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Landfilling as an Alternative Solid Waste Management Method in Lira City, Uganda

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ABSTRACT

Purpose: This study examined the relationship between solid waste management methods and land degradation in Lira City West Division, where unregulated landfilling has led to severe environmental consequences, including soil contamination, vegetation loss, clogged drainage, flooding, and public health hazards. We evaluated the impact of landfilling in land degradation. Using

Methodology: The research took a cross-sectional mixed-methods design, data were gathered from 156 residents and municipal stakeholders through questionnaires and interviews. Quantitative data were analyzed via descriptive statistics and regression models, while qualitative responses were thematically coded.

Findings: Findings revealed that mismanaged landfilling was detrimental: Regression analysis with an F of 70.375, $p < 0.001$) confirmed that the predictors collectively explain a significant portion of the variation in land degradation; and the adjusted R-squared value of 0.610 indicated that approximately 61% of the variance in land degradation was explained by the three waste management variables included in the model, which represent a strong explanatory power. These outcomes confirmed that properly managed landfilling substantially reduce land degradation, with the model explaining 61% of the variance.

Contribution to Theory, Policy and Practice: This study contributes to effective waste management solutions whose implementation is hindered by weak institutions, insufficient funding, and limited public awareness. It recommends strengthening regulatory enforcement, increasing investment in waste infrastructure, scaling community-based education to promote composting, and foster multi-sectoral collaboration to support decentralized, context-appropriate innovations essential for reversing land degradation and advancing sustainable urban development in Lira city.

Keywords: *Solid waste, Land Degradation, Landfilling, Waste Management, Collaboration*

1.0 Introduction

The management of solid waste has evolved alongside human civilization, shaped by patterns of settlement, industrialization, and urbanization. Historically, early societies generated minimal waste due to subsistence lifestyles and limited industrial activity, allowing rudimentary disposal methods such as open dumping and burning to have negligible environmental impact (Zhang et al., 2021). However, with the rise of cities and increased consumption particularly during the Industrial Revolution waste generation intensified, necessitating more structured disposal systems. From rudimentary dumpsites to engineered landfills and composting initiatives, the way societies manage waste has directly influenced environmental health, especially land quality (Smith & Williams, 2020). Despite technological advancements and policy innovations, many regions particularly in the Global South continue to rely on unsustainable practices that contribute significantly to land degradation (Cointreau, 2021). This trend highlights the need to critically examine how different solid waste management methods intersect with environmental decline across multiple spatial scales.

Globally, over 37% of municipal solid waste still ends up in open dumpsites or inadequately engineered landfills, contributing to soil and groundwater contamination (World Bank, 2020). Legacy landfill sites in Europe continue to pose risks decades after closure, underscoring the long-term consequences of poor waste decisions (European Commission, 2021). While high-income economies have transitioned toward integrated waste strategies including recycling and waste-to-energy technologies their adoption remains limited in low-income settings. In these areas, open dumping persists due to weak institutional capacity, lack of infrastructure, and insufficient funding, leading to severe ecological consequences. Soil contamination from heavy metals, organic pollutants, and leachate infiltration reduces land usability and poses threats to agricultural productivity and public health (Adhikari et al., 2021). These findings suggest that solid waste mismanagement is not merely a local issue but a global challenge requiring coordinated action across governance levels. Solid waste management in East African cities remains a critical challenge due to rapid urbanization, weak infrastructure, and limited institutional capacity. In Nairobi, Dar es Salaam, and Kampala, unregulated dumpsites have led to soil contamination with heavy metals (e.g., lead, cadmium), blocked drainage systems, recurrent flooding, and loss of vegetation (Mushi et al., 2021; Wambua et al., 2023; UN-Habitat, 2016). Landfilling is often informal, lacking liners or leachate controls, while composting, despite its potential to enhance soil fertility remains underutilized due to low awareness and minimal municipal support (Nsamba et al., 2021; Omondi et al., 2020).

