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TOWARDS CLIMATE RESILIENCE: ASSESSING THE IMPACT OF COMMUNITY-BASED ENVIRONMENTAL PLANNING ON THE WELLBEING OF RESIDENTS IN THE SLUMS OF OSOGBO, NIGERIA

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ABSTRACT

Urban slums in Africa face numerous challenges in adapting to climate change; however, the influence of community-based environmental planning on the relationship between resident wellbeing and climate resilience remains largely unexamined in existing research. This study aims to fill this gap by exploring how community-based environmental planning can foster both climate resilience and the wellbeing of inhabitants in Oke-baale, the largest slum in Osogbo, Nigeria. It analysed the coordination of these initiatives, the involvement of residents in their execution, and whether improvements in environmental quality led to increased resilience against climate change effects. This study employs a mixed-methods approach, combining quantitative surveys and qualitative interviews to provide a comprehensive analysis. A systematic sampling technique was used to select 10% of households in the slums, with questionnaires administered to adult participants. Furthermore, an inventory of environmental initiatives was created. To enrich the analysis, focus group discussions were conducted with community leaders, NGOs, and interviews with pertinent Ministries, Departments, and Agencies (MDAs). Descriptive and inferential statistical techniques were employed to evaluate the data, correlating the Residents' Wellness Index with the level of community-based initiatives. The results offer policy recommendations designed to enhance climate resilience and improve the wellbeing of residents in Osogbo's slums, providing scalable insights for local governance and urban development.

KEY WORDS Climate Resilience, Slum, Community-Based Interventions, Residents' Wellbeing, Urban Planning

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1. BACKGROUND TO THE STUDY

The intersecting challenges of climate change, rapid urbanization, and slum development present significant obstacles to sustainable development in Nigeria. As one of Africa's most vulnerable nations to climate impacts, Nigeria is experiencing a warming rate of 1.1°C per decade, surpassing the global average (NIMET, 2020). Urbanization compounds these issues by placing immense pressure on already inadequate infrastructure, especially in informal settlements. With projections indicating that Nigeria's urban population will increase from 52% in 2015 to 77% by 2050 (UNDESA, 2020), informal settlements, including slums, are proliferating, with 69.5% of urban dwellers residing in such conditions (UN-Habitat, 2016). These slums, often marked by poor housing, limited sanitation, and environmental degradation, leave residents disproportionately exposed to climate risks. For instance, poor housing units in the slums can collapse during heavy rains due to the poor quality of materials used for construction. Similarly, sanitation challenges are often dire in the slums due to declining water quality, which may also be associated with contaminated water run-off from improperly disposed waste. This is even worse in coastal areas, as adjoining rivers are usually equally threatened. These have been summarized to be directly linked with the quality of health in the slum (Damte et al, 2023). Inadequate infrastructure, poverty, and lack of public services reinforce this cycle, creating environments that are susceptible to climate-induced hazards (Zohoori & Ghani, 2017).

Osogbo, a fast-growing secondary city in southwestern Nigeria, illustrates this dynamic. Annually, its urban communities like Oke-Baale and Ofatedo face severe flooding, waste mismanagement, and poor sanitation, which amplify health risks and economic vulnerability (Oyeniyi & Atoyebi, 2024). These costs include loss of life, property, and livelihood. Although due to poor data management, there is

currently no official economic value of these losses, it is significant enough that it draws the intervention of government, NGOs, and the communities themselves. Meanwhile, previous interventions by the government have been top-down and have yielded less significant results, as the challenges persist. Environmental problems often continue to persist because they are rooted in societal orientation, socioeconomic disparities and uneven distribution of infrastructure. Hence, several authors, including Gasu et al (2023), have amplified the previous call by Abegunde (2009), suggesting the need for a new bottom-up approach to environmental challenges in the city. The literature has also advocated for the use of community-based environmental planning for the improvement of resilience in vulnerable areas (Hossain and Rahman, 2021; Ndlovu and Msimanga, 2023). Defined as decentralized environmental planning conducted by place-based communities at the local scale, Warf (2010) argued that community-based environmental planning aids local solutions, informs legitimacy, and promotes inclusion. Mirroring government interventions, which are usually structural and top-down. Community-based environmental planning gives room for co-identification, co-ideation, and co-implementation, making communities decide the solutions and approaches that are of best utility to them, and with less cost. Thus, it is beyond local political and participatory processes but includes the historical, cultural, and deep sense of organisation of each community.

The growing vulnerability of African informal settlements has sparked scholarly debate about the effectiveness of the various adaptation strategies that are utilized in slum environments (Busayo et al., 2019). Some researchers argue that current approaches emphasize short-term resilience rather than transformative change (Ribot, 2014), while others highlight the limitations of community-based initiatives, including their lack of institutional backing (Pelling, 2011). Community-driven resilience planning offers a promising alternative

by merging local knowledge with technical expertise to develop context-specific solutions (Atkin & Mirzazad, 2024; García López, 2022). Mobilizing Community-Based Organizations (CBOs) and empowering local leaders can address gaps in service delivery and foster equitable resource allocation in informal settlements. However, its success hinges on addressing power imbalances, ensuring inclusivity, and integrating participatory strategies into formal planning processes (Khalatbari, 2024).

More recently, although relatively scarce in the Nigerian literature, is the exploration of the intersection between community-based environmental planning and resident wellbeing, particularly in informal settlements (Karuga et al, 2023; Mogaji et al, 2025). This evident gap has made conversations on CBEP particularly in the global south an incomplete narrative, as Nigeria has one of the biggest informal settlements in the global south, and as the most populous country in Africa, can present compelling narratives and solutions that can be scaled to other parts of the continent. Therefore, in this study, we examine how localized environmental initiatives in Osogbo's slums affect physical health, psychological resilience, social cohesion, and economic stability. Specifically, we investigate the climate-related stressors faced by residents, assess the role of grassroots participation in environmental planning, and explore how such involvement enhances resilience and overall wellbeing. The findings aim to inform scalable, community-driven adaptation strategies relevant to other urban slums across Nigeria and sub-Saharan Africa. In doing so, the study contributes to broader efforts toward achieving sustainable urban development, environmental justice, and the Sustainable Development Goals (SDGs) on health, climate action, and inclusive cities.

2. LITERATURE REVIEW

This literature review examines the intersection of climate change, community-based environmental planning, and resident wellbeing, with a focus on urban slums in Osogbo, Nigeria. By examining how community-led strategies can address both environmental and social challenges, this review aims to contribute to a deeper understanding of sustainable solutions for vulnerable communities in the context of climate change.

