Urban Environmental Governance in Addis Ababa, Ethiopia

By

Addis Taye Tegegn

College of Development Studies, Center for Environment and Development, Addis Ababa University

A Dissertation Submitted in Partial Fulfillment of the Requirements for A Degree of Doctor of Philosophy in Development Studies (Environment and Development)

Addis Ababa University

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Declaration

I, the undersigned, declare that this is my original work, has never been presented at this or any other university, and that all the resources and materials used for the dissertation have been fully acknowledged.

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This Dissertation has been submitted for examination with my approval as the student's supervisor.

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Dissertation Approval

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This is to certify that Addis Taye Tegegn dissertation, Urban Environmental Governance in Addis Ababa, Ethiopia, prepared in partial fulfillment of the requirements for the Degree of Doctor of Philosophy in Development Studies (Environment and Development Studies), complies with university rules and meets the accepted standards with respect to originality and quality.

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This Dissertation is organized based on the following four (4) original articles, two of which have been published and two of which are under review.

Paper 1. Addis Taye, Engdawork Assefa, Belay Simane (2024). Analysis of practices and factors of solid waste management among urban households of Addis Ababa city, Ethiopia. Environmental Challenges 14 (2024) 100811. https://doi.org/10.1016/j.envc.2023.100811

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Abbreviations and Acronyms

AAEPA	Addis Ababa Environmental Protection Authority
AACAEPA	Addis Ababa City Administration Environmental Protection Authority
AACGF	Addis Ababa City Government Farmers
AARPO	Addis Ababa Resilience Project Office
AASWMA	Addis Ababa Solid Waste Management Agency
AEB	Addis Ababa City Administration
APA	Association for Public Awareness
ARPO	Addis Ababa Resilience Project Office
AU	African Union
BPA	Budget Performance Analysis
CSA	Central Statistical Agency
CRGE	Climate-Resilient Green Economy
D-to-D	Door-to-Door Waste Pickers
EIA	Environmental Impact Assessment
EPA	Environmental Protection Authority
EPMD	Environmental Protection and Management Department
FDRE	Federal Democratic Republic of Ethiopia
GCCS	Gender and Climate Change Strategy
GDP	Gross Domestic Product
EGSG	Effective Green Space Governance
GSGI	Green Space Governance Index
GWD	Gender and Waste Disposal
IAD	Institutional Analysis and Development
IAEA	International Atomic Energy Agency
IUCN	International Union for Conservation of Nature
IRB	Institutional Review Board
MDG	Millennium Development Goals
MEFCC	Ministry of Environment, Forest, and Climate Change
MS	Multinomial Regression Statistics

MSW	Municipal Solid Waste
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
PPS	Probability Proportional to Size
RRR	Relative Risk Ratio
SDG	Sustainable Development Goals
SDGs	Sustainable Development Goals
SES	Social-Ecological Systems
SLMP	Sustainable Land Management Program
STATA	Statistics and Data Analysis Software
UN	United Nations
UN-Habitat	United Nations Human Settlements Programme
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UN Women	United Nations Women
WASH	Water, Sanitation, and Hygiene
WB	Waste Bins
WS	Waste Storage

General Abstract

This dissertation explores urban environmental governance in Addis Ababa, focusing on the policies frameworks and institutional structures that shape the city's environmental governance practices. The study assesses the effectiveness of current strategies for green space management and solid waste disposal among urban households, identifying key socio-demographic and economic factors influencing these practices. The study also evaluates gender involvement in environmental governance, emphasizing the role of gender integration in decision-making processes. A mixed-methods approach was employed, utilizing qualitative data gathered from six key environmental institutions through expert interviews, archival documents, and policy reviews. This was complemented by a household survey of 200 participants, providing a comprehensive view of urban environmental governance in Addis Ababa. The study reveals that while Addis Ababa has a comprehensive environmental policy framework aimed at holistic sustainability including public health, climate resilience, and sustainable development challenges persist. These include resource constraints and uneven stakeholder engagement, which hinder effective policy implementation. Although environmental laws are in place, enforcement and monitoring mechanisms are inadequate, leading to gaps in implementation of legal frameworks. Institutional arrangements are varied and often suffer from overlapping responsibilities and coordination issues. Solid waste management practices are influenced by factors such as gender, age, education, employment status, income, family size, and attitudes. Gender mainstreaming within environmental institutions faces obstacles related to organizational culture, resource allocation, capacity building, and gender representation in leadership roles. Green space governance is affected by distribution and accessibility disparities, with higher education and accessibility improving perceptions of governance effectiveness, while distance and transportation costs negatively impact them. The study advocates for improved urban environmental governance in Addis Ababa through better inter-agency coordination, increased funding, and stronger law enforcement. It emphasizes the importance of gender-sensitive policies, greater women's involvement in decision-making and public awareness. Addressing green space accessibility disparities and tailoring solid waste management to socio-demographic factors are also key recommendations for a sustainable urban environment.

Keywords: Urban Environmental Governance, Policy Effectiveness, Solid Waste Management, Green Space Governance, Gender Integration, Sustainable Development, Addis Ababa

CHAPTER ONE

1. General Introduction

1.1. Background and Justification

Urban environmental governance has become increasingly crucial in response to rapid urbanization and it‘s accompanying environmental challenges. As cities worldwide expand, they encounter substantial pressures on their environmental systems, necessitating effective governance frameworks across various levels to manage and mitigate these impacts. For sustainable urban development, environmental governance requires collaboration among state actors, market forces, and civil society at all levels, with strong policy frameworks integrating environmental considerations (Bibri, 2020; Suzuki et al., 2013).

The concept of urban environmental governance involves the policies, institutions, and practices aimed at addressing environmental issues in urban settings while promoting sustainable development (Ding et al., 2019). Historical movements and policy responses, such as Rachel Carson‘s Silent Spring and the establishment of the United Nations Environment Programme (UNEP), have shaped contemporary governance by highlighting the environmental impacts of industrialization and emphasizing the need for global cooperation (Khondker, 2015; Mohamed et al., 2020; Sen, 2020) .However, critiques point out that environmental governance often fails to account for local contexts and the role of local actors, focusing too heavily on global and scale-specific issues (Bennett & Satterfield, 2018).

Urban areas currently house over 55% of the global population, with this figure projected to reach 68% by 2050 (Seto & Shepherd, 2009). This rapid urban growth intensifies issues such as pollution, waste generation, and resource depletion. To effectively tackle these challenges while promoting sustainability and resilience, urban governance systems need to adapt. Successful urban environmental governance encompasses a range of components, including policy formulation, institutional collaboration, public engagement, and enforcement strategies (Carpentiere et al., 2024; Dou, 2021).

However, numerous cities face significant barriers to implementing effective environmental governance. Key issues include fragmented institutional frameworks, resource limitations, and lack of stakeholder engagement. These challenges are particularly acute in developing countries, where rapid urban expansion and financial constraints further complicate efforts to achieve sustainable urban management (Cohen, 2006; Filho et al., 2019). Recent studies highlight the importance of integrated and inclusive governance approaches to address these issues effectively. Participatory governance models, which actively involve communities and stakeholders, are increasingly seen as crucial for successful environmental management (Sanz Sanz et al., 2023).

Effective governance of urban green spaces is critical for improving environmental quality and public well-being. Important indicators of such governance include the accessibility of green spaces, the quality of green infrastructure, and the level of community engagement (Reyes-Riveros et al., 2021). Socio-demographic factors, like income and education levels, significantly influence how green space effectiveness is perceived (Nigg et al., 2023). Key determinants for successful green space management include strong policy frameworks and active community involvement, with participatory planning processes leading to more equitable and efficient outcomes (Teimouri et al., 2023). In Addis Ababa, understanding these indicators and determinants is essential for enhancing green space governance and addressing accessibility disparities (Yirga Ayele et al., 2022).

Solid waste management is a vital aspect of urban environmental governance, shaped by factors such as household income, education level, and community awareness (Debrah et al., 2021). Effective waste segregation and recycling practices necessitate strategies that are tailored to the socio-economic and cultural context of the community. Integrating waste management with broader urban planning and infrastructure development can enhance overall efficiency (Wan et al., 2019). In Addis Ababa, evaluating current waste management practices involves assessing system effectiveness, identifying gaps, and understanding the socio-economic factors that influence waste management behaviors (Beyene et al., 2023).

Gender involvement is increasingly recognized as crucial for achieving sustainable and inclusive outcomes in urban environmental governance. Gender-sensitive policies can significantly enhance environmental program effectiveness by addressing diverse demographic needs

(Strumskyte et al., 2022) .Research demonstrates that women‘s participation in decision-making processes leads to more equitable and effective environmental policies (Grillos, 2018) .In Addis Ababa, evaluating gender involvement entails examining the representation of women in environmental decision-making and the integration of gender perspectives into policy frameworks (Mersha & van Laerhoven, 2019) .

This study aims to evaluate the effectiveness of urban environmental governance in Addis Ababa amidst rapid urbanization and development pressures. By analyzing current frameworks, practices, and challenges, with a focus on gender integration and sustainability principles, the study seeks to assess the effectiveness of environmental policies and institutional structures in managing solid waste and green space governance. The study aims to identify barriers to effective implementation and propose strategies to enhance inclusivity and resilience in governance. By examining successful global models and addressing local challenges, this research aims to contribute to improved policy development and governance practices, fostering sustainable urban development and equitable resource management in Addis Ababa.

1.2. Statement of the Problem

The rapid urbanization of Ethiopia, particularly in its capital city Addis Ababa, has brought about substantial environmental governance challenges. Between 2000 and 2020, Ethiopia's urban population grew from 7.3 million to 22.3 million, with Addis Ababa's population more than tripling to over 3.4 million (Koroso & Zevenbergen, 2024). This swift urbanization has put immense pressure on the city's infrastructure and natural resources, leading to environmental degradation, inefficient waste management, and a shortage of green spaces (Niamir et al., 2024). Despite existing policy frameworks, the effectiveness of urban environmental governance in Addis Ababa remains questionable due to fragmented and overlapping institutional structures. A lack of coordination and integration among these bodies has resulted in suboptimal management of green spaces and solid waste (Derib & Alemayehu, 2024) .

While previous studies have highlighted the need for a cohesive governance framework, they often overlook the practical challenges of policy integration and the crucial role of local governance in effective implementation (Desalegn & Solomon, 2021). The governance of urban

green spaces in Addis Ababa faces additional challenges. These spaces are essential for enhancing quality of life, providing ecological benefits, and supporting public health (Addas, 2023). However, the lack of a coherent policy framework and strategic planning led to fragmented and poorly managed green spaces (Mosissa et al., 2023; Syngellakis & Hernández, 2020). These challenges have been further aggravated by rapid urbanization and population growth (Koroso et al., 2021) .

Additionally, there was a significant gap in community involvement and stakeholder engagement, undermining the sustainability of green space initiatives (Alemayehu & Hido, 2023).Solid waste management remained a significant challenge in Addis Ababa, with issues such as inadequate waste collection and disposal systems, insufficient public awareness and participation, limited financial and technical resources, and weak regulatory frameworks (Abegaz et al., 2021; Fereja & Chemeda, 2022). Improper waste disposal posed serious health risks due to the proliferation of disease-carrying pests and water contamination. The lack of proper waste segregation at the household level and overwhelmed landfill sites further complicated waste management efforts (Debrah et al., 2021; F. Girma & Teshome, 2023).

There was a clear need for a comprehensive analysis of the factors influencing solid waste management practices among urban households, focusing on socio-economic and behavioral factors. Gender involvement in setting goals and decision-making processes within urban environmental governance in Addis Ababa remained insufficient and inconsistent. While gender-specific indicators were often included in policy frameworks, their actual implementation was superficial, rarely influencing core decision-making processes (Eden & Wagstaff, 2021). Women were frequently underrepresented in key decision-making roles, limiting their influence on environmental policies. Successful instances of women's participation leading to more sustainable outcomes highlighted the potential benefits of greater gender involvement (Bryan et al., 2024; Owusu-Manu et al., 2021). This highlights that the potential benefits of increased gender involvement are not being fully realized, revealing significant gaps in the current governance framework (Belcore et al., 2020; Sahiledengle et al., 2023).

Previous studies on urban environmental governance in Addis Ababa often overlook practical challenges in policy integration and the crucial role of local governance. They fail to address the

socio-economic and behavioral factors affecting green space and waste management effectively. Additionally, while gender-specific indicators are included in policies, their implementation is superficial, and the potential benefits of increased gender involvement are not fully realized. Methodologically, the empirical focus of earlier studies has limited their ability to provide a comprehensive understanding of urban environmental governance challenges in Addis Ababa. These studies failed to capture the complex interplay between socio-economic and behavioral factors, institutional structures, and environmental outcomes. This methodological limitation has hindered the development of actionable recommendations for improving urban environmental governance in Addis Ababa.

This study aimed to address these gaps by analyzing existing policy frameworks and institutional structures to identify and recommend solutions for more cohesive governance. It assessed the current state of green space governance, providing insights into strategic planning and community involvement. Additionally, the study investigated socio-economic and behavioral factors influencing waste management practices to propose actionable solutions for improvement. The study also evaluated the practical implementation of gender-specific indicators within policy frameworks to enhance gender-inclusive decision-making processes.
The research adopted a mixed-methods approach, utilizing both qualitative and quantitative data to provide a holistic view of urban environmental governance challenges and opportunities in Addis Ababa. By addressing the identified gaps, this study aimed to contribute to the development of more effective and inclusive urban environmental governance strategies in Addis Ababa. The findings provided actionable insights for policymakers to enhance policy implementation, improve green space and waste management practices, and promote gender-inclusive decision-making processes. Ultimately, the study sought to support sustainable urban development and improve the quality of life for residents of Addis Ababa.

1.3. Objectives of the Study

1.3.1. General Objectives

The general objective of this study is to evaluat urban environmental governance in Addis Ababa, Ethiopia.

1.3.2. Specific objectives

Specifically, the study aimed to

1. To analysis policy frameworks and institutional structures on urban environmental governance in the study area.
2. To investigate the practices and factors influencing solid waste management among urban households in the study area.
3. To examine key indicators and determinants of effective urban green space governance in the study area.
4. To assess the status of gender involvement in setting goals and decision-making processes within urban environmental governance in the study area.

1.4. Research Questions

1. What are the strengths and weaknesses of the current policy frameworks and institutional structures related to urban environmental governance in Addis Ababa?
2. What practices and factors influence solid waste management among urban households in Addis Ababa?
3. What are the key indicators and determinants of effective urban green space governance in Addis Ababa?
4. What is the current status of gender involvement in setting goals and decision-making processes within urban environmental governance in Addis Ababa?

1.5. Significance of the Study

This study on urban environmental governance in Addis Ababa holds significant importance in addressing the critical policy and governance challenges in Ethiopia. It aims to uncover the driving causes behind these challenges and their socio-economic and ecological impacts, providing valuable insights for policymakers to make informed and improved decisions. The research contributes to the depth and breadth of environmental discourse within the Addis Ababa context, playing a crucial role in filling the pervasive knowledge gap in the current academic field of environment and development. By addressing rarely studied aspects of environmental governance, this study adds to the body of knowledge, offering theoretical, methodological, and practical contributions to academics, policymakers, and practitioners. Moreover, the study

provides a comprehensive analysis of the frameworks and institutional structures governing urban environmental policies in Addis Ababa. This analysis is essential for identifying the necessary policy reforms that can lead to more effective governance.

The research also highlights key indicators and determinants of successful urban green space governance, which are vital for enhancing urban livability and biodiversity. Additionally, the investigation into solid waste management practices among urban households offers practical solutions for sustainable waste handling, which is crucial for public health and environmental protection. Furthermore, the study's evaluation of gender involvement in environmental governance emphasizes the importance of inclusive decision-making processes. This aspect is particularly significant in ensuring that diverse perspectives are considered in setting goals and implementing policies, thereby promoting social inclusion and equity. This study not only contributes to the development of sustainable and resilient urban environments in Addis Ababa but also serves as a valuable resource for policymakers, practitioners, and researchers. It supports the achievement of Sustainable Development Goals related to urban sustainability and social inclusion and provides a springboard for further studies in similar areas. By offering young scholars and research institutions an opportunity to build upon the findings, the study helps refine the methods, tools, and theories applied to the country‘s context.

1.6 Scope of the Study

The scope of this study encompasses the analysis of urban environmental governance in Addis Ababa, with a focus on four key areas: policy frameworks and institutional structures, solid waste management practices, green space governance, and gender involvement in decision-making processes. Geographically, the study is limited to the city of Addis Ababa, specifically targeting two sub-cities, Akaki Kality and Kolfe Keranio. These areas represent a diverse cross-section of the urban environment, capturing a range of socio-economic, environmental, and institutional dynamics. Additionally, the study extends to six key environmental institutions at both the Addis Ababa and federal levels, to assess their roles and interactions in urban environmental governance.

Thematically, the study aims to analyze the policy frameworks and institutional arrangements that govern urban environmental issues, focusing on the interactions between different levels of

governance and their effectiveness in addressing urban challenges. The research also investigates the factors that influence solid waste management practices among households and explores the indicators and determinants of effective green space governance. In addition, the study evaluates the role of gender involvement in setting environmental governance goals and shaping decision-making processes. The scope includes data from local stakeholders, regional entities, and policy documents, while also integrating broader international perspectives where relevant to the governance issues in Addis Ababa.

Methodologically, the study utilizes a combination of qualitative and quantitative approaches, including case studies, stakeholder interviews, and statistical analysis. This mixed-method approach is designed to offer a comprehensive understanding of the governance practices, challenges, and opportunities within the study areas. The research covers a two-year period, allowing for an in-depth analysis of recent governance practices, policy implementations, and their impacts. This time scope ensures that the findings are relevant to current and future urban environmental governance efforts, providing actionable recommendations for improving governance effectiveness and sustainability in Addis Ababa.

1.7. Literature Review

1.7.1. Conceptual literature review

1.7.1.1. Urban Environmental Governance

Urban environmental governance is a dynamic field focused on rule-based collaboration among government, private sector, and civil society actors. It emphasizes coordinated responses, blending formal and informal rules, and prioritizes inclusive public engagement across all governance levels. This comprehensive approach aims to tackle urban environmental challenges and promote sustainable urban development (Bulkeley, 2005; Partelow et al., 2020). Urban environmental governance, with a focus on institutional response, is defined as policy-driven action aimed at establishing dynamic and effective institutional frameworks and incentives to mobilize collective efforts in mitigating environmental issues (Chaffin & Gunderson, 2016; Lebel et al., 2006). Other scholars define urban environmental governance as a platform where

non-state actors play a crucial role in addressing governance gaps stemming from governmental capacity limitations. This approach responds to citizens' demands for involvement in environmental decision-making and leverages the expertise, knowledge, and resources of diverse societal segments to enhance environmental outcome (Armitage et al., 2012). Urban environmental governance is also described as a set of regulatory procedures and institutions that enable political bodies to influence environmental decision-making and outcome (Ebo, 2007; Lemos & Agrawal, 2006a; Menashy, 2016).

Environmental governance encompasses a comprehensive process aimed at addressing conflicts over environmental goods and services by providing institutional solutions (Paavola, 2007). It is perceived as an operational response to the challenges threatening the interconnectedness of natural and social systems (Folke et al., 2010; Ostrom, 2010). Emphasizing the influence of power dynamics, Kulczak (2013) defines it as the regulatory processes and organizations through which political actors shape environmental actions and outcomes, supported by various structures such as international agreements and local governance (Lemos & Agrawal, 2006b). The Commission on Global Governance (1995) highlights the intersection of governance and environmental affairs, which involves multiple stakeholders beyond the government, thus delineating the roles of government and governance. Environmental governance encompasses measures to change incentives, knowledge, and policies while engaging government, businesses, and civil society in the pursuit of sustainability(Singh et al., 2021) .It is viewed as a "third way" that balances state and market solutions (Evans, 2011). Adopting the broader definition by Biermann et al. (2009), this study emphasizes the importance of collective action across different geographic scales and administrative levels to effectively address environmental issues within the sustainable development framework.

1.7.1.2. Challenges of Urban Environmental Governance

Effective urban environmental governance is crucial for addressing contemporary environmental challenges, particularly in developing countries where its implementation faces several impediments. One major issue is the novelty of this governance model, resulting in a shortage of adequately trained experts and knowledgeable policy personnel, which hinders the integration of new policies into existing regulatory frameworks at various levels (Charbit, 2011). Additionally,

technical and managerial skill deficits, coupled with an overreliance on international aid and technical support, undermine local capacities and complicate the localization of multilateral agreements, as seen in countries like Vietnam and Niger (Gibbon & Schulpen, 2002; Helble et al., 2018).

Financial constraints further exacerbate the problem, as developing nations often struggle to allocate sufficient resources to the environmental sector, leading to dependence on international financial support that can compromise policy effectiveness (Barbier, 2011; Leonard & Morell, 1981) .Institutional factors also impede governance efforts, with national environment ministries typically having weaker capacities compared to other ministries, limiting their enforcement abilities (Antonio Puppim de Oliveira, 2002).Furthermore, inadequate and unclear environmental information hampers decision-making, exacerbated by weak environmental monitoring systems and insufficient scientific knowledge flow (Ogunkan, 2022a; Weichselgartner & Kasperson, 2010) .

Weak enforcement and compliance with environmental regulations add to the complexity of effective governance. In Kenya, Uganda, and Tanzania, existing laws are poorly enforced due to limited administrative capacities, resulting in continued environmental degradation despite legislative measures (Ackerman & Stewart, 1984; Buzbee, 2003). The globalized nature of environmental governance, with its diverse non-state actors, introduces additional challenges. The chaotic evolution of global environmental policy, characterized by treaty congestion and institutional duplication, complicates national and local responses (Kanie, 2015; Odonkor et al., 2020; Oduor, 2010).Moreover, the increasing involvement of the private sector and NGOs highlights the need for a shift from state-centric systems to more inclusive governance models, with these actors playing critical roles in financing, advocacy, and capacity building (Edwards, 2015).Addressing these challenges requires strengthening environmental governance frameworks and ensuring effective application to promote sustainable urban development.

1.7.1.3. Policy Frameworks in Urban Environmental Governance

Policy frameworks are fundamental to the effectiveness of urban environmental governance, guiding the formulation, implementation, and evaluation of environmental policies across various governance levels. Historically, these frameworks have evolved from centralized, top-down models to more decentralized and participatory approaches that involve local governments, communities, and non-state actors (Biermann et al., 2017; Breuer et al., 2023). This transition recognizes the complexity of urban environmental challenges and the need for coordinated efforts across multiple governance levels. Contemporary policy frameworks often incorporate polycentric governance, which involves multiple overlapping decision-making centers at different scales to enhance resilience and adaptability in response to dynamic environmental conditions (Ostrom, 2010; Rijke et al., 2013). Effective frameworks typically include regulatory instruments such as laws and standards, institutional arrangements for managing and enforcing policies, participatory mechanisms for stakeholder engagement, incentive structures to align economic interests with environmental goals, and monitoring and evaluation processes to ensure adaptive management (Ogunkan, 2022b; Singla & Singh, 2018).

Empirical research and case studies illustrate the impact of well-structured policy frameworks. For instance, Copenhagen‘s climate plan, aiming for carbon neutrality by 2025, demonstrates how comprehensive frameworks can drive sustainability through integrated regulations, institutional support, and public engagement (Damsø et al., 2017).Similarly, Singapore‘s waste management system highlights the effectiveness of robust policy frameworks in managing urban environmental challenges (Kerdlap et al., 2019). In Addis Ababa, the application of policy frameworks faces challenges such as limited resources, overlapping institutional mandates, and inadequate enforcement, although there is potential for improvement through more inclusive and participatory approaches (Koroso & Zevenbergen, 2024; Orkpeh & Adedire, 2024). Integrating gender perspectives into these frameworks is also essential for developing equitable and inclusive policies (Assefa et al., 2019). Effective policy frameworks are crucial for addressing complex environmental issues across various governance levels, as demonstrated by successful models in cities like Copenhagen and Singapore.

1.7.1.4. Institutional Structures in Urban Environmental Governance

Urban environmental governance involves a network of institutions operating at local, regional, and national levels to address urban environmental challenges effectively. Historically, these structures relied on centralized, top-down approaches with limited local input, leading to rigid regulatory frameworks imposed by central authorities (Biermann & Pattberg, 2008). The increasing complexity of urban environmental issues has driven a shift towards more decentralized and participatory models, incorporating polycentric governance where multiple overlapping decision-making centers enhance resilience and adaptability (Folke et al., 2010; Ostrom, 2010).Effective governance now requires key components such as regulatory frameworks for environmental protection (Singla & Singh, 2018), institutional arrangements that facilitate coordination among various levels (Lemos & Agrawal, 2006a; Ogunkan, 2022a), participatory mechanisms to engage local communitie (Hommes et al., 2009; Medema et al., 2017), economic incentives to encourage sustainable practices (Armitage et al., 2012), and robust monitoring and evaluation processes to ensure adaptive management (Brown, 2011; Hassenforder et al., 2016).

Case studies from cities like Copenhagen and Singapore highlight the effectiveness of these institutional structures. Copenhagen‘s climate plan, aiming for carbon neutrality by 2025, integrates regulatory measures, participatory processes, and economic incentives (van Doren et al., 2020), while Singapore‘s waste management system emphasizes recycling and resource recovery (Zhou et al., 2022). In Ethiopia, the Environmental Protection Authority (EPA) oversees national policies, with regional and local governments handling implementation, though challenges such as limited resources and weak inter-institutional coordination persist (Woldemariam et al., 2016). In Addis Ababa, the city‘s governance involves multiple institutions, including the Addis Ababa City Administration and the Addis Ababa Environmental Protection Authority (AAEPA), but is constrained by limited resources, overlapping mandates, and inadequate coordination (Asnake et al., 2021). Recent initiatives like the Addis Ababa Clean Air Project and the Integrated Solid Waste Management Program reflect efforts to address these challenges through multi-stakeholder engagement (Derdera & Ogato, 2023).The shift towards

decentralized and participatory models underscores the need for flexible and adaptive governance frameworks in addressing urban environmental issues.

1.7.1.5. Solid Waste Management among Urban Households

Effective solid waste management (SWM) among urban households is a critical aspect of urban environmental governance, impacting public health, environmental sustainability, and resource efficiency (Rodić & Wilson, 2017). The practices of solid waste management among urban households vary significantly across different cities and regions, influenced by local policies, infrastructure, and socio-economic conditions (Jagun et al., 2023). Generally, these practices include waste collection, segregation, recycling, and disposal. In many urban areas, waste collection services are typically organized by municipal authorities or private contractors to ensure regular and efficient waste collection from households (Banerjee & Sarkhel, 2020). Waste segregation at the source is increasingly promoted to enhance recycling rates and reduce the volume of waste sent to landfills (Zhang et al., 2021).

Recent research highlights various approaches to improving waste management efficiency at the household level. Integrated waste management systems that combine collection, recycling, and disposal are being increasingly adopted to enhance overall waste management effectiveness (Gebremedhin et al., 2016). Additionally, community-based initiatives, such as waste separation programs and local recycling centers, play a significant role in engaging households and promoting responsible waste management practice (Ochieng, 2016). Despite these advancements, challenges persist in solid waste management among urban households, particularly due to the growing volume and complexity of waste generated by urbanization and changing consumption patterns (Abdel-Shafy & Mansour, 2018). This growth strains existing waste management infrastructure, leading to inefficiencies in collection, processing, and disposal (Kamanga et al., 2024).

Developing countries, including Ethiopia, face unique challenges in solid waste management due to rapid urbanization, population growth, and limited resources. Institutional frameworks often suffer from fragmented responsibilities, inadequate funding, and weak enforcement of

regulations (Memon, 2010). In Ethiopia, particularly in Addis Ababa, the challenges are compounded by insufficient infrastructure, limited financial resources, and weak regulatory frameworks (Gislaw, 2018). The Addis Ababa City Administration oversees waste management through various departments, with initiatives like the Integrated Solid Waste Management Program aiming to improve waste segregation, recycling, and composting (Chekole, 2006; Tilaye & van Dijk, 2014). However, challenges such as inadequate funding, limited technical capacity, and insufficient public engagement remain significant obstacles. Research by Getachew et al. (2021) highlights the need for strengthening institutional capacities, fostering community participation, and promoting public-private partnerships, along with continuous monitoring and evaluation to ensure the effectiveness and sustainability of SWM initiatives in Addis Ababa.

1.7.1.6. Effectiveness of Urban green space governance and its indicators

Green space governance is a critical component of urban sustainability, focusing on the management and regulation of parks, gardens, and natural reserves to deliver ecological, social, and economic benefits. Effective governance ensures the sustainability and accessibility of these spaces by addressing challenges across various geographic and spatial scales. This involves a multi-faceted approach, including robust policy frameworks, active stakeholder engagement, and strategic implementation measures (Kabisch et al., 2016). To achieve these goals, governance structures must tackle issues related to land use planning, maintenance, funding, and public access, while prioritizing inclusivity, transparency, and accountability (da Cruz et al., 2019). Engaging diverse stakeholders such as government bodies, private sector entities, NGOs, and local communities is essential for the development and implementation of effective green space policies. Furthermore, adaptive management practices that respond to evolving environmental and social conditions are crucial for long-term success (Connop et al., 2016).

Evaluating the effectiveness of green space governance requires a comprehensive assessment of environmental, social, and economic outcomes. Environmentally, successful governance promotes biodiversity conservation, climate regulation, and pollution reduction (Rahman et al., 2017). Socially, it enhances community well-being by providing recreational opportunities, promoting physical and mental health, and fostering social cohesion (Lee & Maheswaran, 2011). Economically, well-governed green spaces can increase property values, generate tourism

revenue, and create jobs (Wolch et al., 2014). However, achieving these outcomes involves overcoming challenges such as limited funding, competing land uses, and social inequalities in access to green spaces (Byrne et al., 2010). Integrated governance approaches that account for the interconnectedness of environmental, social, and economic factors are increasingly recognized as essential for ensuring sustainable urban development (Haase et al., 2021).

In Ethiopia, green space governance is challenged by rapid urbanization, limited resources, and institutional constraints. Policies are often fragmented and lack effective implementation mechanisms (M. T. Abebe & Megento, 2017; Azagew & Worku, 2020). Despite these obstacles, there are ongoing efforts to improve governance through policy reforms and community-based initiatives. The Ethiopian government has introduced policies promoting green infrastructure, with an emphasis on integrated land use planning, public-private partnerships, and community involvement (B. Y. Ayele et al., 2022). However, practical challenges such as inadequate funding, technical capacity, and land tenure issues continue to hinder progress (Birhanu et al., 2024). Addis Ababa, in particular, faces significant challenges due to rapid urban growth, which has led to the encroachment of green spaces.

The Addis Ababa City Administration has implemented various initiatives, including urban park development, tree-planting campaigns, and community-based projects (Y. Girma et al., 2019). Recent research emphasizes the importance of effective governance structures for the sustainability of green spaces in Addis Ababa, highlighting the need for comprehensive policy frameworks, stakeholder engagement, and continuous monitoring and evaluation (Masha et al., 2023). Public participation and community stewardship are also critical for enhancing governance effectiveness. In conclusion, effective green space governance is indispensable for urban sustainability, requiring multi-faceted approaches and robust measurement frameworks to address the complex environmental, social, and economic challenges facing urban areas.

1.7.1.7. Determinants of Effective Urban Green Space Governance

Effective green space governance is vital for the sustainable management of urban parks, gardens, and natural reserves. The effectiveness of governance is shaped by various socio-demographic, economic, and political factors that can either enhance or impede the management

of these spaces. Several indicators measure the effectiveness of green space governance. However, effectiveness is a dependent variable influenced by multiple factors, and addressing diverse social, political, and economic challenges is crucial for achieving sustainable management globally. "Good governance," a concept promoted by multilateral donor agencies and nation-states since the 1980s, is central to effective green space governance. In environmental governance, "good governance" focuses on achieving objectives that protect natural and social environments from human-induced threats (Evans, 2011; Gisselquist, 2014) . Therefore, understanding effective green space governance requires a clear definition and measurement framework within policy planning.

Empirical studies highlight several socio-demographic factors that play a critical role in green space governance. Gender is a significant factor, with women often exhibiting more pro-environmental behavior than men, although these findings can vary based on socio-cultural contexts (Hansmann et al., 2020; Mikuła et al., 2021; Silvi & Padilla, 2021) .Age also plays a role, as younger individuals are typically more engaged in environmental conservation than older individuals. For example, younger generations in Nigeria view environmental resources as crucial for addressing their growing demands (Ogunbode, 2013). Marital status influences engagement in environmental activities, with married individuals potentially having different priorities that impact their actions (Iranah et al., 2018; Xu et al., 2022).

Education is another key factor, with higher education levels correlating with increased engagement in environmental conservation due to greater exposure to knowledge about environmental issues (Ogunbode, 2013) .For instance, a study in Malaysia found that higher education levels led to a greater willingness to pay for conservation efforts (Kaffashi et al., 2015) .Income also affects governance effectiveness, as higher income levels are associated with a greater willingness to financially support conservation efforts. Visitors with higher incomes in Malaysia were more willing to pay additional conservation fees (Jacobsen & Hanley, 2009) .Benefit sharing, where communities benefit directly from green spaces, can further improve support for conservation (Semeraro et al., 2021).

