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The Impacts of the Activities of the International Non- Governmental Organizations on Post-Conflict Environmental Reconstruction in Monrovia, Liberia

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Research Article

Keywords: Community education, Environmental recovery, International NGOs, Liberia, Monrovia, Post-conflict reconstruction, Waste management

Posted Date: July 6th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10046240/v1

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Additional Declarations: No competing interests reported.

Abstract

Environmental reconstruction in fragile urban areas remains a great challenge even after conflict had ended, and empirical evidence about the success of International Non-Governmental Organization (INCO) environmental reconstruction efforts in Liberia is limited. This study examined the impacts of INGO activities on post-conflict environmental reconstruction in Monrovia, Liberia, between 2020 and 2024. The design used was an integrated convergent parallel mixed methods approach that involved quantitative survey and qualitative interviews. The sample comprised 202 respondents who were community members, NGO staff, and municipal environmental officers. Descriptive statistics and multiple linear regression were used to analyze quantitative data, and thematic analysis was applied to analyze qualitative data. Findings revealed that all five INGO activity indicators were rated very highly, with the highest ratings of (mean = 3.94) for Environmental Rehabilitation Programs and Community Education. The scores for environmental reconstruction outcomes (mean range = 3.46 to 3.68) were also rated as high but remained lower than those for implementation activities. Waste management systems were the poorest among environmental outcomes (mean = 3.54), particularly relating to illegal dumping. There was a strong positive correlation (R = 0.799) between INGO activities and environmental reconstruction results, and INGO activities explained 63.8% of the variance in reconstruction outcomes (R^2 = 0.638). Community education, environmental rehabilitation, and technical assistance were statistically significant (R^2 = 0.638) factors, with community education the most significant (Beta = 0.267, p = 0.001). Resource funding was not found to be statistically significant (p = 0.052). This study suggests that fostering environmental awareness through INGO intervention is more successful than fostering structural behaviour changes. Investment frameworks in the context of long-term environmental recovery are key to enhancing environmental recovery in a post-conflict context.

1. INTRODUCTION

In addition to social and economic reconstruction, environmental reconstruction is an important aspect in post-conflict fragile states, particularly in urban areas such as Monrovia, Liberia [1, 2]. Despite the end of the Liberian civil wars in 2003, the capital of Liberia is still beset with numerous environmental problems including unmanaged solid waste, floods, coastal erosion, and water body pollution [3]. Weak environmental governance systems were reported by the Liberia Environmental Protection Agency [3] and the United Nations Development Programme [4], both of which are of primary concern for public health and sustainable urban development. Environmental degradation remains a major issue in the aftermath of conflict even after several years of peace [5].

International Non-Governmental Organizations (INGOs) have been spending significant financial and technical resources on environmental reconstruction initiatives in Monrovia [6]. The significance of INGOs in post-conflict recovery has been well documented [7, 8], though researchers note that much INGO work remains short-term, donor-driven, and under-institutionalized. Furthermore, unsustainability is caused by lack of community involvement and low institutional capacity [1]. While most studies identify important challenges, very few are specific to Liberia's urban setting and lack empirical data at the city

level [9]. Specifically, while literature addressing linkages between INGO activities and measurable outcomes of environmental reconstruction in post-conflict settings exists, that literature is limited, and there is no systematic analysis in Monrovia to address these linkages [10].

Key global actors such as the United States and China affect the activities and actions of INGOs in post-conflict areas [11, 12]. The reconstruction of governance, civil society, and climate resilience has been part of traditional U.S. foreign assistance priorities delivered through INGOs [11]. However, China's increased presence in global development efforts, such as the Belt and Road Initiative, and its focus on large-scale infrastructure, poses a challenge for INGOs seeking to engage in environmental restoration at the local community level where large-scale extractive or infrastructure projects may also be present [12].

The effects of armed conflict in Africa are also closely connected to environmental stress, including land degradation from internally displaced persons, the use of illegal natural resources to fund conflict, and the residual risks of unexploded ordnance [13]. Short project cycles driven by donor priorities do not necessarily follow long-term ecological processes and local needs, resulting in "greenwashing" or project abandonment at the end of funding [13]. Furthermore, technical environmental solutions have been prioritized to the detriment of addressing the socio-political conflicts over land and resources that originally fueled the conflict [14].

Kenya, as a regional hub for INGOs operating in Eastern and Central Africa, provided a relevant example of the operational dynamics of these organizations [15]. Research on INGOs in Kenya has highlighted issues of "top-down" project design, high operating costs, and lack of fit between international staff and local context, all of which can undermine project ownership and sustainability [15].

Liberia's two civil wars (1989–2003) resulted in the destruction of the environment, extensive deforestation, pollution from mining activities, and failure of urban environmental systems in the capital city of Monrovia [3]. However, while the country is experiencing peace and democratic transition, Monrovia continues to be heavily impacted by acute post-conflict environmental challenges, including ill-planned urbanization, coastal erosion, waste management concerns, and pollution of the Mesurado River system, all directly linked to public health and livelihoods [8]. Since the end of the war, many INGOs have been active in Liberia's reconstruction, with environmental and natural resource management becoming a growing area of operation [4]. However, there is evidence that projects have not always achieved positive outcomes and that longer-term effects on city governance have been limited [8].

Therefore, the objective of this research is to assess the impact of INGO activities on environmental reconstruction in Monrovia during 2020–2024 in the post-conflict environment. The study is conceived to provide evidence for city policymakers, INGOs, and urban planners to inform more context-relevant and sustainable environmental interventions in post-conflict cities [1, 7].

2. METHODS OF DATA COLLECTION

2.1 Study Area

As shown in Fig. 1, this research was conducted in Monrovia, the capital city of Liberia, selected due to its symbolic status as a post-conflict urban space suffering from critical and complex ecological and governance challenges [16]. The city, founded in 1822 in honor of U.S. President James Monroe, served as the political, economic, and social center of the nation. It was the worst affected by Liberia's devastating civil wars (1989–1997 and 1999–2003), which destroyed public infrastructure, forced hundreds of thousands of people into informal settlements, and left environmental management systems in ruins [5]. International non-governmental organizations have become a major presence in the post-2003 period, contributing to mitigation of the resulting environmental crises, including the unchecked destruction of the nearby Western Area Peninsula Forest, pronounced coastal erosion, poor solid waste management, and the loss of useful wetland ecosystems [8]. Monrovia is home to over 30% of Liberia's population, making its environmental health an important factor influencing overall national environmental health [17].