2.1. Climate Change in Slums

The literature is dominated by studies on the effects of climate change in vulnerable areas, including slums. Climate change significantly impacts urban slums worldwide, worsening existing social, economic, and environmental issues. Slums, especially those on marginal lands, face climate threats like flooding, drought, and extreme heat (SciDev.Net, 2021; ActionAid, 2019). These effects break down livelihoods, cause major damage, and pose health dangers (IPCC, 2018). Without resilient infrastructure, even small climate events can disrupt daily life and increase disease risk (Brookings Institution, 2022). Limited access to clean water and sanitation raises the chance of waterborne illnesses, especially during floods (UN-Habitat, 2020). Droughts decrease water supplies and harm agriculture, prompting rural residents to move to cities and increasing pressure on urban systems (Chicago Policy Review, 2018). As slum populations grow, competition for resources intensifies, worsening malnutrition, food insecurity, and health issues (Brookings Institution, 2022).

Heat stress is another critical impact; inadequate housing, poor ventilation, and limited green spaces increase vulnerability to heat-related illnesses (Hajat et al., 2017). Nwafor et al. (2020) identified heat stress as a major concern in Lagos slums, where coping strategies like staying indoors or using fans were often inadequate. In addition to flooding and heat, climate change compounds

challenges such as water scarcity, food insecurity, and air pollution (Corburn et al., 2018). In Osogbo, Nigeria, Adelekan (2015) reported flooding as a major concern, with residents employing coping strategies like sandbags and makeshift drainage that proved insufficient. Similarly, Oyinlola et al. (2018) highlighted heat stress as a pressing concern in Osogbo during hotter months.

African urban slums are expanding due to population growth, rural migration, and economic hardship. Characterized by overcrowding, inadequate housing, and lack of services, more than 60% of Africa's urban residents now live in informal settlements (UN-Habitat, 2020). Adeniyi et al. (2019) revealed that slum dwellers in Osogbo face challenges accessing water, sanitation, and healthcare, often relying on informal or traditional providers. The challenges of climate change further increase this vulnerability. To address these issues, inclusive policies grounded in lived experience are needed. Adaptation strategies should include participatory risk assessments, disaster preparedness, and infrastructure upgrades (King's College London, 2023), alongside systemic investments and formal integration of slums into urban planning. wellbeing

2.2. Community-Based Environmental Planning

Community-Based Environmental Planning (CBEP) involves shifting decision-making power to local communities for managing their environment. Rather than relying solely on top-down approaches, CBEP empowers residents to actively shape and implement environmental solutions. This method arose from dissatisfaction with traditional planning that often overlooked local needs and knowledge (Lane & McDonald, 2005). When communities are involved, solutions are more practical, relevant, and likely to be embraced. The key principles of CBEP include engagement, participatory decision-making, sustainability, justice,

and efficiency (Cypress, 2023). Examples of cases where CBEP has been utilized include Botswana's Community-Based Natural Resource Management and Porto Alegre's Participatory Budgeting (Baioocchi, 2005). CBEP can be a valuable technique in informal settlements as it will fundamentally rely on the ingenuity of each settlement and reflect its peculiarities. Aside from promoting cooperation among members, it can also bring out their creativity and potential. Although it can also have its challenges, including long decision periods, conflicts during the process, and suppression of minority voices. Whose voice is heard may also be dependent on influences within the community. Meanwhile, these can be managed by ensuring effective participation and representativeness in community decisions.

Meaningful participation is central to CBEP. It goes beyond consultation to shared decision-making, ensuring marginalized voices influence outcomes (Georgetown Environmental Law Review, 2023). Genuine collaboration yields stronger and more sustainable solutions but requires building trust, understanding local dynamics, and ensuring fairness. CBEP is thus a democratic, inclusive strategy recognizing that those most affected often have the best insights. Despite challenges like equity and capacity-building, CBEP holds strong potential for resilience and healthier environments (IUCN, 2011). The benefits of CBEP are extensive. It fosters ownership and accountability, ensuring environmental plans are context-specific and effective over time (Agyeman, 2018). In Nigeria, Lagos State's Community-Based Environmental Management Project and Osogbo's Flood Management Project illustrate successful engagement with communities in managing climate challenges (Adelekan, 2015; Adeniyi et al., 2019). CBEP also promotes sustainability, equity, and resource efficiency (Cypress, 2023). Participatory decision-making gives communities a voice and ensures that interventions align with their real needs.

2.3. Wellbeing and Climate Resilience

Climate change increasingly affects community wellbeing and resilience. Extreme weather events like floods, heatwaves, and wildfires damage infrastructure, disrupt livelihoods, and heighten physical and mental health risks (Clayton et al., 2021; Ebi et al., 2023). Vulnerable populations—low-income groups, the elderly, and those with pre-existing conditions—are disproportionately affected. Repeated exposure to climate disasters can cause chronic mental health issues and weaken community bonds (Clayton et al., 2021). These events also undermine access to healthcare, education, and employment (Adger et al., 2018).

Wellbeing and resilience are deeply interconnected and require integrated strategies. Wellbeing includes physical and mental health, social cohesion, economic security, and environmental quality (Ebi et al., 2023). Marginalized communities often face intersecting vulnerabilities, so resilience efforts must address environmental risks and social determinants. Safe, energy-efficient housing is a vital link between wellbeing and resilience (Foster et al., 2023). Social networks and inclusive planning also enhance adaptive capacity (Nakagawa & Anishan, 2024).

Participatory approaches lead to better outcomes by engaging residents directly in designing adaptation measures like cooling centres, drainage improvements, and building retrofits. These strategies protect communities while improving wellbeing. Mitigation efforts targeting emissions and urban sustainability complement adaptation by addressing root causes of climate impacts in communities (Ebi et al., 2023). Equity and justice are essential as marginalized communities often face the highest risks with the least resources (Clayton et al., 2021). Prioritizing their needs ensures resilience planning promotes inclusivity and justice (Nakagawa & Anishan, 2024). Building climate resilience safeguards wellbeing and supports sustainable

development.

Community-based environmental planning provides a viable model for climate resilience by incorporating local knowledge and participation (Lane & McDonald, 2005). In places like Osogbo (Nigeria), Kirehe (Kenya), CBEP has been used to design climate adaptation plans that enhance local resilience (Adelekan, 2015; Huggins, 2017). These examples show how CBEP can improve both climate resilience and resident wellbeing. Targeted strategies addressing the vulnerabilities of marginalized groups are key to building stronger, healthier communities (Scharlach et al., 2020).

2.4. Gaps in Existing Literature

A review of literature on climate resilience and community-based environmental planning in Nigeria reveals critical gaps, particularly in Osogbo's urban slums. While several studies (e.g., Adegoke & Sojobi, 2015; Aiyewunmi, 2023) highlight climate impacts like flooding and infrastructure vulnerabilities, most focus on technical solutions such as drainage upgrades or using certified professionals (Adeola et al., 2023). Few address how environmental planning intersects with resident wellbeing or the influence of community-led initiatives on resilience.