Occupation influences environmental behavior as well, with employed individuals more likely to engage in pro-environmental actions than the unemployed, as shown in a study in China (Chen, 2021). Social marginalization and inequality negatively impact green space governance. Marginalized groups often resort to unsustainable resource use due to limited livelihood options, leading to environmental degradation (Lieu et al., 2020; Sovacool, 2018) . Overall the effectiveness of green space governance is influenced by socio-demographic factors such as gender, age, marital status, education, income, occupation, and social marginalization. Understanding and addressing these factors is essential for sustainable urban green space management.

1.7.1.8. Gender Integration in Urban Environmental Governance

Gender integration in urban multilevel environmental governance is essential for ensuring that environmental policies are both equitable and effective. Historically, gender dimensions were often overlooked in environmental governance, leading to policies that did not adequately address the distinct needs and contributions of different genders (Arora-Jonsson, 2011). However, recent studies emphasize the importance of integrating gender perspectives to create inclusive policies that reflect the diverse experiences of all community members (Bala-Miller et al., 2022).Gender integration involves acknowledging the differentiated impacts of environmental policies on various genders and ensuring equal opportunities for women and men to participate in and benefit from governance processes (Paudyal et al., 2019).Women, particularly in developing countries, are often more directly involved in natural resource management activities, such as water collection and waste management, making their perspectives vital in policy formulation and implementation (Grabowski et al., 2021; Resurrección et al., 2019).Additionally, gender-sensitive approaches can enhance the effectiveness of environmental policies by utilizing the unique knowledge and perspectives of different genders, thereby addressing power imbalances and promoting social equity(Bryan et al., 2024).

Despite its importance, gender integration in urban environmental governance faces significant challenges, including institutional inertia, a lack of gender-disaggregated data, and insufficient representation of women in decision-making roles. Many institutional frameworks lack the capacity or commitment to mainstream gender considerations, leading to policies that fail to

address gender-specific needs (Bonaccolto-Töpfer & Schnabel, 2023; Mbogo, 2022). The absence of gender-disaggregated data further complicates the ability to assess and address the different impacts of environmental policies on various genders (Fors et al., 2015; Namubiru, 2020). Ensuring meaningful participation of women and marginalized groups in decision-making processes is also challenging due to entrenched social norms and institutional barriers (A. K. Gupta & Gupta, 2021).

However, strategies such as incorporating gender quotas, developing gender-disaggregated data, and promoting gender-sensitive participatory approaches can help overcome these challenges. For example, gender quotas can enhance women's representation and influence in decision-making processes, while gender-disaggregated data can improve understanding of how different genders are affected by and contribute to environmental issues (Singh et al., 2021).In urban multilevel environmental governance, integrating gender perspectives at both local and national levels ensures that gender considerations are embedded in all stages of policy-making and implementation, leading to more comprehensive and effective governance outcomes.

1.7.2. Theoretical Foundations of Urban Environmental Governance

1.7.2.1. Environmental Justice Theory Theory

Environmental Justice Theory provides a critical framework for understanding and addressing the inequities associated with environmental governance across different levels. This theory emphasizes the fair distribution of environmental benefits and burdens among all social groups, particularly marginalized and disadvantaged communities (Figueroa, 2022). It focuses on ensuring that no group, especially low-income and minority populations, bears a disproportionate share of environmental hazards or is excluded from the decision-making processes that affect their environment. Environmental Justice Theory is crucial for urban environmental governance as it highlights the need for equity and inclusivity at various governance levels, from local municipalities to national and international bodies (Park & Kwan, 2017).

A central concept in Environmental Justice Theory is the notion of distributive justice, which concerns the fair allocation of environmental resources and exposure to environmental risks. This includes addressing issues such as pollution, access to clean water and air, and the

availability of green spaces (Gebeyehu et al., 2019).Procedural justice is another key concept, which focuses on ensuring that all affected communities have a voice in environmental decision-making processes. This theory advocates for the meaningful involvement of marginalized groups in shaping policies that impact their environment, thus promoting more equitable and effective governance (Williamson et al., 2020). By incorporating these principles, Environmental Justice Theory seeks to rectify historical and systemic inequalities in environmental governance.

The application of Environmental Justice Theory in urban environmental governance involves integrating equity considerations into policy-making and governance structures. Recent literature underscores the importance of this approach in addressing urban environmental challenges. Incorporating environmental justice principles can lead to more equitable outcomes in urban planning and policy, as discussed by Elmström Friberg (2024). Case studies highlight how environmental justice initiatives have improved community health and environmental conditions by has significant implications (Skinner-Thompson, 2022).Addis Ababa is a rapidly growing urban center facing numerous environmental challenges, including air pollution, inadequate waste management, and limited green spaces. Incorporating environmental justice principles can lead to more equitable outcomes in urban planning and policy, promoting fairness and inclusivity in decision-making processes (Assefa et al., 2019).These communities often lack the political power to advocate for better environmental conditions, leading to persistent inequalities. Implementing multilevel governance structures that incorporate environmental justice principles can help address these issues by ensuring that all residents have a voice in environmental decision-making and that resources are allocated equitably.

1.7.2.2. Structuration Theory

Anthony Giddens‘ Theory of Structuration serves as a crucial framework for analyzing the dynamic interplay between social structures and individual agency within the realm of environmental governance. Central to this theory is the concept of the "duality of structure," which posits that social structures are both influenced by and influence the actions of individuals and institutions (Whittington, 1992). This theory seeks to reconcile structuralist perspectives, which emphasize the significance of external social structures, with interpretive approaches that prioritize human agency and subjective interpretation (Chatterjee et al., 2019). This dual

approach is vital for understanding how environmental governance policies, practices, and institutions are continually shaped by interactions among diverse stakeholders.

In this context, structures are understood as ―rules and resources‖ that mediate social interactions, influencing both individual actions and institutional responses. These rules and resources can be transformed and play a significant role in the dynamics of power within governance frameworks (Ali, 2009; Chatterjee et al., 2019). The focus on power dynamics and agency provides valuable insights into how various actors such as governmental bodies, local communities, and civil society adapt and enact governance structures.

The emphasis on dynamic processes aligns well with the ever-evolving nature of urban environmental governance, allowing for the examination of how policies related to solid waste management and green space governance are reproduced or transformed through daily interactions at various levels (Jones & Karsten, 2008). This perspective is particularly useful for analyzing the impact of both top-down policies and grassroots actions, with local agents adapting policies to address specific contexts and needs (Roysen et al., 2024; Sillig, 2022) .Moreover, the theory's focus on the "duality of structure" provides a nuanced lens through which to assess gender participation in governance processes. It reveals how institutional rules and resources can facilitate or hinder gender-inclusive decision-making, emphasizing the importance of creating governance structures that support equal participation and accommodate diverse perspectives (Nam & Dempsey, 2020).

Additionally, Giddens‘ concept of "regionalization" explores the spatial aspects of social interactions, highlighting how actors define local contexts for governance practices. Actors utilize their knowledge and interpretative skills to adapt and manage these spaces, reflecting local priorities while also responding to broader structural influences (Stones, 2020) .Structuration Theory offers a comprehensive framework for understanding the complexities of environmental governance by emphasizing the reciprocal relationship between structural factors and individual agency. It allows for an analysis of policy frameworks, solid waste management practices, green space governance, and gender inclusion, acknowledging the transformative potential of governance structures. Ultimately, this theory contextualizes environmental governance as a dynamic and recursive process in which structural elements and human actions

continuously influence one another. In the context of this study in Addis Ababa, applying Structuration Theory facilitates a deeper exploration of how local stakeholders navigate and adapt governance structures to address specific environmental challenges. Furthermore, it highlights the importance of integrating diverse perspectives and experiences to enhance the effectiveness of urban environmental governance in rapidly changing urban settings.

1.7.3 Review of Empirical Studies of Urban Environmental Governance in Ethiopia

Urban environmental governance in Ethiopia has become a crucial area of study due to the nation's engagement with various multilateral environmental agreements and its struggle with rapid environmental degradation. Research in this field has significantly contributed to understanding Ethiopia's policy and implementation challenges, offering essential methodological approaches and theoretical insights. This review synthesizes empirical studies on urban environmental governance in Ethiopia, highlighting methodological, theoretical, and content-related gaps, and aligns these findings with the objectives of this Ph.D. research.

Empirical studies reveal a complex interplay among governance levels in Ethiopia, including federal, regional, and local authorities. The Environmental Protection Authority (EPA) at the federal level sets national policies, while regional and local bodies handle implementation (Alemu & Mengistu, 2019; Hailemariam et al., 2016). However, challenges such as limited financial resources, inadequate technical capacity, and weak inter-institutional coordination persist (Chekole, 2006; Gebregiorgs, 2018; Woldesenbet, 2021) notes that decentralized governance often leads to overlapping mandates and inefficiencies, particularly in waste management and pollution control.

Stakeholder engagement is critical for effective governance. Research emphasizes the importance of community involvement and public-private partnerships in enhancing governance outcomes. G. K. Ayele et al. (2016) and Tareke et al. (2022) found that local community participation improves policy relevance and compliance, but D. Abebe (2020) and Assefa et al. (2019) observed that public awareness remains limited due to insufficient outreach and education. The informal sector, especially in waste management, plays a significant role but lacks formal recognition and support (Aparcana, 2017; Bjerkli, n.d.; Mekonnen et al., 2022).

Solid waste management (SWM) is a key aspect of urban environmental governance. Improvements have been noted, such as those from the Integrated Solid Waste Management Program in Addis Ababa, which promotes waste segregation, recycling, and composting. However, practical implementation is often hampered by inadequate infrastructure and funding (Berhe et al., 2024; N. Tesfay et al., 2022). Waste-to-energy projects aim to address waste and energy needs but require substantial investment and technical expertise (Behera, 2023; Vlachokostas et al., 2021).Green space governance also faces challenges due to rapid urbanization and inadequate planning. Effective management requires strong institutional frameworks and community involvement(Yirga Ayele et al., 2022) .Gender integration is increasingly recognized as vital for effective governance. Although gender policies exist, their implementation is often superficial and inconsistent. Research indicates that gender mainstreaming in environmental projects has a limited impact on gender equity, suggesting that strengthening these policies could enhance inclusivity and governance effectiveness (Pla-Julián & Guevara, 2020)

The reviewed studies primarily focus on specific environmental resources or the effectiveness of Environmental Impact Assessment (EIA) practices. They often lack a national or comprehensive policy perspective and rely heavily on qualitative methods. This Ph.D. dissertation aims to address these limitations by examining broader policy frameworks and institutional structures, integrating environmental, social, and economic policies to provide a comprehensive understanding of urban environmental governance in Ethiopia.

1.7.4 Conceptual Framework of the Study

The conceptual framework for this study on urban environmental governance in Addis Ababa is built around four key areas: policy frameworks and institutional structures, solid waste management practices, green space governance, and gender involvement in governance. These elements are interconnected and reflect the broader dynamics of urban governance, where effective policy-making and institutional support play central roles. Policy frameworks and institutional structures are the foundation of urban environmental governance, providing the rules and mechanisms through which governance operates. In Addis Ababa, the centralized nature of

governance means that policies developed at the national and city levels have a direct impact on environmental outcomes. These policies determine how urban environmental issues such as waste management and green space preservation are addressed, shaping the governance landscape.

Solid waste management is another critical area in this framework, focusing on the practices adopted by urban households for managing waste. The effectiveness of these practices is influenced by the strength of governance frameworks, including policies that promote efficient waste collection, recycling, and disposal systems. In Addis Ababa, factors such as rapid urbanization and informal settlements pose challenges to effective waste management, making institutional support crucial. Similarly, green space governance is essential for maintaining urban ecological balance, and its effectiveness is closely tied to policies that prioritize sustainability and community involvement. The framework suggests that policies that protect green spaces and encourage public participation are key to effective green space governance.

Gender involvement in governance is a cross-cutting factor that influences all areas of urban environmental governance. In Addis Ababa, the representation of women in decision-making processes remains limited, and this study evaluates how greater gender inclusion can enhance environmental policy outcomes. The framework proposes that gender-sensitive policies and increased participation of women in governance structures can lead to more equitable and sustainable governance practices. This conceptual framework highlights the interconnectedness of policy frameworks, institutional capacity, and inclusivity in shaping effective environmental governance in Addis Ababa.

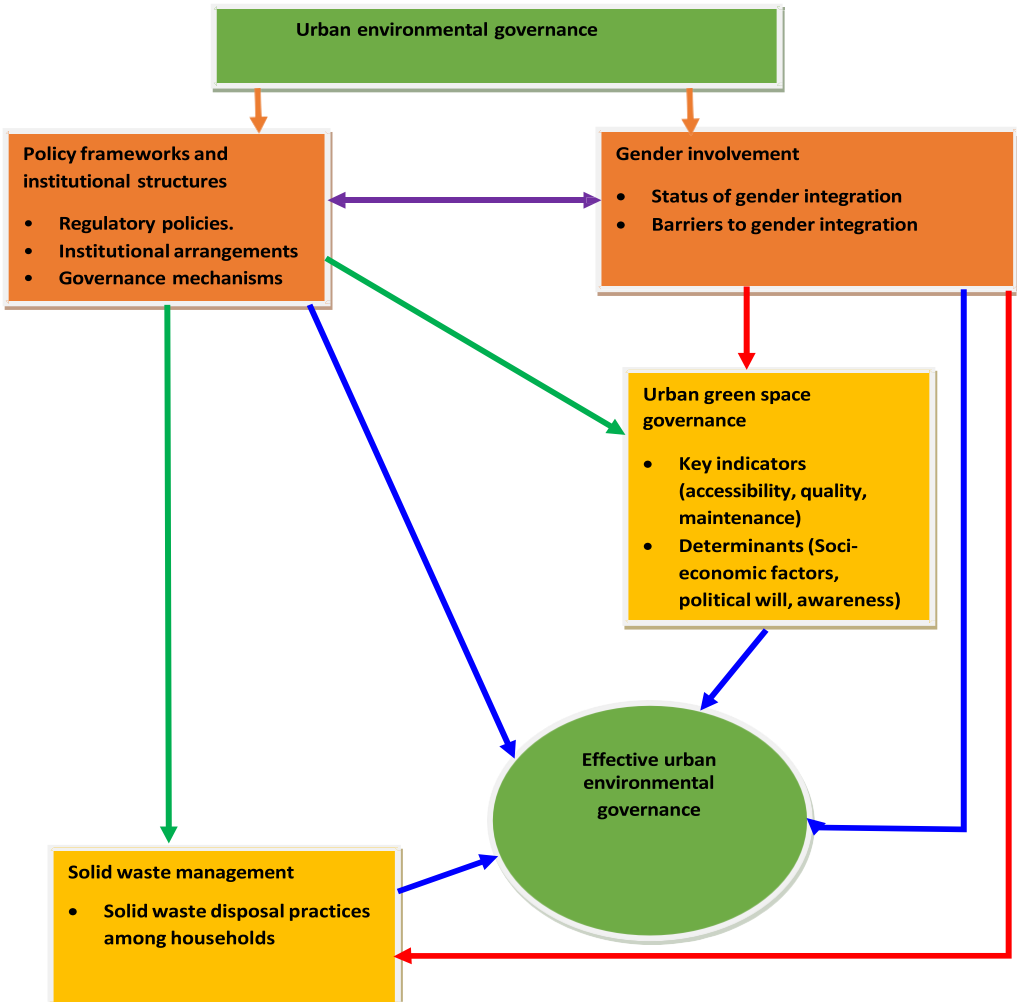

Figure 1.1. Conceptual framework

The conceptual framework of the study illustrates the interdependencies between various components of urban environmental governance through distinct relationships. The connection from Policy Frameworks and Institutional Structures to Solid Waste Management indicates that effective policies and institutional arrangements directly impact household solid waste management practices, promoting sustainable waste handling. This relationship extends to Urban

Green Space Governance, showing that these frameworks also influence the management of urban green spaces, ensuring their accessibility, maintenance, and sustainability. A reciprocal relationship is depicted between Policy Frameworks and Institutional Structures and Gender Involvement, where inclusive policies support gender integration, while active gender involvement helps refine and enhance governance frameworks. The link from Solid Waste Management to Urban Green Space Governance emphasizes that successful waste management is crucial for maintaining the quality and cleanliness of urban green spaces. Lastly, the relationship from Urban Green Space Governance to Gender Involvement highlights the importance of incorporating gender perspectives into the planning and management of green spaces to ensure equitable access and benefits for all community members. These interconnections collectively highlight the mutual reinforcement and interconnectedness of these components, which are essential for effective urban environmental governance in Addis Ababa.

1.8. Study Area and General Methodology

1.8.1. Study area

Addis Ababa serves as the administrative hub of Ethiopia and is located in the central region of the country (Figure 1.2). More specifically, it is positioned at coordinates $9^0 1' 48''$ N and $38^0 44' 24''$ E (Moisa et al., 2023). The city spans an area of 540 square kilometers and exhibits varying altitudes, ranging from 2100 meters to over 3000 meters above sea level (Diriba & Meng, 2021). The highest temperature in Addis Ababa has increased by 0.2°C every ten years from 1951 to 2002. The lowest temperature has also seen a rise of 0.4°C per decade during the same period. However, there hasn't been any significant change in the yearly and seasonal rainfall patterns between 1898 and 2002 (Feyissa et al., 2018). Addis Ababa experiences an average yearly rainfall of 1184 mm, with the rainy season occurring from June until mid-September (Addis et al., 2022). The three main rivers - Kebena, Little Akaki, and Big Akaki - as well as smaller streams, serve the urban area. Among the sub-cities, Addis Ketema has the highest population density, with 37,215 individuals per square kilometer. The city's population in 2007 was 3,384,569, and it is estimated to increase to 7,823,600 in 2019, leading to a population density of 5,165 individuals per square kilometer (Eshetu et al., 2021).

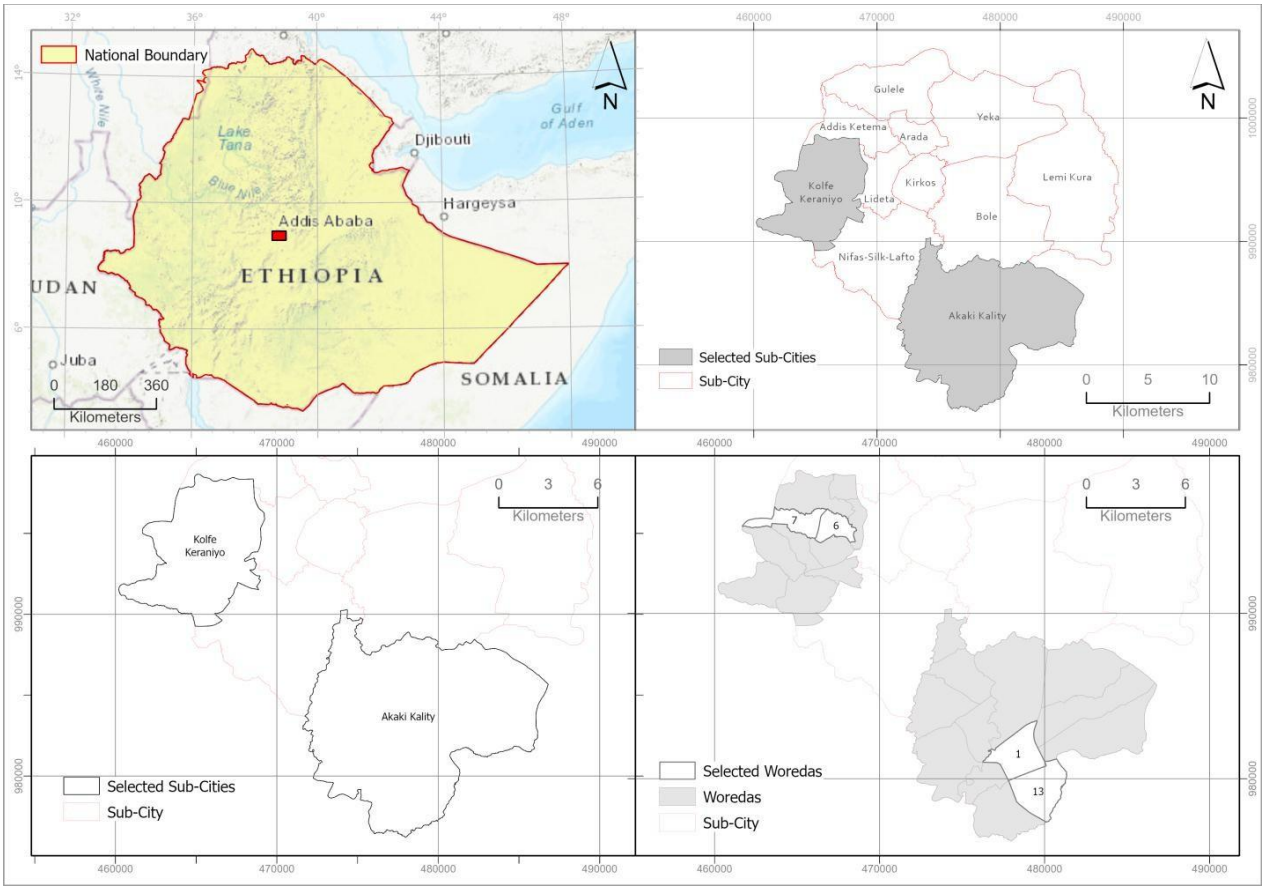

Figure 1.2. Location map of the study area

Addis Ababa was selected for this study because of its rapid urbanization, significant environmental challenges, and critical role as Ethiopia‘s capital, providing a representative context for exploring urban environmental governance in a developing city. The inclusion of six key environmental institutions allows for a comprehensive understanding of the city‘s environmental policy landscape, as these bodies are central to setting and enforcing regulations, managing waste, supporting urban agriculture, and planning resilience measures. Additionally, the choice of two sub-cities, Akaki Kality and Kolfe Keranio, along with four specific woredas within these sub-cities, captures diverse socio-economic and environmental conditions, allowing the study to examine governance effectiveness across different urban settings. This selection provides insights into how institutional efforts interact with local challenges and community dynamics, revealing critical factors for sustainable urban development in Addis Ababa.

1.8.2. Philosophical Foundation

The philosophical foundation of this study is rooted in Pragmatism, a philosophy that emphasizes the practical application of research findings to address real-world challenges. Pragmatism is particularly relevant in studies that aim to generate actionable knowledge, especially in complex and dynamic contexts like urban environmental governance. The core tenet of pragmatism is that the value of ideas and theories lies in their practical consequences and effectiveness in solving problems (Kaushik & Walsh, 2019). In the context of this study on urban environmental governance in Addis Ababa, pragmatism supports the use of mixed methods, incorporating both qualitative and quantitative approaches. This flexibility allows the study to address the multifaceted issues of policy frameworks, institutional structures, green space governance, solid waste management, and gender integration within environmental governance. Pragmatism encourages the integration of various perspectives and methodologies, ensuring that the research is responsive to the specific needs and realities of the study area (Dawadi et al., 2021). By focusing on practical outcomes, the pragmatic approach ensures that the research findings are not only theoretically strong but also directly applicable to improving governance practices in Addis Ababa. This alignment with pragmatism emphasizes the study's commitment to producing knowledge that is both relevant and useful for policymakers, practitioners, and other stakeholders involved in urban environmental governance.

1.8.3. Research Design and Justification

Research design is the way of planning and conducting data collection and analysis that fits the purpose of the study. It provides a general framework for the research process, from developing the hypothesis to examining the data to determining their operational outcomes (Kothari, 2004). The research design of this study employed a mixed-methods approach, integrating both qualitative and quantitative methods to analyze urban environmental governance in Addis Ababa. This design was chosen to provide a comprehensive understanding of key areas, including policy frameworks, institutional structures, solid waste management practices, green space governance, and gender involvement in decision-making processes. The qualitative aspect of the study focused on analyzing policy documents, strategic plans, and institutional reports to examine the interaction between different levels of governance and assess their effectiveness in

addressing environmental challenges. In addition, qualitative interviews were conducted with key stakeholders to understand the role of gender in governance and assess policy frameworks, institutional structures.

The quantitative component of the study involved conducting household surveys to gather empirical data on solid waste management practices, such as waste generation and disposal methods, this data was statistically analyzed to identify patterns and relationships between waste management practices and socio-economic or environmental factors. Surveys were also conducted to assess community satisfaction and involvement in green space governance. By integrating both qualitative and quantitative data, this mixed-methods approach allowed for triangulation, ensuring that the findings were both deep and broad, offering a well-rounded understanding of urban environmental governance in Addis Ababa.

The mixed-methods design was justified by its ability to capture the multifaceted nature of urban governance issues. Qualitative methods offered in-depth insights into governance processes, institutional dynamics, and policy implementation, while quantitative methods provided measurable data to support and validate these insights. The two-year research period allowed for the examination of recent governance practices and policy shifts, ensuring the study‘s findings remained relevant to current urban environmental challenges. This comprehensive approach not only enhanced the reliability of the results but also enabled the formulation of practical recommendations to improve governance effectiveness and sustainability in Addis Ababa.

1.8.4. Type and source of data

This study utilized both primary and secondary data sources to achieve a comprehensive understanding of urban environmental governance in Addis Ababa.

Primary Data: This included qualitative data gathered through semi-structured interviews with key stakeholders, such as government officials, policymakers, environmental experts, and Female representatives from governmental organizations. These interviews provided detailed insights into the frameworks and institutional structures governing urban environmental policies, as well as challenges related to policy implementation and gender integration. Additionally, quantitative data were collected through a structured household survey administered to a representative sample of residents across Addis Ababa. This survey captured information on

socio-demographic and economic factors influencing solid waste management practices and perceptions of green space governance.

Secondary Data: This data was sourced from archival materials, including existing policy documents, legislative frameworks, and institutional reports. Analyzing these documents allowed for an assessment of the current governance landscape, identification of trends, and recognition of gaps in policy and implementation. Combining these primary and secondary data sources enabled a strong and nuanced understanding of urban environmental governance, supporting well-informed recommendations for policy improvement and effective implementation.

1.8.5. Method of Data Collection

This study on urban environmental governance in Addis Ababa employed a comprehensive methodological approach to capture the complex landscape of environmental policies and practices. An exhaustive literature review laid the foundation, covering peer-reviewed academic articles, official governmental reports, policy briefs, and international organizational documents. This documentary analysis provided a thorough understanding of historical and current policy frameworks. Key informant interviews were the primary data collection method, offering in-depth insights into policy frameworks and institutional structures. Semi-structured interviews allowed for both consistency and flexibility, enabling detailed exploration of participants' experiences and perspectives. Comparative analysis of case studies from cities like Curitiba and Copenhagen helped benchmark Addis Ababa's policies and identify areas for improvement.

To supplement the primary data, a multi-stage sampling technique was used for household surveys focused on solid waste management and green space governance. Addis Ababa was selected due to its high urban waste generation and significant challenges related to green space accessibility and management. Specific sub-cities and Woredas were chosen based on both waste accumulation issues and the difficulties faced in maintaining and developing green spaces. Surveys gathered quantitative data on household characteristics, waste generation and disposal methods, and attitudes towards waste and green space management. A pilot test refined the data collection tool. Additionally, expert interviews and purposive sampling were used to explore gender mainstreaming within environmental entities, with the snowball sampling technique

facilitating the inclusion of 20 specialists through referrals. This approach provided domain-specific knowledge and revealed professional networks. The study examined the contributions of six pivotal environmental organizations in Addis Ababa to ecological preservation, sustainability, and aesthetic enhancement. Document analysis of key legal documents and regulatory proclamations, such as Proclamation No. 300/2002 on Environmental Pollution Control and Proclamation No. 513/2007 on Solid Waste Management, further enriched the data, providing a detailed examination of the legislative framework guiding environmental policy and practice in the city.

1.8.6. Methods of Data Analysis

The data analysis for this study on urban environmental governance in Addis Ababa utilized both qualitative and quantitative methods to offer a comprehensive exploration of environmental policies, governance frameworks, and legal enforcement. For the qualitative data, thematic analysis, content analysis, contextual comparison, and document analysis were employed. Thematic analysis helped identify key recurring themes such as governance challenges, stakeholder engagement, policy gaps, and enforcement mechanisms. Content analysis was applied to extract relevant information from interviews and stakeholder inputs, providing deeper insights into the institutional dynamics. Contextual comparison allowed for the evaluation of governance practices in Addis Ababa against similar strategies from other cities, identifying best practices. Document analysis focused on reviewing policies, strategic plans, and literature to validate the study's findings. To ensure credibility, triangulation was employed, considering multiple perspectives and integrating quotations from interviews to construct a coherent narrative.

For the quantitative data, descriptive and inferential statistics, including Chi-square tests and regression models, were used to analyze household surveys on solid waste management and green space governance, employing STATA software (version 17). Descriptive statistics provided an overview of the data, revealing key trends and patterns. Inferential statistics, specifically Chi-square tests, were applied to examine relationships between variables. Binary logistic regression models were used to identify factors influencing green space governance effectiveness, while multinomial logistic regression models identified key determinants of solid

waste management practices. This combined analytical approach ensured a thorough examination of the data, enhancing the reliability and depth of the study's findings. By integrating both qualitative and quantitative methods, the study provided nuanced insights and a well-rounded analysis of urban environmental governance in Addis Ababa.

1.8.7. Ethics of the Study

The ethical considerations for this study on urban environmental governance in Addis Ababa were meticulously planned to ensure the integrity, transparency, and ethical conduct of the research process. Adhering to ethical guidelines was paramount to protect the rights, privacy, and well-being of all participants involved. Informed consent was obtained from all participants before their involvement in the study, with comprehensive information provided about the research objectives, methods, potential risks, and benefits. Participants were assured that their participation was voluntary and that they had the right to withdraw from the study at any time without any consequences. Written consent forms documented their agreement to participate. The confidentiality and anonymity of participants were strictly maintained throughout the study. Personal identifiers were removed from all data, and pseudonyms were used in place of actual names. Data was securely stored, and access was limited to the research team to ensure privacy protection. The principle of non-maleficence, which emphasizes "not harm," was a core ethical consideration in this study.

Efforts were made to minimize any potential risks or discomfort to participants, with the study design and data collection methods carefully evaluated to avoid causing physical, psychological, or social harm. The study aimed to maximize benefits for participants and the broader community by addressing critical issues in urban environmental governance. The research sought to provide valuable insights and recommendations that could contribute to improved policies and practices, with a focus on enhancing environmental sustainability, public health, and social equity. Respect for persons was upheld by recognizing the autonomy and dignity of all participants. They were treated with respect, and their perspectives and experiences were valued. Special attention was given to ensure that marginalized groups, such as women and low-income residents, were included and their voices were heard. The principles of equity and justice guided the selection of participants and the distribution of the study's benefits. Efforts were made to

ensure that the study did not disproportionately burden any particular group and that the benefits of the research were equitably shared.

The inclusion of diverse participants aimed to ensure that the findings were representative and relevant to the broader community. The research process was conducted with transparency and accountability. Participants were informed about the study's progress and outcomes, and the research team adhered to ethical guidelines and institutional review board (IRB) requirements. Any conflicts of interest were disclosed, and ethical dilemmas were addressed promptly and appropriately. By adhering to these ethical principles, the study ensured the protection of participants' rights and well-being while contributing valuable insights to the field of urban environmental governance. The commitment to ethical conduct was fundamental to the study's integrity and the trustworthiness of its findings.

1.9. Structure of the Dissertation

This dissertation, titled "Urban Environmental Governance in Addis Ababa, Ethiopia: Strategies, Challenges, and Opportunities," provides a detailed examination of the governance frameworks, institutional structures, and practices influencing urban environmental policies in Addis Ababa. The research aims to uncover the determinants of effective governance in urban green spaces, solid waste management, and gender involvement in decision-making processes. The dissertation is structured into six chapters, each contributing to a comprehensive understanding of multilevel governance in the context of Addis Ababa.

Chapter 1: Introduction The introductory chapter sets the stage by outlining the significance of the study and its relevance to the urban environmental challenges faced by Addis Ababa. It presents the research questions, objectives, and the scope of the study. The chapter also introduces the concept of governance and its importance in addressing urban environmental issues. The chapter reviews existing literature on urban environmental governance, with a particular focus on multilevel governance frameworks. It covers theories, policy frameworks, and case studies from various cities globally. The literature review identifies gaps in current research, particularly regarding the interaction between different governance levels and their impact on environmental policies in Addis Ababa. Additionally, the methodology chapter details the research design and methods used to conduct the study. It explains the qualitative and

quantitative approaches, including case study analysis, surveys, and interviews with key stakeholders in Addis Ababa. The chapter also discusses data collection procedures, sample selection, and analytical techniques used to ensure the robustness and reliability of findings.

Chapter 2: Governance Frameworks and Institutional Structures This chapter analyzes the frameworks and institutional structures urban environmental policies in Addis Ababa. It examines the roles and interactions of local, regional, and national authorities, as well as community groups. The chapter highlights the strengths and weaknesses of the current governance structures and suggests areas for improvement.

Chapter3: Practices and Factors Influencing Solid Waste Management.This chapter analyzes the practices and factors influencing solid waste management among urban households in Addis Ababa. It examines the effectiveness of current waste management policies and the role of different governance levels in implementing these policies. The chapter also discusses the challenges and opportunities for improving solid waste management practices in the city.

Chapter 4: Key Determinants of Urban Green Space Governance Focusing on urban green spaces, this chapter identifies the key determinants contributing to effective governance in Addis Ababa. It discusses issues such as policy coherence, resource allocation, stakeholder engagement, and community participation. The chapter also provides case studies of successful green space initiatives in the city.