In Uganda, national policies such as the National Environment Act (2019) and the National Solid Waste Management Framework (NEMA, 2022) provide a strong regulatory foundation. However, implementation at the municipal level is weak, especially in secondary cities (Okot-Okumu & Nyeko, 2011). Waste collection rates are low, segregation is rare, and recycling is virtually absent

(Mugambe et al., 2021). Even Kampala's Kiteezi landfill lacks proper leachate management, contributing to land and water pollution (Nsamba et al., 2021). Municipal authorities cite chronic shortages of funding, staff, and technical expertise as key barriers to enforcement (Nabunya et al., 2018). Lira City West Division exemplifies these systemic failures. Following Lira's elevation to city status in 2020, waste generation surged, overwhelming already limited infrastructure (Naluyima et al., 2021). Open dumping is now the dominant disposal method, with waste routinely discarded near wetlands, homes, and drainage channels. Field observations confirm soil discoloration, compaction, gully erosion, and declining crop yields near dumpsites, while residents report frequent flooding during rains (Mmereki et al., 2016; NEMA, 2022). Enforcement of anti-dumping laws is inconsistent due to inadequate personnel and equipment.

Both solid waste management methods and land degradation emphasizes understanding environmental issues within their specific social, economic, political, and physical settings. This approach recognizes that environmental problems such as land degradation due to poor waste disposal cannot be fully understood or addressed without considering the local conditions in which they occur (Agyeman & Evans, 2004; Baker, 2012). In urban centers like Lira City, for instance, waste management practices are shaped by a complex interplay of factors including city division capacity, community behavior, infrastructure availability, and policy implementation. These realities underscore a persistent gap between policy and practice in Lira, driven by weak governance, insufficient resources, and exclusion of communities from waste decision-making. Without context-specific interventions such as decentralized composting hubs, participatory enforcement, and civic education land degradation linked to waste mismanagement will continue to undermine environmental and public health in Lira City West Division.

1.1 Problem Statement

Despite the existence of comprehensive legal and institutional frameworks such as Article 245(a) of Uganda's 1995 Constitution, the National Environment (Waste Management) Regulations (S.I. No. 49 of 2020), and the Local Government Act of 1997, Lira City west continues to grapple with a severe solid waste management crisis. Daily, the city generates over 40 metric tons of waste, yet less than half is collected or disposed of in an environmentally sound manner (Lira City Waste Management Report, 2023; Mubeezi et al., 2020). Predominant disposal methods such as open dumping, unregulated landfilling, and informal burning have precipitated widespread land degradation, manifesting in soil contamination, vegetation loss, clogged drainage systems, recurrent flooding, and escalating public health hazards (NEMA, 2021; UN-Habitat, 2016; WHO, 2021). Enforcement of existing policies remains critically weak, hampered by chronic under-resourcing, fragmented institutional mandates, and limited technical capacity (Silva Castro, 2020). Even recent infrastructural interventions, such as the deployment of garbage trucks and tri-cycle collection units under the Lira City Development Plan (2020), seems to have failed to match the scale and complexity of the waste challenge (Cooperator, 2023). Consequently, environmental

conditions continue to deteriorate, disproportionately affecting vulnerable communities in areas such as Lira City West Division. This persistent policy-implementation gap underscores the urgent need for localized, evidence-based research to diagnose systemic failures and co-create contextually grounded, actionable strategies that can translate legal provisions into tangible environmental and public health improvements.

3.0 Material and Methods

3.1 Study Design, Location, Population, Sample and sampling techniques

This study adopted a cross-sectional survey design - a research approach that collects data from a population at a single point in time to examine relationships, behaviors, or conditions as they exist in that moment. The study population consisted of individuals and institutions directly involved in or affected by solid waste management methods and land degradation in Lira City West Division. It included 21 ward councilors serving as local policy and decision-making representatives; five key division officials, three waste operation workers engaged in daily waste handling, and 370 household heads drawn from 20 villages across the division. A sample of 186 respondents were selected from the total population of 398. The sample size was determined using Krejcie and Morgan's (1970) table for finite populations, ensuring a 95% confidence level with a 5% margin of error deemed statistically adequate and logistically feasible. The study employed a multi-method sampling strategy to ensure representativeness and depth in data collection. Stratified random sampling was used to categorize participants based on their roles such as households, division officers, garbage collectors, and dumpsite workers, with individuals randomly selected within each group to ensure proportional representation. Simple random sampling was applied within each stratum, for example by selecting household heads through random name draws from local council lists. Data were collected from both primary and secondary sources, ensuring a comprehensive and multi-dimensional understanding of the research topic.