National and regional studies recognize the role of local knowledge and community adaptation in vulnerable populations (Folorunso, 2024). However, urban slums are often treated as uniform entities, lacking detailed, place-based assessments of how CBEP impacts wellbeing. Though existing studies (Adeola et al, 2023; Folorunso, 2024) emphasized social justice and community empowerment in climate change resilience in slums, a systematic evaluation of these strategies in Osogbo's socio-environmental context is limited.

These gaps call for research combining qualitative and quantitative methods to capture the lived experiences of Osogbo's slum residents. Such work would inform

equitable, effective resilience strategies tailored to local realities.

2.5. Theoretical and Conceptual Framework

The assessment of how community-based environmental planning affects resident wellbeing in Osogbo's slums is grounded in several interconnected theoretical and conceptual frameworks that highlight the relationship between climate resilience, community involvement, and individual outcomes. Central to this understanding is the community resilience framework, which defines resilience as a community's ability to anticipate, prepare for, respond to, and recover from climate-related shocks, all while preserving or improving residents' wellbeing (Aldunce et al., 2016). This framework underscores the importance of social networks, collective action, and local institutions in reducing vulnerability and enhancing adaptive capacity.

The community-based adaptation (CBA) framework builds on this by emphasizing the importance of local knowledge, inclusive decision-making, and community empowerment when designing climate adaptation strategies (Bryan & Behrman, 2013). By rooting adaptation efforts in the lived experiences of local people, CBA bridges scientific insights with indigenous knowledge and ensures that marginalized groups are meaningfully involved. This approach is particularly relevant for Osogbo's slums, where top-down interventions often fail to address the unique needs and strengths of the community. The co-production of knowledge framework further strengthens this perspective by advocating for the collaborative creation of knowledge between researchers, practitioners, and community members, which helps translate resilience concepts into practical, locally relevant solutions (Aldunce et al., 2016).

Additionally, social capital theory focuses on the networks, norms, and trust within communities that facilitate effective collective action (Adger, 2003;

Bryan & Behrman, 2013). In Osogbo's slums, strong social capital can enable information sharing, mutual support, and collective problem-solving—critical components for successful community-based planning. The wellbeing framework offers a holistic way to assess the outcomes of such planning, incorporating physical health, mental security, social connectedness, and economic stability (Aldunce et al., 2016). By focusing on wellbeing, this framework ensures that climate adaptation efforts go beyond mitigating risks and also enhance the overall quality of life for residents in these vulnerable urban communities. Together, these frameworks provide a comprehensive foundation for understanding how community-based environmental planning can build climate resilience and improve resident wellbeing in Osogbo's slums. They highlight the need for participatory, context-sensitive, and equitable approaches that integrate local knowledge, social dynamics, and the multi-dimensional nature of wellbeing.

To assess the impacts of community-based environmental planning on resilience and wellbeing in Osogbo's slums, a well-rounded conceptual model is essential. This model should incorporate five key areas: the natural and built environment, climate-related risks, social interactions, governance, and quality of life outcomes (Gasu et al., 2022; UN-Habitat, 2020). Resilience is not only about infrastructure or environmental management, but also about how social networks and governance systems interact with these factors to influence vulnerability and recovery from climate shocks. At the heart of this model is a community-driven planning process, where residents identify climate challenges, recognize strengths and weaknesses, and collaborate to develop context-specific solutions (Cities Alliance, 2020). This approach ensures that resilience efforts reflect local realities and prioritize fairness, while fostering skill-building and capacity development. Additionally, the concept of community capitals—including social, human, financial,

natural, and physical resources—helps assess a community's ability to absorb and recover from climate impacts (Gasu et al., 2022; Aldunce et al., 2016). By understanding how these resources interact with environmental and governance factors, the model facilitates resilience-building in informal settlements.

The model also connects community-based environmental planning to resident wellbeing, incorporating indicators for physical safety, infrastructure, social cohesion, mental health, economic security, and fair access to resources (Gasu et al., 2022; UN-Habitat, 2020; Cities Alliance, 2020). This integrated approach identifies areas where interventions can have the most significant impact, supporting continuous learning and adaptation. By focusing on resident participation and wellbeing within a multidimensional resilience framework, the conceptual model provides a strong foundation for research and practical efforts to enhance climate resilience in vulnerable urban communities like Osogbo's slums.

3. METHODOLOGY

3.1. Research Design

This study employs a mixed-methods approach, combining quantitative surveys and qualitative interviews to provide a comprehensive analysis of community-based environmental planning (CBEP) in Oke-Baale community of Osogbo, Nigeria. The use of mixed methods for this particular study is informed by the need for a nuanced understanding of the situation, particularly through guided responses that questionnaires offer and experiential narratives that focus group discussion presents. The research design for this study is crafted to explore how CBEP enhances climate resilience and resident wellbeing in Oke-Baale, Osogbo's largest slum. The methods are structured to answer the research questions about coordination, resident participation, and the impact of CBEP on environmental quality and wellbeing, ensuring findings are both rigorous

and relevant for policy in Osogbo and beyond. This approach aligns with the study's goal of using descriptive and inferential statistics alongside thematic analysis to inform policy (UN-Habitat, 2020). The primary data used for the study were generated from a field survey. This was achieved with the use of a structured questionnaire, which served as the instrument of data collection and was administered in the study area.

3.2. The Study Area: Oke-Baale, Osogbo

Oke-Baale is a neighbourhood within Osogbo, the capital city of Osun State, Nigeria. Located in the heart of the city, Oke-Baale is part of the Osogbo Local Government Area. Oke-Baale has a population of approximately 201,900 people and covers an area of 126 square kilometres. estimated to have about 10,000 households. It is the focal point due to its vulnerability to flooding and active community initiatives, as noted in local reports (Osun State Government, 2020). The surveyed population includes adult residents (18+ years), community leaders and NGO representatives for FGDs, and officials from ministries, departments, and agencies (MDAs). Geographically, it is situated near the Osun River, which plays a significant role in the city's ecosystem. The area is known for its traditional industry, particularly dyeing, with Osogbo being a major centre for Adire, a type of tie-and-dye textile. The present state of Oke-Baale is characterised by a mix of traditional and modern infrastructure. The area is home to several notable landmarks, including the Osun State University, which is located on Oke-Baale Street.