Chapter 5: Gender Involvement in Urban Environmental Governance. This chapter evaluates the status of gender involvement in setting goals and decision-making processes within urban environmental governance in Addis Ababa. It explores the barriers to gender inclusion and the impact of gender-sensitive policies on environmental outcomes. The chapter also highlights successful examples of gender-inclusive governance practices.

Chapter 6: Synthesis The synthesis chapter integrates findings from previous chapters to provide a comprehensive understanding of multilevel urban environmental governance in Addis Ababa. It identifies common themes, patterns, and variations in governance approaches and evaluates their effectiveness in achieving environmental goals. The chapter concludes with a summary of the key findings and contributions of the dissertation, highlighting the original contributions to the literature. It also provides practical recommendations for policymakers, practitioners, and researchers on enhancing multilevel governance for sustainable urban development in Addis Ababa and similar contexts.

CHAPTER TWO

2. Analyzing Environmental Policy Frameworks and Institutional Structure in Addis Ababa, Ethiopia

Abstract

This study explores environmental policy frameworks and institutional structure in Addis Ababa using a rigorous qualitative framework. Its comprehensive methodology includes an extensive literature review, expert interviews, comparative analysis, and document analysis. The aim is to examine environmental governance amid rapid urbanization and development pressures. Insights from key informant interviews with 20 experts illuminate various facets of environmental governance, including policy evolution, the effectiveness of environmental laws, institutional arrangements, implementation challenges, public participation, and capacity-building initiatives. Findings highlight a comprehensive environmental policy framework targeting holistic sustainability, spanning objectives related to public health, climate resilience, and sustainable development. However, challenges persist in policy implementation due to resource constraints and stakeholder engagement disparities. While environmental laws exist, enforcement and monitoring mechanisms face limitations, contributing to gaps in the legal framework. Institutional arrangements exhibit diversity but overlapping mandates and coordination deficiencies. Barriers to implementation include limited resources, inconsistent project prioritization, and fragmented monitoring. Public participation lacks genuine influence, impeding effective governance. Capacity-building efforts encounter obstacles like financial constraints and inconsistent training programs. The study emphasizes the significance of tackling these challenges to drive Addis Ababa towards sustainable environmental governance, with proposed strategies including improving inter-agency coordination, boosting funding, and promoting inclusive stakeholder engagement.

Keywords: environmental governance; policy implementation; stakeholder engagement; sustainable development.

2.1. Introduction

Environmental governance is crucial in tackling contemporary environmental issues in urban areas, encompassing policy formulation, implementation, and enforcement alongside institutional mechanisms (Gibbs & Jonas, 2000; Newig & Fritsch, 2009). These frameworks aim to guide sustainable management of environmental resources while balancing socio-economic development and environmental conservation. In Addis Ababa, Ethiopia's capital, rapid urbanization and population growth have intensified environmental pressures, necessitating effective governance structures to achieve sustainable development goals. The significance of environmental governance lies in its ability to harmonize economic growth with environmental protection objectives (Conca, 2015). Through clear policies, regulations, and institutional mechanisms, governance frameworks shape decision-making processes and resource allocation towards sustainable environmental management (Ogunkan, 2022a). In Addis Ababa, environmental governance initiatives are pivotal in addressing urban environmental issues such as air and water pollution, waste management, and deforestation (DIBIA et al., 2017). The fundamental objective of environmental governance policies and institutions is to advance environmental sustainability, mitigate environmental degradation, and uphold principles of environmental justice (Paavola, 2007). Effective governance frameworks strive to achieve these goals by integrating environmental considerations into urban planning, infrastructure development, and resource management practices.

Environmental governance contrasts globally due to diverse political, social, and environmental contexts (Biermann & Pattberg, 2008). While numerous nations claim well-established governance structures underpinned by solid legal systems and capable institutions, others grapple with issues such as ineffective enforcement, insufficient resources, and a lack of widespread civic engagement (Biermann et al., 2017; Siegel & Bastos Lima, 2020). In nations that are still developing, such as Ethiopia, the management of environmental concerns is particularly challenging due to limited resources, institutional weaknesses, and the need to balance this with other development goals (Abegaz et al., 2021). Despite these challenges, there is a growing recognition of the critical importance of environmental governance in promoting sustainable development and combating ecological deterioration. Various studies of environmental governance expose common gaps and challenges. A study by Calliari et al. (2022) emphasizes

the importance of effective policy implementation and stakeholder engagement, pointing out instances where insufficient enforcement mechanisms and limited public involvement hinder progress.

Similarly, Di Gregorio et al. (2019) advocate for integrated approaches to address complex environmental issues, emphasizing the importance of multi-level governance structures and collaboration across sectors. Numerous studies have delved into environmental governance in Addis Ababa, exposing shortcomings in policy implementation, institutional capabilities, and stakeholder participation (Mohamed et al., 2020). However, there remains a pressing need for comprehensive research to address these gaps and enhance the effectiveness of governance initiatives in the city. Studies conducted by Lema et al. (2019a) in Addis Ababa revealed substantial gaps in environmental governance. These studies identified inconsistencies within the city's environmental policy framework, particularly in translating policy goals into practical strategies. The study aims to evaluate environmental governance in Addis Ababa, Ethiopia, by examining policy objectives, legal structures, institutional setups, and challenges in implementation, stakeholder involvement, and efforts to enhance capacity. Through this analysis, the study seeks to contribute to the formulation of more effective governance approaches to address environmental issues and foster sustainable urban development. Its goal is to discern strengths, weaknesses, gaps, and opportunities across key thematic areas, offering insights to guide policy recommendations aimed at enhancing environmental sustainability in the city.

2.2. Materials and methods

2.2.1. Method of Data Collection

The methodological approach of this study was designed to capture the intricate landscape of environmental policy in Addis Ababa through a rigorous qualitative framework. At the foundation of the study was an exhaustive literature review, which involved an in-depth examination of a spectrum of sources including peer-reviewed academic articles, official governmental reports, policy briefs, and international organizational documents. This documentary analysis laid the groundwork for a comprehensive understanding of the historical and current policy frameworks. The study relies on interviews with key informants as its primary means of data collection, facilitating a deep dive into perspectives and experiences regarding

Policy Frameworks and Institutional Structures. Semi-structured interviews are utilized to maintain both consistency and adaptability, enabling open-ended inquiries and a comprehensive examination of participants' individual experiences.

This qualitative methodology is vital in qualitative research as it facilitates the acquisition of detailed insights from individuals with informed perspectives and direct involvement in the subject under investigation (Marshall, 1996). The semi-structured format of these interviews proves valuable by providing a framework for the discussion while allowing for a natural flow of conversation. This approach facilitates the emergence of new lines of inquiry based on the narratives shared by respondents (Dicicco-Bloom, B. and Crabtree, B.F., 2006). Key informant interviews provide a nuanced perspective on complex issues like analyzing Policy Frameworks and institutional Structures, offering insights that quantitative methods may overlook (Kumar, K., 1989).

Additionally, the study employed a comparative analytical method, drawing insights from case studies of renowned cities like Curitiba and Copenhagen, known for their advanced environmental governance. These comparisons served as a benchmark to assess Addis Ababa's policies, identifying areas for improvement. Field observations were integral, offering firsthand insights into policy implementation across various urban areas, including waste management centers, pollution control sites, and green spaces. Furthermore, a thorough document analysis was conducted, examining key legal documents and regulatory proclamations relevant to environmental governance, such as Proclamation No. 300/2002 on Environmental Pollution Control and Proclamation No. 513/2007 on Solid Waste Management. This analysis offered a detailed examination of the legislative framework guiding environmental policy and practice in Addis Ababa.

2.2.2. Selection of key informants

The methodology employed a qualitative framework, leveraging expert interviews and purposive sampling to probe Sustainable Urban Environmental Governance Landscape: Analyzing Policy Frameworks and Institutional Structures in Addis Ababa. This approach ensured the selection of individuals possessing in-depth knowledge pertinent to the subject. The snowball sampling

technique further enriched the research by revealing professional networks, thereby deepening the qualitative insights (Vogl, 2022). Utilizing this method, the study engaged 20 specialists through referrals, beginning with institutional heads or acknowledged experts, which underlined the efficacy of the snowball technique in accessing domain-specific knowledge. The selection of 20 experts was intentional, balancing the need for comprehensive insights with practical constraints; this sample size was sufficient to reach data saturation, where no new significant information emerged from further participants. Furthermore, a smaller sample allowed for more focused, in-depth interviews, ensuring high-quality, and nuanced perspectives from highly knowledgeable and well-connected experts. The investigation concentrated on six pivotal environmental organizations in Addis Ababa. These institutions were selected for the study due to their central roles in managing and implementing environmental policies in Addis Ababa. Each institution focuses on a distinct aspect of urban sustainability, such as environmental protection, waste management, climate resilience, and urban agriculture, offering a comprehensive view of the city's environmental governance. Together, their efforts are vital for assessing the effectiveness of governance in addressing urban environmental challenges and promoting sustainability (Table 1).

Table 2.1. Key environmental and urban development institutions and their roles in Addis Ababa, Ethiopia.

Institution Name	Description
Addis Ababa Environmental Protection Authority (AAEPA)	Responsible for overseeing the protection and improvement of the environment in Addis Ababa. This includes monitoring environmental pollution, enforcing environmental laws, and promoting sustainable environmental practices.
Ministry of Urban Development and Construction (MUDC)	Tasked with formulating and implementing policies related to urban development and construction. This includes urban planning, infrastructure development, building regulation, and the enhancement of urban living conditions.
Addis Ababa City Government Farmers and Urban Agriculture Development Commission	Focused on the development of urban agriculture, support for city farmers, and ensuring food security within the city. They work towards integrating agricultural practices into the urban setting for local food production and greening strategies.
Addis Ababa Solid Waste Management Agency	This agency is responsible for the collection, transportation, and disposal of the city's solid waste, and plays a crucial role in maintaining the city's cleanliness and hygiene.
Addis Ababa Resilience project office	Operates with the goal of strengthening the city's resilience to physical, social, and economic challenges. This includes planning for disaster risk reduction, climate change adaptation, and ensuring sustainable urban development.
The Ministry of Environment, Forest, and Climate Change (MEFCC) in Addis Ababa, Ethiopia	Oversees the protection and conservation of forests, the management of climate change issues, and the implementation of environmental policies at a local level. They are involved in climate change mitigation, reforestation projects, and safeguarding biodiversity.

Source: The respective institutions, 2023.

2.2.3. Methods of Data Analysis

The study titled Analyzing Policy Frameworks and Institutional Structures in Addis Ababa's Urban Environmental Governance Landscape employs a thorough qualitative analysis approach to explore environmental policy, governance frameworks, and legal enforcement. This method integrates thematic analysis, content analysis, contextual comparison, and document analysis to capture the intricate nature of urban environmental governance. Thematic analysis organizes data to uncover recurring themes such as governance challenges, stakeholder engagement, policy gaps, and enforcement mechanisms. Content analysis extracts relevant information from interviews and stakeholder statements, providing deeper insights. Contextual comparison examines similar strategies in other cities to identify best practices. Document analysis reviews literature and policy documents to validate findings. Data interpretation analyzes themes within the broader context of environmental governance. Triangulation enhances credibility by considering multiple perspectives. Quotations and narrative construction integrate insights, constructing a coherent narrative.

2.4. Result and Discussion

2.4.1. Environmental Policy and Governance

The environmental governance framework of Addis Ababa has experienced notable changes to attain sustainability and resilience in urban settings. This transformation marks a shift from an initial focus on immediate environmental health concerns to a comprehensive approach that incorporates the enhancement of public health, promotion of sustainable socioeconomic development, and proactive measures for climate change mitigation (Degefu, 2021; Mitike et al., 2016). The formation of the AAEPA during the 1990s marked a significant achievement in the city's history of environmental policy. This revolutionary contributed to the creation of a forceful legislative framework (Allen, 2002). Ethiopia adopted its Environmental Policy in 1997, which served as a fundamental guideline for the responsible management and governance of the environment. This policy approach embraced a holistic perspective, recognizing the interdependence between environmental well-being and the broader socio-economic ecosystem (FAO, 2023).

Ethiopia has embraced forward-thinking strategies, like the Climate-Resilient Green Economy (CRGE) initiative introduced in 2011, aligning with international best practices. This strategy highlights Ethiopia's commitment to incorporating environmental sustainability into its developmental agenda, displaying a clear understanding of global environmental priorities and the role of urban centers in addressing them. The CRGE initiative showcases Addis Ababa's efforts to synchronize its policies with the worldwide shift towards sustainability and climate resilience, positioning the city as an active participant in the global environmental conversation (Abab, 2016).The environmental policy framework of Addis Ababa addresses multifaceted challenges of urban sustainability. Key areas include waste management, which is pivotal in mitigating the adverse effects of improper waste disposal on public health and ecosystems (A. Eshete et al., 2024). Urban greening initiatives enhance urban biodiversity and provide green spaces for residents (Oikonomaki et al., 2024). For example, the Sheger Park project has significantly increased green spaces, contributing to urban cooling and community well-being. The city's dedication to adapting to the adverse effects of climate change and ensuring sustainable urban development is evident in the resilience strategies outlined in the policy (Rezvani et al., 2023).

Additionally, measures to control pollution actively contribute to preserving the quality of air and water, prioritizing public health (Kjellstrom et al., 2006). Implementation of air quality monitoring stations throughout the city has significantly enhanced pollution management, demonstrating the tangible impact of concrete actions on public well-being. In Addis Ababa, the process of formulating policies is designed to be inclusive, engaging multiple stakeholders such as government entities, non-governmental organizations, community representatives, and industry experts. This collaborative approach ensures a well-rounded and effective environmental policy by considering diverse perspectives. However, there are inequalities in stakeholder involvement, with certain groups providing minimal input due to various obstacles like limited resources, restricted access to information, or inadequate outreach efforts (Mitike et al., 2016). Addressing these disparities is crucial to guarantee that environmental policies align with the collective vision for a sustainable urban future.

Addis Ababa's environmental strategy aligns ambitiously with national and international sustainability standards, aiming to achieve significant objectives such as a 30% decrease in carbon emissions by 2030, the establishment of comprehensive waste management systems, and the promotion of sustainable urban development (UN, 2015). These goals reflect a strong commitment to environmental stewardship and the global urgency to combat climate change and environmental degradation. For example, the city's emphasis on meeting the targets of the Paris Agreement demonstrates its focus on reducing greenhouse gas emissions.

While it is commendable to set such ambitious targets, their success largely depends on the effectiveness of institutional frameworks and the involvement of stakeholders. An important challenge in implementing Addis Ababa's environmental policy is the disconnect between the policy's ambitious objectives and the capabilities of the ecological institutions responsible for their implementation (Alemayehu et al., 2019). These institutions require adequate resources, a skilled workforce, and appropriate legal and administrative tools to put the policies into practice effectively. Additionally, limited engagement with stakeholders, particularly at the community level, hinders the successful execution of these policies (Martín-de Castro et al., 2016). Involving local communities, businesses, and civil society organizations in decision-making and implementation processes is crucial to ensure that the policies are feasible and culturally relevant. There is a significant deficiency in vigorous mechanisms for monitoring and evaluating progress toward environmental goals. The current systems do not adequately track and report on environmental objectives, impeding the ability to identify deficiencies and adjust strategies effectively. Comprehensive monitoring frameworks that measure progress and the impact on environmental justice, social equity, and resilience are essential to ensure policies benefit all segments of society.

Key advisors and experts from institutions like the Addis Ababa Environmental Protection Authority and the Ministry of Environment, Forest, and Climate Change (MEFCC) stress the various goals of environmental policy. These goals include promoting sustainable urban development, conserving biodiversity, controlling pollution, and mitigating climate change, to achieve a balance between economic growth and environmental preservation. This approach demonstrates Addis Ababa's commitment to meeting sustainable development goals (SDGs) and

the targets set in the Paris Agreement. Advisors highlight that environmental policy development is an ongoing process, adapting to new environmental challenges and global commitments. Despite significant progress, there are still significant gaps, particularly in involving and engaging a diverse range of stakeholders in the policy-making process. Challenges identified by experts include limited public involvement, the underrepresentation of marginalized groups, and insufficient dialogue with community organizations. It is crucial to strengthen participatory processes and ensure a wider range of voices are included in policy-making. Additionally, there is a need for capacity-building initiatives to provide local actors with the necessary knowledge and tools for effective engagement in environmental governance. When examining the approaches of Addis Ababa, Nairobi, and Lagos in dealing with environmental concerns, it becomes apparent that effective measures such as waste management programs driven by the community and initiatives promoting green spaces in urban areas are implemented. These comparisons offer valuable insights into innovative solutions and best practices that can guide the development of strategies to tackle common challenges faced in managing urban environments.

The findings on Addis Ababa's environmental governance can be understood through Structuration Theory and Environmental Justice Theory, which offer insights into the dynamics of policy formulation and implementation. Structuration Theory emphasizes the interplay between human agency and institutional structures, highlighting how the capacity of environmental institutions and stakeholder involvement shape policy outcomes. Challenges such as limited community engagement and institutional constraints reflect the dual role of structure and agency, where local actors are simultaneously constrained and empowered by the existing governance frameworks.

Environmental Justice Theory complements this by addressing disparities in stakeholder participation, especially among marginalized groups, and advocating for the equitable distribution of environmental benefits and burdens. The identified gaps in inclusivity and transparency in Addis Ababa‘s environmental governance reflect a need for justice-oriented approaches that ensure vulnerable populations have a voice in policy development and implementation. Strengthening inclusive policies and frameworks will allow for a more equitable distribution of environmental benefits and promote a sustainable urban future for all residents.

2.4.2. Legal Framework and Enforcement

The Addis Ababa administration enforces several environmental regulations, including Proclamation No. 300/2002 on Environmental Pollution Control and Proclamation No. 513/2007 on Solid Waste Management. These laws are integral to Ethiopia's overall environmental legislation, emphasizing a thorough approach to managing pollution and waste. Recent legislative efforts, such as the Urban Greenery, Parks, and Recreational Areas Development Proclamation, concentrate on urban greenery, air quality, and water quality, reflecting a growing awareness of environmental issues in urban areas. Although the laws for protecting the environment in Addis Ababa seem strong, they often face challenges when it comes to actually putting them into action.

However, many experts recognize that these environmental laws have had a positive effect. One expert pointed out that laws meant to reduce pollution and manage waste have improved the air and water. This finding aligns with Mitike et al.(2016) and Száraz (2014) which show a decline in air pollution levels due to stringent environmental regulations. Additionally, recent initiatives, such as the Urban Greenery, Parks, and Recreational Areas Development Proclamation, reflect a growing commitment to regulating green spaces and air quality, demonstrating the municipality's dedication to environmental protection. Despite positive aspects, the study exposed significant challenges and gaps in the effectiveness of environmental laws in Addis Ababa. Experts emphasized the lack of strong enforcement mechanisms as a significant weakness. One expert from the Addis Ababa Resilience Project office expressed:

"There is a discrepancy between the legal provisions and their implementation. Environmental regulatory bodies are experiencing a deficiency in vital resources and personnel necessary for effectively enforcing environmental laws".

The study by (Mitike et al., 2016) corroborates these challenges, identifying resource limitations and a shortage of qualified personnel as barriers to effective enforcement. The study also identified overlapping mandates among regulatory agencies as another inconsistency in the legal framework. This fragmentation leads to inefficiencies and regulatory loopholes, hindering

effective environmental governance. A supervisor from the Addis Ababa Solid Waste Management Agency noted:

"There is a lack of coordination among relevant institutions, resulting in duplication of efforts and conflicting regulatory measures".

Concerns were also raised about the inadequacy of penalties for environmental violations, which undermines the deterrent effect of the legal framework. Existing penalties are often seen as lenient and fail to deter polluters effectively. One expert from Addis Ababa City Government Farmers and Urban Agriculture Development Commission stated, "The penalties for environmental violations are not commensurate with the gravity of the offenses. This encourages non-compliance and undermines the rule of law." Furthermore, the study showed a deficiency in meaningful public involvement and stakeholder engagement throughout the development and implementation of environmental legislation. This deficiency limits the legal framework's efficacy in addressing community concerns and ensuring accountability. An expert stressed, "It's essential to engage communities and stakeholders in decision-making processes to ensure that environmental laws resonate with local realities and meet community needs." Despite these obstacles, some experts acknowledged regulatory agencies' endeavors to enforce environmental legislation in Addis Ababa. They highlighted regular inspections by environmental authorities to monitor compliance with regulations. A department head from the Environmental Protection Authority of Addis Ababa (AAEPA), remarked:

"*Environmental agencies conduct routine inspections of industrial facilities and waste disposal sites to ensure adherence to environmental laws*".

Nevertheless, significant weaknesses and gaps persist in enforcing and overseeing environmental legislation in Addis Ababa. A key challenge is the limited capacity and resources of regulatory agencies responsible for enforcement. Experts pointed out a shortage of trained personnel and technical proficiency as obstacles to effective enforcement. Moreover, concerns arose regarding the inconsistent application of sanctions for environmental breaches. Professionals observed instances where offenders received lenient penalties or evaded punishment altogether,

undermining the deterrent effect of environmental regulations and diminishing public confidence in the legal framework. Another gap identified in enforcing and overseeing environmental laws is the limited involvement of the public in decision-making processes. Experts stressed the significance of community engagement and stakeholder participation in environmental governance. However, they observed that public involvement is often superficial and lacks substantive input into policy development and enforcement activities. They also called for improved access to information regarding environmental laws, enforcement actions, and compliance status to bolster accountability and trust in the regulatory process. Experts proposed several measures to enhance compliance with environmental regulations in Addis Ababa. One such measure involves the regular implementation of inspections by environmental regulatory agencies. These inspections serve to monitor adherence to environmental laws and identify instances of non-compliance.

As highlighted by key experts, routine inspections of industrial facilities and waste disposal sites are conducted to ensure compliance with environmental regulations. Additionally, engaging stakeholders and involving the community are essential strategies for promoting compliance with environmental regulations. By involving stakeholders, regulatory agencies can raise awareness about environmental laws and cultivate a sense of responsibility among both industry stakeholders and the general public. According to some experts, consulting with stakeholders is crucial for gaining support from industry stakeholders and ensuring adherence to environmental regulations.

To provide a broader perspective, it may be beneficial to compare Addis Ababa's approach with other cities that have successfully enforced similar environmental laws. For example, cities like Curitiba in Brazil and Copenhagen in Denmark have implemented comprehensive environmental regulations and strong enforcement mechanisms, leading to significant improvements in urban sustainability. These cities have invested in institutional capacity, community engagement, and strict penalty systems, which could serve as models for Addis Ababa.

These challenges align with Structuration Theory, which underscores institutional limitations as barriers to effective governance, while Environmental Justice Theory emphasizes equitable community involvement in the regulatory process. Both theories stress the need for enhanced

institutional capacity and inclusive engagement to achieve effective, just environmental governance.

Enhancing the capacity of enforcement agencies by providing adequate resources, training, and technical expertise is crucial. This includes increasing the number of qualified personnel and improving the availability of necessary equipment for inspections. Establishing a centralized coordination body to streamline efforts among various regulatory agencies can reduce duplication and conflicting measures. This body should facilitate inter-agency communication and collaboration.

Revising the penalties for environmental violations to ensure they are commensurate with the severity of the offenses would provide a stronger deterrent against non-compliance. Fostering meaningful public participation in the development and implementation of environmental laws involves engaging communities and stakeholders in decision-making processes and ensuring transparency in enforcement actions and regulatory decisions. Implementing regular and systematic inspections of industrial facilities and waste disposal sites, with well-documented findings made publicly accessible, can enhance accountability. Conducting regular stakeholder consultations to raise awareness about environmental laws and foster a sense of responsibility among industry players and the public can be achieved through public forums, workshops, and educational campaigns.

2.4.3. Institutional Arrangements

Addis Ababa's environmental governance involves various institutions, including the Environmental Protection Authority of Addis Ababa (AAEPA), the Addis Ababa City Administration, the Ministry of Urban Development and Construction (MUDC), Addis Ababa River Basin and Green Area development and Administration Agency, NGOs, and community associations. Experts describe a hierarchical structure with national policies implemented locally, though overlapping mandates sometimes cause confusion. The MUDC ensures urban planning integrates environmental concerns, collaborating closely with the city administration. Despite distinct mandates, there's overlap, notably in environmental impact assessment and urban planning, where both the city and AAEPA conduct assessments, leading to duplicated efforts. Waste management and pollution control pose challenges due to overlapping influence between

AAEPA and MUDC, resulting in bureaucratic inefficiencies. This duplication of efforts hampers effective resource utilization, as noted by environmental researchers.

Conversely, gaps were identified, particularly in areas such as climate change adaptation and sustainable transportation, where efforts are fragmented and lack centralized coordination. These structural deficiencies hinder comprehensive and integrated approaches to environmental governance. The AAEPA is chiefly responsible for setting environmental standards, monitoring compliance, and executing enforcement measures. Experts from the AAEPA stressed their pivotal role in pollution control and ecosystem management. In contrast, the MUDC's role is more focused on ensuring that urban development projects adhere to sustainable practices, as elucidated by a senior urban planner, ―Our mandate is to green the cityscape, ensuring that all new constructions are environmentally sound."

One expert from the Environmental Protection Authority noted, "While our mandate is clear on paper, the overlap with other agencies can create confusion in practice". The Ministry of Urban Development and Construction was frequently mentioned as having a significant role in ensuring that urban planning incorporates environmental considerations. Despite the existence of formal mechanisms for collaboration, such as inter-agency committees, experts express concerns regarding the consistency and effectiveness of these collaborations. A department head at the Addis Ababa City Government Farmers and Urban Agriculture Development Commission remarked, "While we often have the same goals, there is a lack of synchrony in our actions and a need for a unified environmental task force." Collaboration among institutions is often project-based and ad hoc, as emphasized by several participants. A member of the Association for Public Awareness (APA) noted, "We collaborate when urgent issues arise, but there's no sustained mechanism for ongoing partnership." Nonetheless, successful collaborations, particularly in community engagement and awareness programs, have been observed. Inter-institutional collaboration is recognized as both strength and a challenge. While initiatives like the 'Addis Ababa: A City of Green' campaign demonstrate effective collaboration, challenges persist in communication and aligning interests. A supervisor from AAEPA remarked, "Inter-departmental communication can be challenging, and competitive interests sometimes hinder collective action."

Comparing Addis Ababa's governance with cities like Singapore, which has an integrated approach to environmental management, highlights the importance of strong coordination between agencies and public engagement. Singapore's success is largely attributed to a centralized vision that aligns all institutions toward common sustainability goals. The evidence from expert interviews suggests that Addis Ababa could benefit from consolidating overlapping functions and filling institutional gaps, particularly in climate change adaptation and biodiversity conservation. Some key experts suggested, "A centralized environmental database would greatly enhance evidence-based policy-making and inter-agency coordination." These suggestions are supported by similar findings in the literature.

For instance, a study Oosterveer (2009) emphasizes the need for institutional clarity in urban environmental management in East Africa to prevent redundancy and inefficiency. Additionally, Rahimi et al. (2024) highlight that effective environmental governance is often tied to fit inter-institutional networks, advocating for a collaborative approach. Expert interviews provide valuable insights into the institutional framework for environmental governance in Addis Ababa. The Structuration Theory helps illuminate this point, as it suggests that while institutional structures create frameworks for governance, the overlap and fragmented mandates identified may constrain agency and efficient action. Addressing the identified gaps and fostering a collaborative culture could greatly enhance the effectiveness of these institutions in promoting sustainable urban development.

2.4.4 Implementation of Policy

The study of challenges in implementing environmental policies in Addis Ababa revealed several significant obstacles. A primary issue is the lack of coordination among various governmental and non-governmental entities responsible for policy implementation. A department head from the Environmental Protection Authority remarked, "The fragmented nature of responsibilities among different agencies often leads to overlaps, gaps, and conflicting priorities, hindering effective policy implementation." Additionally, bureaucratic hurdles, limited institutional capacity, and inadequate enforcement mechanisms were cited as major barriers to policy implementation. Experts across institutions have raised concerns about the insufficient allocation

of resources for implementing environmental policies. Although there are budgetary provisions for environmental projects and programs, these funds are often inadequate to address the diverse and complex environmental challenges facing Addis Ababa. A supervisor from The Ministry of Environment, Forest, and Climate Change (MEFCC) in Addis Ababa, stated, "Limited financial resources constrain our ability to fully implement environmental policies and initiatives, resulting in suboptimal outcomes."

The lack of dedicated funding streams and competing priorities further exacerbate resource constraints, undermining the effectiveness of policy implementation efforts (Eriksen et al., 2021). The prioritization and funding of environmental projects and programs in Addis Ababa often lack a systematic and transparent process. Decision-making is influenced by various factors, including political considerations, stakeholder interests, and donor priorities, rather than evidence-based assessments of environmental needs and impacts. Experts from various institutions noted, "Environmental projects are sometimes prioritized based on short-term political gains or donor preferences, rather than long-term sustainability and impact." This ad-hoc approach to prioritization and funding allocation leads to inefficiencies and inequities in resource distribution, limiting the effectiveness of environmental interventions.

The implementation of environmental policies in Addis Ababa faces various obstacles, including fragmented monitoring systems and insufficient evaluation methods that primarily focus on output rather than actual environmental impacts (Mohamed et al., 2020). To tackle these challenges, experts suggest several strategies. Firstly, there's a call for better coordination among stakeholders to avoid redundancy and maximize resource utilization, possibly through the creation of collaborative platforms. Secondly, there's a need to secure more funding domestically and through international partnerships to support environmental initiatives adequately. Thirdly, decision-makers should prioritize evidence-based approaches and invest in robust monitoring systems to track policy progress effectively. The challenges in policy implementation in Addis Ababa align with Structuration Theory by highlighting how fragmented institutional structures and limited coordination constrain effective policy execution, while the actions of key stakeholders, such as the need for better collaboration, demonstrate agency in overcoming these structural barriers. Environmental Justice Theory is reflected in the inequitable resource distribution and prioritization of short-term political gains, which disproportionately affect

marginalized communities, emphasizing the need for fairer and more inclusive environmental policies to ensure sustainability and equity in governance.

2.4.5 Public Participation

Several experts have underlined the presence of formal mechanisms for stakeholder engagement, such as public hearings, stakeholder forums, and advisory committees. These structures aim to facilitate input from a range of stakeholders, including the public, regarding environmental policies and projects. A representative from the Addis Ababa Environmental Protection Authority highlighted the establishment of public hearings and forums for gathering stakeholder input on significant environmental initiatives. Similarly, Supervisor from the Ministry of Environment, Forest, and Climate Change emphasized the inclusion of representatives from various sectors in advisory committees to ensure diverse viewpoints are considered. Various experts criticize stakeholder engagement processes as tokenistic, lacking genuine influence on decision-making. Supervisors and key experts expressed dissatisfaction, noting that consultation forums often marginalize voices, with decisions made disregarding perspectives. Supervisors and department heads from the Addis Ababa Resilience project office resonated this sentiment, observing that consultations often serve procedural rather than substantive purposes.

Barriers to effective stakeholder engagement include power imbalances, language barriers, and resource limitations. Academic participants across institutions highlighted the significant gap in influence and resources between government officials and community members, hindering genuine engagement. Additionally, a government official from The Ministry of Environment, Forest, and Climate Change (MEFCC noted language barriers, as many community members struggle to fully participate in consultations due to limited fluency in the official language. Limited financial and human resources further constrain comprehensive stakeholder engagement. Acknowledgment of the importance of incorporating community perspectives into policy formulation and implementation exists, but integration remains limited. Participatory methods like community meetings, focus group discussions, and participatory mapping exercises aim to gather insights from communities on environmental concerns, yet efforts for adequate consideration of community perspectives need improvement, as noted by an expert from the Addis Ababa Solid Waste Management Agency.

Despite concerted efforts, several experts have highlighted challenges in incorporating community perspectives into decision-making processes. A participant from the Addis Ababa Resilience Project office pointed out a discrepancy between rhetoric and reality regarding community participation. Communities often lack the necessary capacity and resources to engage meaningfully, resulting in their perspectives being overlooked in decision-making. Additionally, power imbalances and competing interests among stakeholders can marginalize community voices. Experts also emphasized the disparity between the stated goals of participatory processes and their actual implementation. An environmental activist stressed that while participatory approaches are frequently promoted in policy documents, they are not consistently put into practice. There is a need for a stronger commitment to genuinely value and integrate community input.

The study of stakeholder engagement and consideration of community perspectives in environmental decision-making processes in Addis Ababa reveal significant gaps requiring attention to enhance effectiveness. While the existence of formal engagement mechanisms such as public hearings and stakeholder forums signifies institutional acknowledgment of the importance of stakeholder involvement, the tokenistic nature of participation and barriers to effective engagement undermines their potential benefits. The findings resonate with the broader literature on participatory governance, which emphasizes that meaningful stakeholder engagement is essential for effective decision-making and sustainable development (Wells et al., 2020). Merely seeking stakeholder input without genuinely considering it, known as tokenistic participation, undermines the legitimacy and acceptance of decisions (Reed, 2008), especially in environmental policy contexts where diverse perspectives are vital for tackling complex challenges.

To fill the identified gaps, there's a necessity to strengthen participatory mechanisms, ensuring they're inclusive, accessible, and transparent. This might entail providing communities with capacity-building support, fostering dialogue and collaboration among stakeholders, and embedding participatory processes within decision-making structures. Improving communities' capacity for meaningful engagement in consultations, addressing power imbalances, and overcoming language barriers are crucial steps toward more effective stakeholder involvement.

