmental impacts at the 0.01 level, indicating that these associations are statistically strong and unlikely due to chance. This statistical evidence reinforces the interconnected nature of the ban's effects across multiple dimensions.

Regarding the socio-economic impacts, which constituted the second research objective, the study found largely positive outcomes with an overall mean score of 3.66for economic impact, falling within the "agree" range. The analysis revealed that businesses recognize the ban's contribution to cost savings, enhanced sustainable business practices, and fostered partnerships with environmentally conscious suppliers. Companies have shown support for eco-friendly innovations, highlighting that the plastic ban aligns with long-term business benefits rather than

merely representing a regulatory burden. The correlation analysis showed a strong positive relationship between plastic ban practice and social impact ($r = 0.509$, $p < 0.001$), demonstrating that effective waste management and plastic reduction policies significantly improve community health and social awareness.

The social dimension analysis, with an overall mean of 3.53, indicated that respondents felt the ban improved waste management practices, contributing to community health and safety. There was consensus that companies engage with communities on environmental issues, though the study identified moderate levels of awareness creation, indicating gaps in community-level communication. From a social equity perspective, the research revealed uneven awareness and attention, particularly in lower-income and rural communities, where border smuggling continues to be a source of single-use plastics. This finding underscores the need for more targeted interventions in economically disadvantaged areas.

The third research objective, examining the contribution to environmental conservation and waste management practices, yielded mixed results. The environmental impact assessment scored an overall mean of 3.26, placing it in the "neutral" category. While respondents acknowledged visible improvements in environmental aesthetics and reduced litter, with the item "plastic bans eliminate bags, reducing litter and pollution" receiving a high mean score of 3.51, there was notable skepticism about effects on marine life and mosquito breeding. The analysis revealed that marine life protection scored the lowest (2.15), reflecting either low awareness or lack of observable improvement in this critical area. This suggests that while surface-level environmental impacts are visible and acknowledged, deeper ecological benefits are either not widely observed or not effectively communicated to stakeholders.

The study's investigation of waste management effectiveness revealed significant challenges. Despite the ban's contribution to cleaner environments and innovation in recycling and packaging alternatives, waste management remains problematic for the service sector, and recovery centers are operating poorly. A critical finding indicated that while waste management and bin segregation are stated in regulations, they are not practiced at the household level, being implemented only in

private and government sectors. This gap between policy and practice represents a fundamental challenge to the ban's overall effectiveness.

Addressing the fourth research objective concerning implementation challenges, the study identified numerous obstacles that undermine the ban's effectiveness. Enforcement faces significant difficulties due to limited government resources, inconsistent implementation across regions, and weak public awareness campaigns. The cost and limited availability of eco-friendly alternatives hinder wider adoption, particularly in economically disadvantaged communities. The research revealed a lack of strong coordination among key stakeholders, including government agencies, community groups, and manufacturers, which further compromises the ban's effectiveness. Border smuggling emerged as a persistent challenge, particularly affecting informal and low-income areas where single-use plastics continue to be available through illicit channels.

Despite these challenges, the statistical analysis confirmed the holistic importance of well-enforced and inclusive plastic ban policies. The significant positive correlations between plastic ban practices and their social, economic, and environmental impacts underscore the potential for comprehensive benefits when implementation is effective. The study demonstrates that successful plastic ban policies require more than regulatory frameworks; they demand robust infrastructure, coordinated stakeholder engagement, adequate enforcement mechanisms, and targeted support for affected communities and businesses.

The research contributes to the growing body of literature on plastic ban effectiveness by providing empirical evidence from a major East African urban center. The findings align with similar studies that emphasize the importance of comprehensive approaches to plastic waste management while highlighting unique regional challenges such as cross-border smuggling and informal sector dynamics. The moderate to positive stakeholder perceptions, combined with measurable social and economic benefits, suggest that plastic bans can be effective policy tools when properly implemented and supported by adequate infrastructure and enforcement mechanisms.