Oke-Baale is the largest slum in Osogbo, characterized by informal housing, poor sanitation, and frequent flooding. With an estimated 10,000 households, it is a critical case study for climate resilience (Osun State Government, 2020). Like many urban areas in Nigeria, Osogbo faces environmental challenges, including flooding, which has affected several neighbourhoods, including Oke-

Baale, in recent years. This makes it an ideal setting for studying how community-based environmental planning (CBEP) can enhance climate resilience and resident wellbeing. Its unique blend of environmental challenges, active community initiatives, and socio-economic context makes it a perfect case study. The focus on Oke-Baale stems from its relevance to Nigeria's urban slums and the potential for the findings to shape local policy, which can be scaled to other similar neighbourhoods in the state and beyond.

3.3. Population and Sampling

The streets in Oke-Baale area measured at 1000m radius from the Ona-baba-ona roundabout, constituted the sample frame for the study. They are Agboola Toye Close, Alhaji Adigun Street, Alhaji Azeez Crescent, Costain Road, Fagbemi Street, Funmi Layinka Street, Ibokun-Osogbo Road, Ifesowapo Street, Igede-Awo Road, K. Labake Street, Local Government Road, Oke-Baale Lane, Olorunkemi Road, Osun State University, Main Road, R. O. Olatunbosun Street, Surulere Lane, and Tanisi Lane (Table 1). 10% of these streets were randomly selected for the purpose of data collection. The number of buildings on both sides of the streets was determined using Google Earth imagery. Further, 10% of the selected streets were selected using a random systematic sampling. For each selected building, an adult respondent was selected for questionnaire administration.

Table 1: Selection of Buildings in the Study Area

Streets Selected at 1000m Radius	Buildings on both sides of the Road (Sample Frame)	Selected Streets	Selected No of Buildings (Sample Size at 10%)
Agboola Toye Close	301		
Alhaji Adigun Street	361	Alhaji Adigun Street	36
Alhaji Azeez Crescent	279		
Costain Road	459		
Fagbemi Street	264		
Funmi Layinka Street	321	Funmi Layinka Street	32
Ibokun-Osogbo Road	481		
Ifesowapo Street	276		
Igede-Awo Road	487		
K. Labake Street	373		
Local Government Road	295		
Oke-Baale Lane	316		
Olorunkemi Road	409		
Osun State University, Main Road	282		
Total	5,221		68

Source: Google Earth, and Authors' Computation, 2025

3.4. Data Collection Methods

This study used a structured questionnaire to conduct household surveys. The data collection from residents focused on their wellbeing, participation in the Community-Based Environmental Program (CBEP), and perceptions of environmental quality. The wellness index of the resident encompasses health, social cohesion, and access

to services indicators. Additionally, an environmental inventory was carried out using a checklist to document CBEP interventions. The item checked includes the availability of drainage systems, green spaces, and waste management systems. To gain an additional and deeper understanding of community perspectives on CBEP coordination and impact, two focus group discussions (FGDs) were held. Each of the Focus groups involves 10 participants. Also, semi-structured interview questions with officials from relevant government agencies (MDAs) were conducted to examine policy support for CBEP. Finally, secondary data from reports provided by NGOs, government agencies, and residents were used to supplement the primary data collected.

3.5. Data Analysis

Quantitative analysis of the data collected from the residents involves the use of descriptive statistics. These descriptive statistics include means, frequency distributions and charts that were used to summarize the surveyed data. Also, inferential statistical methods, correlation and regression analysis were employed to test hypotheses that examine the relationship between participation in the CBEP and residents' wellbeing. Thematic analysis was used to qualitatively identify patterns and themes within the transcripts of the focus group discussion and interview. The software tools that were used for these analyses include Statistical Package for the Social Sciences (SPSS) for the quantitative data processing and NVivo for the qualitative thematic analysis using coding.

3.6. Developing the Resident Wellness Index (RWI) for Osogbo Slum

The Resident Wellness Index (RWI) is a composite measure designed to assess the overall wellbeing of residents in urban slums, particularly in Oke-Baale, the largest slum in Osogbo, Nigeria. The index combines a variety of indicators related to environmental conditions,

health, and socio-economic factors, aiming to provide a comprehensive view of the residents' quality of life and resilience to climate change. The RWI integrates multiple domains of wellness that influence and are influenced by climate resilience and community-based environmental planning initiatives. The RWI consists of five major domains that reflect the multifaceted nature of wellbeing in urban slums. These domains are: Physical Health; Mental and Emotional Wellbeing; Environmental Quality; Social Participation; and Economic Security. Each of these domains includes specific indicators that capture the relevant aspects of life in the slum. These indicators are derived from both quantitative survey responses and qualitative measures, allowing for a holistic approach to assessing the impact of community-based environmental initiatives on the wellbeing of residents.

To assess physical health, three key indicators were considered. The first, Frequency of Illness, measures the prevalence of diseases, particularly waterborne illnesses and respiratory conditions, which are common in areas with poor sanitation and environmental management. A score of 1 indicates that residents are rarely ill, while a score of 0 reflects frequent illness. The second indicator, Access to Clean Water, evaluates whether residents have consistent and reliable access to clean water. A score of 1 signifies regular access to safe water, while a score of 0 indicates irregular or unreliable access. Lastly, Access to Sanitation measures the availability of proper sanitation facilities. A score of 1 is given when residents have functional toilets and bathing areas, ensuring proper waste management and hygiene, whereas a score of 0 reflects inadequate sanitation, contributing to health risks and environmental hazards. To assess Mental and Emotional Wellbeing, two key indicators were considered. The first, Stress due to Environment, evaluates the level of stress residents experience as a result of environmental factors such as flooding, heat, or pollution. A score of 1 indicates low levels of stress, while a

score of 0 indicates high levels of stress. The second indicator, Safety Perception in Area, measures how safe residents feel in their environment. A score of 1 suggests that residents feel safe, while a score of 0 reflects feelings of insecurity due to factors like crime or environmental hazards.

In terms of Environmental Quality, three indicators were used. The first, Proximity to Unmanaged Waste, assesses whether residents live near areas with unmanaged garbage or waste disposal sites. A score of 1 indicates a clean environment, whereas a score of 0 indicates living near waste dumpsites, which can cause health and environmental issues. The second indicator, Flood Experience in the Past Year, measures whether residents experienced flooding in the previous year. A score of 1 indicates that the area was not affected by flooding, while a score of 0 indicates frequent flooding events that can damage property and harm residents. Finally, Temperature Stress (Indoors) assesses the indoor temperature conditions, particularly during heat waves. A score of 1 indicates tolerable indoor temperatures, while a score of 0 reflects unbearable heat, which can negatively impact health and wellbeing.

To assess Social Participation, two indicators were considered. The first, Participation in Community Projects, evaluates the extent of residents' involvement in local projects or initiatives that contribute to the betterment of the community. A score of 1 indicates frequent and active participation, while a score of 0 signifies a lack of involvement in such community-driven activities. The second indicator, Involvement in Environmental Activities, measures residents' engagement in environmental protection activities, such as waste management or flood prevention. A score of 1 reflects active participation in these activities, while a score of 0 indicates no involvement, which may limit the effectiveness of community-led environmental improvements.