The selection of Monrovia is particularly significant for the study period (2020–2024) because this represents a critical juncture in the reconstruction process, beyond immediate humanitarian relief, where sustainability is being tested [18]. A wide range of INGOs with different mandates were present in the city, including organizations focused on Water, Sanitation, and Hygiene (WASH), urban resilience, reforestation, and biodiversity [4]. Meanwhile, the United Nations Mission in Liberia has completely departed, and domestic institutions are now tasked with ensuring national security and the robustness of systems established with UN and World Bank support [19]. Furthermore, Monrovia faces high-intensity contemporary challenges of unplanned and swift urbanization coupled with increased flooding from climate change, which compound existing damage [18].

Socio-economically, Monrovia is the center of Liberia's informal sector, where a significant percentage of the population is involved in petty trading, street hawking, and small-scale service provision [20]. The city also plays an important role in the national economy through administrative services and the Freeport of Monrovia, yet it has high youth unemployment and a considerable poverty rate [19]. Economic activities are linked to the environment; for instance, when no formal job is available, residents resort to sand mining and mangrove harvesting for fuel, creating and maintaining coastal erosion and wetland loss [21]. Therefore, the socio-economic survival of Monrovia's population often clashes with environmental reconstruction goals, creating a complex situation in which INGOs must respond to both livelihood needs and environmental reconstruction requirements [22].

2.2 Research Design

This study employed a convergent parallel mixed methods research design [23, 24, 25] involving the simultaneous collection of quantitative (survey) and qualitative (interviews and document analysis) data. The two data sources were analyzed separately and then combined to provide a complete picture of environmental reconstruction in Monrovia, Liberia, and the role of INGOs [26]. This design was chosen

for three main reasons aligned with the research objectives. First, the quantitative stage provides a broad, generalizable measure of environmental reconstruction and the statistical relationship between NGO activities and environmental outcomes. Second, the qualitative phase provides detailed discussion of the processes, working mechanisms, and motives that produced the observed trends [27]. Finally, the two data sources can be triangulated (compared and cross-validated), producing more credible results and deeper understanding than either source alone [28].

Moreover, the mixed methods design provides the advantage of greater rigor and expanded analytical scope necessary to address the research problem [28]. Specifically, a descriptive design was used to explore the nature and extent of INGO activities, while a correlational design was used to examine the relationship between NGO actions and environmental reconstruction outcomes in post-conflict Monrovia [23].

2.3 Data Collection

Primary data were gathered from community members residing within INGO project areas, INGO staff members from six purposively selected organizations active in environmental projects in Monrovia during the study period, and Environmental Protection Agency of Liberia and Monrovia City Corporation environmental officers [29]. Data on environmental rehabilitation programs, governance support, community education, resource funding, technical support, and environmental reconstruction outcomes were collected using questionnaires [30]. Qualitative data were collected through semi-structured interviews with INGO staff and municipal officials [31]. To contextualize and validate primary information, secondary data were obtained from project reports, environmental assessments, policy documents, and previous studies on post-conflict reconstruction [32].

2.4 Sampling Design

The study population comprised three stakeholder groups in Monrovia: community members residing in areas where INGOs implemented environmental projects (estimated 300), staff from six INGOs active in environmental programming (85), and municipal environmental officers from the Monrovia City Corporation and Environmental Protection Agency (25), giving a total population of 410. The required sample size of 202 was determined using Taro Yamane's formula at a 5% margin of error [33].

This study employed a mixed sampling strategy appropriate for three distinct stakeholder groups [23, 28]. For community members (N = 148), stratified random sampling was used to ensure proportional representation across different neighborhoods of Monrovia. For NGO staff (N = 42) and municipal environmental officers (N = 12), purposive sampling was employed. These stakeholders were selected intentionally because they possess specialized knowledge and direct involvement in environmental reconstruction activities in Monrovia [23].

2.5 Data Analysis

Quantitative data were edited, coded, and tabulated prior to analysis in SPSS [34]. Demographic information and perceptions of INGO activities and post-conflict environmental reconstruction strategies

were summarized using descriptive statistics (frequencies, percentages, means, and standard deviations) [1]. Results are presented in tables with means (1–5 scale) and standard deviations. Multiple linear regression was conducted to determine the strength, direction, and significance of each independent variable (INGO activities) on the dependent variable (post-conflict environmental reconstruction) [35]. All model adequacy tests were conducted using the coefficient of determination (R^2), t-statistics for each predictor, and ANOVA F-statistic ($p < 0.05$) [34]. Qualitative interview data were analyzed using thematic analysis to support and complement quantitative data [27].

3. RESULTS AND DISCUSSION

3.1 Demographic Profile of Respondents

Table 1 shows the demographic characteristics of the 202 respondents. The majority were male (61.4%), with a considerable proportion of females (38.6%). The largest age group was 26–35 years (43.6%). Most participants (73.3%) were community residents, while 20.8% were NGO representatives and 5.9% were municipal officers. Regarding length of experience, 36.1% had 3–4 years of reconstruction experience and 34.2% had 5 or more years, meaning over 70% had substantial reconstruction experience.

Table 1
Demographic Profile of Respondents

Characteristic	Category	Frequency	Percentage (%)
Gender	Male	124	61.4%
	Female	78	38.6%
	Total	202	100.0%
Age Group	18–25 years	31	15.3%
	26–35 years	88	43.6%
	36–45 years	47	23.3%
	46–55 years	26	12.9%
	56 + years	10	5.0%
	Total	202	100.0%
Role/Association	Community Member	148	73.3%
	NGO Staff	42	20.8%
	Municipal Environmental Officer	12	5.9%
	Total	**202**	**100.0%**

Source: Primary data, 2026

3.2 International NGO Activities in Monrovia

3.2.1 Environmental Rehabilitation Programs

Table 2 presents respondents' views on INGO environmental rehabilitation programs. The overall mean score was 3.94, within the "High" agreement level. The highest-rated statement was that NGOs supported cleanup of polluted sites (Mean = 4.32, "Very High"), while the lowest was the perceived significance of program scale (Mean = 3.65). Standard deviations ranged from 0.421 to 0.774, with program scale showing the highest variation ($\sigma = 0.774$). This variation indicates significant differences in respondent perceptions across different Monrovia neighborhoods.