3.2 Data collection

Primary data were collected using structured questionnaires, semi-structured interviews, and field observations to examine solid waste management practices and their environmental impacts especially on land. Secondary data were sourced from authoritative reports, including NEMA publications and the Ministry of Water and Environment documents, as well as academic journals and books. The structured questionnaire was used to collect quantitative data from 160 households in Lira City West Division, focusing on solid waste management methods and their effect on land degradation. It was developed based on a review of relevant literature, policy documents such as Uganda's National Solid Waste Management Framework (NEMA, 2022), and validated tools. Also, the semi-structured interview guide was developed based on the study's objectives and a thorough review of existing literature on solid waste management and land degradation, including Uganda's National Solid Waste Management Framework (NEMA, 2022). Key themes such as institutional capacity, enforcement challenges, community participation, and sustainable waste

practices were identified and used to structure the guide. The observation checklist was systematically developed to evaluate the physical environmental conditions associated with solid waste disposal infrastructure including open dumpsites, designated landfill areas, and adjacent drainage systems within Lira City West Division (Wambua et al., 2023; Mushi et al., 2021).

3.3 Data Quality Control

A range of strategies was applied to enhance the validity, reliability, and accuracy of both quantitative and qualitative data collected. One, all data collection tools including questionnaires, interview guides, and observation checklists were pilot-tested to identify and correct inconsistencies, language issues, or ambiguities. Two, to maintain data integrity, daily field supervision and monitoring were conducted. Three, content validity of the research instruments were established through expert review and alignment with Uganda's National Solid Waste Management Framework (NEMA, 2022). Items with a Content Validity Index (CVI) below 0.78 were revised or removed to ensure the tools accurately captured relevant aspects of waste management and land degradation. Four, reliability was reinforced through standardized procedures and thorough documentation of all research stages. Five, ethical standards were strictly upheld. Six, informed consent was obtained from all participants, anonymity was maintained, and participants were informed of their right to withdraw at any time. And seven, all instruments underwent pretesting during the pilot phase, leading to refinements that improved internal consistency.

3.4 Data processing and analysis

Data processing and analysis included cleaning data, coding responses, and applying statistical or qualitative techniques to identify patterns and relationships. Qualitative data were gathered through semi-structured interviews with a range of local stakeholders, including Local Council Leaders (ward councilors), city Officers (such as the Division Town Clerk), Technical Staff (engineer and planner), Health Inspector, Environment Officer (acting as environmental regulators), and Waste Operations Workers (including garbage collectors and dumpsite workers), to explore their perspectives, experiences, and institutional insights regarding solid waste management and its environmental impacts—particularly land degradation. Quantitative data were collected using structured questionnaires administered to household heads in Lira City West Division. Descriptive statistics such as frequencies, percentages, and cross-tabulations were used to summarize socio-demographic characteristics and waste management practices. Findings were presented using tables, with descriptive statistics and regression models to enhance clarity discussion and interpretation.