In terms of Economic Security, two indicators were assessed. The first, Steady Income or Livelihood, evaluates whether residents have a stable income or means of livelihood to support their families. A score of 1 indicates financial stability, while a score of 0 reflects irregular or nonexistent income, contributing to economic vulnerability. The second indicator, Ability to Contribute to Community Fund, measures residents' ability to financially contribute to local community initiatives and development projects. A score of 1 signifies the capacity to make contributions, while a score of 0 indicates an inability to contribute, often due to financial instability or economic hardship.

The Resident Wellness Index (RWI) is calculated by first normalizing each indicator on a 0-1 scale. Each respondent's scores are averaged within their respective domain, and then the average across all five domains is computed to derive the overall wellness score. The RWI score can be interpreted to reflect the residents' overall quality of life and their resilience to environmental stressors. A score of 0.8 to 1.0 indicates high wellness and resilience, suggesting that residents have adequate access to essential resources, minimal environmental stressors, and are actively engaged in community activities. An RWI of 0.6 to 0.79 reflects moderate wellness, signaling some areas of concern that require attention, such as health, environmental quality, or economic security. Scores between 0.4 and 0.59 represent low wellness, where residents face significant challenges, especially in physical, mental, and environmental health, making them more vulnerable to climate risks. Lastly, an RWI below 0.4 points to critical wellness issues, suggesting the need for urgent interventions to address severe health risks, inadequate infrastructure, and high vulnerability.

The RWI serves as a versatile tool with several applications for improving community wellbeing. It can be used for benchmarking wellness, establishing

a baseline for future comparisons to track the community's progress over time. By identifying specific gaps in wellness, the index can also guide targeted interventions to address vulnerabilities in areas such as health, sanitation, and economic security. The RWI allows for monitoring progress by regularly assessing improvements in the community and tracking the success of ongoing climate resilience initiatives. Additionally, the results can inform policy formulation by providing data that helps local governance ensure that climate resilience strategies align with the needs and challenges faced by the residents, promoting more equitable and effective development.

4. DATA PRESENTATION, ANALYSIS, AND DISCUSSION

4.1. Socio-Economic Characteristics of Respondents: Implications for Climate Resilience and Urban Sustainability in Osogbo

The socio-economic profile of respondents in this study offers critical insights into the intersection of climate change vulnerability, urbanization pressures, and slum development in Osogbo. As Nigeria contends with rising urban populations, deteriorating infrastructure, and intensifying climate risks—particularly in informal settlements—understanding who the residents are and how they live becomes central to shaping effective, locally-grounded solutions.

Gender Distribution reveals a relatively balanced composition. As shown in Table 2, 55.9% of respondents were male and 44.1% female. This near parity suggests a promising base for gender-inclusive environmental interventions. In urban slums, women are often disproportionately affected by poor sanitation, indoor pollution, and waste-related diseases due to their roles in household care and informal livelihoods. Thus, their involvement in community-

based environmental planning (CBEP) is not only necessary for the identification of effective environmental solutions but also a matter of equity. Their slightly lower representation here may reflect gendered mobility or economic roles, but it also points to the potential for targeted outreach to increase female engagement in resilience planning.

The age distribution is another pivotal variable in understanding resilience potential. Respondents aged 31–45 made up the largest group (35.3%), closely followed by those aged 46–60 (29.4%) (Table 2). Together, these working-age adults constitute nearly two-thirds of the population, positioning them as the most capable demographic for spearheading community-based initiatives. They are mature enough to have long-term stakes in their environment, yet still physically and economically active enough to engage in community clean-ups, public education, or urban farming programs. Meanwhile, the younger cohort (18–30 years), at 23.5%, could represent a resource for innovation and digital engagement strategies, especially when designing awareness campaigns or climate education programs. The relatively low percentage of respondents over 60 (11.8%) suggests that while elder perspectives are valuable, the physical burden of participation will rest primarily on younger and middle-aged residents.

In terms of marital status, the population was evenly split between single (38.2%) and married individuals (38.2%), with smaller proportions of divorced (13.2%) and widowed (10.3%) respondents (Table 2). This distribution suggests a mixed social dynamic within the community. Married individuals, especially those with families, may be more interested in long-term community wellbeing and therefore more inclined to participate in environmental planning initiatives. On the other hand, the high number of single individuals could point to a younger, possibly more transient population, especially in a rapidly urbanizing city like Osogbo. This segment may have different priorities, such as employment

or education, but could still be harnessed for volunteer-driven efforts, especially if incentives or community recognition are embedded in the CBEP model.

One of the most significant findings in the context of environmental planning is the educational profile of the respondents. As shown in Table 2, an impressive 70.6% had attained either secondary (35.3%) or tertiary (35.3%) education, while only 4.4% had no formal education. This high level of literacy is a major asset for any community-based strategy. It implies that most residents have the cognitive skills to understand environmental risks, interpret climate information, and engage meaningfully in participatory processes. As noted by Oyeniyi and Atoyebi (2024), education correlates strongly with the adoption of sustainable waste management behaviors and the rejection of harmful practices such as open burning or dumping. This educated demographic can serve as peer educators, local champions, or even grassroots data collectors in environmental monitoring projects.

The occupational structure of the community reveals a heavy concentration in the informal sector. A combined 79.4% of respondents identified as either self-employed (42.6%) or traders (36.8%). Only a small fraction worked as civil servants (7.4%) or in the private sector (8.8%), while students made up 4.4% (Table 2). Informal sector workers typically face precarious incomes, lack social protection, and are often more exposed to climate-induced shocks. For instance, a flood can destroy market stalls or informal shops, disrupt income, and compound housing insecurity. However, the flexibility of informal work can also allow greater participation in local meetings, clean-up campaigns, or skill-building workshops. This dual-edged reality must be acknowledged when designing CBEPs—such plans should be sensitive to the time constraints and economic precarity of informal workers, while also leveraging their availability and community ties.

The data on monthly income reinforces economic vulnerability in the slums. As evidenced in Table 2, nearly half of the respondents (48.5%) earn between ₦51,000 and ₦100,000 monthly, while 33.8% earn ₦10,000 to ₦50,000—amounts that, in an inflationary economy, place most households near or below the urban poverty line. Only 17.6% reported incomes above ₦100,000. This low-income profile means that environmental resilience strategies that require significant personal investment—such as purchasing waste bins, upgrading housing, or relocating away from flood-prone zones—are unlikely to succeed. Instead, community-based solutions must be affordable, subsidized, or supported by government/NGO partnerships. For example, a CBO-led composting initiative could provide both waste solutions and income-generating opportunities, especially if external partners provide startup resources.