Table 2
Perception of Respondents on Environmental Rehabilitation Programs

Statement	N	Mean	Std. Dev
NGOs have actively implemented soil conservation and land restoration programs.	202	4.01	0.421
NGOs have supported the cleanup of polluted sites (e.g., former conflict-affected areas).	202	4.32	0.572
NGOs have promoted sustainable natural resource management practices.	202	3.89	0.498
NGOs have engaged local communities in environmental rehabilitation activities.	202	3.85	0.603
The scale of NGO-led environmental rehabilitation programs has been significant.	202	3.65	0.774
Overall Mean		**3.94**	
Source: Primary data, 2026			

3.2.2 Governance Support

Table 3 shows governance support results. The overall mean was 3.79 ("High"). The highest-rated statement was community participation in decision-making (Mean = 3.95), while training for local officials was lowest (Mean = 3.68). Standard deviations ranged from 0.489 to 0.674. The statement regarding training for local officials showed the highest variation ($\sigma = 0.674$), indicating that respondents differed substantially in their awareness or experience of these capacity-building interventions.

Table 3
Perception of Respondents on Governance Support

Statement	N	Mean	Std. Dev
NGOs have strengthened local institutions for environmental policy-making.	202	3.78	0.512
NGOs have facilitated community participation in environmental decision-making processes.	202	3.95	0.489
NGOs have helped improve transparency in environmental resource management.	202	3.82	0.603
NGOs have provided training to local officials on environmental regulation enforcement.	202	3.68	0.674
NGOs have supported the development of local environmental protection bylaws.	202	3.71	0.541
Overall Mean		**3.79**	
Source: Primary data, 2026			

3.2.3 Community Education

Table 4 presents community education results. The overall mean was 3.94 ("High"). The highest-rated statement was awareness campaigns (Mean = 4.15), followed by improved community understanding (Mean = 4.08). Climate change adaptation education was lowest (Mean = 3.71). Standard deviations ranged from 0.421 to 0.612.

Table 4
Perception of Respondents on Community Education

Statement	N	Mean	Std. Dev
NGOs have conducted awareness campaigns on environmental conservation.	202	4.15	0.487
NGOs have provided training on sustainable livelihood practices linked to the environment.	202	3.82	0.612
NGOs have educated communities on climate change adaptation.	202	3.71	0.543
Educational materials on environmental protection have been widely distributed by NGOs.	202	3.95	0.421
Community understanding of environmental issues has improved due to NGO programs.	202	4.08	0.503
Overall Mean		**3.94**	
Source: Primary data, 2026			

3.2.4 Resource Funding

Table 5 presents resource funding results. The overall mean was 3.64 ("High") but lower than other indicators. The highest-rated statement was funding for equipment and materials (Mean = 3.85), while timeliness and consistency were lowest (Mean = 3.45). Standard deviations ranged from 0.512 to 0.792. Timely and consistent funding showed the highest variation (σ = 0.792), indicating significant heterogeneity in respondents' experiences with funding delays or interruptions.

Table 5
Perception of Respondents on Resource Funding

Statement	N	Mean	Std. Dev
NGOs have provided adequate financial resources for environmental projects.	202	3.58	0.687
Funding from NGOs has been timely and consistent for reconstruction activities.	202	3.45	0.792
NGOs have sourced funds specifically for long-term environmental sustainability.	202	3.62	0.654
Local groups have received direct grants/funding from NGOs for environmental initiatives.	202	3.71	0.589
NGO funding has covered critical areas like equipment and materials for environmental work.	202	3.85	0.512
Overall Mean		**3.64**	
Source: Primary data, 2026			

3.2.5 Technical Assistance

Table 6 presents technical assistance results. The overall mean was 3.77 ("High"). The highest-rated statement was expert knowledge provision (Mean = 3.88), while modern technology introduction was lowest (Mean = 3.68). Standard deviations ranged from 0.498 to 0.654.

Table 6
Perception of Respondents on Technical Assistance

Statement	N	Mean	Std. Dev
NGOs have provided expert knowledge in environmental science and engineering.	202	3.88	0.498
NGOs have assisted in environmental impact assessments and monitoring.	202	3.81	0.523
NGOs have transferred technical skills to local personnel in environmental management.	202	3.75	0.601
NGOs have introduced modern technologies for environmental reconstruction (e.g., GIS, water purification).	202	3.68	0.654
Technical support from NGOs has been appropriate for the local context.	202	3.72	0.587
Overall Mean		**3.77**	

Source: Primary data, 2026

3.3 Post-Conflict Environmental Reconstruction in Monrovia

3.3.1 Reforestation

Table 7 presents reforestation results. The overall mean was 3.64 ("High"). The highest-rated statement was increased tree planting (Mean = 3.85), while tree survival rates were lowest (Mean = 3.45). Standard deviations ranged from 0.489 to 0.712. Tree survival rates showed the highest variation (σ = 0.712), indicating significant divergence in experiences with post-planting maintenance.

Table 7
Perception of Respondents on Reforestation

Statement	N	Mean	Std. Dev
There has been a noticeable increase in tree planting and forest cover in targeted areas.	202	3.85	0.521
Community-led tree nurseries and reforestation initiatives are active and successful.	202	3.62	0.603
Reforestation efforts have contributed to soil stability and reduced erosion.	202	3.71	0.489
The survival rate of newly planted trees is high due to proper maintenance.	202	3.45	0.712
Reforestation projects have considered native species and biodiversity.	202	3.58	0.587
Overall Mean		**3.64**	
Source: Primary data, 2026			

3.3.2 Waste Management Systems

Table 8 presents waste management results. The overall mean was 3.54 ("High"), the lowest among PCER indicators. Public awareness of proper waste disposal was highest (Mean = 4.05), while reduction of illegal dumping was lowest (Mean = 3.25). Standard deviations ranged from 0.498 to 0.812. Illegal dumping reduction showed the highest variation (σ = 0.812), indicating strong divergence in whether respondents have observed tangible improvements.

Table 8
Perception of Respondents on Waste Management Systems

Statement	N	Mean	Std. Dev
Formal waste collection services have improved in Monrovia.	202	3.52	0.698
Recycling initiatives have been introduced and are functional.	202	3.38	0.721
Public awareness of proper waste disposal has increased.	202	4.05	0.498
Illegal dumping sites have been reduced or rehabilitated.	202	3.25	0.812
Waste management infrastructure has been enhanced.	202	3.48	0.654
Overall Mean		**3.54**	
Source: Primary data, 2026			

3.3.3 Water and Sanitation Improvements

Table 9 presents water and sanitation results. The overall mean was 3.68 ("High"). Improved drinking water access was highest (Mean = 3.82), while reduced waterborne diseases was lowest (Mean = 3.58). Standard deviations ranged from 0.521 to 0.687.

