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Open Dumping for effective Solid Waste Management in Lira City, Mid-North Uganda

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ABSTRACT

Purpose: This study examined the significance of open dumping, as a solid waste management method, in Lira City.

Methodology: Using a cross-sectional mixed-methods design, data were gathered from 156 residents and city 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 open dumping is widespread and strongly associated with visible environmental harm, yet public awareness of its long-term degradation effects remains low. The regression analysis confirmed that open dumping significantly exacerbates land degradation. The study concludes that while effective waste management solutions exist, their implementation is hindered by weak institutions, insufficient funding, and limited public awareness.

Contribution to Theory, Policy and Practice: This study contributes to strengthening regulatory enforcement, increasing investment in waste infrastructure and fostering multi-sectoral collaboration to support decentralized, context-appropriate innovations essential for reversing land degradation and advancing sustainable urban development in the division.

Key words: *Solid Waste Management, Land Degradation, Open Dumping, Environment*

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).

Uganda, like many East African countries, faces significant challenges in managing solid waste at both national and municipal levels. According to the National Environment Management Authority (NEMA) report (2019), less than 40% of urban areas in Uganda had access to formal waste collection services as of 2018, leading to increased reliance on illegal dumpsites. In Kampala, studies conducted between 2010 and 2016 revealed that poorly managed landfills

contributed to groundwater contamination and loss of agricultural land (Mbuligwe, 2005; Okot-Okumu & Nyenje, 2011). In Lira City, located in northern Uganda, the absence of engineered landfills and composting facilities has led to continuous open dumping, especially in peri-urban zones (Lira District Local Government, 2020). These issues are compounded by seasonal flooding and poor drainage systems, which exacerbate land degradation through soil erosion and chemical leaching (Ogwueleka, 2009; Mugambe et al., 2018). The Ugandan 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).

1.1 Problem Statement

Lira City 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. 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. Therefore, the objective of the study was to examine the effect of waste management methods on land degradation in Lira City West Division. Specifically, the researchers focused on assessing the effect of open dumping land degradation in Lira city west division.

2.0 Material and Methods

2.1 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.

Table 1: Sample Size Determination

Category	Target Population	Total population	Sample Size	Sampling Method
Local Leaders	Ward councilors	21	19	Purposive Sampling
Municipal Officers	Division Town Clerk	1	1	Census
Technical Staff	Engineer, planner	2	2	Census
Health Inspector	Public health officials	1	1	Census
Environment Officer	Environmental regulators	1	1	Census
Waste Operations Workers	Dumpsite workers	3	3	Census
Households	Household heads from 20 villages	370	160	Multi-stage Sampling
Total		**398**	**186**	

Source: Planning Unit Report on parish Baseline Assessment 2021(modified by the researcher 2025)

2.2 Sample determination

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.

2.3 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).

2.4 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 was 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.

2.5 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.

3.0 Findings

3.1 Demographic Profile of 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.

3.2 The degree of Open dumping in Lira City

Table 2: Descriptive statistics on the degree of open dumping in Lira City

Items	Mean	SD
Open dumping of waste is common in my area.	4.22	1.31
There are visible open dumpsites with accumulated waste.	3.36	0.95
Vegetation around open dumpsites are sparse or deteriorating.	3.61	1.47
Plastic and non-biodegradable waste is frequently seen in open dumping areas.	3.69	1.18
Land near open dumpsites is unsuitable for farming or construction.	2.76	0.99
Areas with open dumping show noticeable signs of land degradation.	2.95	1.11
Grand total (overall average)	3.43	1.17

Source: field data, 2025

The descriptive analysis (table 2) above shows that open dumping is a widespread practice in Lira City West Division, with three-quarters of respondents (n=105, 75.0%) agreeing that it is common in their area, yielding a high mean of 4.22 (SD=1.31). A large proportion also acknowledged the presence of visible open dumpsites (n=89, 63.6%, mean=3.36, SD=0.95), and most observed deterioration of vegetation around such areas (n=79, 56.4%, mean=3.61, SD=1.47). Similarly, the majority reported frequent presence of plastics and other non-biodegradable waste in open dumping areas (n=87, 62.1%, mean=3.69, SD=1.18). However, fewer respondents agreed that land near dumpsites is unsuitable for farming or construction (n=22, 15.7%, mean=2.76, SD=0.99) or that such areas show noticeable signs of land degradation (n=37, 26.4%, mean=2.95, SD=1.11). Overall, the average score of 3.43 (SD=1.17) suggests that while open dumping is highly prevalent and visible, its long-term impacts on land use and degradation are less acknowledged by the community.