Integrating community perspectives into policy formulation and implementation is crucial for effective urban environmental governance. Achieving this requires proactive efforts to address power imbalances, foster cultural sensitivity, and allocate resources for meaningful community engagement. By institutionalizing these practices, it is possible to bridge the gap between rhetoric and reality, ensuring that community input is not only solicited but also valued and incorporated into decision-making. Enhancing stakeholder engagement and embracing inclusive approaches are essential for advancing environmental democracy and fostering sustainable development in Addis Ababa. Addressing current deficiencies through more participatory processes will strengthen environmental governance; ensuring decisions reflect the diverse needs and priorities of all stakeholders.

Structuration Theory provides insight into how institutional structures can both enable and constrain stakeholder participation, with power dynamics and resource limitations playing a key role in shaping the scope of engagement. Similarly, Environmental Justice Theory highlights the inequities in participation, particularly for marginalized communities who are often excluded due to power imbalances and language barriers. This highlights the need for more inclusive and equitable engagement strategies that ensure fairness and justice in environmental governance.

2.4.6 Institutional Capacity

Representatives from Addis Ababa's Environmental Protection Authority and the Ministry of Environment, Forest, and Climate Change have shed light on their consistent efforts to train and develop their staff. They emphasized that the trainings are meticulously designed to cover cutting-edge environmental regulations and technological advancements, keeping their workforce up-to-date with international ecological standards and methodologies. Furthermore, they are actively forging alliances with global organizations and local non-profits. A consultant from the Addis Ababa Resilience project office emphasized the value of international collaboration for gaining technical knowledge and financial aid. Such collaborations are pivotal for sharing wisdom and gathering essential resources that are instrumental in building capabilities. Institutions have established specialized units to tackle specific environmental issues. For instance, the Addis Ababa Solid Waste Management Agency has a dedicated department for managing hazardous waste. This specialization enables focused and expert-driven approaches to various environmental challenges. Several experts emphasized the importance of

public awareness campaigns in enhancing environmental consciousness. An expert from Addis Ababa Resilience project office noted, "Our public awareness campaigns have played a vital role in encouraging community engagement in environmental preservation." These campaigns aim to educate the public on the significance of environmental protection and promote sustainable behaviors.

The Ministry of Environment, Forest, and Climate Change has introduced educational initiatives in schools and universities. "Incorporating environmental education into the school curriculum has been a significant stride towards nurturing a culture of environmental responsibility among young people," observed one expert. These endeavors seek to lay a foundation of environmental knowledge from an early age. Despite these efforts, some experts highlighted the irregularity and inconsistency of training programs. "Although training programs are available, they are not consistently conducted or comprehensive, resulting in knowledge and skill gaps," noted an expert from the Addis Ababa Resilience project office. This inconsistency undermines the overall effectiveness of capacity-building endeavors.

Financial limitations were identified as a major obstacle to effective capacity building. "Budget constraints often limit the extent and frequency of our training and awareness initiatives," expressed a participant from the Addis Ababa Solid Waste Management Agency. Insufficient funding hampers institutions' ability to implement and sustain comprehensive capacity-building programs. Experts stressed the necessity of integrating environmental education more effectively into mainstream educational systems. "Environmental education is still not fully integrated into the curriculum of many schools, which restricts the reach and impact of these initiatives," highlighted one expert. Ensuring that environmental education is an integral part of the education system is vital for sustainable governance in Addis Ababa.

Experts within the environmental sector have raised concerns regarding the efficacy of community engagement strategies in Addis Ababa. A representative from the Addis Ababa City Government Farmers and Urban Agriculture Development Commission observed, "Notwithstanding the outreach efforts, a substantial segment of the populace remains aloof from participating in environmental endeavors." It is imperative to enhance community involvement

to ensure the success of environmental programs. A critical review reveals that despite the strides made towards strengthened institutional capacity for environmental management in Addis Ababa, several pronounced deficiencies exist. These include irregularities in educational programs, fiscal restrictions, inadequate incorporation of environmental studies into educational frameworks, and suboptimal community participation. There is a consensus among practitioners that a systematic and consistent approach to training is necessary. Such an approach corroborates with scholarly discourse, which advocates for ongoing professional development as a key component for a proficient environmental governance workforce (Daily & Huang, 2001). Fiscal challenges emerged as a recurrent obstacle, underscoring the necessity for augmented funding and improved allocation of resources. This perspective is supported by research indicating that financial impediments are a principal constraint on effective environmental governance, particularly in developing nations (Lemos & Agrawal, 2006a).

The insufficient integration of environmental education into mainstream education systems underlines a critical gap. The significance of incorporating environmental education from an early age is well-documented, as it nurtures long-term environmental stewardship (O'Neil et al., 2020). Limited community engagement highlights the need for more inclusive and participatory approaches to environmental initiatives. Active community involvement is vital for the success of environmental programs, ensuring local ownership and sustainability of efforts (Muhamad Khair et al., 2020). The findings align with Structuration Theory, as institutional efforts to build capacity are influenced by both enabling structures and constraints, such as inconsistent training programs and limited resources. While commendable progress has been made in building institutional capacity and raising environmental awareness in Addis Ababa, addressing these gaps through strategic policy interventions and sustained efforts is crucial. Strengthening training programs, securing adequate funding, integrating environmental education into the core curriculum, and enhancing community engagement are essential steps to significantly improve the effectiveness of environmental sustainability initiatives in the city.

2.5. Conclusion

The findings of environmental governance in Addis Ababa reveal a complex landscape characterized by both progress and challenges. The city's environmental policy framework demonstrates a commitment to addressing various environmental issues and promoting sustainable development. However, gaps persist in policy implementation due to resource constraints, capacity limitations, and institutional fragmentation. Environmental laws play a crucial role in governing environmental issues in Addis Ababa, but there are gaps and inconsistencies in the legal framework. Enforcement and monitoring mechanisms face challenges, hindering effective compliance with environmental regulations. Institutional arrangements involve multiple entities with defined roles, but overlaps and gaps exist in mandates, impacting coordination and collaboration efforts. Despite some collaboration, more streamlined coordination mechanisms are needed to enhance effectiveness. Policy implementation faces challenges related to resource allocation, prioritization of projects, and monitoring mechanisms. Stakeholder engagement, while recognized, requires improvement to ensure meaningful participation and integration of community perspectives. To address these issues, several recommendations are proposed. Enhancing coordination mechanisms among environmental institutions at both national and municipal levels can minimize overlaps and streamline decision-making processes. Mobilizing resources through increased budgetary allocations and exploring innovative financing mechanisms is essential to ensure adequate resources for policy implementation and capacity building. Improving enforcement and monitoring mechanisms for environmental laws is crucial to ensure compliance and address gaps in implementation. Fostered stakeholder engagement can be achieved through the development of structured mechanisms that promote transparency, accountability, and meaningful participation in decision-making processes. Building institutional capacity through investments in human resources, technical expertise, and organizational infrastructure is vital for strengthening the capacity of environmental institutions. Promoting environmental awareness through targeted campaigns and integrating environmental education into formal curricula can foster a culture of environmental stewardship among residents. Lastly, ensuring coherence and alignment of environmental policies with other sectors such as urban planning and economic development is essential for promoting sustainable urban development. By implementing these recommendations, Addis Ababa can overcome existing challenges and advance its environmental governance agenda, fostering a more sustainable and resilient urban environment for its residents.

CHAPTER THREE

3. Analysis of practices and factors of solid waste management among urban households of Addis Ababa city, Ethiopia

Abstract

The management of solid waste is crucial for urban areas to prevent the spread of diseases, reduce pollution, enhance cleanliness, promote resource recovery, and create employment opportunities. This study aims to examine the practices and factors related to the management of solid waste among urban households in Addis Ababa City, Ethiopia. A survey was conducted with 200 participants from four districts in two sub-cities. The survey utilized questionnaire. The data collected were analyzed using descriptive statistics and the multinomial logit regression model. The results indicate that various factors such as gender, age, education, employment status, income, family size, and attitude significantly influence the selection of solid waste disposal methods by households. Gender significantly influences the preference for nearby containers over open spaces when it comes to waste disposal. Females are 7.55 times more inclined than males to choose nearby containers instead of open spaces. Age also plays a substantial role, with respondents aged 46-64 being 604 times more likely to utilize nearby containers. Respondents aged 65 and above are 69 times more likely, while respondents aged 31-45 are three times more likely to use nearby containers. Education level is also a significant factor, as individuals holding college diploma or higher degree are more likely to opt for nearby containers and door-to- door pickers rather than open spaces. Retired individuals are less likely to utilize door-to-door pickers compared to government employees. The decision between nearby containers and open spaces for waste disposal is influenced also by family size. The likelihood of choosing nearby containers decreases by 45% with each unit increase in family size. Attitude also plays a role in the preference for door-to-door pickers over open spaces. The likelihood of using door-to-door pickers increases by 64% for each unit increase in attitude. Individuals with higher incomes are unexpectedly inclined towards using open spaces as a method of waste disposal, possibly due to their increased consumption levels, resulting in higher generation of solid waste in their households. To promote a clean, healthy, and sustainable urban environment, the government needs to formulate and implement solid waste management strategies that effectively consider the specific demographic and socio-economic characteristics of households.

Keywords: Solid waste; solid waste disposal methods; solid waste management; Addis Ababa

3.1. Introduction

Municipal solid wastes (MSW) primarily consist of waste generated from households, businesses, and institutions (Mamo, 2020; Teferi, 2022; Wogayehu, 2019). In urban areas, the main components of this waste include biodegradable and non-biodegradable materials such as food scraps and garden waste, along with paper, glass, metals, and plastics (Teshome, 2021). Moreover, the presence of ash, dust, and street debris also contributes to the composition of solid waste (Al-Ghouti et al., 2021). The handling of solid waste necessitates a holistic method encompassing gathering, storing, moving, treating, processing recycling, and ultimately disposing of it (Odonkor et al., 2020; Rada et al., 2013). Effective management systems for solid waste should be straightforward, budget-friendly, and enduring from financial, ecological, and societal standpoints (Odonkor et al., 2020). Equitable service provision is crucial, catering to both economically disadvantaged and affluent households (Lema et al., 2019b).

Proper handling of solid waste remains a major issue for many developing nations, including Addis Ababa, the capital of Ethiopia (Beka & Meng, 2021; Cheru, 2016). Actions taken by households regarding solid waste have been found to significantly impact solid waste management (H. Eshete et al., 2023; Odonkor et al., 2020). The uneven production of solid waste and deficiencies in solid waste management systems in municipalities present difficulties for many countries (David et al., 2020). These problems are linked to several factors, which include inadequate infrastructure, lack of legal enforcement for environmental issues, random dumping of solid waste, population growth, urbanization resulting from migration from rural to urban areas, limitations in funding for solid waste management processes, and absence of advanced waste disposal technology (Abdel-Shafy & Mansour, 2018).

Urban centers in Ethiopia are encountering a notable issue concerning the handling and disposal of domestic solid waste, primarily due to the swift rise in population and urban development (Cheru, 2016; Gelan, 2021). Ethiopia, as a nation with a limited income, is presently encountering challenges in the effective management of solid waste. In the urban area of Addis Ababa, around 20 to 30% of the waste generated remains uncollected (Lema et al., 2019b). Households currently use open spaces, door-to-door collection services and public containers available at different locations throughout the city. The solid waste disposal method

recommended most by the city administration is the use of door-to-door collectors. This service is generally widely available. However, households are required to pay a monthly fee for the collection and disposal of their solid wastes. The other methods are available at no cost to the households. The solid waste treatment facilities available in the city include a landfill site, and some private recycling facilities. The solid waste disposed at the landfill site is regularly incinerated by the city administration. The private recycling plants produce such useful materials as hand bags, blankets, flower buckets, and so on (Workentin et al., 2022) . The generation of solid waste is increasing as the population of Addis Ababa expands (Fesseha & Bin, 2015).

The proper implementation of waste management policies relies on households' dedication to adopting responsible waste disposal practices, as they are the main contributors to the generation of municipal waste (Zhao et al., 2021). Several studies conducted in various countries have investigated the socio-economic elements that impact households' waste disposal behavior, and reported that factors like gender, age, and educational attainment greatly influence the choice of waste management options (Abebaw, 2008; Mehra et al., 1996a; Talalaj & Walery, 2015). Regarding household waste recycling behavior, previous research has shown that factors such as income, gender, and education have a significant impact (Handayani et al., 2018; Talalaj & Walery, 2015). After conducting a recent investigation (Tang et al., 2022), it was discovered that the manner in which households manage their waste is greatly influenced by social pressure emanating from family, friends, and even the government. According to (Zaikova et al., 2022), convenience of the place or method of disposal also determines household waste management practices.

Important factors that could assist in decreasing waste production at the household level are the understanding and beliefs of individuals regarding the efficient utilization of resources (H. Eshete et al., 2023). Also, numerous studies have investigated the impact of social norms on the recycling behaviors of households and the influence of socio-psychological factors on households' willingness to pay for enhanced services in solid waste management (J. Mohammed, 2013; Zhao et al., 2021). Waste management policies and practices may vary among different countries, which can lead to varying outcomes in terms of waste generation and household behaviors.

The objective of the study is to examine the various methods employed by households in Addis Ababa for disposing of solid waste, with a particular emphasis on identifying the key components and evaluating the current practices. Previous studies on solid waste management in Addis Ababa primarily concentrated on identifying the issues, obstacles, and prospects associated with waste management (Diriba & Meng, 2021; Gebremedhin et al., 2016). A gap exists in our understanding of household behaviors and how socioeconomic factors influence attitudes toward effective practices for disposing of solid waste. To address this gap, this study utilizes a multinomial logistic model to assess the impact of waste 'management factors' on the methods and components of solid waste disposal in households, taking into account socioeconomic factors like family size, monthly income, education level, and occupation. There are several reasons why this study is important. As a developing urban center, Addis Ababa faces significant obstacles in effectively handling its garbage. It is imperative to conduct further research on the factors that influence the management of solid waste and the socio-economic aspects that impact how households dispose of their waste. This will help draw the attention of the city administration and all stakeholders to address and prevent this issue. Therefore, it is vital to explore how waste management factors and socio-economic variables influence the proper disposal of waste at the household level.

3.2. Materials and methods

3.2.1. Sampling design

The study employs a sampling technique with multiple stages to choose the sample for the household survey. Initially, the capital of Ethiopia, Addis Ababa, was intentionally selected since urban households generate more waste per individual. The Addis Ababa Solid Waste Management Agency identified Akaki-Kality and Kolfe-Keranyo sub-cities as having significant household waste management challenges due to dense residential settlements and rapid population growth. These factors make them ideal case study sites for examining household waste management practices and issues in Addis Ababa. Woreda 1 and Woreda 13 in Akaki-Kality, along with Woreda 6 and Woreda 7 in Kolfe-Keranyo, were purposively selected due to their high population density, limited waste collection infrastructure, and socioeconomic diversity. These factors contribute to significant household waste generation, providing an ideal

sample for analyzing varied waste management practices in Addis Ababa.These chosen case study sites are expected to provide a comprehensive view of the practices and factors influencing solid waste management in the city. To select a total of 200 households, a systematic random sampling technique was employed. The selection process was based on the probability proportional to size (PPS) method applied within the enumeration areas. The determination of the sample size was computed using Yamane's (1967) formula.

$$n = \frac{N}{1 + N(e^2)} = \frac{27448}{1 + 27448\ (0.07^2)} \approx 203,$$

where, n = the desired sample size; N = total number of population and, e= the level of precision which is equal to 0.07.

Table 3.1. Distribution of sample size by subcity and Weredas

Sub-city	Sample Woreda	Total No. of Households	Sample size (PPS)
Akaki-Kality	Woreda 1	6547	48
	Woreda 13	6485	48
Kolfe-Keranyo	Woreda 6	7527	56
	Woreda 7	6889	51
Total	4	27,448	203

Source: Field survey, 2023

3.2.2. Methods of data collection

The study utilized an interview questionnaire schedule to gather quantitative data from a representative sample of households in selected areas of Addis Ababa. The survey covered various aspects such as household characteristics, waste generation, waste disposal methods, waste disposal facilities and services, and factors related to solid waste, particularly attitudes and

awareness. To ensure accurate data collection, eight enumerators received training on the assessment's objectives and the data collection tool. A pilot test was conducted by interviewing 20 household heads in areas not included in the sample, which helped refine the final data collection tool by incorporating relevant questions and excluding unnecessary ones.

3.2.3. Methods of data analysis

The quantitative data from the survey was analyzed using descriptive statistics, inferential statistics (specifically Chi-square and F-tests), and a multinomial logistic regression model. To conduct the descriptive and multinomial logistic regression analysis, the study used STATA software (version 17). Dependent and independent variables are described in Table 3. 2. Figure 3.1 presents the framework of the technical and methodological approach followed for this study.

Table 3.2. Summary of the dependent and independent variables

Variable	Description
Dependent variable:	
Solid waste disposal methods	The possible solid waste disposal methods used by households (1= open space (OS); 2= waste container (WC); 3 = door-to-door waste pickers (D-to-D)).
Independent variables:	
Gender	Gender of the household head (1=female; 0 = male)
Age	Age of the household head (1 = <30; 2 =31-45; 3 = 46-64; >=65).
Education level	Education level of the household head (1 = Read and write; 2 = Primary (Grade1-8); 3 = Secondary (Grade 9-12); 4 = College diploma; 5 = Degree and above).
Employment status	Employment status of the household head (1 =

	Government employee; 2 = Private employee; 3 = Self- employed; 4 = Retired).
Income level	Monthly income of the household head in Eth. birr (1 = <3000; 2 = {3,000 - 5,000); 3 = [5,000 - 10,000); 4 = >=10,000).
Family size	Number of family members in the household.
*Awareness	Average awareness of the household head about waste management (5=agree; 4=somewhat agree; 3=neutral; 2=somewhat disagree; 1=disagree).
*Attitude	Average attitude of the household head towards waste management (5=agree; 4=somewhat agree; 3=neutral; 2=somewhat disagree; 1=disagree).
Waste container	Availability of container in the area to dispose waste (1 = yes; 0 = no).
Waste collection service	Availability of regular waste collection service in the area (1 =. yes; 0 = no).

*They are measured with a 5-point Likert scale by constructing appropriate attitude and awareness statements related to solid waste management and their mean value is taken for analysis.

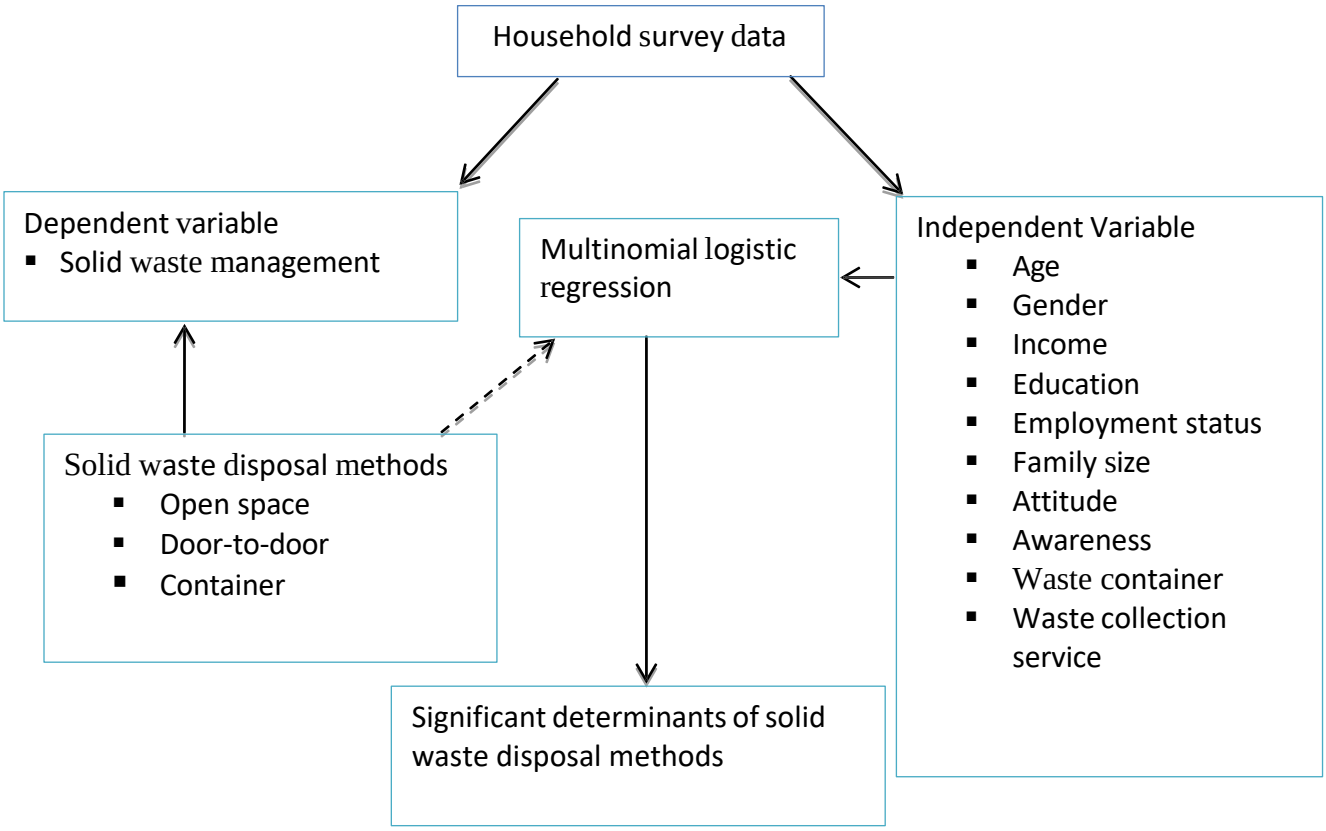

Figure 3.1.A framework for the technical and methodological approach followed for the study

3.2.4. The multinomial logit model

The multinomial logistic regression model is extensively utilized in health and life sciences to examine the association between nominal qualitative response variables and their corresponding explanatory variables or covariates (Castilla & Chocano, 2021). It is commonly employed when the outcome variable has multiple unordered categories and assumes that the probability of choosing each category depends on a set of explanatory variables. The explanatory variables can be continuous, categorical, or both. In the multinomial logit model, one among the categories of the outcome variable is set to be a base category. This study took the ―open space‖ (1=OS) as a base category. Following (Wang, 2005), suppose yi is the dependent variable with three categories (c), for individual observation i and the probability of being in category c (c =2 ―Waste container‖ (WC), c=3 ―Door-to-door waste pickers‖ (D-to-D), can be represented by (Equation 1):

$$\Pr(yi = c) = \pi_i^{(c)}, with\ a\ base\ category\ \pi_i^{(1)} \quad ----------(1)$$

For a simple model with a single explanatory variable x_i, the multinomial logistic regression model can be specified as (Equation 2):

$$\log\left(\frac{\pi_i^{(c)}}{\pi_i^{(1)}}\right) = \beta_0^{(c)} + \beta_1^{(c)} x_i, c = 2,3 \quad ----------(2)$$

The same explanatory variables are used for each category with separate intercept ($\beta_0^{(c)}$) and slope parameter ($\beta_1^{(c)}$) estimated for contrast. The slope parameters denote the additive effect of a unit increase in the explanatory variable, x, on the log odds of being in category c instead of the base category. However, it is sound and meaningful when the slope parameters are interpreted in their exponential form ($\exp\beta_1^{(c)}$) resulting in the multiplicative effect of a unit increase in the explanatory variable on the odds of being in category c than the base one.

Alternatively, predicted probabilities ($\pi_i^{(c)}$) can be used to interpret the effect of each explanatory variable for a different value of the same (Equation 3):

$$\pi_i^{(c)} = \frac{\exp\left(\beta_0^{(c)} + \beta_1^{(c)} x_i\right)}{1 + \sum_{k=2}^{3} \exp\left(\beta_0^{(k)} + \beta_1^{(k)} x_i\right)} \quad ----------(3)$$

Since the all the probabilities add up to one, the probability being in the base category, ―1‖ (OS), can be computed as (Equation 4):

$$\pi_i^{(1)} = 1 - \sum_{k=2}^{3} \pi_i^{(k)} \quad ----------(4)$$

3.3. Results

3.3.1. Descriptive analysis

3.3.1.2. Characteristics of sample respondents

Table 3 show cases the analysis of sample respondents based on the methods they employ to dispose of solid waste. The analysis focuses on various categorical and continuous variables. For the categorical variables, the table presents the percentages of respondents using different solid waste disposal methods based on their gender, age, education level, employment status, income level, waste container availability, and waste collection service accessibility. The result reveals that the majority of males (54%) utilize open spaces for waste disposal, compared to their counterparts. Additionally, 69.2% of females utilize nearby containers, and 59.5 % of females rely on door-to-door pickers. Among males, nearly 53% utilized open spaces and nearly 40% females relied on door-to-door pickers over other solid waste disposal options (Fig.3.2). The chi-square test indicates a significant relationship between gender and solid waste disposal method ($p < 0.05$) (Table 3.2). Notably, females prefer using nearby containers or door-to-door pickers, while males are more inclined to utilize open spaces.

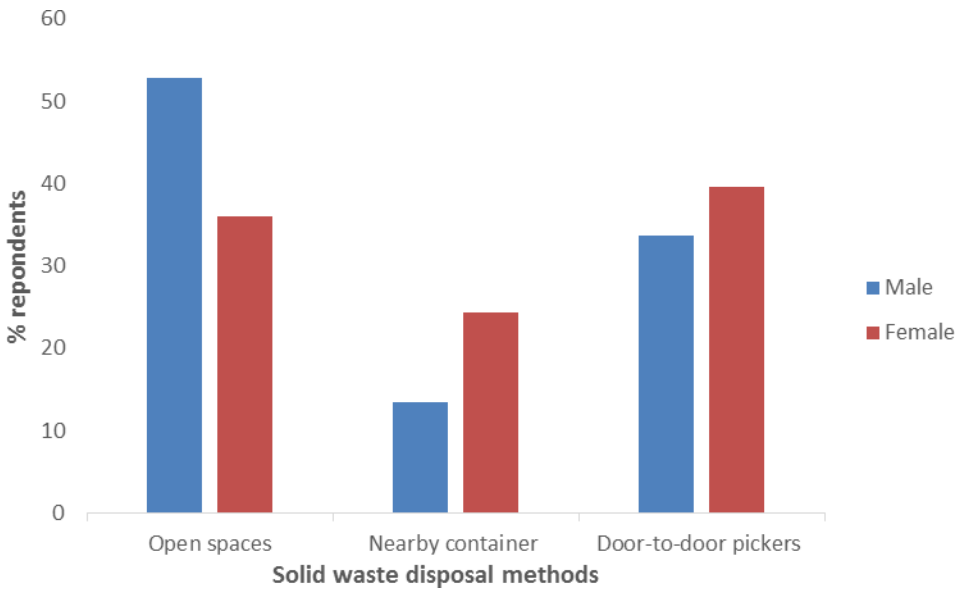

Figure 3.2. Use of solid waste disposal method by sex of respondents

Regarding age, the majority of those below 30 years (53%) prefer open spaces, followed by nearby containers (23.1%) and door-to-door pickers (17.6%). On the other hand, respondents aged 31-45 show a higher inclination towards nearby containers (43.6%), while those aged 46-64 mainly rely on door-to-door pickers (40.5%). Individuals aged 65 and above prioritize door-to-door pickers (17.6%). The correlation between age and solid waste disposal methods is statistically significant ($p < 0.01$) (Table 3.3). Figure 3.3 shows that among respondents below the age of 30 (nearly 68%) followed by the age category of 31-45 (46%) preferred disposing of solid waste in open spaces. Respondents aged 46-64 (nearly 70%) and 65 and above (54%) chose door-to-door pickers as their preferred method of solid waste disposal. Overall, the result shows that younger individuals tend to favor open spaces, while the door-to-door picking method becomes more popular among older age categories.

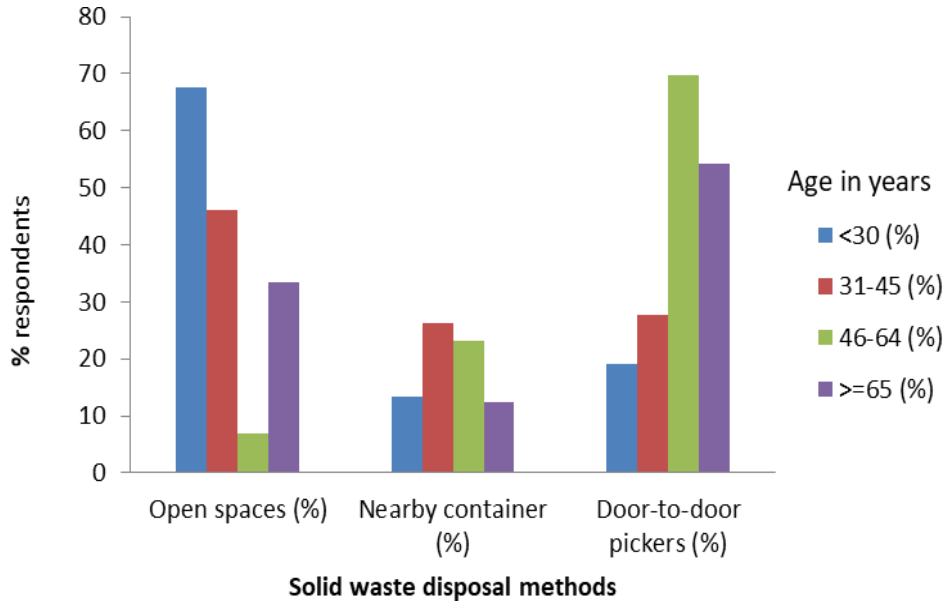

Figure 3.3. Use of solid waste disposal methods by age category of the respondents

Respondents with different educational backgrounds exhibit distinct waste disposal practices (Table 3.4). Those with a primary education level (Grade 1-8) (41.4 %) followed by those with basic literacy skills (31%) tend to prefer open spaces. Respondents holding a college diploma and a degree and above largely depend on door-to-door pickers (36.5 % and 46% respectively).

It is worth noting that there is a significant association between education level and solid waste disposal methods ($p < 0.01$).

Figure 3.4 depicts that among respondents with basic literacy skills, primary and secondary education levels, 71%, 75%, and 56%, respectively prefer disposing of solid waste in open spaces. However, the door-to-door picking method is more prevalent among respondents with college diploma (67.5%) and degree and above (85%). The result reveals that as the level of education increases, the reliance on open spaces decreases and the utilization of door-to-door pickers becomes more prevalent.

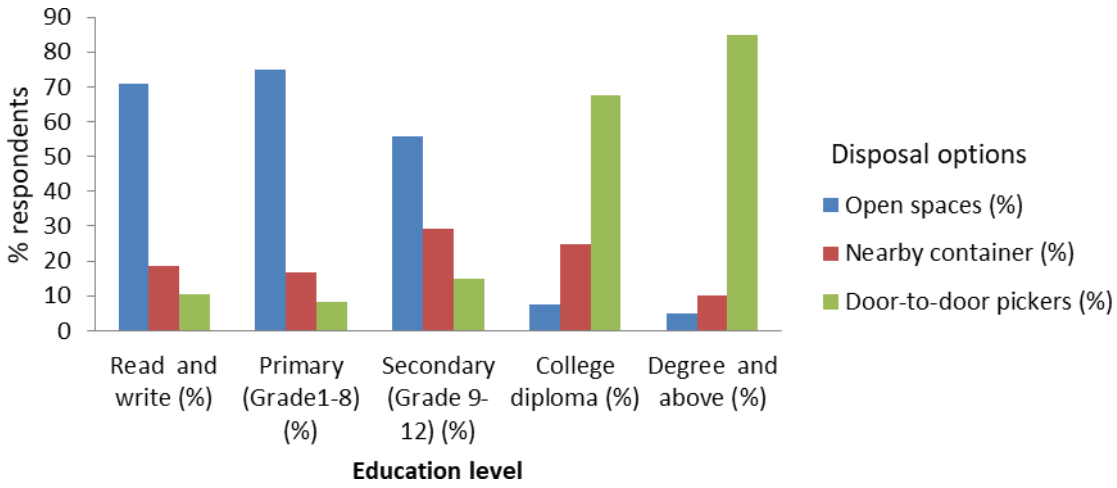

Figure 3.4. Solid waste disposal methods by education level of respondents

The methods of waste disposal are also influenced by employment status. Government employees (46%) and self-employed individuals (31%) tend to utilize door-to-door pickers, while private employees have a higher inclination to rely on nearby containers (48.7%). Retired individuals primarily utilize open spaces (8%). Finally, there is a significant correlation between employment status and solid waste disposal methods ($p < 0.05$).