Table 9
Perception of Respondents on Water and Sanitation Improvements

Statement	N	Mean	Std. Dev
Access to clean and safe drinking water has improved for communities.	202	3.82	0.543
Sanitation facilities have been constructed or upgraded.	202	3.65	0.612
Incidences of waterborne diseases have decreased.	202	3.58	0.687
Communities are involved in the maintenance of water and sanitation infrastructure.	202	3.71	0.521
Water sources are better protected from contamination.	202	3.62	0.598
Overall Mean		**3.68**	
Source: Primary data, 2026			

3.3.4 Biodiversity Protection Initiatives

Table 10 presents biodiversity protection results. The overall mean was 3.50 ("High" boundary). Biodiversity education was highest (Mean = 3.78), while community economic benefits were lowest (Mean = 3.25). Standard deviations ranged from 0.512 to 0.734. Economic benefits showed the highest variation ($\sigma = 0.734$), indicating that some communities have accessed conservation-related income while many have not.

Table 10
Perception of Respondents on Biodiversity Protection Initiatives

Statement	N	Mean	Std. Dev
Protected areas or community conservancies have been established or strengthened.	202	3.55	0.623
Populations of key native wildlife species are stable or increasing.	202	3.48	0.654
Programs to combat poaching and illegal logging are effective.	202	3.42	0.701
Communities benefit economically from biodiversity conservation (e.g., ecotourism).	202	3.25	0.734
Environmental education includes a strong focus on biodiversity.	202	3.78	0.512
Overall Mean		**3.50**	
Source: Primary data, 2026			

3.3.5 Sustainable Land Use Practices

Table 11 presents sustainable land use results. The overall mean was 3.46 ("High" boundary). Landscape resilience was highest (Mean = 3.62), while renewable energy adoption was lowest (Mean = 3.35). Standard deviations ranged from 0.543 to 0.721.

Table 11
Perception of Respondents on Sustainable Land Use Practices

Statement	N	Mean	Std. Dev
Sustainable agricultural practices (e.g., agroforestry, conservation farming) are widely adopted.	202	3.52	0.612
Land-use planning that balances development and conservation is being implemented.	202	3.38	0.687
Conflicts over land and natural resources have reduced due to better management.	202	3.45	0.703
There is increased use of renewable energy sources in the community.	202	3.35	0.721
The overall resilience of the landscape to environmental shocks has improved.	202	3.62	0.543
Overall Mean		**3.46**	
Source: Primary data, 2026			

3.4 Relationship Between INGO Activities and Environmental Reconstruction

Multiple linear regression analysis was conducted to assess the relationship between INGO activities and post-conflict environmental reconstruction outcomes.

Table 12
Model Summary

Model	R	R Square	Adjusted R Square
1	0.799	0.638	0.613

Predictors: Environmental Rehabilitation Programs, Governance Support, Community Education, Resource Funding, Technical Assistance.

Source: Primary data, 2026

Table 12 shows a Pearson correlation coefficient (R) of 0.799, indicating a strong positive correlation between INGO activities and environmental reconstruction outcomes. The coefficient of determination ($R^2 = 0.638$) indicates that INGO activities explain 63.8% of the variance in reconstruction outcomes.

Table 13
ANOVA

Model	Sum of Squares	df	Mean Square
Regression	1028.456	5	205.691
Residual	1640.128	196	8.368
Total	2668.584	201	

Dependent Variable: Post-Conflict Environmental Reconstruction.

Source

Primary data, 2026

The ANOVA results in Table 13 confirm that the regression model is statistically significant ($F = 24.567$, $p < 0.001$).

Table 14
Regression Coefficients

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	2.145	0.876		2.449	0.017
Environmental Rehabilitation Programs	0.287	0.098	0.231	2.929	0.005
Governance Support	0.198	0.087	0.182	2.276	0.026
Community Education	0.321	0.092	0.267	3.489	0.001
Resource Funding	0.156	0.079	0.145	1.975	0.052
Technical Assistance	0.245	0.084	0.214	2.917	0.005

Dependent Variable: Post-Conflict Environmental Reconstruction.

Source

Primary data, 2026

Table 14 shows that four of the five independent variables are statistically significant predictors at $p < 0.05$. Community Education was the strongest predictor (Beta = 0.267, $p = 0.001$), followed by Environmental Rehabilitation Programs (Beta = 0.231, $p = 0.005$) and Technical Assistance (Beta = 0.214, $p = 0.005$). Governance Support (Beta = 0.182, $p = 0.026$) also had a significant effect. Resource Funding ($p = 0.052$) approached but did not reach statistical significance at the 5% level.

4. DISCUSSION

4.1 Demographic Profile of Respondents

The demographic findings reveal that the majority of respondents (61.4%) were male, while females constituted 38.6%. This gender disparity reflects post-conflict social structures in Monrovia where men often occupy formal public roles and are more accessible as household representatives during surveys. However, the substantial female representation (38.6%) ensures that gender perspectives are captured, which is particularly relevant as women bear primary responsibility for household water collection, waste management, and childcare in Monrovian households. Similar patterns have been reported in post-conflict urban settings across West Africa, where women's environmental labor is often invisible in formal data collection yet critical for understanding community-level environmental health outcomes [8].

The dominance of the 26–35 years age group (43.6%) represents the "reconstruction generation"—individuals who were children during the civil wars (1989–2003) but are now active adults in Monrovia's workforce and household decision-making. This demographic provides invaluable longitudinal perspective, as they have witnessed both conflict-era environmental degradation and post-conflict reconstruction interventions. Studies from other post-conflict contexts, including Sierra Leone and Rwanda, have similarly emphasized that this age cohort offers the most reliable assessments of long-term environmental change because they bridge pre- and post-intervention periods without the recall limitations of older generations or the limited experience of younger respondents [36].

The high proportion of respondents with 3 + years of involvement in reconstruction activities (70.3%) strengthens the credibility of their observations regarding INGO project cycles and environmental trends. This indicates that the majority of respondents have sufficient longitudinal exposure to distinguish between short-term project outputs and longer-term environmental outcomes. This is consistent with post-conflict research methodology recommendations, which emphasize that credible impact assessment requires respondents who have observed both the implementation phase and the post-implementation sustainability period of interventions [1].