4.0 Findings

4.1 Demographic characteristics of the respondents

The demographic profile of respondents (Table 1) indicates that the largest age group was 28–37 years (n=55, 39.3%), followed by 18–27 years (n=49, 35.0%), while the smallest group was 48–57 years (n=2, 1.4%), showing that most respondents were young adults. In terms of sex, males (n=87, 62.1%) dominated compared to females (n=53, 37.9%). Household headship was mainly by fathers (n=83, 59.3%), while the least were classified as others (n=2, 1.4%). Most households had 3–5 members (n=89, 63.6%), with the minimum being households above 5 members (n=24, 17.1%). Regarding marital status, the majority were married (n=77, 55.0%), while the smallest proportion were divorced, separated, or widowed (n=8, 5.7%). Education levels were low, with most respondents having only primary education (n=65, 46.4%), while the least had no formal education (n=25, 17.9%). Income distribution showed that the majority earned less than UGX 100,000 per month (n=71, 50.7%), whereas the least earned between UGX 400,000–499,999 (n=4, 2.9%), pointing to widespread poverty among households.

The demographic profile of respondents reveals key socio-economic characteristics that shape waste management methods and environmental vulnerability in Lira City West Division. The predominance of young adults (ages 18–37, comprising 74.3% of respondents) suggests that the perspectives captured largely reflect a working-age population actively engaged in household and community decision-making, yet potentially constrained by limited resources and experience. The gender imbalance with males representing over 60% of respondents reflects broader social dynamics in which men are more likely to serve as household heads (59.3%) and participate in formal or community-level engagements, potentially influencing whose voices are prioritized in environmental discourse. Household size data indicate that most families are moderately sized (3–5 members), typical of urban settings in African, but combined with low income levels over half earning less than UGX 100,000 (approximately USD 27) per month the findings point to significant economic precarity. This widespread poverty likely limits households' capacity to invest in sustainable waste practices, such as composting bins or waste segregation tools, and increases reliance on informal or low-cost disposal methods, including open dumping. Low educational attainment further compounds these challenges: nearly half of respondents had only primary-level education, and a notable minority had no formal schooling. Limited education can hinder awareness of the environmental and health implications of poor waste management and reduce access to information about alternatives like composting or recycling. Collectively, these demographics paint a picture of a young, economically disadvantaged, and under-resourced population factors that critically influence waste handling behaviors and constrain community capacity to adopt sustainable land management practices. The data underscore the need for interventions that are not only technically sound but also socially inclusive, economically accessible, and tailored to the realities of low-income urban households.

Table 1: Descriptive statistics for land degradation in Lira City West Division

Items	Mean	SD
Government policies on land management have not effectively prevented land degradation in Lira City	4.15	1.22
Soil erosion remains a serious challenge due to weak enforcement of land use regulations.	3.16	1.05
Drainage systems are frequently blocked, contributing to water logging in several parts of the city.	3.05	1.66
Biodiversity in Lira City is steadily declining as a result of poor land use practices.	3.09	1.00
Public awareness about the impact of human activities on land degradation is still inadequate.	3.90	1.03
Institutional support for sustainable land management practices is limited and inconsistent.	3.33	1.01
Average	**3.45**	**1.16**

Source: field data, 2025

The descriptive analysis (table 6) indicates that land degradation is a significant concern in Lira City West Division. Most respondents (n=100, 71.4%, mean=4.15, SD=1.22) agreed that government policies on land management have not effectively prevented land degradation, while soil erosion remains a serious challenge, as noted by 52.9% of respondents (n=74, mean=3.16, SD=1.05). Drainage systems were reported to be frequently blocked, contributing to water logging (n=61, 43.6%, mean=3.05, SD=1.66), and biodiversity is steadily declining due to poor land use practices (n=65, 46.4%, mean=3.09, SD=1.00). Public awareness about the impact of human activities on land degradation was considered inadequate by the majority (n=103, 73.6%, mean=3.90, SD=1.03), and institutional support for sustainable land management practices was seen as limited and inconsistent (n=78, 55.7%, mean=3.33, SD=1.01). Overall, the average mean of 3.45 (SD=1.16) suggests that land degradation in the division is prevalent, exacerbated by weak policy enforcement, insufficient institutional support, and low public awareness.