In conclusion, Kenya's single-use plastic ban in Nairobi demonstrates both promise and limitations. While the policy has achieved notable successes in reducing visible litter, improving

environmental aesthetics, fostering sustainable business practices, and enhancing community health and safety, significant challenges remain in enforcement, stakeholder coordination, and equitable implementation. The study's findings emphasize that effective plastic ban policies require comprehensive approaches that address infrastructure development, stakeholder engagement, enforcement capacity and social equity considerations. The positive correlations identified between ban practices and their multidimensional impacts provide a foundation for policy optimization, suggesting that investments in addressing current limitations could yield substantial improvements in overall effectiveness.

5.2 Recommendations

- ✓ Based on the study's findings, several recommendations are proposed to strengthen the effectiveness and impact of plastic ban measures in Kenya. First, robust infrastructure is essential prior to implementing a ban. Without adequate service providers, waste pickers, and material recovery facilities, the ban's effectiveness will be compromised. A system for waste management should be established proactively with waste segregation bin on domestic waste and institution as it is stated on the regulation it should be applied. Proper landfills**,** collection facilities, and energy recovery mechanisms can significantly enhance the ban's effectiveness. Public-private partnerships among relevant stakeholders, where KAM can play a major role, with the EPR regulation is crucial.
- ✓ Second Regulatory enforcement must be enhanced by allocating more resources and manpower to enforcement agencies, particularly in informal areas. Consistent inspections, clear communication of legal requirements, and strong monitoring systems are essential to improve compliance and public trust. The ban also requires a regional approach, necessitating collaboration with neighboring countries to reduce border smuggling and enhance overall effectiveness.
- ✓ Third, targeted economic support should be provided to small and medium enterprises as well as informal workers affected by the ban. This includes offering tax incentives, subsidies, and capacity-building programs to facilitate the transition to sustainable packaging solutions. Promoting local production of affordable, biodegradable alternatives crucial in ensuring that both businesses and consumers can adopt eco-friendly practices without financial strain.

- ✓ Fourth, comprehensive and sustained public awareness campaigns should be implemented to educate citizens on the environmental and health impacts of plastic use. These campaigns should utilize diverse platforms such as media, schools, community centers, and local influencers to ensure widespread understanding and behavioral change across all demographic groups. Awareness creation is critical, especially among the younger generation, regarding waste management and waste segregation.
- ✓ Fifth, it is important to improve access to affordable alternatives to plastic. Investments should be made in scaling up local production and distribution networks for the process of manufacturing biodegradable and compostable bags.
- ✓ Lastly, monitoring and evaluation systems must be institutionalized to assess the effectiveness of plastic ban policies over time. These systems should track social, economic, and environmental indicators, enabling real-time feedback and evidence-based policy adjustments.
- ✓ Future research should explore broader geographic areas and delve deeper into risk management and knowledge-sharing mechanisms to improve plastic ban outcomes nationwide.

References

Adeyanju, G. C., et al. (2021). *Plastic bag alternatives: A socio-economic analysis of adoption challenges*. *Journal of Environmental Management*, 280, 111855.

Akrofi, M. M., et al. (2021). Plastic alternatives and the economic impacts on small businesses in Ghana. *Environmental Economics and Policy Studies*, 23(4):891–910.

Álvarez, L., & Coolsaet, B. (2018). Environmental justice: Decolonizing the narratives. *Nature Sustainability*, 1(6):304–311.

Bandura, A. (2009). *Social cognitive theory of mass communication*. In J. Bryant & M. B. Oliver (Eds.), *Media Effects: Advances in Theory and Research* (3rd ed., pp. 94–124). Routledge.

Borg, K., et al. (2020). Social norms and the behavioral changes in plastic avoidance: A global perspective. *Journal of Cleaner Production*, 253, 119843.

Diana, L., et al. (2022). Policy frameworks and single-use plastic regulation: A global review. *Waste Management*, 135, 203–210.

Dikgang, J., & Visser, M. (2012). Behavioral response to plastic bag legislation in South Africa. *Environment for Development Discussion Paper Series*.

El Mekaoui, N., et al. (2021). Social and economic impacts of banning single-use plastics in Morocco. *Sustainable Cities and Society*, 71, 102974.

Espaldon, M. L. O., et al. (2018). Impacts of plastic bans in coastal cities: A Philippines perspective. *Marine Pollution Bulletin*, 129(1), 57–64.