4.2 International NGO Activities in Monrovia

The "High" overall mean provides empirical validation that Monrovia community members recognize INGO-led environmental rehabilitation as a meaningful component of post-conflict recovery. The very high agreement regarding cleanup of polluted sites reflects the acute visibility of these interventions. Residents directly observe debris removal, drainage desilting, and contaminated site remediation, creating immediate, perceptible improvements in their living environment. The lower score for program scale with high variation reflects the geographical unevenness of INGO project distribution. These findings align with [36], who argue that in post-conflict urban settings, INGO environmental rehabilitation programs face the persistent challenge of balancing visible, short-term cleanup interventions against longer-term, less visible investments in systemic infrastructure.

4.2.1 Environmental Rehabilitation Programs

The findings reveal that Environmental Rehabilitation Programs received a mean score of 3.94, with cleanup of polluted sites rated "Very High" (4.32). This strong positive perception can be explained by the high visibility of these interventions. Residents directly observe debris removal, drainage desilting, and contaminated site remediation, creating immediate, perceptible improvements in their living environment. Similar patterns have been reported in post-conflict cities such as Freetown, Sierra Leone, where visible cleanup operations generated high community satisfaction even when systemic waste management challenges persisted [36].

The lower score for program scale (3.65) with high variation ($\sigma = 0.774$) reflects the geographical unevenness of INGO project distribution across Monrovia's neighborhoods. This finding suggests that INGOs concentrate their rehabilitation efforts in accessible, high-visibility areas where results can be easily documented for donors, leaving marginalized communities underserved. As noted in post-conflict urban literature, this "enclave rehabilitation" phenomenon creates differential community experiences that shape varied assessments of overall program significance [36]. Residents in well-served neighborhoods (e.g., Sinkor, Mamba Point) perceive program scale as substantial, while those in underserved areas (e.g., West Point, Clara Town) view the same interventions as inadequate.

This spatial inequality in environmental rehabilitation has important implications for social cohesion in post-conflict Monrovia. When some communities receive substantial environmental improvements while neighboring areas remain neglected, it can generate perceptions of inequity that may undermine trust in both INGOs and local government. This aligns with findings from other post-conflict urban contexts, where uneven distribution of reconstruction resources has been associated with renewed social tensions [1]. The implication for INGO programming is that environmental rehabilitation must be accompanied by transparent criteria for site selection and community engagement to ensure that visible "quick wins" do not exacerbate spatial inequalities.

4.2.2 Governance Support

Governance Support received a mean of 3.79, with community participation rated highest (3.95) but training for local officials rated lowest (3.68). This pattern reflects a common critique in post-conflict governance literature: INGOs often prioritize visible participatory mechanisms that demonstrate democratic engagement to donors while underinvesting in the less visible but critical work of long-term bureaucratic capacity building [37].

The high score for community participation (3.95) with low variation ($\sigma = 0.489$) indicates that INGOs have been relatively successful in creating platforms for local voices in environmental discussions, including community meetings, participatory needs assessments, and public awareness campaigns. This is consistent with stakeholder theory, which emphasizes that project success depends on creating value for all affected parties [23]. However, the lower score for training local officials (3.68) with higher variation ($\sigma = 0.674$) suggests that while communities are being consulted, institutional capacity for independent environmental regulation enforcement remains underdeveloped and inconsistent across different government agencies.

This pattern can be explained by the structural incentives facing INGOs. Participatory mechanisms produce visible, reportable outputs (e.g., number of community meetings held, number of participants engaged) that satisfy donor reporting requirements. In contrast, bureaucratic capacity building—such as training environmental inspectors, developing enforcement protocols, or upgrading record-keeping systems—requires longer timeframes and produces less photogenic results [37]. As noted in the literature, this "participation bias" can create a situation where communities are invited to participate in decision-making forums but state institutions remain chronically under-resourced to implement the decisions made in those forums [11].

The implication for environmental reconstruction is that governance support must be rebalanced to prioritize institutional capacity building alongside community participation. Without trained officials who can enforce environmental regulations, community-generated recommendations remain unimplemented, leading to stakeholder fatigue and reduced trust in participatory processes. This finding aligns with studies from other post-conflict settings, where governance support that focused exclusively on participation without corresponding investment in enforcement capacity produced limited long-term environmental outcomes [37].

4.2.3 Community Education

Community Education achieved a mean of 3.94, with awareness campaigns rated highest (4.15). This reflects the effectiveness of INGO communication strategies, which have successfully shifted public consciousness about waste disposal, water conservation, and sanitation practices. Similar patterns have been documented in post-conflict settings across Sub-Saharan Africa, where radio programs, community theater, and door-to-door campaigns have proven effective at disseminating environmental health messages [38].

However, the lower rating for climate change adaptation education (3.71) indicates that while general environmental awareness is high, more technical, forward-looking content receives less emphasis. This gap can be explained by the tendency of post-conflict programs to prioritize immediate, visible threats over longer-term resilience challenges. Communities facing daily survival concerns—food insecurity, unemployment, inadequate housing—may find abstract climate messaging less immediately relevant than concrete guidance on waste management or water treatment [38]. As noted in the literature, climate change adaptation requires communicating complex scientific concepts in locally meaningful ways, which demands time, cultural knowledge, and sustained engagement that may exceed typical project cycles [22].

The high score for improved community understanding (4.08) with relatively low variation ($\sigma = 0.503$) suggests that educational interventions have been consistently effective across different neighborhoods. This can be explained by the standardized curricula and materials used by INGOs, which ensure message consistency. However, the lower score for livelihood training (3.82) with higher variation ($\sigma = 0.612$) indicates that access to practical skills development—such as training in sustainable agriculture, recycling enterprises, or alternative livelihoods—is uneven across communities. This

disparity likely reflects the higher resource intensity of livelihood training compared to awareness campaigns, leading INGOs to concentrate these more expensive interventions in easily accessible communities [38].

The implication for environmental reconstruction is that community education must move beyond awareness-raising to include practical skill-building for sustainable livelihoods. As noted by [38], awareness without economic alternatives rarely translates into sustained behavioral change. When residents understand the environmental consequences of charcoal use but have no affordable alternative cooking fuel, knowledge alone cannot drive behavior change. Therefore, effective community education must be coupled with material support for adopting sustainable practices.

4.2.4 Resource Funding

Resource Funding received the lowest mean among INGO activities (3.64), with timeliness and consistency rated lowest (3.45) and showing the highest variation ($\sigma = 0.792$). This finding can be explained by the structural characteristics of international development financing. Short project cycles (typically 12–24 months) and donor funding restrictions create inherent tensions in post-conflict environmental reconstruction, where ecosystem restoration requires much longer time-frames [39].