The descriptive findings reveal that open dumping is a highly visible and pervasive waste disposal practice in Lira City West Division, with 75% of respondents affirming its common occurrence and reporting a high level of agreement (mean = 4.22). Respondents also frequently observed open dumpsites, the presence of non-biodegradable waste particularly plastics and noticeable vegetation decline in surrounding areas, indicating acute awareness of the immediate environmental symptoms associated with unregulated waste disposal. However, recognition of the longer-term consequences of these practices remains limited: only a minority acknowledged that land near dumpsites is unsuitable for agriculture or construction or exhibited clear signs of land degradation. This discrepancy suggests a gap in community understanding of the cumulative ecological impacts of open dumping, particularly its role in soil contamination, loss of land productivity, and structural instability. The overall moderate mean score (3.43) reflects strong awareness of the practice's prevalence but weaker perception of its enduring effects on land integrity, highlighting a critical need for targeted environmental education and awareness initiatives that connect visible waste issues to their underlying implications for land degradation and sustainable land use.

The qualitative findings indicate that open dumping is highly prevalent in Lira City West Division, with numerous visible dumpsites scattered across the area. Residents reported that vegetation around these sites is sparse or deteriorating, and non-biodegradable waste such as plastics is commonly found. One resident explained,

> *"Before they started dumping here, we used to grow cassava and sweet potatoes nearby. Now nothing grows well."*

3.2 The level of Land degradation in Lira City

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).

***Table 3*: Descriptive statistics for land degradation in Lira City**

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

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 further 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.

3.3 The relationship between open dumping and land degradation in Lira City

The study used Pearson's Product-Moment Correlation Analysis to establish the relationship between open dumping and land degradation in Lira City West Division. The matrix of correlation, showing r values, is presented in Table 4.

Table 4: Correlation of open dumping and land degradation in Lira City

Variables	(1)	(2)	(3)	(4)
(1) Land Degradation	1.000			
(2) Open Dumping	0.709*	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. 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 open dumping and land degradation in Lira City West Division. These correlations provide insight into how open dumping is associated with the extent of land degradation. Land degradation shows a strong positive and statistically significant correlation with open dumping ($r = 0.709$, $p < 0.05$). This indicates that as the reliance on open dumping increases, the level of land degradation also rises substantially. Open dumping is typically unregulated, lacks environmental safeguards, and often occurs on vacant lands, riverbanks, or along roadsides. The high correlation suggests that this practice contributes directly to soil contamination, loss of vegetation, surface sealing, and disruption of natural drainage systems which are key drivers of land degradation.

3.4 Linear regression analysis of the effect of open dumping on land degradation in Lira City West Division

Table 5 shows the results of linear regression analysis that was used to establish the simultaneous effect of open dumping on land degradation in Lira City West Division

Table 5: Regression analysis of the effect of open dumping on land degradation in lira city

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
_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 open dumping 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 open dumping, which represents a strong explanatory power. Open Dumping ($\beta = 0.53$, $p < 0.001$). Open dumping has 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.

3.5 The effect of open dumping on land degradation

The regression analysis in table 8, reveals that Open dumping in Lira City West Division significantly drives land degradation ($\beta = 0.53$, $p < 0.001$). It causes soil compaction, waterlogging, erosion, drainage blockage chemical contamination, and reduced fertility. The qualitative findings revealed that weak enforcement of existing policies and limited technical capacity have worsened the problem of open dumping in Lira City West Division. The Division Town Clerk explained: *"We have laws and guidelines, but we lack the manpower and funds to enforce them. As a result,*

waste is dumped everywhere without control." Similarly, a health inspector stressed that, *"Our priority has been collection and disposal, but monitoring what happens after disposal is almost non-existent."* Local leaders and technical staff further highlighted the visible environmental and structural damage resulting from uncontrolled dumping. The Division Engineer stated: *"Most of the dumpsites we inspected are on sloping ground, and we already see gully erosion cutting through them."* He added, *"In nearly 70% of the sites, plastics have blocked the drainage channels, leaving water stagnant and causing flooding whenever it rains."* An environmental officer confirmed this by noting, *"Soil in these areas is stained, compacted, and chemically contaminated. It can no longer support vegetation growth."*