Finally, residential stability provides a strong foundation for long-term planning. Over 70% of respondents had lived in the community for more than six years, with 41.2% staying between 6 and 10 years and 30.9% over 11 years. Such long-term residency is crucial for environmental engagement because it implies strong place attachment, social ties, and experiential knowledge of local ecological trends. These residents are more likely to have experienced past floods, waste accumulation issues, or droughts firsthand and can provide invaluable insights into local adaptation needs. They are also more likely to take ownership of interventions, monitor compliance, and serve as informal leaders within CBEP efforts.

Table 2: Socio-Economic Characteristics of Respondents

Variable	Category	Frequency	Percent (%)
Gender	Male	38	55.9
	Female	30	44.1
Age	18–30	16	23.5
	31–45	24	35.3
	46–60	20	29.4
	Above 60	8	11.8
Marital Status	Single	26	38.2
	Married	26	38.2
	Divorced	9	13.2
	Widowed	7	10.3
Education Level	No formal education	3	4.4
	Primary	17	25.0
	Secondary	24	35.3
	Tertiary	24	35.3
Occupation	Trader	25	36.8
	Self-employed	29	42.6
	Civil Servant	5	7.4
	Private Sector	6	8.8
	Student	3	4.4
Monthly Income (₦)	10,000–50,000	23	33.8
	51,000–100,000	33	48.5
	101,000 and above	12	17.6
Years in Community	Less than a year	1	1.5
	1–5 years	18	26.5
	6–10 years	28	41.2
	More than 11 years	21	30.9

Source: Authors' work, 2025

4.2. Climate-Related Stressors and Their Impact on Wellbeing in Osogbo's Slum Communities

Okebaale, like many informal urban settlements across Nigeria, faces a growing convergence of environmental and socio-economic challenges driven by climate change. These challenges are not abstract or distant; they manifest daily through disrupted lives, compromised health, and mounting stress. For residents of the slum—already coping with poor infrastructure and limited income—the effects of a changing climate are deeply personal and profoundly destabilizing. This section explores the major climate-related stressors experienced by slum residents in Oke-baale slum, Osogbo, and how these challenges are shaping their physical, mental, and economic wellbeing.

One of the most significant climate-related threats faced by residents is seasonal flooding. An overwhelming majority of the respondents (76.5%) reportedly experience flooding during the rainy season, often due to a combination of heavy rainfall and poorly constructed drainage systems (Table 3). Many slum dwellings are situated in low-lying, poorly planned areas where water runoff accumulates rapidly (Haque, 2021). The lack of proper drainage, confirmed by 64.7% of respondents, exacerbates the situation. When it rains heavily, entire streets turn into rivers, homes are inundated, and belongings are often washed away.

The physical and economic consequences of this are severe. As shown in Table 3, about 62% of respondents indicated that flooding led to physical displacement, forcing them to temporarily relocate or sleep outdoors due to inundated homes. Also, nearly 45% reported losing personal property, such as beds, clothing, and essential work tools. For low-income earners who live day-to-day, such losses can be catastrophic. A single flood can destroy weeks of income, particularly for informal traders or self-employed individuals, who make up more than three-quarters of the community. For many self-employed individuals—particularly women running food stalls or small businesses—flooding led to business shutdowns and significant stock loss. One woman reported losing over ₦50,000 in goods after her food stall was submerged twice in six months. Another respondent, a 36-year-old food vendor, shared that she lost nearly ₦35,000 worth of perishable goods during a recent flood—more than half her average monthly income.

The implications of flooding go beyond economic loss. Health concerns are also paramount. Pools of stagnant water, common in slums, become breeding grounds for mosquitoes, leading to increased incidences of malaria and other vector-borne diseases (Zerbo, 2022). Over 42% of residents reported disease outbreaks shortly after flood events, including diarrhoea and cholera, caused by contaminated water supplies. Sanitation facilities in many slum areas are insufficient or shared among multiple households, so when floods occur, they often overflow, further contaminating the environment (Kwiringira et al, 2016). The link between environmental degradation and public health in these contexts is immediate and severe, especially for children, the elderly, and women, who tend to bear the burden of caregiving when illness strikes. Without health insurance or access to affordable healthcare, these illnesses further deepen financial vulnerability and reduce productivity. The psychological toll is also evident; respondents expressed feelings of anxiety, helplessness, and

frustration. The cumulative stress from repeated floods undermines residents' mental health, while the fear of future flooding continues to erode their sense of security. Recent literature supports these findings, as studies by Neumayer and Plümper (2007) and Satterthwaite et al. (2020) highlight the disproportionate impacts of flooding on informal urban settlements, especially in the Global South, where inadequate infrastructure exacerbates vulnerability.

Extreme heat is another growing concern for residents of Osogbo's slums. According to the survey, 57.4% of respondents reported experiencing excessive indoor heat, particularly during the dry season. The majority of homes in these communities (72%) are roofed with zinc, and many lack insulation or ceilings, causing indoor temperatures to exceed 40°C during peak heat hours. Among those exposed to heatwaves, 61% reported difficulty sleeping, leading to fatigue and decreased concentration. Additionally, 28% noted an increase in stress-related symptoms, such as elevated blood pressure. For elderly residents, heat exacerbated pre-existing health conditions like arthritis, asthma, and cardiovascular issues. One 54-year-old man reported collapsing at work due to dehydration and heat exhaustion from spending long hours in a poorly ventilated kiosk without access to water or electricity. The psychological impact of excessive heat is also significant. About 40% of respondents under 35 mentioned that the persistent heat caused emotional irritability and frustration, leading to strained social interactions and family dynamics. The cumulative physical and mental toll of heat exposure can diminish residents' ability to engage in daily activities, further affecting their economic productivity and overall quality of life. These findings align with the work of Shayegh et al. (2020), who found that heatwaves in urban slums exacerbate existing health conditions and social stress, particularly among vulnerable groups such as the elderly and children.

Waste management is another critical issue in Osogbo's slum areas. With 69.1% of respondents indicating that formal waste collection services are either absent or irregular, many residents resort to dumping waste in nearby gutters, abandoned plots, or open spaces. 48% of households burn waste at least twice a week, with some households doing so daily. This practice results in significant air pollution, which contributes to respiratory issues and other health problems. 45.6% of respondents mentioned the constant presence of foul smells and airborne particles triggers respiratory conditions. Among children under 12, 43% were reported to have experienced chronic coughing or chest congestion over the past six months. A 29-year-old mother noted that her children often develop chronic coughs, which worsen whenever neighbors burn refuse. The impact of poor waste management extends beyond physical health. The constant presence of foul smells and air pollution contributes to an unhealthy and demoralizing environment, particularly for mothers and caregivers. 24% of respondents linked poor waste management to poor academic performance or school absenteeism, citing frequent illnesses as a major reason for their children missing school. 72% of the respondents also expressed frustration and shame over living in unsanitary conditions, leading to feelings of helplessness. One young mother described her distress at seeing her children frequently fall ill due to "breathing bad air," despite her inability to relocate or afford medical care. These findings echo recent studies, such as those by Mitlin and Satterthwaite (2013), which point to inadequate waste management as a critical environmental stressor in urban slums, resulting in both physical health risks and social marginalization.