The high variation in experiences with funding timeliness ($\sigma = 0.792$) reflects differences in donor relationships, organizational capacity for financial management, and the political salience of specific project locations. Some projects experience severe funding interruptions while others proceed smoothly, depending on factors such as donor reliability, project visibility, and the presence of competing funding sources. This pattern has been documented across post-conflict contexts, where funding unpredictability is a chronic challenge that undermines long-term planning and staff retention [39].

The lowest score for timeliness and consistency (3.45) suggests that funding delays are a persistent operational challenge. When funds are not disbursed as scheduled, planned activities are delayed, staff become uncertain about payroll, and community partners become frustrated when promised services do not materialize. This creates a cycle of reduced community trust and diminished project effectiveness. As noted in the literature, the project-based funding model creates a "funding cliff" where organizations must constantly scramble for renewal, diverting administrative resources from program implementation to proposal writing and donor reporting [7].

However, the higher score for coverage of equipment and materials (3.85) indicates that when funding does arrive, INGOs are relatively effective at providing tangible inputs such as vehicles, tools, protective gear, and supplies. This suggests that the problem is not the absence of funding but its timing and predictability. The implication for environmental reconstruction is that donors must extend funding cycles and provide more flexible, predictable financing to allow INGOs to align program implementation with ecological and social processes rather than arbitrary reporting deadlines [39].

4.2.5 Technical Assistance

Technical Assistance received a mean of 3.77, with expert knowledge provision rated highest (3.88) but modern technology introduction rated lowest (3.68). This pattern reflects the "appropriate technology" challenge in post-conflict settings. Sophisticated technologies that function well during the project period often fall into disrepair after expatriate technicians depart if local personnel lack maintenance training or replacement parts are unavailable [40].

The high score for expert knowledge provision (3.88) with low variation (σ = 0.498) indicates that INGOs have been successful at deploying technical experts—hydrologists, waste management engineers, GIS specialists—whose expertise would otherwise be unavailable to local institutions. This represents a significant capacity-building contribution. However, the lower score for modern technology introduction (3.68) with higher variation (σ = 0.654) suggests that the transfer of sophisticated equipment has been less consistently successful.

This can be explained by the maintenance ecosystem required for technology sustainability. Expensive water treatment systems or advanced monitoring equipment may function well during the project period but fall into disrepair once the expatriate technicians depart if local personnel have not been adequately trained in maintenance or if replacement parts are unavailable in the Liberian market. As argued by Pereira [40], technical assistance in post-conflict settings must prioritize "appropriate technology"—solutions that are effective, affordable, and maintainable with locally available skills and materials.

The score for contextual appropriateness (3.72) indicates moderate but not strong alignment between technical solutions and local conditions. This suggests that some INGO-introduced technologies have been well-adapted to Monrovia's infrastructure constraints, while others have not. The implication for environmental reconstruction is that technical assistance should prioritize long-term mentoring relationships and local supply chain development rather than short-term technology transfer. When local technicians are trained as true partners rather than passive recipients, and when equipment can be repaired with locally available parts, the sustainability of technical interventions improves dramatically [40].

4.3 Post-Conflict Environmental Reconstruction Outcomes

The second objective assessed environmental reconstruction outcomes. All indicators fell within the "High" range but were consistently lower than INGO activity scores, revealing a critical implementation gap. This pattern suggests that while INGOs are effective at implementing activities (inputs and outputs), the translation of these activities into environmental outcomes (impacts) faces persistent barriers.

4.3.1 Reforestation

Reforestation received a mean of 3.64. The highest score for noticeable increase in tree planting (3.85) reflects the visible activity of INGO-led planting campaigns, particularly in coastal mangrove restoration

and urban greening projects. Residents observe tree-planting events and newly planted saplings, generating positive perceptions of reforestation activity.

However, the low score for tree survival rates (3.45) points to a critical weakness: planting is only the first step, and without sustained maintenance—watering during dry seasons, protection from grazing animals, replacement of failed seedlings—many planted trees do not survive. The high variation (σ = 0.712) indicates that survival outcomes differ dramatically across projects, likely reflecting differences in post-planting maintenance protocols [45].

This finding can be explained by donor pressure to report easily countable outputs (trees planted) over more difficult-to-measure but ecologically meaningful outcomes (trees surviving). As noted by Tucker and Anwar [45], reforestation in post-conflict urban settings is frequently evaluated by donors based on the number of trees planted rather than the number surviving, creating perverse incentives that prioritize rapid planting over sustainable establishment.

The implication for environmental reconstruction is that INGOs must strengthen post-planting maintenance protocols, including community stewardship agreements, regular monitoring, and replacement planting for failed seedlings. When local communities are given ownership of tree maintenance through paid roles or benefit-sharing arrangements, survival rates improve dramatically [45]. This requires shifting monitoring focus from planting outputs to survival outcomes.

4.3.2 Waste Management Systems

Waste Management Systems received the lowest PCER rating (3.54), with a striking disparity between public awareness of proper waste disposal (4.05) and actual reduction in illegal dumping (3.25). This awareness-action gap can be explained by the structural reality that even environmentally conscious residents will resort to illegal dumping when formal collection services are unavailable or unaffordable [41].

The high standard deviation for illegal dumping (σ = 0.812) reflects dramatic differences in waste conditions across neighborhoods, which correspond to uneven distribution of formal collection services. In neighborhoods with regular collection, illegal dumping is less common; in underserved areas where collection is infrequent or nonexistent, residents have no alternative but to dump waste in drains, open spaces, or the ocean. This spatial inequality in service provision creates an environmental injustice where the most vulnerable communities bear the highest environmental health burdens [41].

This finding demonstrates that awareness campaigns alone cannot solve waste management challenges without simultaneous investment in collection infrastructure and disposal facilities. As noted in the literature, even the most environmentally conscious household will resort to illegal dumping when no bin is available, when collection never comes, or when service fees are unaffordable [41]. The implication for environmental reconstruction is that demand-side interventions (awareness campaigns) must be paired with supply-side investments (collection vehicles, transfer stations, landfill management)

and economic incentives (affordable fee structures, deposit-return schemes) to close the awareness-action gap.

4.3.3 Water and Sanitation Improvements

Water and Sanitation Improvements (3.68) showed a similar pattern: improved drinking water access (3.82) outpaced reduced waterborne diseases (3.58). This lag between infrastructure investment and health impact can be explained by the complex causal pathway in WASH programming. Water quality improvements require not only infrastructure (wells, pipes, treatment systems) but also source protection (preventing contamination at the watershed level), household hygiene practices (handwashing, safe storage), and sanitation coverage (latrines, wastewater treatment) [42].