Community members also testified about the effects on agriculture and livelihoods. A farmer lamented: *"Before, I used to harvest cassava from this land, but now nothing grows because the soil has become too weak and poisoned."* Another resident shared how waste has worsened living conditions, stating: *"When drainage is blocked, water just stands and kills our crops. At the same time, mosquitoes increase, and children fall sick all the time."*

Generally, both quantitative and qualitative findings revealed that open dumping significantly contributes to land degradation in Lira City West Division. These results agree with global studies showing that open dumping is one of the most harmful ways to dispose of waste, especially in low-income countries where regulations are weak, infrastructure is limited, and cities are growing rapidly (Cointreau, 2021; Adhikari et al., 2021; Mushi et al., 2021). In Lira, waste is often dumped along roads, wetlands, and residential areas, similar to patterns in other East African cities, leading to blocked drainage, poor soil quality, and reduced agricultural productivity (Wambua et al., 2023; Nsamba et al., 2021). In contrast, high-income countries have reduced land degradation through engineered landfills and waste management technologies. In Lira, however, gaps in enforcement, lack of funding, and limited technical skills mean that open dumping continues despite national laws (Kjeldsen et al., 2002; NEMA, 2022; Okot-Okumu & Nyeko, 2011). Composting is a better alternative, improving soil health and fertility, but it is not widely practiced because of low awareness, weak institutional support, and lack of training (Adebowale et al., 2022; Mugambe et al., 2021). The study highlights that open dumping is both an environmental and social problem, harming land and increasing inequality. Urgent action is needed, including better enforcement of anti-dumping rules, investment in landfills and composting, training for city staff, and community awareness campaigns. These measures would help restore soil quality, support agriculture, and make waste management in Lira more sustainable.

The findings of this study particularly the contrasting effects of open dumping 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 strong, positive association between open dumping and land degradation ($\beta = 0.53$, $p < 0.001$) starkly contradicts EMT's foundational premise of decoupling waste generation from environmental harm. In Lira city, open dumping does not represent a transitional phase en route to modernized waste systems but rather reflects a systemic failure of state capacity and infrastructural investment conditions that EMT frequently underestimates or implicitly assumes away. The theory presumes the existence of a competent regulatory state, a technocratic bureaucracy, and market mechanisms capable of internalizing environmental externalities (York & Rosa, 2003). However, the absence of basic waste collection services, enforcement mechanisms, and public environmental literacy in Lira city exemplifies what Swyngedouw (2007) critiques as the "hollowing out" of the developmental state in post-colonial urban contexts. Here, open dumping functions not as a residual practice awaiting technological substitution but as a symptom of institutional abandonment, thereby challenging EMT's techno-optimism and its implicit faith in top-down, state-led environmental governance.

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 centers (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

The study was about the relationship between open dumping and waste management in Lira city. It was revealed that open dumping significantly drives land degradation in Lira City West

Division, as evidenced by widespread soil compaction, waterlogging, gully erosion, vegetation loss and declining soil fertility across study sites. The regression analysis confirmed a strong, positive, and statistically significant relationship between open dumping and land degradation, underscoring its role not merely as a sanitation issue but as a primary environmental stressor. This degradation is exacerbated by weak enforcement of existing environmental regulations, limited institutional capacity, and insufficient technical infrastructure, which collectively perpetuate reliance on unregulated disposal practices despite their visible and measurable ecological consequences.

5.2 Recommendations

It is recommended that open dumping be adopted only for bio-degradable waste within Lira city and its surroundings for effective environmental management.

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Declaration of conflict of interest

No conflict of interest was registered.

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