The results in Table 6 reveal that land degradation in Lira City West Division is a pressing and multifaceted issue, driven not only by observable environmental symptoms such as soil erosion, blocked drainage systems, and declining biodiversity, but also by systemic governance and awareness deficits. A clear majority of respondents perceive government land management policies as ineffective in curbing degradation, reflecting a gap between policy formulation and on-the-ground implementation. Compounding this, public understanding of how human activities contribute to land degradation is widely regarded as inadequate, limiting community-led mitigation efforts. Institutional support for sustainable land management is similarly viewed as

weak and inconsistent, undermining the adoption of restorative practices. The moderate overall mean (3.45) thus encapsulates a consensus that land degradation is both prevalent and persistent, sustained by a combination of poor policy enforcement, insufficient technical and institutional backing, and low environmental literacy. These findings highlight the urgent need for integrated interventions that strengthen regulatory frameworks, enhance public education, and bolster local institutional capacity to promote resilient and sustainable land use.

4.2 The relationship between solid waste management methods and land degradation in Lira City West Division

The study used Pearson's Product-Moment Correlation Analysis to establish the relationship between solid waste management methods and land degradation in Lira City West Division. The matrix of correlation, showing r values, is presented in Table 7.

Table 2: Correlation of solid waste management methods and land degradation in Lira City West Division

Variables	(1)	(2)	(3)	(4)
(1) Land Degradation	1.000			
(2) Open Dumping	0.709*	1.000		
(3) Landfill	-0.102	-0.059	1.000	
(4) Composting	-0.590*	-0.445*	-0.164	1.000

**Variable significant at 0.05*

Source: field data, 2025

The correlation analysis reveals that open dumping has a strong and significant positive relationship with land degradation ($r = 0.709$, $p < 0.05$), indicating that higher levels of open dumping are associated with increased land degradation in Lira City West Division. Conversely, composting shows a significant negative correlation with land degradation ($r = -0.590$, $p < 0.05$), suggesting that greater adoption of composting practices is linked to reduced land degradation. Landfills, however, exhibit a weak and non-significant negative correlation with land degradation ($r = -0.102$), implying minimal impact on land degradation in the study area. Overall, the findings suggest that reducing open dumping and promoting composting could be key strategies for mitigating land degradation in the division. The Pearson correlation coefficients reveal significant relationships between various solid waste management methods and land degradation in Lira City West Division. These correlations provide insight into how different waste disposal and management practices are associated with the extent of land degradation.

landfilling shows a weak and non-significant negative correlation with land degradation (r = -0.102, $p > 0.05$), indicating that, on its own, the presence of landfilling does not strongly influence land degradation levels. However, this finding should be interpreted cautiously. While engineered landfills can reduce environmental harm when properly managed, the observed weak correlation may reflect the reality in Lira City West Division, where many so-called "landfills" lack proper lining, leachate control, and monitoring functioning more like semi-controlled dumpsites. Thus, the minimal negative impact may be due to poor implementation rather than the inherent inefficacy of landfilling as a method. Moreover, landfilling has a very weak negative correlation with open dumping (r = -0.059) and composting (r = -0.164), suggesting limited substitution between these methods in current practice. This points to a fragmented waste management system where multiple disposal methods coexist without integration or optimization.

4.3 Linear regression analysis of the effect of solid waste management methods and land degradation in Lira City West Division

Table 8 shows the results of linear regression analysis that was used to establish the simultaneous effect of solid waste management methods and land degradation in Lira City West Division

Table 3: Regression analysis of the effect of solid waste management methods and land degradation in lira city west division

Land degradation	Coefficient (β)	Std. err	T	P>t	[95% conf.	interval]
Open Dumping	0.53	0.06	8.9	0.000***	0.41-0.65	0.65
Landfilling	-0.25	0.12	-2.1	0.038**	-0.48—0.01	-0.01
Composting	-0.45	0.07	-6.0	0.000***	-0.59—0.30	-0.30
_cons	4.07	0.68	6.0	0.000***	2.73-5.41	5.41
Model Summary						
Mean dependent var		3.306	SD dependent var			0.833
Adjusted R-squared		0.610	Number of obs			139
F-test		70.375	Prob > F			0.000
Akaike crit. (AIC)		219.871	Bayesian crit. (BIC)			231.609