European Commission (EC). (2020). *A European strategy for plastics in a circular economy*. Retrieved from https://ec.europa.eu/environment/plastics

Gomez, S., et al. (2022). The unintended environmental trade-offs of single-use plastic bans. *Journal of Industrial Ecology*, 26(3), 540–552.

Hardesty, B. D., et al. (2021). *The future of plastic waste management*. United Nations Environment Programme.

Hasson, R., et al. (2007). The economics of plastic bag legislation in South Africa. *South African Journal of Economics*, 75(1), 66–83.

Herberz, T., et al. (2020). Environmental trade-offs of banning single-use plastics: A lifecycle perspective. *Sustainability*, 12(21), 9051.

Holbert, R. L., Kwak, N., & Shah, D. V. (2003). Environmental communication and media influence. *Journal of Communication*, 53(2), 235–255.

Jenks, R. A., & Obringer, R. (2020). The societal impacts of single-use plastic straw bans. *Resources, Conservation, and Recycling*, 158, 104839.

Lapinski, M. K., & Rimal, R. N. (2005). An explication of social norms. *Communication Theory*, 15(2), 127–147.

MacDonald, S. H., et al. (2023). Behavioral interventions for reducing plastic consumption. *Environmental Research Letters*, 18(2), 024016.

Mwesigye, P., et al. (2019). Impact of plastic bans in East Africa: Case of Rwanda. *Waste Management & Research*, 37(3), 244–255.

Nagarajan, R. (2022). Effects of plastic bans on micro, small, and medium enterprises. *International Journal of Environmental Policy and Decision Making*, 23(4), 456–472.

Pathak, P. (2022). Policy innovations for sustainable plastic management. *Journal of Policy Design*, 13(2), 34–47.

Plastics Europe. (2017). *Plastics: The facts 2017*. Retrieved from https://plasticseurope.org

Singh, A., et al. (2020). Recycling trends post-plastic bans in India. *Waste Management*, 101, 172–181.

Steensgaard, I., et al. (2017). Reducing marine litter: The role of plastic bag policies. *Marine Policy*, 84, 221–229.

Temper, L. (2019). Environmental justice in policy-making: A critical review. *Global Environmental Change*, 57, 101927.

United Nations Environment Programme (UNEP). (2018). *Legal limits on single-use plastics and microplastics*. UNEP Report.

United Nations Environment Programme (UNEP). (2020). *Biodegradable plastics and their implications*. UNEP Press.

United Nations Environment Programme (UNEP). (2021). *State of plastic waste management: A global report*.

Xanthos, D., & Walker, T. R. (2017). International policies to reduce plastic marine pollution. *Marine Pollution Bulletin*, 118(1–2), 17–26.

Zho, Y. (2011). Plastic bans in East Asia: Lessons from China. *Environmental Policy Review*, 9(1), 14–21

Appendix Questionnaires

ADDIS ABABA UNIVERSITY

COLLEGE OF DEVELOPMENT STUDIES

CENTER FOR RURAL, LOCAL AND REGIONAL DEVELOPMENT STUDIES

MASTERS PROGRAM OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

Dear survey respondents,

This study is conducted to ***"Assess the perceptions and effects of the single use plastic ban measures on socio-economic and environmental dimensions in Nairobi, Kenya***." To meet this objective, survey is conducted to gather pertinent information for the study purpose. Please be

noted that the study is conducted for academic purpose in partial fulfillment for the requirements of Master of Arts Degree in Environment and Sustainable Development at Addis Ababa University. Thus, you are not expected to write your name. I assure you that the information you provide kept confidential and will not be transferred to a third party. I kindly request you to spare some 15 minutes of your time to answer the following questions as honestly as possible. If you agree with answers given, put a tick (√) in the box beside the answer.