Table 3.3. Distribution of sample respondents by use of soild waste disposal methods(Categorical values)

	Open spaces (%)	Nearby container (%)	Door-to-door pickers (%)	Chi sq (p-value)
Gender:				6.64 (0.036)**
Male	54	30.8	40.5	
Female	46	69.2	59.5	
Age (year):				48.52 (0.000)***
<30	52.9	23.1	17.6	
31-45	34.4	43.6	24.3	
46-64	3.5	25.6	40.5	
>=65	9.2	7.7	17.6	
Education level:				106.12 (0.000)***
Read and write	31	18	5.4	
Primary (Grade1-8)	41.4	20.5	5.4	
Secondary (Grade 9-12)	21.8	25.6	6.8	
College diploma	3.5	25.6	36.5	
Degree and above	2.3	10.3	46	
Employment status:				15.81 (0.015)**
Government employee	42.5	33.3	46	
Private employee	26.4	48.7	16.2	
Self employed	22.9	10.3	31	
Retired	8.1	7.7	6.8	
Income level				103.53

(birr/month):				(0.000)***
<3000	2.3	12.8	67.6	
[3,000 - 5,000)	47.1	60	21.6	
[5,000 Birr - 10,000)	42.5	28.2	2.7	
>=10,000	8	-	8.1	
Waste container:				0.10 (0.949)
Yes	24.1	23.1	25.7	
No	75.9	76.9	74.3	
Waste collection service:				15.24 (0.000)***
Yes	59.77	61.54	86.5	
No	40.23	38.46	13.5	

***p < 0.01; **p < 0.05; * p < 0.1

Source: Survey data, 2023

The distribution of respondents based on "Income level" plays an important role in waste disposal practices. There is a significant correlation between income level and the utilization of solid waste disposal methods ($p < 0.01$). Among those with lower income levels (less than 3000 Birr/month), the primary approach is to rely on door-to-door pickers (67.6 %). As income levels increase, the preference shifts towards using nearby containers, particularly for respondents earning between 3000 and 5000 Birr per month (60%). Conversely, individuals with higher incomes (5,000 - 10,000 Birr/month) primarily opt for open spaces (42.5%).

Furthermore, the analysis shows that respondents utilizing waste collection services are more likely to use door-to-door pickers (86.5 %), while those without waste collection services predominantly utilize open spaces (40.2%). The chi-square test demonstrates a significant association between waste collection service availability and solid waste disposal method ($p < 0.01$). As indicated in Table 4, there exists a noticeable disparity in the average family size between the groups ($p < 0.05$). Respondents who opt for open spaces tend to have a larger average family size (3.89) compared to those who use nearby containers (3.15) or door-to-door pickers (3.11). Furthermore, there is a significant difference in the average awareness of waste

management among the groups ($p < 0.01$). Respondents who rely on door-to-door pickers exhibit the highest average awareness level (4.47), followed by those who use nearby containers (4.39), while those who opt for open spaces have the lowest average awareness level (4.01).

Table 3.4. Distribution of sample respondents by use of solid waste disposal methods (Continous variables)

	Open spaces	Nearby container	Door-to-door pickers	F (p-value)
Family size				
Mean (SD)	3.89 (2.086)	3.15 (1.755)	3.11 (1.659)	4.18 (0.0166)**
Awareness				
Mean (SD)	4.01 (.521)	4.39 (.561)	4.47 (.247)	22.78 (0.0000)***
Attitude				
Mean (SD)	4.68 (1.512)	5.04 (3.023)	4.83 (.438)	0.62 (0.5401)

***p < 0.01; **p < 0.05; * p < 0.1

Source: Survey data, 2023

3.3.2. Econometric analysis

Table 3.5 displays the findings of a multinomial logistic regression analysis that forecasts the utilization of various solid waste disposal methods, including open spaces, nearby containers, and door-to-door pickers. The reference group for the dependent variable is 'open spaces'. The relative risk ratio (RRR) indicates the extent to which the odds of selecting a particular disposal method change for a unit increase in the explanatory variable while holding all other variables constant. The gender variable has a significant positive impact on the preference for nearby containers over open spaces ($p < 0.05$). Specifically, females are 7.55 times more likely than males to opt for nearby containers.

Age has a strong positive impact on the utilization of nearby containers compared to open spaces ($p < 0.01$ for all age groups except 31-45). Respondents aged 46-64 are 604 times more likely to use nearby containers, respondents aged 65 and above are 69 times more likely, and respondents

aged 31-45 are three times more likely. Additionally, age significantly influences the use of door-to-door pickers compared to open spaces ($p < 0.01$ for 46-64 and 65 and above). Respondents aged 46-64 are 836 times more likely to use door-to-door pickers, while respondents aged 65 and above are 8,849 times more likely to use the same.

Education level has a significant impact on the utilization of nearby containers over open spaces, with a statistically significant difference observed for college diploma holders ($p < 0.01$) and secondary and degree holders ($p < 0.05$). In comparison to individuals who possess basic literacy skills, those with a college diploma are 716.18 times more likely to opt for nearby containers. Similarly, those with a degree and above are 176.12 times more likely, while individuals with a secondary education are 5.63 times more likely to choose nearby containers. Additionally, education level also plays a significant role in the preference for door-to-door pickers over open spaces, with a significant difference found for respondents with a college diploma and degree and above ($p < 0.01$). College diploma holders are 13161.35 times more likely to use door-to-door pickers, while those with a degree and above are 18038.75 times more likely to use the same.

Table 3.5. Multinominal logistic regression result

Solid waste disposal method	RRR	Robust Std. Err.	Z	P > |z|
Open spaces: Base				
Nearby container				
Gender	7.547	7.736	1.97	0.049**
Age: Base <30				
31-45	3.379	2.478	1.66	0.097*
46-64	604.270	1234.959	3.13	0.002***
>=65	69.195	96.018	3.05	0.002***
Education level: Base Read and write				
Primary (Grade1-8)	0.921	0.814	-0.09	0.926

Secondary (Grade 9-12)	5.631	4.554	2.14	0.033**
College diploma	716.181	1658.074	2.84	0.005***
Degree and above	176.119	416.552	2.19	0.029**
Employment status: Base Government employee				
Private employee	9.031	8.158	2.44	0.015**
Self employed	0.228	0.334	-1.01	0.313
Retired	0.660	0.925	-0.30	0.767
Income level: Base <3000				
3,000 - 5,000	0.189	0.214	-1.47	0.142
5,000 Birr - 10,000	0.046	0.068	-2.07	0.039**
>=10,000	6.31e-10	1.65e-09	-8.11	0.000***
Family size	0.446	0.141	-2.55	0.011**
Awareness	7.344	11.649	1.26	0.209
Attitude	1.136	0.120	1.20	0.229
Waste container	3.863	6.143	0.85	0.395
Waste collection service	1.328	1.183	0.32	0.750
_cons	4.75e-06	0.000	-1.79	0.073
Open spaces: Base				
Door-to-door waste pickers				
Gender	4.763	5.478	1.36	0.175
Age: Base <30				
31-45	0.445	0.584	-0.62	0.538
46-64	836.481	1872.61	3.01	0.003***
>=65	8849.386	20049.15	4.01	0.000***
Education level: Base Read and write				
Primary (Grade1-8)	0.406	0.611	-0.60	0.549
Secondary (Grade 9-12)	2.172	3.191	0.53	0.597
College diploma	13161.35	32300.76	3.86	0.000***

Degree and above	18038.75	38126.97	4.64	0.000***
Employment status: Base Government employee				
Private employee	2.194	2.550	0.68	0.499
Self employed	0.460	0.723	-0.49	0.622
Retired	0.011	0.0198	-2.61	0.009***
Income level: Base <3000				
3,000 - 5,000	0.000	0.000	-4.36	0.000***
5,000 Birr - 10,000	0.000	0.000	-4.64	0.000***
>=10,000	0.000	0.000	-3.57	0.000***
Family size	0.540	0.202	-1.64	0.101
Awareness	2.898	3.553	0.87	0.385
Attitude	1.635	0.276	2.91	0.004***
Waste container	21.650	44.780	1.49	0.137
Waste collection service	4.626	5.223	1.36	0.175
_cons	0.000	0.000	-1.68	0.092
Number of obs = 200	Wald Chi sq (38) =	687.59	Prob > chi2 = 0.000	Pseudo R2 = 0.707
Log pseudo likelihood =	-61.449			

Source: Multinomial logit model output, 2023. Use addisyehelina@gmail.com to request for model analysis result.

The impact of employment status on the selection of waste disposal methods is particularly noticeable among private employees, with a p-value below 0.05. Private employees are 9.03 times more likely to choose nearby containers compared to government employees. Similarly, employment status has a significant influence on the preference for door-to-door pickers over open spaces, especially among retired individuals, with a p-value below 0.01. Retired respondents are 0.01 times less likely to utilize door-to-door pickers compared to government employees.

The choice of waste disposal methods is also influenced by income level, with statistical significance observed for the income brackets [5,000 - 10,000] and [>=10,000 birr/month]. Individuals earning an income of (5,000 - 10,000) birr/month are 0.05 times less likely to opt for nearby containers compared to those earning below 3,000 birr/month. Similarly, individuals with an income of >=10,000 birr/month show an extremely low likelihood of utilizing nearby containers. Income level also impacts the preference for door-to-door pickers over open spaces, with statistical significance observed for all income levels (p-value < 0.01). Individuals with an income of [3,000 - 5,000], [5,000 - 10,000], or [>= 10,000 birr/month] are almost zero times less likely to use door-to-door pickers compared to those with an income level below 3,000 birr/month.

Furthermore, the decision between nearby containers and open spaces for waste disposal is significantly influenced by family size ($p < 0.05$). The likelihood of choosing nearby containers over open spaces decreases by 45% with each unit increase in family size, assuming all other variables remain constant. Additionally, attitude plays a significant role in the preference for door-to-door pickers over open spaces ($p < 0.01$). The likelihood of using door-to-door pickers over open spaces increases by 64% for each unit increase in attitude, holding other variables constant.

3.4. Discussion

The multinomial regression result (Table 3.5) portrays that a range of variables significantly influence the decision to use waste disposal methods at household level. In this section, these variables and their implications are discussed in relation to similar studies.

3.4.1. Gender

The multinomial logistic regression analysis result reveals that females exhibit a higher probability of utilizing nearby containers for disposing of solid household waste in comparison to males (Table 3.5). Put simply, being female reduces the likelihood of resorting to open spaces for waste disposal. This implies that women may have a preference for using nearby garbage

containers instead of open areas due to factors such as convenience, accessibility, and hygiene, which they may prioritize more than men (Lema et al., 2019c). Furthermore, women and men may hold different perspectives and attitudes towards domestic waste and its disposal, influenced by their distinct responsibilities and available resources. Women's involvement in household tasks such as cleaning, food preparation, family health, laundry, and domestic maintenance undoubtedly influences their waste management practices. As they play a significant role in these activities, women often manage waste differently compared to men. Their management strategies are often shaped by their unique needs, circumstances, and priorities (Mehra et al., 1996b; *OECD*, 2011). *UNEP* (2019) also noted that women recognize that improper waste management can lead to health hazards such as the spread of diseases or the attraction of pests and rodents, and therefore often take extra care to ensure waste is disposed of in a way that minimizes health risks for their families. The preferences and needs of women may often go unheard or ignored in community decision-making processes or municipal infrastructure planning. This is due to the presence of gender inequalities in power, resources, and opportunities, which create barriers for women to actively participate (*OECD*, 2011). Therefore, it is essential to ensure women's participation and representation in waste management initiatives, while also collecting and analyzing sex and gender-disaggregated data. This will aid in understanding the diverse impacts and benefits of waste management for both women and men (*UNEP*, 2022).

In addition, according to Abebaw (2008) the choice of household waste disposal methods is significantly influenced by gender. Female-headed households tend to use bins or public waste disposal sites for waste collection, rather than burying it. This suggests that women feel more responsible for maintaining cleanliness and hygiene in their homes or compounds by properly disposing of solid waste, as compared to men. This is related to what is found by other researchers as well (Abebaw, 2008; Adzawla et al., 2019; Motaung, 2020) who stated that female-headed households are more likely to perform legal disposal practices. On the contrary, households headed by men tend to dispose of solid waste in open areas such as gutters, streets, and water bodies, instead of using proper waste management services. Thus, when women are responsible for making the final decisions, they are capable of implementing more suitable systems that ensure maximum cleanliness. According to (Adzawla et al., 2019; Uma et al., 2020)

women also demonstrate a greater willingness to invest more money into improved waste disposal systems compared to their male counterparts.

The findings of this study align with Structuration Theory, highlighting how gender influences waste disposal decisions. Women, often responsible for household waste management, play a key role in waste practices; yet structural constraints limit their decision-making power. Environmental Justice Theory further underscores the inequities faced by women, as they disproportionately bear the burden of inadequate waste management systems, despite their central role in maintaining cleanliness. Gender inequalities restrict women‘s involvement in shaping waste management systems, exacerbating environmental risks. Ensuring women‘s active participation in decision-making is crucial to improving waste management practices and advancing environmental justice.

3.4.2. Age

Regarding age, respondents in all age groups demonstrate a higher inclination for choosing nearby garbage containers over open spaces as a disposal method compared to those who are younger than thirty (the base category). Individuals aged 46-64 years and those aged 65 and above exhibit significantly greater odds of selecting door-to-door pickers as a disposal method. This indicates that older individuals are more prone to utilizing door-to-door services for waste disposal compared to respondents who are under 30 years old. These findings are consistent with previous research that emphasizes how older individuals may possess distinct preferences or constraints regarding waste management practices in comparison to younger individuals (Sorsa, 2018; Wogayehu, 2019). The findings align with Structuration Theory by demonstrating how age influences waste disposal choices through a combination of individual behavior and structural constraints, with older individuals preferring formal services like door-to-door pickers.

Due to their age, elderly individuals tend to make more informed decisions when evaluating health and environmental issues, leading to a higher willingness to pay. As a result, households with older heads of households are more likely to dispose of household waste at designated public disposal sites or place it in bins for proper disposal by waste management authorities, rather than littering in open spaces. Conversely, households with relatively younger heads of

households are more likely to dump solid waste in inappropriate locations (F. Smith et al., 2020). In contrast, a study by (David et al., 2020) revealed that younger individuals, particularly the millennial show a higher inclination towards sustainable waste disposal methods. They are more likely to engage in recycling, composting, and reducing waste generation compared to older generations. This trend can be attributed to increased environmental awareness, education, and exposure to sustainability initiatives.

However other studies indicate that older generation tends to display more self-discipline compared to the younger generation; for instance, (Adzawla et al., 2019; *Awunyo-Vitor et Al*, 2013) older individuals willingly invest significant amounts of money into improving waste management systems, indicating their heightened awareness of environmental sanitation. But other findings (Teshome, 2021) challenged this assertion and argued that older household heads were unable to exhibit the same level of awareness as their younger counterparts. These conflicting results from various studies demonstrate the varied impacts of age.

3.4.3. Education level

According to the regression results presented in Table 3.5, different levels of education demonstrate statistical significance for both solid waste disposal methods - nearby containers and door-to-door waste pickers in comparison to the reference category of "Read and write." This indicates that higher education levels impact the choice of suitable waste disposal methods, possibly due to heightened awareness of the environment or knowledge regarding proper waste management practices. Similar finding have been documented in studies highlighting the influence of education on waste management behavior (Abebaw, 2008).

As the level of education increases for the head of the household, they are more likely to adopt more efficient waste disposal methods. Previous studies conducted in Africa have also demonstrated the significant impact of education on proper waste disposal (Abebaw, 2008; Tadesse et al., 2007). A study conducted by (F. Smith et al., 2020) examined the waste management behavior of households with varying education levels in New Zealand. The study found that households with higher education levels were more likely to engage in source

separation of recyclables and practice proper waste disposal techniques. Similarly, a study by (Torres-Pereda et al., 2020) investigated the connection between educational attainment and waste management behaviors. Their findings highlighted that individuals with higher educational levels were more likely to adopt sustainable waste disposal practices.

Generally, formal education is expected to enhance individuals' comprehension of the significance of maintaining a healthy and hygienic environment. Education effectively emphasizes the adverse repercussions of incinerating waste materials. Consequently, individuals who have attained higher levels of education are more likely to ensure the proper disposal of their household waste. Astudy by (Alhassan et al., 2017) also found that individuals with higher education levels are more willing to allocate additional funds for the improvement of waste management. The findings align with Structuration Theory by demonstrating how education, as a form of personal agency, shapes waste disposal choices, with higher education levels fostering more sustainable practices. Furthermore, Environmental Justice Theory is reflected in the disparities in access to proper waste management services, where individuals with lower education levels face greater challenges, amplifying environmental inequities.

3.4.4. Employment status

Private sector employees have a higher tendency to opt for open spaces for waste disposal compared to government employees. However, retired respondents show a lower preference for door-to-door waste pickers compared to government employees. This suggests that occupational factors play a role in waste disposal practices. Although there is limited research comparing different occupational groups, studying waste management practices among such groups could provide valuable insights. (Obayelu, 2013) Corroborates these findings, supporting the idea that occupation level influences waste disposal preferences. This could be attributed to the fact that most employed individuals have received education and acquired knowledge. Consequently, they are well aware of the adverse environmental effects and can utilize their earnings to implement more effective methods of garbage disposal, such as continuous utilization. (Heidari et al., 2019) examined the impact of employment status on waste disposal methods in urban households. They found that employed individuals were more likely to adopt sustainable waste management practices, such as recycling and composting, compared to those who were unemployed or underemployed. Regarding specific employment types, (Liu et al., 2019) reported that

individuals working in environmentally conscious industries were more inclined to adopt sustainable waste management practices due to their job-related awareness and exposure to environmental concerns. The findings align with Structuration Theory by showing how employment status, as personal agency, affects waste disposal practices, with employed individuals more likely to adopt sustainable methods due to education and resources. Environmental Justice Theory is reflected in occupational disparities, where those with more secure employment have better access to sustainable waste management, while retired or unemployed individuals face greater challenges, exacerbating environmental inequalities.

3.4.5. Income level

Income level reveals an interesting trend. Individuals in higher income (5,000 Birr - 10,000 Birr and 10,000 Birr or above) show a significantly lower likelihood, indicating a strong inclination towards open spaces as a waste disposal method among individuals with higher incomes. One possible explanation for this phenomenon could be the generation of larger amounts of solid waste due to increased consumption associated with higher annual household incomes. However, this finding contradicts with certain previous studies that have linked higher income with better waste management practices (Alhassan et al., 2017; *Awunyo-Vitor et Al*, 2013). According to (Abebaw, 2008), income has a significant impact on household preferences for solid waste disposal options. This finding, which relates to the influence of income on embracing a hygienic solid waste disposal approach, contrasts with studies conducted by (Tadesse et al., 2007; Uma et al., 2020), which reported that households with higher incomes do not participate in open waste disposal but instead utilize communal waste containers.

3.4.6. Family size

Family size plays a vital role in waste disposal habits, with larger families showing a lower tendency to utilize nearby garbage containers (Table 3.4). The underlying reason behind this is that larger families tend to produce more household waste, resulting in improper disposal practices compared to smaller families. It is anticipated that individuals residing in households with more members will exhibit a higher willingness to invest in maintaining a clean environment. This is because the greater the number of people in a household, the higher the

amount of waste generated, posing challenges in waste management (Niringiye & G, 2010). Apart from generating more waste, larger families also distribute the responsibility among family members, thereby reducing the burden. These findings align with the studies conducted by Kalsman (2000) Sugirtharan (2010) which indicate an increase in resource utilization and waste production in households with larger members. Similarly, (Suthar & Singh, 2015) confirmed the same pattern, observing that households with larger family sizes tend to generate more waste. However, the contrasting results obtained by Mahale et al. (2023) challenge this notion, highlighting that as family size increases, household waste generation actually decreases.

3.4.7. Attitude

Attitude exhibits statistically significant association with use of "door-to-door waste pickers" (Table 3.4). This suggests that individuals with a more positive outlook on waste management are more inclined to choose this approach. This result aligns with previous studies that have emphasized the role of attitudes and perceptions in shaping waste management behaviors (Ajzen, 1991). Consequently, a majority of households express strong agreement that solid waste is a source of contamination for the environment, necessitating immediate attention from the local government. Additionally, these households demonstrate a favorable disposition towards proper solid waste disposal. This finding corroborates previous studies conducted elsewhere (Gebremedhin et al., 2016; F. Smith et al., 2020).

3.5. Conclusion and policy implications

The study examines the impact of demographic and socio-economic factors on solid waste management in Addis Ababa city. A survey was conducted with 200 participants from four Woredas in two sub-cities, revealing significant associations and correlations. The findings indicate that gender influences solid waste disposal methods, with females preferring nearby containers or door-to-door pickers, while males are more inclined to utilize open spaces. Age also plays a role, as younger respondents tend to use open spaces, while older respondents prefer door-to-door pickers or nearby containers. Education level is another determining factor, with higher-educated individuals favoring door-to-door pickers and lower-educated individuals opting for open spaces. Family size affects the choice of nearby containers versus open spaces, and attitude towards improved waste management influences the preference for door-to-door pickers

over open spaces. Retired respondents are less likely to use door-to-door pickers compared to government employees. Surprisingly, higher-income households show a strong inclination towards using open spaces, possibly due to higher consumption levels and more waste generation. These findings inform the development of targeted waste management strategies and interventions that cater to the specific characteristics and preferences of different demographic and socioeconomic groups. Recommendations include gender-specific awareness campaigns, educational programs targeting younger age groups and lower-educated individuals, tailored initiatives for higher-income and larger households, workplace initiatives to promote waste management practices, and comprehensive campaigns to change attitudes towards waste. The aim is to enhance waste management practices and promote a sustainable and clean environment by emphasizing responsible waste disposal and highlighting the environmental and health benefits.

CHAPTER FOUR

4. Indicators and Determinants of Effective Green Space Governance in Addis Ababa, Ethiopia

Abstract

The study investigated indicators and factors influencing effective green space governance in the Akaki Kality and Kolfe Kerayo sub-cities of Addis Ababa. Utilizing a quantitative method, it combined data from 200 respondents and employed chi-square tests and binary logistic regression analysis using STATA software to assess key governance indicators. The findings revealed significant relationships between the effectiveness of green space governance and the factors influencing it. Accessibility to green spaces showed the strongest association, with a highly significant regression coefficient of 79.9181 ($p < 0.05$). Environmental awareness rising ($\chi^2 = 27.8705$, $p = 0.000$) and institutional support ($\chi^2 = 61.1111$, $p = 0.000$) were also strongly associated with governance effectiveness. Other critical factors include the role of diverse actors ($\chi^2 = 24.5614$, $p = 0.000$) and the enforcement of environmental laws ($\chi^2 = 71.7949$, $p = 0.000$). Policy implications highlight the need for enhancing green space accessibility, investing in public education programs, and strengthening institutional frameworks. Recommendations include fostering community participation through inclusive planning processes, developing adaptive governance structures, and implementing strong legal frameworks with effective enforcement mechanisms. These strategies aim to improve urban green space management and overall governance effectiveness in rapidly growing urban areas.

Keywords:Green Space Governance; Accessibility institutional frameworks; governance effectiveness

4.1. Introduction

Urban green spaces are increasingly vital for sustainable urban development, offering crucial ecosystem services like air quality regulation, temperature moderation, biodiversity conservation, and enhanced human well-being (Kabisch et al., 2016). With urbanization rapidly accelerating, now encompassing over 56% of the global population and projected to reach 68% by 2050, the governance of urban green spaces faces significant challenges, particularly due to climate change (Ramaiah & Avtar, 2019). The degradation and loss of these spaces threaten environmental sustainability in cities, making effective governance essential for maintaining livable, resilient, and inclusive urban environments (Elias, 2020). However, recent studies reveal a growing gap between the need for green spaces and the effectiveness of their governance, citing inadequate policies, weak institutional frameworks, and insufficient public engagement as key barriers to their management and conservation (Green et al., 2016; Kronenberg, 2015) .

In Africa, the challenges of green space governance are intensified by rapid urbanization, population growth, and limited resources, leading to the degradation of valuable green spaces due to urban expansion (Haaland & van den Bosch, 2015). The absence of comprehensive urban planning and the prioritization of economic development over environmental concerns further complicate green space management. Additionally, weak institutional capacities, limited public awareness, and poor enforcement of environmental policies contribute to ineffective governance across the continent (Cilliers et al., 2013). Nevertheless, there is a growing recognition of the importance of green spaces in African cities, with increasing efforts to integrate green space governance into urban planning frameworks (Cobbinah & Addaney, 2022). Sub-Saharan Africa faces unique challenges in green space governance, including rapid, often informal urbanization that leads to the expansion of informal settlements and the loss of green spaces (Lindley et al., 2018). The region's lack of data and research on green space governance further complicates the development of effective policies and interventions (Wolch et al., 2014). Socio-economic disparities also impact access to and the distribution of green spaces. Despite these obstacles, there are emerging efforts to promote sustainable urban development by preserving and expanding green spaces in sub-Saharan African cities (du Toit et al., 2018).

Addis Ababa, Ethiopia's capital, exemplifies the challenges in urban green space governance faced by cities in sub-Saharan Africa. Rapid urban expansion in the city often occurs at the expense of green spaces (Kjellström, 2021).These green spaces, essential for environmental quality and residents' well-being, are increasingly threatened by rapid urbanization, inadequate urban planning, and weak governance structures (Gashu et al., 2020). Numerous studies emphasize the importance of green space governance for urban sustainability and public well-being, with research in European cities highlighting the need for integrated approaches that address ecological, social, and economic dimensions (Baycan-Levent & Nijkamp, 2009; Kabisch et al., 2016). In Africa, studies reveal both progress and challenges, such as community involvement in Ghana despite a lack of governmental support (Odoom et al., 2021), and the existence of urban planning frameworks in Kenya that often exclude marginalized communities (Omollo, 2023) .Despite these efforts, there remains a significant gap in integrating green space policies with local economic development strategies (Ncube & Arthur, 2021).

However, many studies tend to focus on high-income or well-researched regions, leaving a gap in understanding the unique challenges faced by rapidly urbanizing cities in the Global South, particularly in sub-Saharan Africa. Research specific to Addis Ababa highlights issues like poor policy implementation and insufficient community participation, but often lacks a comprehensive analysis of how socio-economic, political, and institutional factors interact to affect green space governance effectiveness (Gashu et al., 2020; M. W. Tesfay, 2016). This study aims to address these gaps by providing a detailed analysis of green space governance in Addis Ababa. It focuses on identifying and assessing key indicators of successful green space management, examining how various socio-economic and institutional factors impact governance outcomes. Specifically, the study seeks to answer three core questions: What are the primary indicators of effective green space governance in Addis Ababa? How do socio-economic and institutional factors influence this effectiveness? And what are the main challenges and opportunities for improving green space governance? By addressing these questions, the study not only fills gap in the literature but also offers actionable insights for policymakers and urban planners. This focused approach enhances our understanding of governance dynamics in Addis Ababa and provides practical recommendations that can be applied to similar urban contexts, contributing to more effective and sustainable management of urban green spaces.

4.2. Materials and methods

4.2.1. Sampling design

The study adopts a multi-stage sampling design to select the sample for the household survey, focusing on green space governance. Addis Ababa was intentionally chosen as the study area due to its significance as the capital of Ethiopia and the challenges it faces in managing urban green spaces. The study obtained data from the Addis Ababa Environmental Protection Authority (AEPA), which identified Akaki-Kality and Kolfe-Keranyo sub-cities facing significant green space governance challenges due to rapid population growth. Four Woredas Woreda 1 and Woreda 13 from Akaki-Kality, and Woreda 6 and Woreda 7 from Kolfe-Keranyo were purposively selected as enumeration areas due to their high population density, which places greater demand on green spaces, and the inadequate infrastructure for park maintenance and development. Additionally, these Woredas encompass a range of socioeconomic backgrounds, ensuring a diverse sample that captures the various challenges and governance practices associated with green space management. These selected case study sites are expected to provide key insights into the factors influencing green space governance in Addis Ababa. To select a total of 200 households for the survey, a systematic random sampling technique was employed, utilizing the probability proportional to size (PPS) method within the enumeration areas. The sample size determination was computed using Yamane's (1967) formula, ensuring adequate representation and statistical validity.

$$n = \frac{N}{1 + N(e^2)} = \frac{27448}{1 + 27448\ (0.07^2)} \approx 203,$$

where, n = the desired sample size; N = total number of population and, e= the level of precision which is equal to 0.07.

Table 4.1. Distribution of sample size by subcity and Weredas

Sub-city	Sample Woreda	Total No. of Households	Sample size (PPS)
Akaki-Kality	Woreda 1	6547	48
	Woreda 13	6485	48
Kolfe-Keranyo	Woreda 6	7527	56
	Woreda 7	6889	51
Total	4	27,448	203

4.2.3. Methods of data collection

The study employed questionnaire schedule to collect quantitative data from a representative sample of households in selected areas of Addis Ababa, focusing on green space governance. The survey encompassed various dimensions, including household characteristics and attitudes towards green space governance. To ensure the accuracy of data collection, eight enumerators underwent training on the objectives of the assessment and the utilization of the data collection tool. A pilot test was conducted, involving interviews with 30 household heads residing in areas not included in the final sample. This pilot test facilitated the refinement of the data collection tool by incorporating pertinent questions and eliminating unnecessary ones, thereby enhancing the effectiveness of the survey instrument

4.2.4. Methods of data analysis

The method of data analysis for this study involved several key steps using STATA software (version 17). Initially, descriptive statistics were employed to summarize the fundamental aspects of the data, such as green space availability, satisfaction levels, and community engagement. Following this, Chi-square tests were conducted to explore associations between governance indicators and the effectiveness of green space management, assessing how factors such as accountability, participation, and institutional support were related. For a more detailed analysis, a binary logistic regression model was utilized to evaluate the impact of various

predictors, including demographic variables and perceptions of accessibility, on the likelihood of effective green space governance. This approach, which included the use of Pseudo R-squared and likelihood-ratio chi-squared tests, ensured a comprehensive evaluation of the factors influencing green space governance.

4.2.5 Indicators of effective environmental governance and index estimation strategy

Effective governance of urban green spaces requires multidimensional indicators based on SMART criteria (specific, measurable, achievable, relevant, and time-bound) and the OECD's principles of policy relevance, analytical soundness, and measurability (Grunewald et al., 2019; Nunziante, 2022)). Key indicators include the extent and quality of green spaces, biodiversity, accessibility, community engagement, and maintenance effectiveness. These can be integrated into an index using a methodology similar to the Human Development Index, involving the standardization and aggregation of variables as shown in a similar equation to (1) in the referenced text.

$$\text{Index Value (Standerdized value)} = \frac{\text{Actual Value} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum Value}} \quad (1)$$

EGSG index computation follows the UNDP variable normalization process, summing variables, dividing by the number of variables for each component, and weighting them based on the number of questions asked (Darimani et al., 2013; UNDP, 2007). A binary logit model then identifies factors influencing governance effectiveness, aiding policy improvements. For specific indicator variables, see Table 4.2.

Table 4.2. Indicator variables used to measure the effectiveness of green space governance

Indicator symbol	Indicator definition	Unit of measurement	Hypothesized signs	Functional relationship
Acc (I_1)		Yes(1), No (0)	(+/-)	The more accountable the management, the better the effectiveness of green space governance (EGSG)
Prt (I_2)	Participation	Yes (1), No (0)	(+/-)	The higher the participation of stakeholders in green space governance, the better the EGSG.
Awr I_3)	Awareness	Yes (1), No (0)	(+/-)	The more the public is aware of green space benefits, the better the EGSG.
Knl (I_4)	Knowledge	Yes (1), No (0)	(+/-)	The greater the knowledge on green space ecosystems and management, the better the EGSG.
Ins (I_5)		Yes (1), No (0)	(+/-)	The stronger the institutional

				framework supporting green spaces, the better the EGSG.
Act (I_6)	Actors	Yes (1), No (0)	(+/-)	The more diverse and engaged the actors in green space governance, the better the EGSG.
ELw (I_7)	Env'tal laws	Yes (1), No (0)	(+/-)	The more specific and comprehensive the laws protecting green spaces, the better the EGSG.
Trp (I_8)	Transparenc y	Yes (1), No (0)	(+/-)	The higher the transparency in governance processes, the better the EGSG.
Enf (I_9)	Enforcement & compliance	Yes (1), No (0)	(+/-)	The stronger the enforcement and compliance with green space laws, the better the EGSG.
ESP (I_{10})	Env'tal sensitization	Yes (1), No (0)	(+/-)	The more widespread the

				environmental sensitization practices regarding green spaces, the better the EGSG.
Prn (I_{11})	Env'tal partnership	Yes (1), No (0)	(+/-)	The stronger and more diversified the partnerships for green space management, the better the EGSG.
DR (I_{12})	dispute resolution	Yes (1), No (0)	(+/-)	The more effective the dispute resolution mechanisms for green space issues, the better the EGSG.
Adp (I_{13})	Adaptiveness	Yes (1), No (0)	(+/-)	The more adaptive the green space management to environmental and social changes, the better the EGSG

Source: Adapted from (Benjamin M. et al., 2019; Darimani et al., 2013)

Table 4.2. outlines the indicator variables employed to assess the effectiveness of green space governance (EGSG), each measured dichotomously (Yes = 1, No = 0). This methodological approach enables the analysis of various factors influencing EGSG by capturing the presence or

absence of key governance elements. Indicators such as accountability (Acc), stakeholder participation (Prt), public awareness (Awr), and institutional strength (Ins) are used to gauge how these factors contribute to effective green space management. By examining the relationships between these binary indicators and EGSG, the study aims to identify which aspects such as environmental laws (ELw), transparency (Trp), enforcement (Enf), and adaptiveness (Adp) have a positive or negative impact on governance outcomes. The functional relationships hypothesize that higher values in these indicators correlate with better governance effectiveness, providing a comprehensive framework for evaluating and improving green space management practices.