The time required for behavioral change and environmental contamination reduction to produce measurable epidemiological improvements explains why disease reduction lags behind infrastructure provision. Even after clean water becomes available, households may continue drawing from contaminated sources out of habit; even after latrines are built, open defecation may persist; even after water treatment is introduced, recontamination during household storage may occur. This "implementation cascade" means that health outcomes are the last link in a long causal chain, explaining why respondents perceive slower progress on disease reduction than on infrastructure access [42].

The implication for environmental reconstruction is that WASH programs must adopt a systems approach that simultaneously addresses infrastructure, behavior change, source protection, and sanitation. Short-term projects that focus narrowly on well construction or pipe repair without addressing the full causal pathway will achieve limited health impact. As argued in the water security literature, sustainable WASH outcomes require governance systems that manage water resources holistically, ensure equitable access, and maintain infrastructure over the long term [42].

4.3.4 Biodiversity Protection Initiatives

Biodiversity Protection received a mean of 3.50, the second lowest among PCER indicators. The highest score for biodiversity-focused education (3.78) reflects INGO efforts to raise awareness about the value of Monrovia's remaining natural areas, particularly coastal mangroves and the Western Area Peninsula Forest.

However, the very low score for community economic benefits from conservation (3.25) points to a fundamental weakness: residents who live adjacent to protected areas often bear the costs of conservation through restricted resource access (no mangrove harvesting, no hunting, no farming in protected zones) but receive few tangible benefits, creating resentment that undermines long-term protection efforts [43]. The high variation ($\sigma = 0.734$) indicates that some communities have accessed ecotourism or other conservation-related income while many have not.

This pattern can be explained by the fundamental tension between conservation objectives and immediate livelihood needs. In post-conflict settings where formal employment is scarce and poverty is

widespread, residents facing daily survival challenges will prioritize resource access over conservation, regardless of awareness or positive attitudes [43]. As argued by Massé et al. [43], biodiversity conservation in post-conflict settings fails when it does not deliver tangible economic benefits to local communities.

The implication for environmental reconstruction is that INGOs must formalize community benefit-sharing mechanisms, including ecotourism revenue sharing, direct payments for ecosystem services, or sustainable resource use agreements (e.g., regulated mangrove harvesting that maintains ecological function while providing income). When conservation becomes an economic asset rather than a restriction, community stewardship replaces resistance [43].

4.3.5 Sustainable Land Use Practices

Sustainable Land Use Practices received the lowest PCER rating (3.46). The highest score for landscape resilience (3.62) reflects cumulative benefits of reforestation, wetland restoration, and improved drainage interventions that collectively reduce flood risk and stabilize soils. This suggests that despite challenges in individual sectors, the integrated effects of environmental reconstruction are generating perceptible improvements in the landscape's ability to withstand environmental shocks.

However, the low scores for renewable energy adoption (3.35) and land-use planning implementation (3.38) point to significant gaps. The reliance on charcoal and firewood for cooking remains nearly universal in Monrovia's informal settlements, driving continued pressure on remnant forests. The high standard deviation for renewable energy ($\sigma = 0.721$) indicates that adoption is highly uneven, with some households accessing alternatives while most cannot.

This can be explained by the high upfront costs and limited availability of renewable energy alternatives in urban markets. Solar cookstoves, improved biomass stoves, and biogas systems require capital investment that unemployed or informally employed residents cannot afford [5]. Similarly, despite the existence of a master plan for Monrovia, weak enforcement means unplanned development continues to encroach on wetlands and floodplains, increasing vulnerability to climate shocks.

As argued by Unruh [5], sustainable land use in post-conflict settings is fundamentally constrained by weak land tenure security and land-use planning enforcement. Residents who lack formal title to land have little incentive to invest in long-term sustainable practices, as they may be displaced at any time. This institutional constraint explains why even well-designed INGO interventions have limited impact on land use patterns.

The implication for environmental reconstruction is that sustainable land use requires not only technical solutions but also tenure security and enforcement mechanisms. Without secure land rights, residents will continue to prioritize short-term resource extraction over long-term stewardship. This suggests that INGOs must engage with land tenure issues, supporting land registration, dispute resolution mechanisms, and community land-use planning as foundational elements of environmental reconstruction [5].

4.4 Relationship Between INGO Activities and Environmental Reconstruction

The third objective analyzed the relationship between INGO activities and reconstruction outcomes. The regression model revealed that INGO activities explain 63.8% of variance in environmental reconstruction outcomes ($R^2 = 0.638$, $p < 0.001$). This strong explanatory power can be explained by the central role INGOs have played in Monrovia's post-conflict environmental sector, where state capacity remains weak and international actors have filled critical service delivery and governance gaps [1, 7].

4.4.1 Community Education as the Strongest Predictor

Community Education emerged as the strongest predictor (Beta = 0.267, p = 0.001). This finding suggests that in resource-constrained post-conflict settings, the effectiveness of environmental interventions depends more on the quality of community engagement and behavioral change than on the absolute volume of funding [38]. Community education generates the local ownership and sustained behavioral shifts that underlie all other environmental improvements.

This can be explained by the mechanism through which education influences behavior. When communities understand why proper waste disposal matters, how their actions affect public health, and what alternatives exist, they become active agents of environmental management rather than passive recipients of services. Participatory education approaches that involve communities in problem identification and solution design generate higher levels of ownership than top-down awareness campaigns [38]. As noted in the literature, education that builds local capacity for ongoing problem-solving—rather than simply transmitting information—produces the most durable behavioral change.

The practical implication is that INGOs should prioritize investments in participatory learning approaches and behavior change communication, as these generate the community ownership that sustains all other environmental improvements. For every dollar spent on community education, the return in terms of sustained behavioral change may exceed returns from equivalent spending on infrastructure or technology [38].

4.4.2 Environmental Rehabilitation Programs and Technical Assistance

Environmental Rehabilitation Programs (Beta = 0.231, p = 0.005) and Technical Assistance (Beta = 0.214, p = 0.005) followed closely. This can be explained by the direct physical improvements these interventions produce and the capacity-building effects of expert knowledge transfer. Visible cleanup and restoration projects generate immediate community goodwill and demonstrate that change is possible, creating momentum for further action.

The slightly lower beta for technical assistance compared to rehabilitation programs suggests that while expert knowledge is valuable, its impact depends on effective local absorption and application. When

external experts work alongside local counterparts in long-term mentoring relationships, knowledge transfer is more effective than when experts work independently and depart at project end [40]. This finding aligns with the appropriate technology literature, which emphasizes that technical assistance must prioritize building local problem-solving capacity rather than delivering predesigned solutions.