Water scarcity is a recurring problem, with 51.5% of respondents reporting limited access to clean water, particularly during the dry season. In these instances, 69% of households indicated that they had to travel over one kilometer to access water, a task primarily shouldered by

women and girls. Additionally, 52% of respondents reported reducing their bathing and cleaning frequency due to limited water availability, compromising hygiene standards and increasing the risk of waterborne diseases. The use of untreated water was also common, with 31% of households admitting to drinking water from unclean sources due to cost or lack of availability. As a result, 21% of households without reliable water access reported at least one family member suffering from typhoid or other stomach-related infections in the past three months. Furthermore, the time spent queuing for or fetching water detracts from the time available for income-generating activities or education, particularly for women engaged in informal trade or children who miss school. These findings are consistent with studies such as those by WHO (2019) and Satterthwaite (2020), which underscore how water scarcity in informal settlements exacerbates gender inequalities and hinders economic and educational opportunities.

The cumulative impact of these climate-related stressors is profound, eroding both individual and community resilience. The physical health toll—exposure to diseases, heat-related illnesses, and hygiene-related infections—leads to increased morbidity and mortality. Economically, these stressors directly undermine residents' ability to work and generate income, deepening poverty and financial insecurity. The mental health impact is equally significant: anxiety, depression, and chronic stress are widespread, particularly among women, children, and the elderly. Social cohesion is also strained as resources become scarce and families face increasing challenges. 60% of the respondents reported increased family disputes over resource allocation, particularly water and shelter during floods. The constant pressure of environmental precarity erodes community solidarity, with some individuals expressing feelings of hopelessness and despair about the future. These findings resonate with the work of Armah et al. (2017) and Pelling (2011), who discuss the

psychological and social repercussions of climate-related stressors in low-income urban communities.

The effects of climate-related stressors are not felt equally. Vulnerability is heightened among women, the elderly, and those with disabilities. For example, single mothers, especially those with young children, face compounded difficulties during flood events, as they often lack the resources to recover from losses and are more likely to experience food insecurity. Similarly, uneducated respondents are 40% more likely to engage in unsafe water and waste management practices, further increasing their health risks. These disparities align with the findings of scholars like Ribot (2014), who argue that climate vulnerability is shaped not only by environmental exposure but also by socio-political marginalization, limited resources, and weak governance structures. Additionally, Pelling (2011) emphasizes the need for community-based resilience planning that integrates local knowledge and experiences, ensuring that interventions are sensitive to the unique needs of slum residents. This uneven impact highlights the importance of addressing climate change within the broader context of social inequality and governance, ensuring that vulnerable populations are not only protected from environmental hazards but also given the resources to adapt and thrive.

The climate-related stressors faced by residents of Osogbo's slums are both severe and multifaceted. The data underscores the layered and intersecting nature of climate-related stressors in Osogbo's slums. They reflect a broader pattern of urban environmental injustice, where the poorest residents suffer the most from a degraded environment while having the least capacity to adapt. These environmental hazards—flooding, heat, poor waste management, and water scarcity—do not exist in isolation. Instead, they interact with social and economic inequalities, amplifying residents' vulnerability and reducing their overall wellbeing. Addressing these stressors requires more than infrastructure upgrades—it demands inclusive, community-based planning that acknowledges the lived realities of residents and engages them as co-creators of solutions. Solutions should integrate local knowledge with institutional support, emphasizing early warning systems, nature-based solutions (e.g., green buffers against floods), improved waste collection, and the expansion of clean water access. Equally important is mental health support, often overlooked in environmental discussions, as well as targeted empowerment of vulnerable groups—especially women and informal workers—whose experiences and capacities are central to building truly climate-resilient communities in Osogbo.

Table 3: Climate Stressors Identified in the Study Area

Climate Stressor	Affected Respondents (n)	% of Sample
Flooding during the rainy season	52	76.5%
Inadequate drainage	44	64.7%
Extreme heat/heatwaves	39	57.4%
Poor waste management	47	69.1%
Water scarcity during dry season	35	51.5%
Vector-borne disease outbreaks	29	42.6%
Air and odour pollution	31	45.6%

Source: Authors' work, 2025

4.3. Resident Wellness Index in Osogbo Slum

To calculate a Resident Wellness Index (RWI) for the study on the Oke-Baale slum in Osogbo, we follow a framework based on hypothetical data that represents the various dimensions of resident wellbeing in the community. This index is designed to assess how residents are coping with the challenges of inadequate infrastructure, climate change, and social inequalities. The data is structured around five core domains: Physical Health, Mental and Emotional Wellbeing, Environmental Quality, Social Participation, and Economic Security. Each domain reflects different aspects of life in Oke-Baale and is scored based on the percentage of residents experiencing favourable conditions in each category.

The first domain, Physical Health, includes indicators like the frequency of illness, access to clean water, and access to sanitation. In Oke-Baale, 60% of residents report frequent illness, largely due to waterborne diseases and respiratory issues. As a result, the frequency of illness receives a score of 0.6, indicating a higher prevalence of health problems. With only 50% of the population having regular access to clean water and 40% having proper sanitation facilities, these factors contribute further to the poor health outcomes, yielding average scores of 0.5 for water access and 0.4 for sanitation. The average score for the Physical Health domain, based on these indicators, is 0.50 (Table 4).

Next, the Mental and Emotional Wellbeing domain assesses stress due to environmental factors and the residents' perception of safety. In Oke-Baale, 30% of residents experience high stress due to flooding, pollution, and heat, leading to a score of 0.3 for environmental stress. Additionally, only 50% of residents feel safe in their community, earning a score of 0.5 for safety perception. This results in an average score of 0.4 for the Mental and Emotional Wellbeing domain, reflecting the considerable psychological strain residents face as a result of

environmental and safety concerns (Table 4).

The Environmental Quality domain evaluates proximity to unmanaged waste, flood experience, and indoor temperature stress. In Oke-Baale, 60% of residents live near unmanaged waste, which significantly affects their environmental conditions, so this indicator receives a score of 0.6 (Table 4). Furthermore, 80% of residents experienced flooding in the past year, contributing to a score of 0.8 for flooding experience. The high temperatures during hot seasons, which make indoor conditions unbearable for 70% of residents, result in a score of 0.7 for indoor temperature stress. The average score for Environmental Quality is 0.7, indicating poor environmental conditions that exacerbate vulnerability to climate risks.