4.2.6. Binary logit model estimation

In this study, a Green Space Governance Index (GSGI) was constructed, falling along a continuum ranging between zero and one. Using the index values, GSGI was categorized into two categories to allow clearer analysis and the creation of GSGI thresholds in the Ethiopian context. Hence, the effectiveness of the green space governance (GSG) threshold approach was adapted to establish a GSG threshold (Darimani et al., 2013). Where, the value of GSGI ≥ the mean value is to indicate that green space governance is effective, and the value ≤ the mean value is to denote that green space governance will not be effective. Thus, the effectiveness of green space governance was considered as an outcome variable, which was dummy coded (1=GSG is effective and 0=GSG is not effective). The binary logit model was then applied to identify factors that influence the effectiveness of green space governance in the context of the study area. The logit regression model as indicated by (Darimani et al., 2013) expressed as equation (2):

$$EGSG = \alpha + \beta + Zy + £ \qquad (2)$$

Where,

EGSG, Green Space Governance outcome (1 if effective, 0 if not effective).

α is a constant or intercept which is the value of EGSGO when all the proxies equal zero

β is the regression coefficient of the sample which determines the EGSG. This is the coefficient ofinterest and its statistical significance will be determined from the statistics from the regression.

Z is the independent variables

GSG is Green Space Governance outcome (the independent variable).

y is a vector of parameters

ε represents the error term

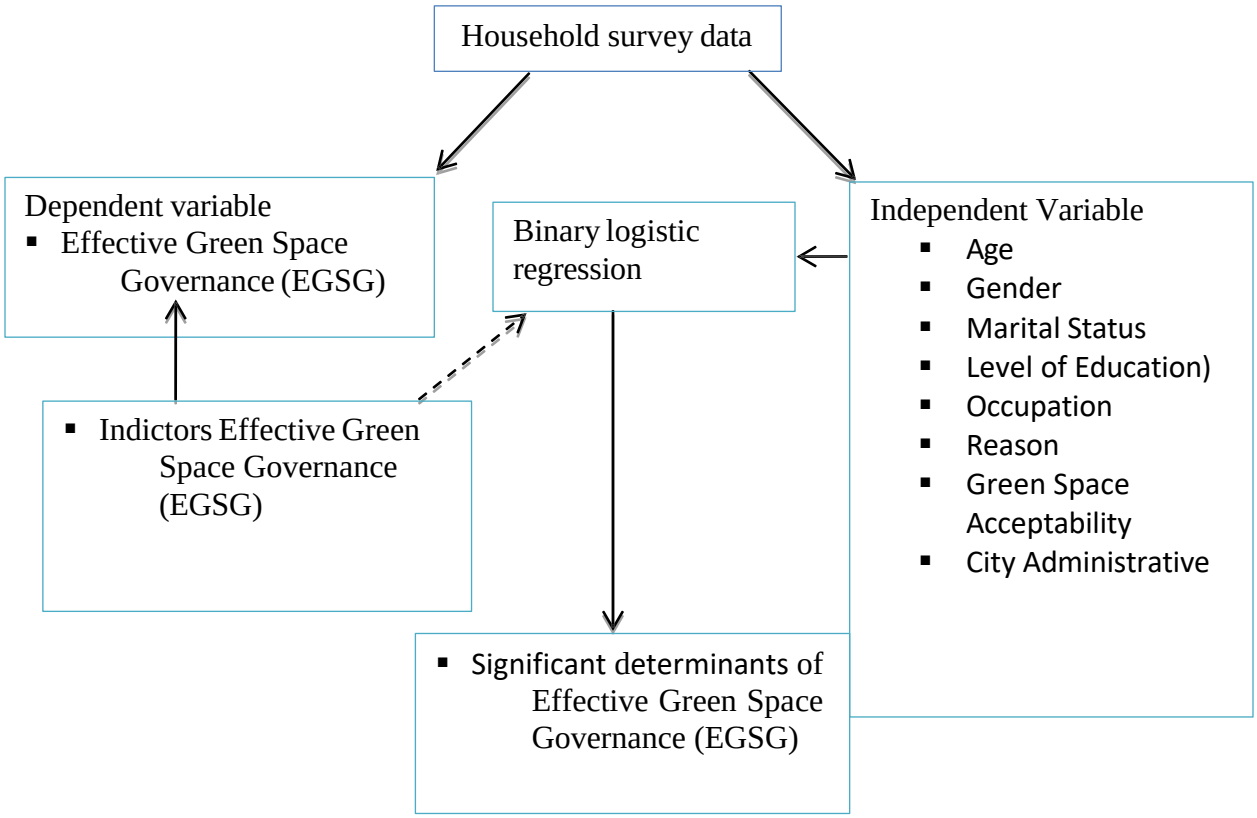

Figure 4.1.A framework for the technical and methodological approach followed by the study

4.3. Results and Discussion

4.3.1. Descriptive analysis

4.3.1.2. Characteristics of sample respondents

The socio-demographic characteristics of the respondents are detailed in Table 4.3, offering a comprehensive overview of the study population. The sample includes 151 males (75.5%) and 49 females (24.5%). The majority of respondents, 119 individuals (59.5%), are within the 31-45 age groups, followed by 53 respondents (26.5%) in the 46-60 age groups. Younger respondents, under 30 years, constitute 12% (24 respondents), while only 4 (2%) are over 61 years old. A significant majority of respondents, 177 individuals (88.5%), are married with a single spouse. The

remaining respondents are either single (4 respondents, 2%) or divorced (16 respondents, 8%). Nearly half of the respondents, 96 individuals (48%), have lived in the area for less than 5 years, while 64 respondents (32%) have resided there for 5-10 years, and 40 respondents (20%) for more than 15 years. The educational background of the respondents is notably high, with 104 individuals (52%) holding postgraduate degrees. Additionally, 72 respondents (36%) have completed college or university education, 16 respondents (8%) have secondary school education, and 8 respondents (4%) have primary school education or below. Regarding employment, the majority of respondents, 166 individuals (83%), are employed in government positions. This is followed by 13 respondents (6.5%) who are self-employed, 11 respondents (5.5%) working for NGOs, 7 respondents (3.5%) involved in family businesses, and 3 respondents (1.5%) who are housewives. A substantial majority of respondents, 168 individuals (84%), earn more than 5000 birr per month. Those earning between 3000-5000 birr constitute 12% (24 respondents), while only 4% (8 respondents) earn less than 2000 birr.

Table 4.3. Socio-economic profile of the households

Variables	Frequency	Percent
Sex:		
Male	151	75.5
Female	49	24.5
Age		
Less than 30	24	12
Between 31- 45	119	59.5
Between 46- 60	53	26.5
Above 61	4	2
Marital status		
Married	177	88.5
Single	4	2
Divorced	16	8
Widowed	3	1.5

how long live in this area		
Less than 5 years	96	48
Between 5-10 years	64	32
above 15	40	20
Level of education		
Primary school and below	8	4
Secondary School	16	8
College /University	72	36
Post graduates	104	52
Occupation		
self-employment	13	6.5
Government	166	83
NGO	11	5.5
Family business	7	3.5
.House Wife	3	1.5
Income:		
Less than 2000.00 birr	8	4
3000 birr -5000birr	24	12
>50000	168	84

Source: Household Survey (2023)

4.3.1.3. Factors Influencing Effective Green Space Governance

Effective green space governance is influenced by multiple factors that contribute uniquely to the sustainability and management of urban green spaces. Previous studies emphasize the importance of accountability, which fosters trust and cooperation among stakeholders (Caldwell & Karri, 2005), and community participation, which fosters a sense of ownership and commitment to green space initiatives (Brazeau-Béliveau & Cloutier, 2021). Environmental awareness and knowledge, enhanced through education and outreach, significantly improve public engagement (Zawieska et al., 2022). Institutions provide the necessary framework and resources for effective governance (Rahman et al., 2017), while diverse actors, including government agencies and NGOs, strengthen governance through collaboration (Glass et al.,

2023). Strong environmental laws and their enforcement ensure the protection and maintenance of green. Environmental sensitization practices and partnerships between stakeholders enhance public engagement and resource sharing (Phillipson et al., 2012). Effective dispute-resolution mechanisms are critical for addressing conflicts (Bingham et al., 2009), and adaptiveness in governance structures ensures long-term sustainability amid changing conditions (Underdal, 2010) .

Table 4.4 presents the factors influencing effective green space governance based on responses from the study participants. Each variable was analyzed using chi-square tests to determine its significance. Below is a detailed analysis and interpretation of each variable. The chi-square value (χ^2= 0.8911, p = 0.345) indicates no significant association between accountability and effective green space governance (p > 0.05). While accountability is generally seen as crucial for governance, its non-significance here suggests that other factors might be more critical in this context. This finding is somewhat surprising and might contradict studies like those by (Bovens, 2012), which emphasize the importance of accountability in public governance. The significant chi-square value (χ^2= 15.9171, p = 0.000) shows a strong association between participation indicators and effective green space governance (p < 0.05). This highlights the role of public involvement in governance. High levels of participation correlate with better environmental governance and more effective implementation of policies. This aligns with (Willness et al., 2023) ladder of citizen participation, which emphasizes the role of public involvement in achieving sustainable environmental practices.

The chi-square value (χ^2= 27.8705, p = 0.000) indicates a significant link between environmental awareness raising and effective governance (p < 0.05). Awareness programs are crucial for educating the public about environmental issues and promoting sustainable behaviors. This finding is supported by (Kollmuss & Agyeman, 2002), who emphasize the importance of environmental awareness in fostering pro-environmental behavior. With a significant chi-square value (χ^2= 11.7623, p = 0.001), the results show that environmental knowledge is positively associated with governance effectiveness (p < 0.05). Educated individuals and communities are better equipped to participate in and support green space governance. (Kim, 2003) also emphasize the role of environmental education in promoting sustainable behavior.

The chi-square value (χ^2= 61.1111, p = 0.000) emphasizes the importance of strong institutional support in effective green space governance. Institutions have a highly significant impact on governance effectiveness (p < 0.05). Strong institutions provide the necessary framework for implementing and enforcing policies. The study by (DeCaro et al., 2021) supports this finding, demonstrating that well-structured institutions are crucial for managing common-pool resources. The significant chi-square value (χ^2= 24.5614, p = 0.000) highlights the critical role of various actors, including government, NGOs, and the community, in influencing governance effectiveness. The involvement of multiple stakeholders is significantly associated with effective governance (p < 0.05). Collaboration among different actors enhances governance outcomes. This supports the collaborative governance model suggested by (de Loë et al., 2015). A study by (McQuaid et al., 2021) also emphasize the importance of multi-actor governance in environmental management.

The chi-square value (χ^2= 71.7949, p = 0.000) indicates the importance of having comprehensive environmental laws in place for effective governance. There is a highly significant relationship between environmental laws and governance effectiveness (p < 0.05). Robust legal frameworks are essential for regulating activities and protecting green spaces. (Partelow et al., 2020) underline the importance of strong environmental laws for achieving sustainability goals. With a significant chi-square value (χ^2= 84.2593, p = 0.000), the findings emphasize the necessity of transparency in governance processes, fostering trust and accountability. Transparency is significantly associated with effective governance (p < 0.05). Transparent processes build trust among stakeholders and ensure accountability. (A. Gupta & Mason, 2016) highlight that transparency can lead to more effective environmental governance. The chi-square value (χ^2= 35.4192, p = 0.000) indicates that the enforcement of environmental laws is crucial for effective governance. Effective implementation and enforcement of laws are critical for achieving governance outcomes (p < 0.05). Without enforcement, laws remain ineffective. Studies by (Oberthür, 2009) illustrate the importance of enforcement mechanisms in environmental regulation. The significant chi-square value (χ^2= 27.8705, p = 0.000) suggests that sensitization practices are essential for raising public awareness and engagement in green space governance. Sensitization practices significantly impact governance (p < 0.05). These

practices engage and inform communities about the importance of green spaces. Sensitization is vital in promoting environmental stewardship by raising awareness, altering attitudes, and motivating communities to engage in sustainable practices for the preservation of natural resources (Neiman & Ades, 2014). The chi-square value (χ^2= 5.4525, p = 0.020) shows a positive but less strong association between partnerships and governance effectiveness. Environmental partnerships are significantly related to effective governance ($p < 0.05$). Partnerships foster collaboration and resource sharing, enhancing the effectiveness of governance initiatives. Studies support the effectiveness of partnerships in addressing complex environmental issues (Wassmer et al., 2014).

The significant chi-square value (χ^2= 9.5238, p = 0.002) highlights the importance of effective dispute resolution mechanisms in maintaining governance stability and community trust. Effective dispute resolution mechanisms are significantly associated with better governance ($p < 0.05$). Resolving conflicts ensures smoother implementation of policies. The importance of dispute resolution is well-supported by (Bonnitcha et al., 2017) .The chi-square value (χ^2= 51.8519, p = 0.000) indicates a significant positive association between adaptiveness to environmental challenges and governance effectiveness. Adaptiveness shows a strong significant relationship with effective governance ($p < 0.05$). The ability to adapt to changing circumstances is crucial for sustainable management. Adaptive management offers significant benefits in addressing environmental uncertainties. This approach is effectively demonstrated by Pretty et al. (2007). The findings of this study reveal that the involvement of actors, environmental laws, transparency, law enforcement, sensitization practices, partnerships, dispute resolution, and adaptiveness are critical factors influencing effective green space governance in Addis Ababa. The findings align with Environmental Justice Theory by highlighting the need for inclusive governance, equitable access to green spaces, and active public participation. Key factors such as community engagement, transparency, and sensitization practices reflect the theory's emphasis on fair treatment in environmental decision-making. The study also underscores the role of institutional support and collaboration in addressing environmental inequalities, while governance mechanisms like dispute resolution and adaptiveness ensure sustainable, just outcomes for all stakeholders.

Table 4.4. Factors influencing effective green governance

Variable	Response		x^2 value	P Value
	Yes	No		
Accountability	152(76%)	48(24%)	0.8911	0.345
Indicators of participation	128(64)	72(36)	15.9171	0.000
Environmental Awareness Raising	112(56)	88(44)	27.8705	0.000
Environmental Knowledge	104(52)	96(48)	11.7623	0.001
Institutions	112(56)	88(44)	61.1111	0.000
Actors	152(76)	48(24)	24.5614	0.000
Environmental laws	104(52)	96(48)	71.7949	0.000
Transparency	96(48)	104(52)	84.2593	0.000
Implementation/ enforcement of laws	104(52)	96(48)	35.4192	0.000
Environmental sensitization practices	112(56)	88(44)	27.8705	0.000
Environmental Partnership	88(44)	112(56)	5.4525	0.020
Dispute resolution	80(40)	120(60)	9.5238	0.002
Adaptiveness	120(60)	80(40)	51.8519	0.000

Source: Household Survey (2023)

4.3.1.4. Green Space Governance and Accessibility

Table 4.5 presents a comprehensive overview of green space governance and accessibility in Addis Ababa, based on respondent data from Akaki Kality and Kolfe Keranio sub-cities. These insights are crucial for urban planning and policymaking. Firstly, a significant majority of respondents (52%) indicated a lack of green spaces around their residences, revealing a notable disparity in urban green space distribution. This gap is concerning, given the well-established benefits of green spaces for urban health and wellbeing (Lennon et al., 2017) .While satisfaction with current green space availability was not directly measured, only 28% of respondents perceived green spaces as accessible, suggesting potential dissatisfaction and highlighting the need for enhanced urban planning and policy interventions. Improved accessibility is critical for fostering urban sustainability and public health (Kabisch et al., 2016).

Interestingly, despite accessibility challenges, a majority (56%) of respondents reported having visited a green space, indicating community utilization when accessible. However, the high percentage (76%) of respondents perceiving green spaces as inaccessible suggests barriers such as distance, safety concerns, or inadequate facilities. This mismatch between utilization and perceived accessibility underscores potential inequities in green space distribution. Respondents recognized population growth as a significant factor impacting green space development, with 88% acknowledging its influence. This aligns with global urbanization trends where increasing populations often lead to reduced green spaces due to heightened demand for housing and infrastructure (du Toit et al., 2018). Urban planners in Addis Ababa must incorporate green space development into urban growth plans to ensure sustainable city development.

The study also highlighted community appreciation of green spaces' benefits, with 64% acknowledging their positive impact on wellbeing. Moreover, a substantial majority (96%) expressed willingness to participate in green space development, indicating strong community support for such initiatives. This willingness could be leveraged through participatory planning processes that involve local communities in designing, implementing, and maintaining green spaces. City administrative officials were recognized as pivotal in green space development, with 76% of respondents attributing importance to their role. This highlights the need for effective governance and supportive policies to facilitate green space initiatives. However, actual green space development by respondents was lower (36%), suggesting potential barriers such as resource constraints, lack of knowledge, or insufficient institutional support. The findings underline the urgent need for improved green space governance and accessibility in Addis Ababa. Equitable distribution and enhanced accessibility of green spaces are crucial for urban residents' well-being. The findings align with Environmental Justice Theory, emphasizing the inequitable distribution of green spaces and the barriers to accessibility faced by urban populations in Addis Ababa. The community‘s strong willingness to engage in green space development reflects the theory‘s focus on participatory governance as a means to address these disparities. Achieving environmental justice in this context requires effective, inclusive governance and equitable access to green spaces to promote urban sustainability and enhance residents' well-being.

Table 4.5. Green space governance and accessibility

Variables	Yes	No
Green spaces around your residence	96(48)	104(52)
Are you satisfied with the current availability of green spaces in the city Are green spaces accessible to the people	56(28)	136(68)
Have you ever visited a green space	112(56)	72(36)
Are green space Accessible to people	48(24)	152(76)
Does population growth affect green space development	176(88)	24(112)
Green space has benefits for the wellbeing of the community	72(36)	128(64)
Are you willing to participate in green space development	192(96)	8(4)
Do city administrative officials play an important role in green space development	152(76)	48(24)
Do you develop green space in your surroundings	72(36)	128(64)

Source: Household Survey (2023)

4.3.2. Results of binary logit model

The binary logistic regression analysis examining the factors influencing the effectiveness of green space governance (EGSG) in the sub-cities of Akaki Kality and Kolfe Keraniyo in Addis Ababa yields several important insights. The dependent variable was the effectiveness of green space governance, coded as 1 for effective. The findings indicate that gender, specifically being male, is positively associated with the perception of effective green space governance, as evidenced by a regression coefficient of 0.4742 (standard error: 0.182). However, the marginal effect is minimal and statistically insignificant at -0.09442 (standard error: 0.176), suggesting that the actual impact on the probability of perceiving governance as effective is negligible. This implies that gender does not significantly influence perceptions of green space governance effectiveness, consistent with findings by (Hunter et al., 2019). However, it contrasts with studies such as (Zelezny & Bailey, 2006), which indicated that women are generally more concerned with environmental issues than men. The divergence in findings could be due to contextual

differences in the study populations or variations in the operational definitions of environmental effectiveness.

Age is another critical factor, with individuals aged between 31-45 years showing a slight positive regression coefficient of 0.07411 (standard error: 0.000) but a significantly negative marginal effect of -0.3293 (standard error: 0.000). This negative marginal effect indicates that people in this age group are less likely to perceive green space governance as effective, which could be attributed to higher expectations or a more critical view of public services. This result aligns with the findings of (Torgler et al., 2008), who reported that younger individuals tend to be more critical of environmental governance. This demographic is often more environmentally aware and active, leading to higher expectations and thus a more critical perspective on governance effectiveness.

Marital status, particularly being married, significantly increases the likelihood of perceiving green space governance as effective, with a regression coefficient of 2.5540 (standard error: 0.274) and a marginal effect of 0.1187 (standard error: 0.271). Although the coefficient is positive, the result was not statistically significant ($p > 0.05$). This may be due to married individuals' potential greater use and valuation of green spaces, making them more appreciative of governance efforts. This finding is supported by (Torgler et al., 2008), who found that marital status has a minor influence on environmental attitudes. However, it contradicts some studies suggesting that married individuals may have stronger community ties and a greater vested interest in local environmental quality, thus potentially perceiving governance as more effective. Education level, particularly having a college education, shows a very high positive coefficient and significant marginal effect, indicating that higher education levels are strongly associated with perceptions of effective green space governance. This is reflected in a substantial regression coefficient of 16.4709 (standard error: 0.000) and a significant positive marginal effect of 0.3546 (standard error: 0.271). This suggests that education enhances awareness and appreciation of environmental governance, aligning with previous research indicating that higher education levels are associated with greater environmental awareness and activism (Huddart Kennedy et al., 2015; Jilani et al., 2021) .

Occupation in government shows a positive regression coefficient of 0.6523 (standard error: 0.481), yet the marginal effect is negative and statistically insignificant at -0.05407 (standard error: 0.000). This suggests that government employees are less likely to perceive green space governance as effective. This could be due to their closer involvement with governance processes and greater awareness of shortcomings, consistent with studies showing that insiders in governance systems often have more critical perspectives(Adams et al., 2010) .The reasons for not recreating in green spaces, such as distance and transport costs, significantly decrease the likelihood of perceiving governance as effective, with a regression coefficient of 0.0800 (standard error: 0.001) and a significant negative marginal effect of -0.3196 (standard error: 0.000). This highlights the critical role of accessibility in public satisfaction with green spaces. This finding aligns with studies on urban green space utilization (Jim & Chen, 2009; Quatrini et al., 2019). Accessibility to green spaces emerges as the strongest predictor of perceived governance effectiveness, with a highly significant regression coefficient of 79.9181 (standard error: 0.000) and a significant positive marginal effect of 0.5496 (standard error: 0.000). This underscores the importance of ensuring that green spaces are easily accessible to enhance public perception of their governance. Research highlights the importance of accessible green spaces in urban environments(Giles-Corti, 2006). Accessible green spaces improve public perception and usage, thereby enhancing governance effectiveness (Rubaszek et al., 2023).

The responsibility of city administration in the development, management, and protection of green spaces shows a positive association with effective governance, as indicated by a regression coefficient of 2.0169 (standard error: 0.232) and a marginal effect of 0.0888 (standard error: 0.3128). However, the marginal effect is not statistically significant, suggesting that while administrative efforts are recognized, they may not substantially alter public perception without addressing other factors such as accessibility and infrastructure. The importance of administrative roles in effective green space management has been emphasized, but the varying significance across contexts suggests that other factors, such as public participation and cross-sectoral partnerships, may also be crucial (Yirga Ayele et al., 2022).

Comparative studies align with these findings. For instance, research in Nairobi, Kenya, found that accessibility and proper management significantly contributed to the perceived effectiveness

of green spaces (Mwangi, 2021; Mwaura, 2023). Conversely, a study in New Delhi, India, highlighted the influence of socio-economic factors such as education and occupation on governance perception (Sharma-Wallace et al., 2018).In Addis Ababa, case studies in Akaki Kality and Kolfe Keraniyo sub-cities indicate that public satisfaction with green spaces is closely linked to accessibility and the proactive role of city administration. This analysis underlines the multifaceted factors influencing green space governance perception in Addis Ababa. Improving accessibility and reducing transport costs emerge as critical strategies for enhancing the perceived effectiveness of green space governance. The findings align with Environmental Justice Theory, emphasizing inequitable access to green spaces and barriers like distance and transport costs. They highlight the need for equitable governance, with a focus on improving accessibility and the role of city administration in addressing disparities. Ensuring fair access to green spaces is essential for advancing environmental justice and enhancing public satisfaction.

Table 4.6. Binary logistic regression result

EGSG (1=Effective)	Regression	Marginal effect
Sex(male)	0.4742 (0.182)	-0.09442 (0.176)
Age (Beteween 31-45)	0.07411 (0.000)	-0.3293 (000)
Martial (Married)	2.5540 (0.274)	0.1187 (0.271)
Levele_Education (College level)	16.4709 (000)	0.3546 (0.271)
Occupation (Government)	0.6523 (0.481)	-0.05407 (000)
Reason for not recreating in the green space (Distance and transport cost)	0.0800 (0.001)	-0.3196 (0.000)
Green spaces accessible	79.9181 (000)	0.5496 (0.000)
Responsible for development management, maintenance, and protection of green space (City Administrative)	2.0169 (0.232)	0.0888 (0.3128)
Constant	0.0404 (0.25)	
N	184	
Pseudo R^2	0.3005	
LR $chi^2(14)$	115.55	
Prob > chi^2	0.000	

Source: computed from household survey (2023)

4.4. Conclusion and Policy Implications

This study on green space governance in Addis Ababa, using chi-square tests and binary logistic regression analysis, revealed that public participation, environmental awareness, knowledge, and strong institutional frameworks are crucial for effective governance. Active involvement of various actors, enforcement of environmental laws, transparency, sensitization practices, adaptiveness, and effective dispute resolution and partnerships were also significant. Accountability was not statistically significant, suggesting other factors play more critical roles. Education, particularly at the college level, emerged as a significant predictor, highlighting the importance of educational interventions. Accessibility issues, such as distance and transport costs, were significant barriers, indicating the need for targeted interventions. Other demographic factors like sex, age, marital status, and occupation were not significant, suggesting governance effectiveness is more closely tied to systemic and institutional factors. Based on the study's findings, several policy recommendations are proposed to enhance green space governance in Addis Ababa. These include increasing public participation through community workshops and participatory planning; boosting environmental awareness with public education campaigns integrated into school curricula; strengthening institutional frameworks with dedicated resources and authority; improving legal frameworks and enforcement with comprehensive laws and strict monitoring; promoting transparency with open communication and accessible information; enhancing adaptiveness with flexible governance structures; addressing accessibility issues by improving infrastructure and public transport; and leveraging education to build a knowledgeable workforce dedicated to green space governance. It emphasizes the importance of collaboration among stakeholders to achieve sustainable and effective management of urban green spaces, contributing to environmental sustainability and community well-being. Future research should focus on longitudinal studies to evaluate the impact of policy interventions and monitor the evolution of these governance factors over time.

CHAPTER FIVE

5. Gender Integration and Sustainability in Environmental Governance: Challenges and Strategies for Gender Policy Implementation in Addis Ababa, Ethiopia

Abstract

This study investigates gender mainstreaming in environmental institutions in Addis Ababa City Administration aiming to enhance gender equality and decision-making processes. Through qualitative analysis of expert interviews and exploration of four key areas, it reveals varying degrees of gender mainstreaming implementation across institutions. Challenges identified include organizational culture, resource allocation, capacity building, execution practices, and gender representation in leadership roles. Despite recognizing the importance of gender equality, inconsistent execution persists due to cultural norms, financial constraints, and a lack of gender-specific data. The study advocates for strategic measures such as gender-sensitive indicators, increased women's participation in decision-making and comprehensive gender data collection to improve integration. It concludes by emphasizing the critical need for a systematic approach to gender mainstreaming in environmental institutions, underlining its significance in fostering sustainable development and social justice.

Keywords: Gender Mainstreaming; Environmental Institutions; Environmental governance; Decision-making; Addis Ababa

5.1. INTRODUCTION

The integration of gender perspectives into the governance frameworks of urban environmental entities is essential for advancing gender equality on a global scale. The United Nations (UN) emphasizes the critical importance of conducting thorough analyses on the potential effects that proposed policy measures and initiatives may have on individuals of all genders across various sectors and hierarchical levels. In support of this ethos, the UN's Global Gender Office has played a pivotal role in developing innovative strategies and providing essential tools designed to integrate gender considerations systematically into environmental programming (IUCN, 2023). The United Nations Environment Programme (UNEP) further reinforces this commitment with its Gender Action Plan, prioritizing gender equality within environmental initiatives (IUCN, 2023). In the context of the developing world, the integration of gender perspectives is increasingly recognized as a cornerstone for mitigating poverty and advancing sustainable development (Moser, 1993; Walter, 2011). Nonetheless, challenges such as ingrained sociocultural norms, underrepresentation, and barriers to resource accessibility and decision-making continue to impede progress (Bermúdez Figueroa et al., 2023). Across the African continent, regional entities, including the African Union, are vocal proponents of gender mainstreaming in environmental management, although the degree of implementation varies notably between nations (AU, 2015).

Ethiopia, in particular, has acknowledged the principle of gender equality in its constitution (FDRE, 1995). However, Ethiopian women encounter hurdles in participating in environmental governance due to resource constraints, educational limitations, and entrenched societal expectations (UN Women, 2018). Despite recognizing the critical role of women in the stewardship of natural resources, the translation of policy into tangible actions remains elusive (Zegeye et al., 2018). Empirical research by (Agarwal, 2009; Khandker et al., 2020) illuminates the beneficial impacts of gender mainstreaming in forest preservation and water resource management, respectively. Yet, Ethiopian environmental institutions grapple with a dearth of gender-disaggregated data, which hampers the evaluation of mainstreaming outcomes and the formulation of efficacious interventions (Rai et al., 2021).

The schism between the acknowledgment of gender mainstreaming and its practical execution is underscored by (Arora-Jonsson & Ågren, 2019), signaling an urgent requirement for focused strategies. A study by (Rai et al., 2021) assert that current gender mainstreaming efforts in climate change mitigation may inadvertently perpetuate stereotypes rather than subverting them. (Kaijser & Kronsell, 2014) criticize the neglect of intersectionality in mainstreaming endeavors, thereby ignoring critical factors such as race, class, and ethnicity. (Lema et al., 2019c) highlights the obstacles associated with implementing gender mainstreaming policies within Ethiopia's urban environmental institutions, attributing it to a deficiency in understanding and commitment.

Furthermore, (Dierig, 1999) found that in the solid waste management sector of Addis Ababa, women's participation significantly improves performance, despite facing notable obstacles. However, there remains a lack of systematic monitoring and evaluation of gender mainstreaming efforts, hindering the ability to gauge progress and make necessary adjustments. Additionally, there is a noticeable absence of definitive indicators for women's leadership in the environmental sector, hampering tracking of advancements and formulation of improvement strategies. The existing literature, with its limited focus on specific themes, leaves significant gaps in understanding the complex interactions among policy, organizational structure, resource allocation, and Expertise and capacity. This study aims to address these gaps by providing a comprehensive examination of the intricacies of gender mainstreaming within Addis Ababa's environmental institutions. It seeks to offer nuanced insights to facilitate more effective gender mainstreaming practices. The objective of the study is to examine and analyze the current status of gender mainstreaming in environmental institutions in Addis Ababa and its implication to environmental governance practices related to gender and environment.

5.2. Materials and Methods

5.2.1. Selection of key informants

The methodology employed a qualitative framework, leveraging expert interviews and purposive sampling to probe gender mainstreaming in environmental entities. This approach ensured the selection of individuals possessing in-depth knowledge pertinent to the subject. The snowball sampling technique further enriched the research by revealing professional networks, thereby deepening the qualitative insights (Vogl, 2022). Utilizing this method, the study engaged 20

specialists through referrals, beginning with institutional heads or acknowledged experts, which underscored the efficacy of the snowball technique in accessing domain-specific knowledge. The investigation concentrated on six pivotal environmental organizations in Addis Ababa, Ethiopia (Table 5.1).

Table 5.1. Public environmental institutions in Addis Ababa along with their institutional mandates

Institution Name	Description
Addis Ababa City Government Environmental Protection and Green Development Commission	Develops and enforces environmental protection policies, oversees green development initiatives, and ensures sustainable urban planning.
Addis Ababa River Basin and Green Area Development and Administration Agency	This office focuses on implementing environmental policies and initiatives at the municipal level.
Addis Ababa City Government Farmers and Urban Agriculture Development Commission	Responsible for the collection, transportation, and disposal of solid waste. Implements waste reduction, recycling, and management strategies to minimize environmental impact.
Addis Ababa Solid Waste Management Agency	This agency is responsible for the collection, transportation, and disposal of the city's solid waste, and plays a crucial role in maintaining the city's cleanliness and hygiene.
Addis Ababa Resilience project office	Focuses on building the city's resilience to environmental and socio-economic challenges, including climate change adaptation and disaster risk reduction.
The Ministry of Environment, Forest, and Climate Change (MEFCC) in Addis Ababa, Ethiopia,	Formulates environmental policies, laws, and regulations at the national level, oversees forest conservation, and implements climate change mitigation and adaptation strategies

Source: The respective institutions, 2023

5.2.2. Key informant interviews

The study relies on interviews with key informants as its primary means of data collection, facilitating a deep dive into perspectives and experiences regarding gender integration within organizations. Semi-structured interviews are utilized to maintain both consistency and adaptability, enabling open-ended inquiries and a comprehensive examination of participants' individual experiences. This qualitative methodology is vital in qualitative research as it facilitates the acquisition of detailed insights from individuals with informed perspectives and direct involvement in the subject under investigation (Marshall, 1996). The semi-structured format of these interviews proves valuable by providing a framework for the discussion while allowing for a natural flow of conversation. This approach facilitates the emergence of new lines of inquiry based on the narratives shared by respondents (Dicicco-Bloom, B. and Crabtree, B.F., 2006). Key informant interviews provide a nuanced perspective on complex issues like gender mainstreaming within institutions, offering insights that quantitative methods may overlook (Kumar, K., 1989).

5.2.3. Methods of Data Analysis

In this study, the method of data analysis employed was thematic analysis, chosen for its applicability to qualitative research and its adaptability to the exploration of gender mainstreaming in environmental institutions. Thematic analysis served as the primary approach to identify, analyze, and report patterns or themes within the gathered data. This method provided the flexibility necessary to capture the intricate nature of gender mainstreaming in the specific context of environmental institutions in Addis Ababa. The data, derived from key informant interviews, underwent systematic coding and analysis to discern recurring themes and patterns across four key areas of focus: policy level, organizational issues, resource allocation and expertise and capacity in the environmental sector. This comprehensive approach ensured a nuanced understanding of the complexities surrounding gender mainstreaming in environmental institutions, enriching the study's findings and contributing to a more informed discourse on the subject.