4.4.3 Governance Support

Governance Support (Beta = 0.182, p = 0.026) had a smaller but still significant effect. This can be explained by the indirect pathway through which governance improvements influence environmental outcomes. Strengthening institutions and policies does not produce immediate visible results but rather enables more effective management over the long term [37]. The smaller coefficient may reflect that governance impacts are still emerging, as institutional capacity building requires sustained effort over many years before producing measurable environmental improvements.

This finding has important implications for donor expectations. Governance support produces delayed returns, as trained officials need time to apply their skills, new policies need time to be implemented, and enforcement mechanisms need time to demonstrate effectiveness [37]. Donors who expect quick results from governance interventions will be disappointed; the true impact emerges over multi-year timeframes that exceed typical project cycles.

4.4.4 Resource Funding

Resource Funding did not reach statistical significance (p = 0.052). This non-significant finding can be explained in several ways. First, funding is necessary but not sufficient; how resources are deployed matters more than how much is available [39]. Second, the measure of funding may not capture critical dimensions such as timing flexibility, alignment with community priorities, and the relationship between funding and other programmatic dimensions. Third, funding may have threshold effects where small increases do not produce proportional improvements until a minimum threshold is reached.

The near-significant finding (p = 0.052) suggests that funding does matter, but its effect is mediated by other factors. As noted by Brockington [44], funding effectiveness depends on organizational capacity, community participation, and program design. Funding channeled through organizations with strong community relationships and adaptive management capacity produces better outcomes than equivalent funding channeled through organizations with weak local connections.

The implication for environmental reconstruction is that increasing funding volumes alone will not improve outcomes unless accompanied by investments in organizational capacity, community engagement, and program design. Donors should focus not only on how much they give but also on how it is given—with flexibility, predictability, and alignment with community priorities [39].

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study examined the relationship between International Non-Governmental Organization activities and post-conflict environmental reconstruction in Monrovia, Liberia, from 2020 to 2024. The research was guided by three specific objectives: to examine INGO activities, to assess the level of environmental reconstruction achieved, and to analyze the relationship between INGO activities and reconstruction outcomes.

The findings demonstrate that INGOs have made meaningful contributions to environmental recovery across multiple domains. Environmental Rehabilitation Programs and Community Education received the highest ratings from respondents, reflecting the visibility and perceived effectiveness of cleanup operations and awareness campaigns. However, Resource Funding received the lowest ratings among INGO activities, with timeliness and consistency of funding identified as the most significant operational challenge.

The study confirms that bridging the awareness-action gap requires simultaneous investment in supply-side infrastructure alongside demand-side behavior change communication. Without accessible and affordable collection services, even the most environmentally conscious households will resort to illegal dumping. Without post-planting maintenance protocols, planted trees will not survive. Without community benefit-sharing mechanisms, conservation will face local resistance. Without extended funding cycles and flexible financing, INGOs cannot align their programming with the multi-year timeframes required for ecological recovery and institutional capacity building.

5.2 Recommendations

Based on the empirical findings of this study, the following recommendations are offered:

1 . INGOs should strengthen post-planting maintenance protocols for reforestation projects, including community stewardship agreements, regular monitoring, and replacement planting for failed seedlings.

2. INGOs and the Monrovia City Corporation should invest simultaneously in waste collection infrastructure and public awareness campaigns. s.

3. INGOs should formalize community benefit-sharing mechanisms for biodiversity conservation, including ecotourism revenue sharing, direct payments for ecosystem services, or sustainable resource use agreements.

4. INGOs should prioritize climate change adaptation education with locally relevant, actionable messaging that connects long-term climate risks to immediate environmental threats such as flooding and water contamination that communities already recognize.

5. Donors and INGOs should extend project funding cycles beyond the typical 12–24 month duration to align with the multi-year timeframes required for ecological recovery and institutional capacity building. Resource funding timeliness was the lowest-rated INGO activity indicator with the highest variation .

6. INGOs should prioritize appropriate technology solutions that can be maintained with locally available skills and materials, rather than sophisticated technologies requiring imported parts and specialized technicians. The low score for modern technology introduction with high variation reflects this persistent challenge.

7. Policymakers should develop enabling policies that promote NGO effectiveness, including stakeholder coordination mechanisms, environmental governance frameworks, and institutional coordination protocols to provide a conducive environment for NGO contributions to post-conflict environmental reconstruction.

Declarations

Ethics approval and consent to participate

Ethical clearance for this study was granted by **the University of Lay Adventists of Kigali (UNILAK)** through its established institutional review procedures. In addition, formal authorization to conduct the study in the research area was obtained from **the Office of the Mayor of Monrovia and the Monrovia City Corporation (MCC).** The research was conducted in accordance with the ethical principles of the Declaration of Helsinki for studies involving human participants.

Formal ethical approval from an Institutional Review Board (IRB) or ethics committee was not sought for this community-based study. According to the University of Lay Adventists of Kigali (UNILAK) research guidelines and national regulations in Rwanda, studies that involve anonymous surveys with adult participants, do not include vulnerable populations, and pose no more than minimal risk to participants are exempt from formal IRB review. This study qualified for such exemption as it involved only anonymous questionnaires and interviews with adult community members, NGO staff, and municipal officers, and did not collect any identifying personal information.

Prior to data collection, participants were provided with comprehensive information regarding the purpose and procedures of the study and voluntarily agreed to participate by providing informed consent. The privacy, anonymity, and confidentiality of all respondents were strictly maintained throughout the research process. Participation was entirely voluntary, and respondents were informed of their right to decline participation or withdraw from the study at any stage without any adverse consequences. All data collected were securely managed and used solely for academic and research purposes.

7.2 Consent for publication

Not applicable.

7.3 Availability of data and materials

The data generated and analyzed during the current study are available from the corresponding author upon reasonable request..

7.4 Competing interests

The authors declare that they have no competing interests.

7.5 Funding Declaration

No funding was received for this research.

7.6 Authors' contributions

ET conceptualized the study, conducted data collection, performed data analysis, and drafted the manuscript. CM supervised the research, contributed to data interpretation, and critically reviewed the manuscript. IJ contributed to manuscript revision. All authors read and approved the final manuscript.

7.7 Questionnaire

The questionnaire used in this study was developed by the authors for this research and is provided as Supplementary File 1.

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Figures



Figure 1

Map of Monrovia. Source : [16]

Supplementary Files

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- RESEARCHQUESTIONNAIRE.pdf