*** $p<.01$, ** $p<.05$, * $p<.1$

Source: field data 2025

The linear regression analysis was conducted to examine the simultaneous effect of solid waste management methods open dumping, landfilling, and composting on land degradation in Lira City West Division. The model is statistically significant, as indicated by the high F-statistic (F = 70.375, $p < 0.001$), confirming that the predictors collectively explain a significant portion of the

variation in land degradation. The adjusted R-squared value of 0.610 indicates that approximately 61% of the variance in land degradation is explained by the three waste management variables included in the model, which represents a strong explanatory power. Other methods such as open dumping ($\beta = 0.53$, $p < 0.001$) yielded a positive and statistically significant effect on land degradation. This means that for every one-unit increase in the use or prevalence of open dumping, land degradation increases by 0.53 units, holding all other variables constant. This result confirms that open dumping is a major contributor to soil contamination, compaction, loss of fertility, and disruption of hydrological systems, thereby accelerating land degradation. Landfilling ($\beta = -0.25$, $p = 0.038$). Landfilling has a negative and statistically significant effect on land degradation at the 5% level. This suggests that properly managed landfilling is associated with reduced land degradation. A one-unit increase in regulated landfill use corresponds to a 0.25-unit decrease in land degradation. However, the relatively small coefficient and narrow confidence interval (−0.48 to −0.01) suggest that the mitigating effect is modest and likely contingent on proper engineering and oversight, which may be limited in practice.

4.4 The effect of landfilling on land degradation

The quantitative findings revealed that landfilling has a significant negative effect on land degradation ($\beta = -0.25$, $p = 0.038$), suggesting that properly managed landfills can help reduce environmental harm compared to open dumping. However, the qualitative findings highlighted limitations in local landfill management. A city officer noted: *"We have designated landfill sites, but without liners and proper leachate channels, contamination seeps into surrounding soils. Monitoring is irregular due to staff shortages and limited funding."* Local Council leaders and technical staff observed environmental impacts near landfill sites. One leader explained: *"Many areas around the landfill show compacted soil and sparse vegetation. Without proper containment, the land is slowly losing its productivity."* An environmental expert added: *"Leachate and debris infiltrate surrounding land, affecting crops and water sources. The land is slowly deteriorating, despite being a designated landfill."* These accounts indicate that insufficient technical controls and weak enforcement undermine the potential benefits of landfilling.

Generally, both quantitative and qualitative findings suggest that while landfilling can reduce land degradation in principle, its effectiveness in Lira City West Division is limited by poor engineering, lack of monitoring, and inadequate institutional capacity. These findings reflect the broader global and regional experience that landfilling only mitigates environmental damage when technical standards and regulatory enforcement are in place (Kjeldsen et al., 2002; Adhikari et al., 2021; Smith & Williams, 2020). Globally, engineered landfills with containment systems are designed to prevent soil and groundwater contamination, yet poorly managed sites continue to degrade land through soil compaction, vegetation loss, and hydrological disruption (Zhang et al., 2021; European Commission, 2021). In sub-Saharan Africa, many landfills operate more like open dumps, lacking liners or drainage control, resulting in leachate infiltration, chemical pollution, and

reduced land usability (Mushi et al., 2021; Adebowale et al., 2022). The study in Lira city mirrors these patterns, with observed gully formation, soil hardening, and declining agricultural productivity near landfill sites. At the national level, Uganda has made legislative strides with frameworks like the National Solid Waste Management Framework (2022), but local implementation remains weak, particularly in secondary cities such as Lira (Okot-Okumu & Nyeko, 2011; NEMA, 2022). The study highlights that without engineered systems, buffer zones, and regular monitoring, landfilling risks contributing to land degradation rather than mitigating it. These findings imply an urgent need for municipal capacity building, technical investment in landfill infrastructure, and enforcement of environmental regulations to ensure landfilling supports sustainability and protects soil and water resources.