5.3. Results and Discussion

Gender mainstreaming is a vital approach that promotes gender equality and aims to integrate a gender perspective into the policies, structures, and practices of organizations. In the context of Addis Ababa environmental institutions, this study aims to provide a comprehensive discussion of the findings of a study that focused on five key areas related to gender mainstreaming. Thematic analysis of expert interviews, specifically expert number 20, has been conducted to gain deeper insights into the challenges and potential strategies for enhancing gender equality in these institutions.

5.3.1. Policy Level: Gender Policies and Laws in the Environmental Sector

5.3.1.1. Gender policies and strategies in the environmental sector

Ethiopia has made notable strides in integrating gender considerations into its environmental policy and legislation, spanning forestry, agriculture, water resources, and energy sectors. This commitment is evident in national and sector-specific strategies aimed at fostering gender equality and women's empowerment in environmental management (Desta & Haug, 2024). The Government of Ethiopia implemented the National Gender Policy in 2014, highlighting the importance of incorporating gender mainstreaming across developmental sectors, especially in environmental conservation and natural resource management (UN Women – Africa, 2014). This policy has yielded tangible results, including heightened awareness of gender equality's significance in achieving sustainable development goals. Initiatives such as the Gender and Climate Change Strategy have been instrumental in integrating gender perspectives into climate change adaptation and mitigation endeavors (UNDP, 2024). Furthermore, the Sustainable Land Management Program has prioritized women's involvement in land rehabilitation projects, resulting in enhanced land productivity and improved livelihoods for women (Kato et al., 2022).

Despite these advancements, challenges persist in implementing gender policies within the environmental sector. Persistent gender disparities in resource access and decision-making authority pose significant problems. Additionally, entrenched cultural norms and stereotypes impede women's participation in decision-making processes at community and institutional levels, limiting their influence on environmental policies and programs (K. Mohammed et al.,

2022). Several experts, particularly female representatives and department heads highlighted the existence of gender mainstreaming initiatives within their respective institutions. These initiatives encompass various aspects, including workforce diversity, gender-sensitive planning and programming, and capacity building for women in environmental management roles. For instance, Experts from the Addis Ababa City Government Environmental Protection and Green Development Commission emphasized the existence of gender-sensitive policies aimed at promoting equitable participation in environmental decision-making processes. These policies are evident in initiatives targeting various environmental sectors, including waste management, urban agriculture, and resilience projects.

Furthermore, insights from female representatives and department heads within the Addis Ababa River Basin and Green Area Development and Administration Agency highlighted the importance of gender mainstreaming in environmental planning and management. However, despite policy frameworks advocating for gender equality, practical implementation often faces difficulties such as resource constraints, institutional barriers, and limited awareness among stakeholders. Female representatives from the Addis Ababa Solid Waste Management Agency underscored the need for tailored interventions to address gender disparities in waste management practices and employment opportunities within the sector.

Moreover, discussions with experts from the Ministry of Environment, Forest, and Climate Change (MEFCC) in Addis Ababa revealed ongoing efforts to strengthen gender-responsive approaches in environmental governance. Yet, challenges persist in translating policy intentions into actionable strategies, particularly in fostering women's participation in climate change adaptation and mitigation programs. Additionally, insights from the Addis Ababa City Government Farmers and Urban Agriculture Development Commission emphasized the significance of recognizing women's roles in urban agriculture and ensuring their access to resources. The Addis Ababa Resilience project office highlighted the importance of integrating gender perspectives in resilience-building initiatives to address vulnerabilities and enhance community resilience to environmental hazards. However, despite recognizing the importance of gender-responsive approaches, practical implementation faces constraints related to capacity gaps and limited coordination among stakeholders. Gender integration in Addis Ababa's

environmental institutions faces hurdles despite policy support. Resource constraints, institutional inertia, and limited awareness impede effective implementation. Tailored interventions in sectors like waste management and urban agriculture are needed to address disparities.

The findings align with Structuration Theory by highlighting the dynamic interplay between gender policies and institutional practices in environmental governance. While national policies advocate for women's participation, the persistent challenges reveal the influence of institutional actors and power structures. The gap between policy intentions and implementation underscores the tension between top-down directives and local-level barriers, such as cultural norms and resource constraints, which shape individual and institutional actions. Strengthening capacity and fostering interagency coordination are essential to overcoming these barriers and transforming these structures effectively. Promoting women's participation and access to resources is crucial for advancing gender equality. Capacity-building and interagency collaboration are vital for overcoming implementation challenges.

5.3.2. Organizational Structure

5.3.2.1. Gender focal points, gender units, and specialists

In Addis Ababa's environmental institutions, the appointment of gender focal points, gender units, or specialists has been inconsistent. Some institutions, such as the Addis Ababa City Government Environmental Protection and Green Development Commission, have designated gender units since 2017. These units play a critical role in ensuring that environmental policies are analyzed through a gender lens, reflecting the importance of gender-sensitive approaches (Bolwig et al., 2008),who emphasizes that environmental projects should recognize the different roles and needs of men and women to be effective. Similarly, the Addis Ababa Solid Waste Management Agency has appointed gender focal points within its structure to address gender disparities in waste management activities.

On the other hand, the absence of such gender-focused roles in institutions like the Addis Ababa River Basin and Green Area Development and Administration Agency leaves a significant gap in addressing the gender dynamics within environmental initiatives. This gap is not unique to Addis

Ababa; it is reflective of broader global challenges in institutionalizing gender-responsive environmental governance (Rico, 1998) ,who argues that gender disparities in environmental management are indicative of wider socio-political inequalities that must be addressed for sustainable development. The responsibility of integrating gender considerations into environmental planning and implementation often falls on department heads or supervisors, who are frequently female representatives, within organizations such as the Addis Ababa City Government Environmental Protection and Green Development Commission and the Ministry of Environment, Forest, and Climate Change (MEFCC). However, the absence of clear accountability mechanisms and the lack of organizational prioritization of gender considerations can pose significant challenges.

Expert interviews have revealed numerous challenges that Addis Ababa's environmental institutions face in terms of gender mainstreaming. A primary concern is the sporadic appointment of gender focal points or specialists, which signals a lack of uniform institutional commitment to integrating gender in environmental policies and projects. While certain institutions have taken commendable strides in establishing dedicated gender units or appointing focal points, others remain behind, leading to inconsistent progress toward mitigating gender disparities.

Confronting the challenges of gender mainstreaming within Addis Ababa's environmental institutions necessitates an integrative approach that embeds gender considerations throughout all phases of environmental planning and policy formulation. Such an approach is essential for enhancing the effectiveness of environmental initiatives and also serves the larger objective of fostering gender equality and sustainable development. The findings align with Structuration Theory by highlighting how institutional structures influence gender integration in environmental governance. The inconsistent appointment of gender focal points and the absence of clear accountability mechanisms demonstrate the interplay between agency (individual actions) and structure (organizational norms and priorities). This emphasizes the need for a more coherent and systematic approach to institutionalizing gender mainstreaming, ensuring that organizational structures are aligned with gender-responsive policies for effective implementation. The findings align with Structuration Theory by showing how institutional structures and cultural norms

influence gender dynamics in leadership. The underrepresentation of women in senior roles highlights the interaction between individual efforts and organizational biases, emphasizing the need for systemic change to promote gender equality and support women's leadership advancement. Addressing these systemic issues will require sustained efforts and an unwavering commitment to gender-responsive governance.

5.3.2.2. Gender balance in environmental institutions

Among the experts interviewed, female representatives consistently pointed out the underrepresentation of women in senior positions across all institutions. They emphasized that despite efforts to promote gender diversity, structural barriers such as cultural norms and stereotypes continue to hinder women's advancement into leadership roles. For instance, some female representatives expressed frustration with entrenched gender biases within recruitment and promotion processes, which often favor male candidates. Despite the qualifications and capabilities that women may possess, they are frequently overlooked due to these persistent biases. For example, a study by Branscombe & Ryan (2013) highlights the "labyrinth" metaphor, describing the numerous obstacles women face in their career paths, which differ from the "glass ceiling" in that they involve a complex set of challenges and not just a single barrier to top leadership positions.

Supervisors and department heads acknowledged the importance of addressing gender disparities within their organizations. However, they cited practical challenges such as limited resources and capacity constraints that hinder the effective implementation of gender mainstreaming initiatives. Furthermore, while supervisors and department heads may acknowledge the importance of addressing gender disparities, practical challenges such as limited resources and capacity constraints can impede the implementation of gender mainstreaming initiatives. This is echoed by a report from the United Nations Development Programme (UNDP), which suggests that without adequate resources and a strategic approach, gender initiatives may not achieve their intended impact (OECD, 2022).

Targeted mentorship and leadership development programs are indeed pivotal in empowering women to ascend to leadership roles. A study by (Abalkhail & Allan, 2015) suggests that such

programs can provide women with the necessary skills, confidence, and networks to navigate their careers successfully. These programs can also help in challenging the status quo by cultivating a new generation of female leaders who can serve as role models and change agents within their organizations. Institutions like the Addis Ababa City Government Environmental Protection and Green Development Commission have shown that with organizational commitment, it is possible to promote gender equality through progressive policies and programs. The case of this commission exemplifies how gender-sensitive recruitment practices and inclusive decision-making processes can create a more equitable work environment. A report by the International Union for Conservation of Nature (IUCN) further supports this by emphasizing that proactive measures and strong leadership commitment are necessary for the successful mainstreaming of gender in environmental governance (IUCN, 2023).

The study highlights the significant challenge of addressing gender disparity in Addis Ababa's environmental institutions. Structural barriers hinder women's advancement into senior roles despite recognition of the importance of gender diversity. Cultural biases in recruitment processes and limited resources underscore the need for systemic interventions. Investing in training and mentorship programs is crucial to enhancing women's leadership skills and confidence. Positive examples of gender equality initiatives demonstrate the potential for progress with organizational commitment. Institutions prioritizing gender diversity not only advocate for equity but also benefit from diverse perspectives, enhancing decision-making and performance. y within environmental institutions. The findings align with Structuration Theory by showing how gender dynamics in leadership are influenced by both individual actions and institutional structures. The underrepresentation of women in senior positions reflects the impact of cultural norms and organizational biases, highlighting the need for systemic changes to support women's advancement and promote gender equality in environmental institutions.

5.3.2. 3 Collaborations among the environmental institutions gender mainstreaming

Female representatives from the Addis Ababa City Government Environmental Protection and Green Development Commission and Addis Ababa River Basin and Green Area Development and Administration Agency highlighted collaborative efforts between environmental and gender-

focused departments. They cited joint projects aiming to address environmental challenges and gender inequalities simultaneously. Examples include initiatives combining environmental education with sustainable resource management to promote sustainable livelihoods for women. Such integration aligns with the United Nations Sustainable Development Goals, particularly SDG 5 (gender equality and empowerment of women and girls) and SDG 12 (sustainable management of natural resources) (SDG 12) (UNDP, 2015).

However, challenges persist in achieving seamless integration. Some experts, such as department heads from the Addis Ababa City Government Farmers and Urban Agriculture Development Commission and the Addis Ababa Solid Waste Management Agency, pointed out that while there is recognition of the importance of gender perspectives in environmental initiatives, operationalizing this recognition remains a challenge. Limited resources, including funding and staffing, often hinder the implementation of gender-sensitive approaches in environmental projects. Additionally, bureaucratic hurdles and competing priorities within institutions sometimes impede effective collaboration between environmental and gender-focused departments.

The findings highlight commendable efforts to integrate gender perspectives into environmental initiatives in Addis Ababa, yet significant challenges hinder comprehensive cooperation between environmental institutions and gender equality departments. Collaborative projects signify a growing acknowledgment of the link between environmental sustainability and gender equality, crucial for addressing environmental impacts on marginalized communities. Incorporating gender perspectives into planning ensures both environmental soundness and social equity. However, challenges, such as resource constraints and bureaucratic hurdles, necessitate robust institutional support for effective collaboration. Streamlining processes and aligning priorities are vital for overcoming barriers. While progress is evident, concerted efforts are needed to foster meaningful cooperation between environmental and gender-focused departments. The findings align with Structuration Theory by highlighting how institutional structures and available resources shape the success of gender mainstreaming in environmental projects. The integration of gender perspectives demonstrates the interaction between individual actions (agency) and organizational constraints (structure).

5.3.3. Resource Allocation

5.3.3.1 Financial resources allocated for gender-specific approaches to environmental policies

Most of the experts highlighted a lack of specific financial resources allocated for gender-specific approaches within environmental policies. They noted that while gender mainstreaming is acknowledged in policy documents, it often lacks substantive budgetary allocation. For instance, one female representative from the Addis Ababa Resilience Project office expressed,

"Although gender mainstreaming is emphasized in our policies, the actual allocation of resources specifically for gender-sensitive programs remains inadequate‘‘ (Interviewee 12).

Experts across institutions acknowledged the importance of stakeholder participation in environmental policy formulation and implementation. However, they also highlighted challenges in effectively engaging stakeholders, particularly marginalized groups such as women and local communities due to budget constraints. A supervisor from the Addis Ababa Solid Waste Management Agency noted:

"*While we aim for inclusive decision-making processes, reaching out to diverse stakeholders, especially women and vulnerable communities, remains a challenge due to resource constraints and limited capacity"(Interviewee 5).*

Several challenges were identified regarding the implementation of gender-specific approaches and stakeholder participation in environmental policies. These included bureaucratic hurdles, limited awareness and understanding of gender issues among policymakers and practitioners, and insufficient capacity-building initiatives. A department head from the Addis Ababa River Basin and Green Area Development and Administration Agency emphasized:

"There is a need for targeted capacity-building programs to enhance understanding and skills in gender mainstreaming among our staff" (Interviewee 8).

The findings highlight a significant gap between policy intentions and their implementation regarding gender mainstreaming and stakeholder involvement in environmental governance in

Addis Ababa. Despite policy acknowledgment, tangible resource allocation for gender-sensitive approaches remains limited, hindering effective implementation. This discrepancy perpetuates gender disparities in accessing environmental initiatives. Additionally, challenges in stakeholder participation underline the need for more inclusive decision-making processes involving diverse stakeholders, particularly women and marginalized groups. The findings align with Structuration Theory by showing how institutional structures and individual actions interact to influence resource allocation for gender-specific environmental policies. The gap between policy goals and actual resource distribution highlights organizational constraints, such as budget limitations and bureaucracy, that hinder effective implementation. To address these challenges, structural changes like gender-responsive budgeting and capacity-building initiatives are needed to empower individuals and foster more inclusive decision-making.

5.3.3.2 Application of gender budgeting in environmental programs and processes

Experts from various institutions highlighted a lack of awareness and comprehension of gender budgeting principles among decision-makers and budget planners. This deficiency was attributed to a broader issue of incomplete integration of gender mainstreaming into institutional policies and practices. Without a thorough grasp of gender-responsive budgeting, its practical implementation becomes challenging, leading to oversight and neglect of gender-specific needs within environmental initiatives. Furthermore, department heads from the Addis Ababa City Government Environmental Protection and Green Development Commission and the Addis Ababa River Basin and Green Area Development and Administration Agency underscored the absence of dedicated resources and mechanisms for gender analysis within budgeting processes. While efforts were made to incorporate gender considerations, the absence of specific allocations and guidelines hindered effective implementation. Consequently, gender disparities persisted, and the potential for inclusive and equitable environmental outcomes remained unrealized.

Supervisors and key experts from the Addis Ababa City Government Farmers and Urban Agriculture Development Commission and the Addis Ababa Solid Waste Management Agency highlighted bureaucratic obstacles and resistance to change as significant challenges. They pointed out that entrenched budgeting structures and practices made it difficult to introduce gender-sensitive approaches. Moreover, female representatives from the Addis Ababa Resilience

project office and the Ministry of Environment, Forest, and Climate Change stressed the necessity for capacity-building and technical assistance. They emphasized the importance of training and awareness programs to empower staff in gender analysis and budgeting. Without sufficient skills and knowledge, the integration of gender perspectives into budgeting processes remains superficial and ineffective.

The findings underscore systemic hurdles in implementing gender budgeting within Addis Ababa's environmental institutions. Despite its recognized significance, several barriers impede its effective adoption. Insufficient awareness, resources, and technical expertise hamper the integration of gender considerations into budgeting processes, perpetuating gender disparities in environmental outcomes (Khandker et al., 2020). The limited inclusion of gender perspectives in budgeting mirrors broader shortcomings in mainstreaming gender within institutional frameworks. Without a comprehensive grasp of gender dynamics and specific needs, environmental policies and programs are unlikely to address the diverse realities faced by men and women. Therefore, urgent institutional reforms are needed to prioritize gender equality and social inclusion in environmental decision-making.

Moreover, resistance to change entrenched within bureaucratic structures obstructs progress toward gender-responsive budgeting. Overcoming inertia necessitates concerted efforts to foster an inclusive and accountable culture within environmental institutions. Leadership commitment, along with targeted interventions to address resistance and foster consensus, is crucial for instigating transformative change. Capacity-building emerges as a vital strategy to bridge knowledge gaps and empower staff in gender analysis and budgeting. The findings align with Structuration Theory by demonstrating how institutional structures and individual agencies shape the adoption of gender budgeting in environmental policies. Bureaucratic resistance, lack of awareness, and limited capacity reflect structural constraints that impede effective gender mainstreaming. Addressing these challenges requires systemic changes and the empowerment of individuals to integrate gender perspectives into budgeting processes.

5.3.4. Knowledge and expertise in the field of gender and environment

The environmental institutions in Addis Ababa demonstrated a strong awareness of gender issues within their operational framework. Experts highlighted the incorporation of gender-sensitive policies that aim to enhance women's participation considerations. Additionally, partnerships with civil society organizations and academia offer valuable expertise and resources to support gender-responsive budgeting initiatives.

in environmental governance. However, the practical application of these policies was often inconsistent, with some institutions lacking clear mechanisms for ensuring gender equity. Interviews revealed that there is a varying degree of expertise regarding the intersection of gender and environment. Some experts were well-versed in the nuances of how environmental changes disproportionately affect women, particularly in areas such as water management and land use. This awareness is crucial, as it aligns with global observations that women often face the brunt of environmental challenges (Brown, 2011) .

The practices within these institutions reflected a commitment to green development and resilience within Addis Ababa. Initiatives such as river basin conservation and urban agriculture have been implemented with consideration of their gendered impacts. However, experts noted that women's representation in decision-making roles remains limited, which could hinder the effectiveness of these initiatives from a gender perspective. Experts acknowledged several challenges in integrating gender considerations into environmental programs. These include cultural barriers, lack of gender-disaggregated data, and limited resources dedicated to gender mainstreaming. It was often cited that without addressing these systemic issues, achieving gender equality in environmental outcomes would remain a challenge. These challenges align with broader global trends that recognize the need for concerted efforts in integrating gender considerations into environmental programs (Miller & Razavi, 1995).

Despite the challenges, there were examples of progress and innovative approaches to gender and environmental issues. For instance, the Addis Ababa Resilience Project Office has been working on incorporating gender-sensitive approaches in its urban resilience strategies, and the

MEFCC has initiated projects that empower women through environmental conservation and climate change mitigation activities. The finding emphasizes the importance of institutional knowledge and expertise in bridging gender gaps in environmental governance.

While policies exist on paper, their implementation varies, suggesting a gap between policy and practice. The need for capacity building and targeted training on gender-environment linkages was evident across institutions. Moreover, the findings pointed to the systemic barriers that impede the integration of gender considerations. To overcome these, institutions must prioritize the collection of gender-disaggregated data that can inform more nuanced policy-making. Additionally, fostering a culture that values and promotes women's leadership in environmental sectors is crucial. Innovative approaches that have yielded positive results offer a blueprint for scaling up gender-sensitive environmental practices. These examples serve as a testament to what can be achieved with concerted effort and dedication to gender equality.

5.3.5. Gender-environment training

The study on the need for gender-sensitive training within environmental institutions in Addis Ababa brings to light a significant oversight in organizational training frameworks. As noted, while general training programs on environmental issues are commonplace, the integration of gender perspectives is frequently neglected. This absence underlines a systemic issue in recognizing the intersectionality between gender and environmental concerns. Research emphasizes the importance of adopting an intersectional approach to environmental training, give emphasis to the potential shortcomings of ignoring the nuanced impacts of environmental issues on different genders (Steinfield & Holt, 2020). Moreover, experts have pointed out the necessity for bespoke training sessions that delve into the dynamics between gender and the environment. Without such specialized training, there is a risk that staff may not possess the required competencies to employ gender-sensitive approaches effectively. The lack of these critical skills can ultimately compromise the success of environmental programs and narrow the scope of inclusive decision-making. A study by Sharr (2023) highlights similar findings, where the absence of gender-focused training correlates with reduced effectiveness in environmental initiatives and decision-making processes.

The challenges identified by participants, such as limited resources and competing organizational priorities, further complicate the establishment of gender training sessions. Budgetary constraints and high-pressure workloads can lead to the devaluation of gender-related capacity building, thus perpetuating gender disparities and underrepresentation of women in the environmental sector (S. G. Smith & Sinkford, 2022). These institutional barriers resonate with the broader discourse on the interrelation between resource availability and the advancement of gender equity initiatives. In light of these findings, it is imperative for Addis Ababa's environmental institutions to prioritize the implementation of gender-sensitive training programs. Such programs should be specifically tailored to the institutions' needs and context, employing interactive methodologies and practical instruments for integrating gender considerations into routine operations. Collaborating with external entities like civil society organizations and academia can contribute valuable expertise and additional resources, bolstering the efforts to mainstream gender perspectives. By embracing shared knowledge and experiences, the environmental institutions in Addis Ababa can strengthen their capacity to bridge gender gaps and foster a more inclusive and equitable approach to environmental governance.

5.4. Conclusions

Ethiopia has recognized the importance of gender integration within its environmental policies; however, the actualization of gender mainstreaming in Addis Ababa's environmental sector faces significant hurdles. Persistent systemic obstacles, entrenched cultural norms, and unequal access to resources hinder the operationalization of gender-sensitive approaches. Although gender focal points and specialists have been appointed in environmental entities, there remains an urgent need for enhanced resources, improved data acquisition, and augmented inter-institutional cooperation to address the enduring gender imbalances, notably at higher echelons of leadership. To advance, Addis Ababa's environmental institutions must implement a cohesive and comprehensive strategy that seamlessly incorporates gender perspectives into every aspect of environmental policy development, program execution, and decision-making processes. Such a strategy should prioritize the strengthening of policy enforcement mechanisms, the challenging and reshaping of cultural norms, and the cultivation of supportive work environments that encourage female empowerment and celebrate diversity. The initiation of mentorship schemes, leadership training, and programs aimed at dispelling gender stereotypes is essential to nurturing

female leadership within the environmental domain. Furthermore, inter-agency collaboration, along with partnerships with civil society and other pertinent entities, is crucial to build alliances and promote the gender equality agenda within environmental management. The adoption of gender-responsive fiscal practices, including the allocation of funds for gender-focused activities and equitable resource distribution, should be expanded. Capacity-building endeavors are essential to equip personnel, especially women, with the gender-specific competencies that are currently deficient. Addressing institutional impediments such as resistance to change and the absence of gender-aware procedures necessitates thorough organizational reforms and robust accountability frameworks. Engaging all stakeholders, particularly women, in participatory decision-making and backing educational platforms will enhance female involvement and ascendancy in environmental education and capacity-building initiatives. Prioritizing gender equality in environmental governance is not merely a quest for social equity; it is a strategic imperative to unleash the full capabilities of women as vital agents of sustainable development in Addis Ababa. It is through these collective actions and cooperative initiatives that we can aspire to realize a more balanced and sustainable future for all.

CHAPTER SIX

6. Synthesis

6.1. Introduction

The urban landscape of Addis Ababa faces a multitude of environmental challenges that necessitate a strong governance framework. This chapter synthesizes the findings of the research, which aims to provide a comprehensive understanding of the urban environmental governance in Addis Ababa. The primary objectives of the research are to analyze the policy frameworks and institutional structures onurban environmental governance, determine the key determinants contributing to effective urban green space governance, examine the practices and factors influencing solid waste management among urban households, and evaluate the status of gender involvement in goal setting and decision-making processes.

Urban environmental governance is critical for the sustainable development of cities, particularly in rapidly urbanizing regions such as Addis Ababa. The institutional frameworks and policies that guide urban environmental management play a crucial role in addressing issues related to green spaces, solid waste management, and gender inclusivity. By examining these components, this research provides valuable insights into the effectiveness of current governance structures and offers recommendations for improvement.

The synthesis presented in this chapter draws on recent studies and empirical data to highlight the interconnectedness of various governance elements. It underlines the importance of a participatory approach that includes diverse stakeholders, particularly in addressing gender disparities in environmental decision-making processes. Furthermore, the chapter discusses the implications of these findings for policymakers, urban planners, and community leaders in Addis Ababa, aiming to foster a more inclusive and effective urban environmental governance system.

6.2. Discussion of major findings

The examination of existing policies within the study area exposed that while there are numerous policies in place aimed at enhancing urban environmental governance, their effectiveness is often hindered by inadequate implementation and enforcement. Key policies related to urban green

spaces, solid waste management, and gender inclusion was found to have significant gaps between their intended outcomes and actual impacts. This discrepancy highlights the need for more strong policy frameworks and stronger enforcement mechanisms to ensure that policies achieve their intended goals.

The study found that while there are comprehensive policy frameworks governing urban environmental management in Addis Ababa, their effectiveness is undermined by gaps in institutional structures. The lack of clear, gender-responsive policies and insufficient resources for implementation were significant barriers. The findings indicate that although policies theoretically support integrated environmental management, the practical application is often compromised by bureaucratic resistance and inadequate institutional capacity (chapter 2).
The inefficiencies in policy frameworks and institutional structures impact all other areas of environmental governance. For instance, ineffective policy implementation directly affects the management of solid waste and green space. The lack of gender-sensitive frameworks exacerbates disparities in these areas, as gender-specific needs and contributions are often overlooked in policy and decision-making processes. Strengthening institutional structures and ensuring that policies are effectively implemented can improve the overall governance of environmental resources.

Solid waste management practices among urban households were found to be influenced by a variety of factors, including awareness levels, availability of infrastructure, and economic incentives. Higher levels of awareness and education regarding the benefits of proper waste management were associated with more effective practices. Conversely, the lack of adequate waste disposal infrastructure and economic disincentives, such as high costs associated with waste collection services, were identified as major barriers to effective waste management. The study highlighted the importance of improving infrastructure and providing economic incentives to encourage better waste management practices among urban households (chapter 4).

Ineffective solid waste management is both a consequence and a contributor to broader governance issues. Poor waste management practices reflect the inadequacies of existing policy frameworks and institutional structures. Conversely, the failure to integrate gender

considerations into waste management exacerbates existing challenges, making it difficult to address the specific needs of women and marginalized groups. Effective solid waste management requires robust policy frameworks that incorporate gender perspectives and institutional support to ensure efficient and equitable practices.

The study identified several determinants contributing to effective urban green space governance, including community engagement, adequate funding, and inter-agency collaboration. Community engagement emerged as a critical factor, as active participation by local residents in the planning, maintenance, and utilization of green spaces greatly enhanced their sustainability and effectiveness. Additionally, sufficient funding was necessary to support the development and upkeep of green spaces, while collaboration among various governmental and non-governmental agencies facilitated more comprehensive and coordinated governance efforts (chapter 2).

The effectiveness of green space governance is influenced by both institutional frameworks and solid waste management practices. Inadequate institutional support for gender-sensitive approaches limits the potential for inclusive and effective green space management. Moreover, the misalignment of green space governance with solid waste management practices can lead to environmental degradation, which further impacts green spaces. Addressing these issues requires a holistic approach that integrates gender perspectives into all aspects of urban environmental governance.

The evaluation of gender involvement in urban environmental governance revealed significant disparities in the inclusion of women in decision-making processes. Women were often underrepresented in key roles related to environmental policy-setting and goal development. However, when women were actively involved, their contributions led to more holistic and inclusive governance outcomes. This finding emphasizes the need for policies and practices that promote gender equity in environmental governance, ensuring that both men and women have equal opportunities to participate and influence decision-making processes (chapter 5).

Gender involvement is crucial for effective policy implementation and governance across all environmental sectors. The lack of gender representation impacts solid waste management and green space governance by perpetuating policies that do not consider gender-specific needs. Additionally, ineffective policy frameworks and institutional structures are exacerbated by the limited inclusion of women in decision-making processes. Enhancing gender involvement can improve the effectiveness of policies and practices in both waste management and green space governance.

The findings emphasize the interconnectedness of policy frameworks, institutional structures, solid waste management practices, green space governance, and gender involvement. Ineffective institutional frameworks and policies undermine solid waste management and green space governance. Conversely, inadequate solid waste management and poor green space governance reflect broader issues in policy implementation and institutional capacity. Addressing these challenges requires a comprehensive approach that integrates gender considerations into all aspects of environmental governance. Strengthening institutional frameworks, improving policy implementation, and enhancing gender involvement are essential for achieving more effective and equitable environmental management. By addressing these interrelated issues, Addis Ababa can improve its urban environmental governance, leading to better outcomes in solid waste management, green space management, and overall environmental sustainability.

6.3. Contribution of the Study

This study makes significant empirical contributions by providing a comprehensive analysis of environmental governance in Addis Ababa. It empirically examines the effectiveness of policy implementation, the impact of socio-economic and demographic factors on waste management, the governance of urban green spaces, and the integration of gender perspectives into environmental policies. The empirical findings highlight the real-world challenges and successes in these areas, offering data-driven insights that can inform policymakers and practitioners. For instance, the study identifies specific barriers to effective policy implementation, such as resource constraints and institutional fragmentation, and provides empirical evidence on how different socio-economic factors influence waste disposal behaviors. These insights are invaluable for developing tailored interventions that address the unique needs of various

communities. Theoretically, this research advances Environmental Justice Theory by revealing issues of equity, access, and representation in Addis Ababa‘s governance structures. The study finds that low-income neighborhoods not only have limited access to well-maintained green spaces but also bear a heavier burden of inadequate waste disposal services. This aligns with Environmental Justice Theory, which highlights the inequitable distribution of environmental resources and challenges. The study also extends this theory by incorporating a gendered perspective, illustrating how access to green spaces and environmental services can differ by gender, underscoring an intersectional approach that considers socio-economic and gender-based disparities.

Additionally, the study contributes to Structuration Theory by examining how governance structures and community agency shape and influence one another in Addis Ababa. Structuration Theory posits that structures shape, and are shaped by, social practices a dynamic evident in this study. For instance, community-led initiatives to improve green spaces have influenced local governance policies, illustrating the active role that residents play in reshaping governance despite structural constraints. Furthermore, the research finds that socio-economic factors affect community agency; neighborhoods with higher socio-economic resources demonstrate a greater ability to maintain green spaces and advocate for improvements. This interplay between structure and agency highlights how governance frameworks adapt and respond to community practices and needs.

6.4. Conclusion

This dissertation has provided a comprehensive examination of environmental governance in Addis Ababa, addressing key aspects such as policy implementation, the influence of demographic and socio-economic factors on solid waste management, the effectiveness of green space governance, and the integration of gender perspectives in environmental policies. The study's findings reveal a complex landscape marked by both significant progress and substantial challenges; necessitating targeted and holistic policy interventions. The analysis of environmental policy implementation highlights Addis Ababa's commitment to sustainable development. However, it also identifies critical barriers such as resource constraints, capacity limitations, and institutional fragmentation that impede effective policy execution. These insights

underline the need for streamlined coordination mechanisms and healthy enforcement and monitoring systems to bridge the gaps in policy implementation and compliance. The investigation into solid waste management practices demonstrates the significant impact of demographic and socio-economic factors on waste disposal behaviors. Gender, age, education level, family size, attitude towards waste management, and employment status all play crucial roles in shaping how waste is managed. The study's findings inform the development of targeted waste management strategies tailored to the specific needs and preferences of diverse demographic groups, thereby enhancing the efficiency and effectiveness of waste management systems in the city. The assessment of green space governance identifies several pivotal factors influencing its effectiveness, including participation, environmental awareness, knowledge, institutions, actors, laws, transparency, implementation, and enforcement. The study reveals that education level and accessibility issues are critical predictors of governance success, emphasizing the importance of educational interventions and the removal of barriers to green space utilization.

These insights are vital for the formulation of policies and programs that promote sustainable and accessible urban green spaces. Furthermore, the analysis of gender integration within environmental policies sheds light on the systemic obstacles and entrenched cultural norms that hinder gender mainstreaming in Addis Ababa's environmental sector. The study calls for enhanced resources, improved data acquisition, and augmented inter-institutional cooperation to address these challenges. It proposes a cohesive strategy that includes mentorship schemes, leadership training, inter-agency collaboration, and gender-responsive fiscal practices, aiming to advance female involvement and leadership in environmental governance. Overall, the findings of the study underscore the importance of adopting a holistic approach to urban environmental governance. Addressing systemic issues, integrating demographic and socio-economic factors, and prioritizing gender equality are crucial for achieving effective and sustainable management of urban environmental challenges in Addis Ababa. By implementing targeted interventions and strategic policies, the city can advance toward more effective governance and a sustainable future.