Part One: Demographic Information

1. Sex: A) Male B) Female
2. Age: A) 25 and below B) 26- 35 C) 36-45 D) Above 46
3. Education: A) Certificate B) Diploma C) Degree D) Masters and above
4. For how long have you been worked in the sector? (Work experience in years)
   A) 1-5 B) 6-10 C) 11-15 D) 16-20 E) 21-25 F) above 26

Part Two: Plastic ban measures and impacts

The following questions are prepared on a 5 five point Likert Scale. If the item indicated strongly matches with your response choose number 5 and if you completely disagree with the item choose number 1. Be honest and give a true picture of your feelings.

1= Strongly Disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree

	Item	response options				
	Plastic Ban Measures	1	2	3	4	5
1	Policies to ban plastic usage are effectively implemented across all departments.					
2	The company promotes alternatives to single-use plastics.					
3	Compliance with government regulations on plastic bans is a priority.					

4	Awareness campaigns on single-use plastic ban measures are regularly conducted for stakeholders.					
	Social Impact					
1	Our waste management practices improve community health and safety.					
2	The company actively engages with local communities regarding environmental initiatives.					
3	Recycling and waste reduction programs have increased awareness in the community.					
4	Social equity is considered when implementing plastic ban measures.					
	Economic Impact					
1	The plastic ban has led to cost savings in operational activities.					
2	Economic benefits are generated through sustainable business practices.					
3	Our company supports eco-friendly innovations that enhance profitability.					
4	The plastic ban encourages partnerships with environmentally conscious suppliers.					

Part Three: Effectiveness of plastic ban measures

The following questions are prepared on a 5 five point Likert Scale. If the item indicated strongly matches with your response choose number 5 and if you completely disagree with the item choose number 1. Be honest and give a true picture of your feelings.

1= Strongly Disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree

	Effectiveness of plastic ban measures					

1	The plastics bans eliminates plastic bags, which equals less litter and less pollution					
2	Because of the plastic ban measure, marine life has improved due to reduced contamination of water bodies					
3	The ban helps to improve drainage infrastructures as a result of elimination of plastic litter which often clogs drainage systems, causing unnecessary flooding					
4	Because of the plastic ban measure, there is a reduction in breeding ground for the mosquito population which spread malaria					
5	Because of the plastic ban measure, there is improvement on aesthetic beauty on the environment					
6	The plastic ban measure has contributed towards the reduction of landfills arising from heaps of plastic waste					
7	Overall, I perceive that there is good implementation of single use plastic ban measure in Nairobi, Kenya					

FGD leading questions

1. How do you feel the single-use plastic ban has changed daily life and business practices in Nairobi?
2. What alternative materials or practices have replaced plastics in your community or organization, and how effective have they been?

3. What challenges have you experienced or observed with enforcing or complying with the plastic ban?
4. In your view, has the plastic ban had a visible impact on the environment or people's behavior in Nairobi? Please share examples.
5. What should the government, organizations, or communities do differently to make the plastic ban more effective?

Key Informant Interview

Profile of key informants:

- **Name of the organization: _____**
- **Age: _____**
- **Sex: _____**
- **Position in the organization: _____**
- **Time of the interview:_____**

1. How were plastic ban measures introduced and communicated within the organization and the community?
2. What enforcement mechanisms are in place to ensure compliance with the ban?
3. What alternatives to plastic have been promoted, and how effective are they?
4. What lessons have you learned from implementing plastic ban measures that could benefit others?
5. What is your perception towards the plastic ban measure in Nairobi, Kenya? Please explain it
6. How do you evaluate the overall effectiveness of the single plastic ban measure in terms of achieving its objectives in Nairobi, Kenya?
7. What economic benefits has your organization experienced as a result of adopting the plastic ban?
8. What economic costs has your organization experienced as a result of adopting the plastic ban?

9. Are there opportunities for generating revenue or cost savings through sustainability measures?
10. Do you think that the single-use plastic ban measure has impacted the socio-cultural values, beliefs and norms in Nairobi? Yes/ No? If yes, then, how?
11. What is the effect of the single-use plastic ban measure on the natural environment in Nairobi? Please discuss it
12. How do you balance economic goals with environmental and social responsibilities?
13. What are the key challenges of implementing single-use plastic ban measures in Nairobi, Kenya?
14. What do you recommend to improve the effectiveness of single-use plastic ban measure in Nairobi? Please discuss it