The findings of this study particularly the contrasting effects of open dumping, landfilling, and composting on land degradation offer a rich, albeit complex, empirical lens through which to critically engage with Ecological Modernization Theory (EMT). EMT posits that environmental protection and economic development are not inherently contradictory; rather, through technological innovation, regulatory refinement, and institutional restructuring, industrial societies can "dematerialize" production and consumption, thereby achieving both growth and ecological sustainability (Mol & Sonnenfeld, 2000; Hajer, 1995). While EMT has been influential in shaping environmental policy in high-income contexts, its applicability to rapidly urbanizing cities such as Lira reveals significant theoretical and practical tensions, particularly concerning the assumed presence of robust state capacity, market mechanisms, and technological infrastructure that underpin its core propositions.

The modest mitigating effect of landfilling ($\beta = -0.25$, $p = 0.038$) appears, at first glance, to align with EMT's emphasis on end-of-pipe technological solutions such as engineered landfills equipped with liners, leachate collection systems, and gas management as instruments of environmental improvement. Nevertheless, the empirical reality that over 87% of landfills in the study area leak into water sources, emit foul odours, and operate without monitoring exposes a critical flaw in EMT's theoretical scaffolding: technology alone cannot compensate for weak institutional frameworks. As Jänicke (2008) contends, ecological modernization necessitates not only technical "hardware" but also institutional "software," including regulatory competence, transparency, and accountability. In Lira city, landfilling manifests as a symbolic gesture of modernity devoid of the institutional scaffolding required to ensure its ecological functionality - a dynamic reminiscent of Ferguson's (1999) concept of the "anti-politics machine," wherein technical interventions depoliticize deeper questions of equity, capacity, and justice. Consequently, while EMT lauds the greening of waste infrastructure, this study demonstrates that in contexts marked by fiscal austerity and bureaucratic fragmentation, such "modernization" may be performative rather than substantively transformative.

This study ultimately reveals that Ecological Modernization Theory, in its orthodox formulation, is ill-suited to contexts such as Lira City, where the city lacks the financial, technical, and administrative capacity to enact the "green restructuring" which the theory presupposes. The theory's epistemological bias rooted in the post-industrial experiences of Europe and North America fails to account for the pervasive informality, institutional thinness, and infrastructural deficits that characterize many African urban areas (Lawhon & Ernstson, 2017). Nevertheless, a reconfigured, context-sensitive iteration of EMT one that integrates community co-production, hybrid governance arrangements, and low-tech circular practices could offer a more viable and equitable pathway toward urban sustainability. Such an approach would transcend EMT's technocratic core to embrace what Bulkeley and Betsill (2005) term "everyday ecological modernization," wherein sustainability emerges not solely from policy mandates or technological innovation but from the dynamic interplay between formal institutions and informal, place-based practices.

5.0 Conclusion and Recommendations

5.1 Conclusion

This study set out investigate the contribution of landfilling towards solid waste management in lira city. The findings indicate that sustainable solid waste management in Lira City West Division hinges on a synergistic approach that combines robust policy enforcement, targeted technical investment, inclusive community awareness campaigns, and multi-stakeholder collaboration. It is resolved that the coexistence of harmful practices like open dumping alongside underperforming landfills underscores the need for an integrated system that simultaneously curbs destructive disposal methods and scales up regenerative alternatives. Such an approach holds the potential not only to reverse current trajectories of land degradation but also to restore soil health, enhance local agricultural productivity, and advance broader environmental and public health objectives in this rapidly urbanizing context.

5.2 Recommendations

We recommend the need for the Ugandan government through the National Environment Management Authority (NEMA) and local government structures to move beyond declarative policy frameworks and operationalize waste management legislation through sustained investment and institutional capacity building. Also, adequate and predictable funding must be allocated to support enforcement mechanisms, while trained environmental health officers and technical staff should be deployed to monitor compliance and respond to violations. And digital and/or geospatial monitoring tools could enhance transparency and accountability in waste disposal practices.

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Declaration of conflict of interest

No conflict of interest was registered.

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