6.5. Recommendations

Based on the findings and insights derived from the study, several recommendations are proposed to enhance urban environmental governance within the study area. These recommendations address the key objectives of the study, focusing on policy effectiveness, urban green space governance, solid waste management practices, and gender involvement in environmental decision-making processes. To strengthen policy frameworks and enforcement mechanisms, it is crucial to develop more comprehensive and detailed policies that clearly outline the goals, responsibilities, and expected outcomes related to urban environmental governance. Implementing stronger enforcement mechanisms, such as regular monitoring, inspections, and penalties for non-compliance, will ensure that policies are not only adopted but also effectively executed. Engaging a wide range of stakeholders, including government agencies, non-governmental organizations, and community groups, in the policy-making process will help to ensure that policies are inclusive and address the needs of all relevant parties.

Enhancing urban green space governance requires fostering active community participation in the planning, maintenance, and utilization of urban green spaces. This can be achieved through community workshops, volunteer programs, and public consultations. Securing sufficient funding for the development and upkeep of green spaces through government budgets, public-private partnerships, and grants is essential. Innovative financing mechanisms, such as green bonds, should also be explored. Promoting collaboration among various governmental and non-governmental agencies will ensure a coordinated approach to urban green space governance. Establishing inter-agency committees or task forces to oversee green space initiatives can facilitate this collaboration.

Improving solid waste management practices involves increasing awareness and education about the importance of proper waste management through public campaigns, school programs, and community workshops. Highlighting the environmental, health, and economic benefits of effective waste management will encourage better practices. Investing in the development of adequate waste disposal infrastructure, including recycling facilities, waste collection services, and composting centers, is critical. Ensuring that these facilities are accessible to all urban households will further support effective waste management. Providing economic incentives,

such as subsidies for waste collection services, tax rebates for recycling, and financial rewards for communities that achieve waste reduction targets, can motivate households to adopt better waste management practices.

Promoting gender equity in environmental governance requires developing and implementing policies that create equal opportunities for both men and women to participate in decision-making processes. Providing training and capacity-building programs for women to enhance their skills and knowledge in environmental governance is essential. Encouraging the participation of women in leadership roles within environmental organizations and government agencies will further promote gender equity. Adopting gender-sensitive approaches in all aspects of environmental governance, including conducting gender assessments and collecting gender-disaggregated data, ensures that initiatives consider the unique needs and perspectives of women. Adopting a holistic approach to urban environmental governance integrates policy effectiveness, community engagement, resource allocation, infrastructure development, economic incentives, and gender equity. Recognizing the interconnected nature of these elements and addressing them simultaneously will achieve comprehensive and sustainable outcomes. Establishing mechanisms for continuous improvement and adaptation of governance practices is also important. Regularly reviewing and updating policies, seeking feedback from stakeholders, and remaining responsive to emerging challenges and opportunities will ensure that urban environmental governance remains effective and resilient.

By implementing these recommendations, urban areas can enhance their environmental governance frameworks, leading to more sustainable, inclusive, and resilient communities. The insights and recommendations provided by this study serve as a valuable resource for policymakers, practitioners, and researchers dedicated to improving urban environmental governance.

6.6. Limitations of the Study

This study presents limitations that may affect the scope and applicability of its findings. The research is confined to Addis Ababa, focusing specifically on two sub-cities—Akaki Kality and Kolfe Keranio. This narrow geographic scope may not fully capture the diverse environmental governance challenges and practices present in other areas of the city or in different urban

settings across Ethiopia. Additionally, within these sub-cities, the study further narrows its focus to four woredas, potentially overlooking variations in governance practices and issues across other woredas. This selective focus may limit the comprehensiveness of the analysis. The study also examines only six environmental institutions, which, while relevant, may not encompass the full range of stakeholders involved in urban environmental governance. This limited institutional scope excludes other significant entities, such as non-governmental organizations (NGOs), which play a critical role in environmental management and advocacy. Furthermore, the research encountered challenges in obtaining adequate secondary data on environmental policy and governance, as documented sources were limited. Many institutions either lacked comprehensive documents due to poor institutional memory or were unable to provide detailed historical data because of high turnover rates in the public sector. This led to a reliance on qualitative interviews with policy personnel and experts, which, while valuable, may introduce subjectivity.

The methodological approach also presents limitations. Some aspects of the study rely solely on qualitative thematic analyses and key informant interviews, which may miss quantitative aspects of governance practices. Conversely, other aspects of the study use only quantitative methods, which may not capture the nuanced, qualitative experiences and perceptions of stakeholders. Additionally, due to resource constraints, quantitative data for the Environmental Governance (EG) index were collected from only two of the study sites, with qualitative data from other sites supplementing this. A more comprehensive survey across all sites, combined with corresponding qualitative data, would have provided more complete and robust evidence. Overall, these limitations suggest that while the study offers valuable insights, future research could benefit from a broader geographic and institutional scope, the inclusion of a wider array of stakeholder perspectives, and a more balanced use of qualitative and quantitative methods to achieve a more comprehensive understanding of urban environmental governance.

6.7. Future Research

Based on the limitations and findings of this study, several key research areas are proposed for the future to enhance our understanding and effectiveness of environmental governance. Longitudinal studies on policy implementation should be conducted to monitor the long-term

effectiveness of environmental policies. This includes assessing the impact of policy changes over time and identifying factors that contribute to sustained policy success or failure. Additionally, an in-depth analysis of institutional fragmentation is necessary to understand the causes and consequences within environmental governance. Research should explore how different governance structures and coordination mechanisms can be optimized to reduce overlap and improve collaboration among various entities.

Further studies should examine the evolving socio-economic dynamics and their impact on waste management practices. This includes exploring how changes in income levels, urbanization, and demographic shifts influence waste generation and disposal behaviors. Evaluating the accessibility of urban green spaces is also crucial, focusing on how distance, transport costs, and physical barriers affect utilization. This research should aim to develop strategies to improve equitable access to green spaces for all community members.

Gender mainstreaming in environmental governance warrants further research to explore effective strategies for integrating gender perspectives. This includes studying the impact of gender-sensitive policies and interventions on environmental outcomes and identifying best practices for promoting gender equality in decision-making processes. Additionally, investigating the effectiveness of various educational interventions and awareness-raising initiatives in enhancing environmental knowledge and behavior is essential. This includes assessing the impact of formal education, community-based training, and public awareness campaigns on environmental governance.

Global comparative studies should be conducted across different cities and countries to identify best practices and innovative solutions in environmental governance. This includes examining how different contexts and governance models influence environmental outcomes and identifying transferable lessons. Research should also explore the role of technological innovations, such as remote sensing, data analytics, and IoT, in improving environmental monitoring and enforcement. Assessing the effectiveness of these technologies in enhancing data collection, analysis, and decision-making processes is critical.

Further studies should investigate the impact of community engagement and participatory governance on environmental outcomes. This includes exploring how different forms of stakeholder participation influence policy development, implementation, and monitoring. Additionally, future research should focus on climate change adaptation and resilience strategies in urban settings. This includes studying the effectiveness of various adaptation measures and identifying ways to enhance the resilience of urban communities to climate-related risks. Addressing these key research areas will provide valuable insights and contribute to the development of more effective and sustainable environmental governance frameworks. By building on the findings and addressing the limitations of this study, future research can help advance the field of environmental governance and promote sustainable development globally.

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Appendices

Appendix I. Key Informant Interview Checklist

Addis Ababa University

College of Development Studies

Center for Environment and Development

KII checklist for officials, experts

Introduction and consent

The main objective of this study is to generate data for a PhD research project entitled _Urban environmental governance in a developing country context using Gender dimensions as a case study in Addis Ababa'. Besides its academic purpose, the research will generate useful evidence to improve environmental policy implementation and governance in Addis Ababa. Therefore, your kind cooperation in responding to this questionnaire is vital for the overall success of the study. I confirm that respondents will remain anonymous and their responses will be kept confidential.

(KII checklist for Environmental institustions officials)

I Environmental Policy:

1. What are the key objectives of the environmental policy in Addis Ababa?
2. How has the environmental policy evolved over time?
3. What are the main components of the current environmental policy?
4. How inclusive and participatory is the process of formulating environmental policy?
5. Are there any specific targets or goals outlined in the environmental policy?

II. Environmental Laws:

1. What are the main environmental laws applicable in Addis Ababa?
2. How effective are these laws in addressing environmental issues?
3. Are there any gaps or inconsistencies in the legal framework for environmental governance?
4. How are environmental laws enforced and monitored?
5. What measures are in place to ensure compliance with environmental regulations?

III. Institutional Arrangements:

1. What are the key institutions involved in environmental governance in Addis Ababa?
2. How are these institutions structured and organized?
3. What are their respective roles and responsibilities?
4. Are there any overlaps or gaps in institutional mandates?
5. How do different institutions collaborate and coordinate their efforts?

IV .Implementation of Policy:

1. **4.** What challenges exist in implementing environmental policies in Addis Ababa?
2. Are there sufficient resources allocated for policy implementation?
3. How are environmental projects and programs prioritized and funded?
4. What mechanisms are in place to monitor and evaluate the effectiveness of policy implementation?
5. What strategies are employed to address barriers to policy implementation?

V.Public Participation:

1. How are stakeholders, including the public, engaged in environmental decision-making processes?
2. To what extent are community perspectives considered in policy formulation and implementation?

VI. Capacity Building:

3. What efforts are made to build institutional capacity for environmental governance?
4. Are there any training programs or initiatives for enhancing environmental awareness and expertise?

(KII checklist for officials and experts, in Addis Ababa city)

Addis Ababa University

College of Development Studies

Center for Environment and Development

KII checklist for officials, experts

Introduction and consent

The main objective of this study is to generate data for a PhD research project entitled ‗Urban environmental governance in a developing country context using Gender dimensions as a case study in Addis Ababa'. Besides its academic purpose, the research will generate useful evidence to improve environmental policy implementation and governance in Addis Ababa. Therefore, your kind cooperation in responding to this questionnaire is vital for the overall success of the study. I confirm that respondents will remain anonymous and their responses will be kept confidential.

Addressed to Environmental institustions

Country: ……

Department/Agency responsible for filling in the Survey: ……

Name respondent: …….

Contact Address: …….

Email: …….

I. Policy level

1. Has your country developed and adopted gender policies and/or strategies for its Environmental policies and legislation? For which environmental sectors? Please describe, including its successes and obstacles in implementation.

II. Organisational structure

4. Is there an internal gender policy in existence for your ministry? Since when? Please describe.

5. (a) Have any gender focal points, gender units or specialists been appointed in the ministry/department responsible for environment? Please. describe, including

mandate, since when, at what level? (b) Who is responsible for the organisational performance on gender issues? At what level?

6. What is the gender balance in your organisation, noting different levels, but particularly at senior levels?

7. Is there any cooperation with and coordination between the environment ministry and ministries/departments charged with gender equality and/or women‘s affairs?

III. Resource allocation

8. Are specific financial resources allocated for gender-specific approaches and participation of stakeholders in environmental policies?

9. Do you apply gender budgeting in your environmental programmes and processes? What is your experience in applying this approach?

IV. Expertise and capacity

10. Please describe the institutional knowledge and expertise in the field of gender and environment?

11. Have you implemented any gender training for your staff? Or have you held any other specific sessions, meetings on gender-environment? Please describe.

12. Are you undertaking/commissioning any research on gender and environment? If yes, please describe the main subjects.

V. Implementation and methods used

13. How, if at all, is gender mainstreaming implemented in your environmental processes and practices?

14. Are you applying any gender analysis / gender audit / gender impact assessment to your environmental policies and/or programs? Please explain.

15. Do you use any gender-specific indicators in the environmental sector? Please describe.

VI. Monitoring and evaluation

16. Are environmental policies and processes monitored and evaluated from a gender perspective? If yes, how and give some examples?

17. Are there any national monitoring systems related to the environment that are disaggregated by sex?

18. Does any reporting on gender issues in environment take place? If yes, when

and by whom?

VII. Enhancement of women's leadership in environment

19. How has the participation of women in environment at the national and local levels increased or decreased since 1995? Please quantify, and give qualitative information on the levels of participation. What are main opportunities and obstacles?

20. Are success stories on women's participation in decision-making on natural resources and the environment available and documented?

21. To what extent do women participate in environmental education and training? What are the main opportunities and obstacles for their participation?

22. Are there any specific women's organizations working on environment in your country? Other relevant civil society initiatives? Please give a few examples.

VIII. Position of local women

23. How are local women's interests represented in the environmental sector at national and global levels? Does any assessment of the needs, experiences and knowledge of (local) women in environment take place? Please explain.

24. Have any specific efforts been made in the environmental sector to enhance women's rights and meeting their needs? Please explain.

25. Is local women's access to environmental information ensured and promoted? How?

Appendix Il Document Review Checklist

1. Type and content of policies and laws related to environmental issues
2. Institutions and actors that were involved in EP &EG at recent year
3. The challenges of safeguarding the environment during each regime
4. The major outcomes (positive and negative) of each era environmentalism
5. Legal and policy basis for institutional set up and mandate allocation
6. Evolution of environmental institutions, the changes in institutional mandates, pace ofthose changes, and reasons behind the changes?
7. The relationship between the national and subnational bodies in discharging theirrespective environment related roles Policy and legal basis for actor engagement
8. Roles of major actors including Government, Market, and CSO in policy formulation andEG
9. Role of the wider public in policy formulation and EG
10. Implementation and challenges of different policies and strategies including the CSE, theEP, the Forest policy, the CRGE, the GTPs, and the current NAP-ET
11. Implementation and challenges of Protected area governance
12. Implementation challenges of environmental regulations (domestic and ratified by thecountry).

Appendix III Household Survey Questionnaire (HSQ)

Addis Ababa University

College of Development Studies

Center for Environment and Development

Survey Questionnaire

The main objective of this study is to generate data for a PhD research project entitled ‗Urban environmental governance in a developing country context using solid waste management as a case study in Addis Ababa'. Besides its academic purpose, the research will generate useful evidence to improve environmental policy implementation and governance in Addis Ababa. Therefore, your kind cooperation in responding to this questionnaire is vital for the overall success of the study. I confirm that respondents will remain anonymous and their responses will be kept confidential.

A. Household Details

Part I Socio economic and demographic profile of sample household heads:

1. Name of the head of the household (optional).....
2. Sex:
   A. Male
   B. Female.
3. Age:
   A. Less than 30
   B. Between 31- 45
   C. Between 46- 64
   D. 65 and above
4. Marital Status:
   A. Single
   B. Married
   C. Divorced
   D. Widowed

5. Family size
    A. male ----------
    B. female--------
    C. total--------

6. For how long did you live in this area?
    A. Less than 5 years
    B. Between 5-10 years
    C. 10 years and above

7. Level of education:
    A. Read and write
    B. Primary (Grade1-8)
    C. Secondary (Grade 9-12)
    D. College diploma
    E. Degree and above

8. Employment type of the head of the household
    A. Government employee
    B. Private employee
    C. self employed
    D. Retired
    E. Other, specify _____

9. Monthly income:
    A. Less than 3000.00 Birr
    B. Between3,000 - 5,000 Birr
    C. Between 5,000 Birr - 10,000 Birr
    D. 10,000 and above

Part II .Household Waste Generation and Disposal

10. Where do you dispose your household waste?
    A. Nearby container
    B. Open spaces
    C. Collected by door-to-door collectors

D. Others—Specify ……..

11. Would you separate your household wastes if told by your collection service provider?

A. Yes

B. No

12. Are there any waste containers in your area?

A. .Yes

B. No

Part III, Garbage Collection Services

13. Do you have regular garbage collection in your area?

A. Yes

B. No

14. If yes, do you use it?

A. Yes

B. No

15. Which collection service do you use?

A. Public

B. Private

C. Other, specify.....

PART IV_ Respondent's Responses on Solid Waste Management Factors

Please select the most appropriate response for the below factors relating to solid waste management and out _X' mark under the corresponding number.

Rank	5	4	3	2	1
Level of agreement	Agree	Somewhat agree	Nither agree or disagree	Somewhat disagree	Disagree

Statements about factors influencing solid waste management

N$^{0.}$	**Knowledge**	**5**	**4**	**3**	**2**	**1**
1	I have good knowledge about my responsibility on solid waste generation and management at home.					
2	I have good knowledge about controlling solid waste generation at home.					
3	I have a good understanding of timely neediness for solid waste source separation at home.					
4	I know that solid waste can be transformed into a valuable resource of income after source separation and recycling at home.					
5	I have good knowledge about the nearest waste collection centers established for collecting source-separated wastes at home.					
6	I have good knowledge about problems that may occur due to inappropriate ways of disposing of solid waste at home.					
7	I have good knowledge about proper solid waste disposal methods at home.					
Motivation						
8	I always feel motivated to control unnecessary waste generation inside my home.					

9	I always feel motivated to start proper waste management from my household.					
10	I always feel motivated to recycle my wastes.					
11	I always feel motivated to dispose of waste properly.					
12	I always feel motivated to make compost from kitchen waste.					
13	I always feel motivated to pay additional money to buy substitute products for polythene and plastic.					
14	I always feel motivated to dispose of waste in separate bins.					
Contribution						
15	I often contribute to or participate in waste management programs.					
16	I know that my contribution to waste management will increase the standard of living in my household.					
17	I always encourage my family members to participate in the proper management of waste generated at home.					
18	I often try to influence my friends and neighbors to try to control their household solid generation.					
19	I am satisfied with the current waste collection service					
Time						
20	I always have enough time to engage in waste management activities at home.					
21	I always take time to control unnecessarily solid waste generation at home.					
22	Managing my time would make it convenient to separate solid waste at home.					
23	I have enough time to dispose of your waste properly.					
Awareness						
24	I am well aware of the environmental harm that can stem from inappropriate waste separation and disposal practices of household					
25	I h a v e learned a lot from the local authorities about waste management and how households can help manage and contribute to.					

26	I have a good understanding of the importance of solid waste source separation at home.					
27	I am well aware of national policies and laws regarding solid waste generation and waste management at home.					
28	Community based Organization can improve the local waste removal system and help to provide a better environment.					
29	Community participation is inevitable for local waste collection system and improvement of the environment – do you agree?					
Attitude						
30	I always show positive attitudes towards controlling and managing solid waste generated at home.					
31	I am open and willing to encourage my neighbors to follow the best household waste management practices.					
32	In my opinion, separate and dispose of solid household waste in a proper way is a good practice.					
33	I am willing to contribute to solid waste reduction (minimizing solid waste generation) programs at the household level.					

Addis Ababa University

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Survey Questionnaire

The main objective of this study is to generate data for a PhD research project entitled of Effectiveness of Urban Green space governance as a case study in Addis Ababa'. Besides its academic purpose, the research will generate useful evidence to improve environmental policy implementation and governance in Addis Ababa. Therefore, your kind cooperation in responding to this questionnaire is vital for the overall success of the study. I confirm that respondents will remain anonymous and their responses will be kept confidential.

A. Household Details

Part I Socio economic and demographic profile of sample household heads:

Date _____

1. **Code**_____

2. **Sex:** 1.Male 2 Female.

3. **Age:** 1. < 30 2. 31- 45 3. 46- 60 4. >61

4. **Marital Status:** 1.Married with single spouse 2.Single 3.Divorced 4.Widowed
5. Separated 6.Married with more than one spouse/ polygamous

5. Family size: male ---------- female-------- total--------

6. **For how long live in this area?**

1. 1-10<years 2. 11-14years 3. >15years

7. Level of education:

1. Primary school or below 2.Secondary school 3.College/University 4.Postgraduate

8. Occupation

1. Unemployed 2. Self-employment 3. .Government 4. NGO
5. Family business 6.House Wife

9. **Income**: 1. Less than 2000.00 birr 2.2,000 - 3,000 birr 3. 3000 birr -5000birr 4.>50000

10. Religious 1.Orthodox; 2.Muslim; 3.Catholic; 4.Protestant, 5.Traditional religion; 6. other (specify) _____

Part II. Questions on Green Space Development and Management

1. Are there green spaces around your residence?

1. No 2. Yes

2. How many green spaces are there around your residence?

1. None 1.1 2.2 3. 3 or more

3. Are you satisfied with the current availability of green spaces in the city?

1. No 2.Yes

4. Are green spaces accessible to the people?

1. No 2.Yes

5. If no, why?

1. Few green spaces 2.Green spaces are not in good condition 3.Not beneficial

6. How many minutes do you spend to reach the nearest green space on foot?

1 .Less than quarter hour 2.Less than half hour

3. Half hour 4.More than one hour

7. Have you ever visited a green space?

1. No 2.Yes

8. If yes, what is the frequency?

1. Not at all 2.Annually 3.Once in 6 months 4.Once in 3 months

5.Monthly 6.Weekly

9. What was the reason for not recreating in the green space?

1. Shortage of time 2.Fee amount 3.Distance and transport cost

4. Poor facility of parks 5.Not well managed

10. Who frequently visits green spaces in Addis Ababa?

1 .Males 2.Females

11. Does population growth affect green space development?

1. No 2.Yes

12. Green space has benefits for the wellbeing of the community?

1. No 1. Yes

13. Who is responsible for development management, maintenance, and protection of green space?

1. Residents 2.Community 3.Kebele administration 4City administration

14. Are you willing to participate in green space development?

1.No 2.Yes

15. What is your responsibility in green space development?

1. Financial support 2.In-kind support 3.Participating in community discussions

16. Do city administrative officials play an important role in green space development?

1. No 2.Yes

17. Do you develop green space in your surroundings?

1.No 2.Yes

III .QUESTIONS ON EFFECTIVENESS OF GEEN SPACE GOVERNAN

	Indicators (Assign your number of choice to each component indicator in the space provided)	Responses (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree).
A. Accountability		
A1	Government bodies are held accountable for harm to local people due to decisions on green space management	
A2	The local/Wereda government responds promptly to community demands regarding green space resources (e.g., park access, maintenance)	
A3	The roles and responsibilities of the Wereda, Kebele, and local communities are clear and unambiguous in green space management.	
A4	Actions and decisions at all tiers of government (Kebele, Wereda, Zone, and upper tiers) are consistent with the needs of local people and respective environmental laws regarding green spaces.	
B. Participation		
B1	Local communities are involved in identifying green space governance issues. |	
B2	Local communities are involved in the planning of green space governance measures.	
B3	Local communities are involved in the implementation of green space governance measures.	
B4	Local communities are involved in setting rules for green space protection.	

B5	Local communities are involved in the enforcement of rules and regulations for green space protection.	
B6	Local communities take part in monitoring and evaluation of green space management activities.	
B7	Local communities take part in making decisions related to the use and distribution of green space resources.	
B8	Local communities take part in the arrangement of benefit-sharing modalities from publicly owned resources (e.g., parks, protected areas, grazing land).	
C. Environmental Awareness Raising		
C1	Regular awareness-raising practices (meetings, trainings, etc.) are conducted for local people on green space management.	
C2	Local people actively participate in trainings/meetings related to green space management.	
C3	People are well informed and aware of the importance of protecting green spaces.	
C4	Awareness-raising activities have successfully changed local people‘s attitudes and skills towards green space management.	
D. Environmental Knowledge		
D1	Traditional knowledge of resource conservation is frequently applied in the conservation of green spaces.	
D2	Traditional knowledge is recognized and supported by local level expert knowledge for green space management.	
D3	Local level expertise is more frequently utilized for green space governance than expertise from upper levels.	

D4	Knowledge and expertise from upper tiers (zone, regional, central) play a supportive role and are not imposed on local levels for green space governance.	
D5	Support from NGOs, in terms of knowledge and expertise, is present to improve green space governance performance.	
D6	Engagement of knowledge and expertise from the private sector exists to enhance green space governance performance.	
E. Institutions		
E1	Adequate environmental institutions (EIs) with clear mandates and capacity exist for green space protection.	
E2	Green space governance decisions are executed by local institutions with ample support from upper tiers.	
E3	Traditional community institutions play a significant role in green space governance decisions.	
F. Actors		
F1	Government bodies and local communities carry out green space protection and governance.	
F2	Civil society actors participate in green space protection and governance.	
F3	Community-based organizations (CBOs) facilitate green space protection and governance.	
F4	Private sector actors are engaged in green space protection and governance processes.	
F5	Green spaces are conserved through collaboration between communities, CBOs, NGOs, government, and private businesses.	
G. Environmental laws		
G1	Adequate local level rules and regulations exist for	

	governing green spaces.	
G2	Local communities are well informed about environmental protection laws.	
G3	Community bylaws are often utilized for green space protection in addition to government laws.	
H. Transparency		
H1	Benefits from green spaces are allocated transparently.	
H2	. Decisions on green space use and management are transparent and known to local people.	
H3	Local communities are aware of their roles and responsibilities in green space protection.	
I. Implementation/ enforcement of laws		
I1	Local communities participate in the implementation of green space protection laws.	
I2	Rules and regulations for green space conservation are practical and enforceable.	
I3	There is a high level of compliance with environmental laws at the local level	
I4	Violators of green space protection rules are penalized according to the law.	
J. Environmental sensitization practices		
J1	Conservation of green spaces is actively promoted.	
J2	Incentives exist to encourage local people to conserve green spaces.	
J3	Environmental or nature clubs promote the importance of green space protection.	
K. Environmental partnership		

K1	Strong partnerships exist between environmental institutions and local communities.	
K2	Environmental institutions have strong partnerships with other government units.	
K3	Green space governance is conducted in partnership with NGOs, research institutions, private businesses, CBOs, etc.	
L. Dispute resolution		
L1	Clear and adequate dispute resolution mechanisms are available for conflicts over green spaces.	
L2	Disputes over green spaces are resolved fairly and promptly without bias.	
L3	Dispute resolution mechanisms are publicly established and known.	
M. Adaptiveness		
M1	The local people are able to or do have the capacity to respond when environmental resource constraints happen (shortage of water, pasture, firewood and others)	
M2	The local government is capable of helping the communities to withstand the problem when environmental resource constraints happen (shortage of water, pasture, firewood and others)	
M3	The local level NGOs are capable of helping the communities to withstand the problem when environmental resource constraints happen (shortage of water, pasture, firewood and others)	
M4	Local people, private business, local government and NGOs cooperate to withstand the problem when environmental resource constraints happen (shortage of water, pasture, firewood and others)	

Appendix IV

Table A1. Multicollinearity diagnostics

Variable	VIF	Tolerance
Gender	1.06	0.9460
Age	1.17	0.8532
Education level	1.33	0.7507
Employment status	1.17	0.8548
Income level	1.22	0.8187
Family size	1.16	0.8636
Awareness	1.11	0.1951
Attitude	1.02	0.0402
Waste container	1.03	0.9701
Waste collection service	1.17	0.8560
Mean VIF	1.16	

Source: Model output, 2023

Appendix V. Descriptive statistics of the modeled variables

	N	Mean	Std. Deviation
Accountability_Mean	200	.5400	.26219
Participation_Mean	200	.4450	.31718
Environmentalaw_Mean	200	.4300	.36506
EnvironmentalKnowledge_Mean	200	.4267	.31730
Institutions_Mean	200	.4267	.38416
Actors_Mean	200	.6080	.33300
Environmentallaws_Mean	200	.4133	.40411
Transparency_Mean	200	.3867	.36214
Implementationenforcementlaw_Mean	200	.3500	.33997
Environmentalensitizationpractices_Mean	200	.4267	.38416
Environmentalpartnership_Mean	200	.3600	.36509
Disputeresolution_Mean	200	.3733	.42606
Adaptiveness_Mean	200	.5600	.38358
Valid N (listwise)	200		

Source: Model output, 2023

Appendix VI. Green Space Development and Management

Variables	Yes	No
green spaces around your residence	96(48)	104(52)
Are you satisfied with the current availability of green spaces in the city	56(28)	136(68)
Are green spaces accessible to the people		
Have you ever visited a green space	112(56)	72(36)
Are green space Accessible to people	48(24)	152(76)
Does population growth affect green space development	176(88)	24(112)
Green space has benefits for the wellbeing of the community	72(36)	128(64)
Are you willing to participate in green space development	192(96)	8(4)
Do city administrative officials play an important role in green space development	152(76)	48(24)
Do you develop green space in your surroundings	72(36)	128(64)

EFFECTIVENESS OF GEEN SPACE GOVERNAN

Accountabilit	Yes	No
Government bodies are held accountable for harm to local people due to decisions on green space management	112(56)	88(44)
The local/Wereda government responds promptly to community demands regarding green space resources	64(32)	136(68)
The roles and responsibilities of the Wereda, Kebele, and local communities are clear and unambiguous in green space management	152(76)	48(24)
Actions and decisions at all tiers of government (Kebele, Wereda, Zone, and upper tiers) are consistent with the needs of local people and respective environmental laws regarding green spaces		96(48)

Participation	Yes	No
Local communities are involved in identifying green space governance issues. |	88(44)	112(56)
Local communities are involved in the planning of green space governance measures.	112(56)	88(44)
Local communities are involved in the implementation of green space governance measures	128(64)	72(36)
Local communities are involved in setting rules for green space protection.	88(44)	112(56)
Local communities are involved in the enforcement of rules and regulations for green space protection.	72(36)	128(64)
Local communities take part in monitoring and evaluation of green space management activities.	96(48)	104(52)
Local communities take part in making decisions related to the use and distribution of green space resources.	64(32)	136(68)
Local communities take part in the arrangement of benefit-sharing modalities from publicly owned resources (e.g., parks, protected areas, grazing land).	64(32)	136(68)

Environmental Awareness Raising	Yes	No
Regular awareness-raising practices (meetings, trainings, etc.) are conducted for local people on green space management.	80(40)	120(60)
Local people actively participate in trainings/meetings related to green space management.	64(32)	136(68)
People are well informed and aware of the importance of protecting green spaces.	88(44)	112(56)
Awareness-raising activities have successfully changed local people‘s attitudes and skills towards green space management.	112(56)	88(44)

Environmental Knowledge	Yes	No
Traditional knowledge of resource conservation is frequently applied in the conservation of green spaces.	80(40)	120(60)
Traditional knowledge is recognized and supported by local level expert knowledge for green space management.	96(48)	104(52)
Local level expertise is more frequently utilized for green space governance than expertise from upper levels	104(52)	96(48)
Knowledge and expertise from upper tiers (zone, regional, central) play a supportive role and are not imposed on local levels for green space governance.	80(40)	120(60)
Support from NGOs, in terms of knowledge and expertise, is present to improve green space governance performance.	80(40)	120(60)
Engagement of knowledge and expertise from the private sector exists to enhance green space governance performance.	72(36)	128(64)
Institutions	Yes	No
Adequate environmental institutions (EIs) with clear mandates and capacity exist for green space protection.	80(40)	120(60)
Green space governance decisions are executed by local institutions with ample support from upper tiers.	64(32)	136(68)
Traditional community institutions play a significant role in green space governance decisions.	112(56)	88(44)

Actors	Yes	No
Government bodies and local communities carry out green space protection and governance.	152(76)	48(24)
Civil society actors participate in green space protection and governance.	112(56)	88(44)
Community-based organizations (CBOs) facilitate green space protection and governance	112(56)	88(44)
Private sector actors are engaged in green space protection and governance processes.	104(52)	96(48)
Green spaces are conserved through collaboration between communities, CBOs, NGOs, government, and private businesses..	128(64)	72(36)

Environmental laws	Yes	No
Adequate local level rules and regulations exist for governing green spaces	104(52)	96(48
Local communities are well informed about environmental protection laws.	64(32)	136(6
Community bylaws are often utilized for green space protection in addition to government laws	80(40)	120(6

Transparency	Yes	No
Benefits from green spaces are allocated transparently.	64(32)	136(68)
Decisions on green space use and management are transparent and known to local people.	72(36)	128(64)
Local communities are aware of their roles and responsibilities in green space protection.	96(48)	104(52)

Implementation/ enforcement of laws	Yes	No

Local communities participate in the implementation of green space protection laws.	104(52)	96(48)
Rules and regulations for green space conservation are practical and enforceable	63(32)	136(68)
There is a high level of compliance with environmental laws at the local level	48(24)	152(76)
Violators of green space protection rules are penalized according to the law.	63(32)	136(68)

Environmental sensitization practices	Yes	No
Conservation of green spaces is actively promoted	80(40)	120(60)
Incentives exist to encourage local people to conserve green spaces.	64(32)	136(68)
Environmental or nature clubs promote the importance of green space protection.	112(56)	88(44)

Environmental partnership	Yes	No
Strong partnerships exist between environmental institutions and local communities	88(44)	112(56)
Environmental institutions have strong partnerships with other government units.	56(28)	144(72)
Green space governance is conducted in partnership with NGOs, research institutions, private businesses, CBOs, etc..	72(36)	128(64)

Dispute resolution	Yes	No
Clear and adequate dispute resolution mechanisms are available for conflicts over green spaces	64(32)	136(68)
Disputes over green spaces are resolved fairly and promptly without bias	80(40)	120(60)
Dispute resolution mechanisms are publicly established and known.	80(40)	120(60)

Adaptiveness	Yes	No
The local people are able to or do have the capacity to respond when environmental resourceconstraints happen (shortage of water, pasture, firewood and others)	96(48)	104(52)
The local government is capable of helping the communities to withstand the problem when environmental resource constraints happen (shortage of water, pasture, firewood and others)	120(60)	80(40)
The local level NGOs are capable of helping the communities to withstand the problem when environmental resource constraints happen (shortage of water, pasture, firewood and others)	104(52)	96(48)