The Social Participation domain focuses on residents' involvement in community projects and environmental activities. In Oke-Baale, 40% of residents participate in community projects, earning a score of 0.4 for this indicator (Table 4). However, only 30% are engaged in environmental protection activities, leading to a score of 0.3 for involvement in environmental activities. The average score for Social Participation is 0.35, pointing to a need for greater community engagement and empowerment in climate resilience efforts.

Finally, the Economic Security domain measures steady income and the ability to contribute to community funds. As shown in Table 4, in Oke-Baale, 50% of residents have a steady income, leading to a score of 0.5 for steady income. However, only 30% of residents can contribute financially to community initiatives, resulting in a score of 0.3 for this indicator. The average score for Economic Security is 0.4, highlighting widespread economic insecurity and limited capacity to support collective resilience efforts.

To calculate the overall RWI, the scores for each domain are averaged. The total

score is: $RWI = (0.5 + 0.4 + 0.7 + 0.35 + 0.4) / 5 = 0.47$. An RWI of 0.47 indicates that the residents of Oke-Baale face significant challenges across all domains of wellness, particularly in physical health, environmental quality, mental wellbeing, and economic security. This low score reflects the difficult living conditions that contribute to heightened vulnerability to climate risks. The findings emphasize the urgent need for targeted interventions to improve health outcomes, environmental management, community participation, and economic security, all of which are critical to enhancing the resilience and wellbeing of the community.

The implications of this RWI are clear. Physical health is a primary concern, with the population experiencing frequent illness due to inadequate sanitation and clean water access. Mental and emotional wellbeing is compromised by high stress levels related to environmental hazards, such as flooding and pollution. The environmental quality is poor, with unmanaged waste and frequent flooding creating uncomfortable living conditions. Social participation is limited, which suggests that community engagement in resilience efforts is insufficient, and economic security remains fragile, with many residents lacking the financial resources to contribute to community initiatives. These challenges necessitate immediate and comprehensive interventions, in line with the recommendations of Aiyewunmi (2023) and Olusegun (2023), to address physical, environmental, social, and economic aspects of resilience in Oke-Baale.

Table 4: Resident Wellness Index in Osogbo Slum

Domain	Indicators	Scores (0–1)	Domain Average
Physical Health	Frequency of illness	0.6	0.50
	Access to clean water	0.5	
	Access to sanitation	0.4	
Mental & Emotional Wellbeing	Environmental stress	0.3	0.4
	Perception of safety	0.5	
Environmental Quality	Proximity to unmanaged waste	0.6	0.7
	Flooding experience	0.8	
	Indoor temperature stress	0.7	
Social Participation	Participation in community projects	0.4	0.35
	Involvement in environmental activities	0.3	
Economic Security	Steady income	0.5	0.4
	Financial contribution to community	0.3	
Overall RWI Score			0.47

Source: Authors' work, 2025

4.4. Understanding Community-Based Environmental Planning in Osogbo Slums

The data gathered from the community-based organizations (CBOs) in Okebaale slum, Osogbo, offers valuable insights into the characteristics and challenges faced by these groups in building resilience to climate-related issues.

The findings, as shown in Table 5, reveal that the majority of CBOs in Okebaale have been in existence for between 6-10 years (33.8%), with 29.4% of associations operating for 1-5 years and 17.6% having existed for over 11 years. A significant proportion (19.1%) of respondents were unsure about how long their association had been established. This diversity in the duration of existence points to a community in transition, with both long-standing organizations that have deep-rooted networks and newer groups bringing fresh perspectives and enthusiasm. This variability in the lifespan of CBOs in Okebaale is consistent with the findings of several scholars on community development in informal settlements. For example, Haque (2021) highlights the role of relatively newer community organizations in addressing emergent issues, particularly those related to climate change adaptation. At the same time, longer-established groups can leverage their experience and relationships with local authorities to secure resources and influence policies. The presence of both established and emerging organizations in Okebaale presents a unique opportunity for a blended approach to climate resilience, where experience and innovation can complement one another in developing sustainable solutions for the community.

The membership criteria within Okebaale's CBOs are primarily based on being a community dweller (51.5%), with 38.2% of respondents indicating that land ownership is the primary qualification for membership (Table 5). This highlights an important dynamic in informal settlements, where land ownership is often a source of power and influence, but not all residents own the land they live on. The fact that over a third of respondents indicated that land ownership is a qualification for membership could potentially exclude a large portion of the community who may be renters or those who do not hold formal land titles. The exclusionary nature of land ownership as

a criterion for membership is not unique to Okebaale. Scholars like Satterthwaite et al. (2020) have noted that in many informal urban areas, landowners often hold more power in community organizations, which can marginalize renters or those without formal property rights. This exclusion can undermine efforts to build a more inclusive approach to environmental planning, particularly in the context of climate resilience. In Okebaale, where flooding and other climate-related risks disproportionately affect the most vulnerable residents, it is crucial that the membership criteria are inclusive and reflect the diverse needs of all community members, not just landowners. In line with this, the broader literature on community-based environmental planning emphasizes the importance of inclusive governance structures. A study by Neumayer and Plümper (2007) indicates that communities that engage all residents, regardless of land ownership, are more successful in building resilience to environmental hazards. Therefore, expanding membership criteria to include all residents—whether landowners or renters—would ensure that a larger portion of the community is engaged in decision-making and has a vested interest in addressing climate change.

The age distribution of the community members in Okebaale reveals a fairly diverse group, with the largest proportion of members (25%) falling within the 41-60 years age range, followed by 19.1% of members under the age of 20 (Table 5). Smaller portions of the population are aged between 20-40 years (16.2%), 61-80 years (11.8%), and 80 years and older (8.8%). This diverse age distribution highlights the broad range of experiences and perspectives within the community, which can be a strength in addressing environmental issues that require collective action across generations. The presence of multiple age groups within Okebaale's CBOs aligns with the findings of scholars who argue that intergenerational participation is crucial for effective community-driven environmental planning. According to Satterthwaite et al. (2020), involving

both older generations, who bring experience and local knowledge, and younger generations, who can offer innovative solutions and energy, enhances the overall effectiveness of climate resilience strategies. In Okebaale, the older members likely bring essential experience in navigating local challenges and negotiating with authorities, while younger members are poised to contribute fresh ideas and advocate for more dynamic, youth-oriented approaches to climate action.

Furthermore, the participation of younger members is particularly important given the growing recognition of youth as key agents of change in environmental movements. The youth's involvement in climate action is increasingly seen as essential for long-term sustainability, as they are more likely to champion progressive ideas and implement new technologies. Therefore, Okebaale's CBOs have an opportunity to capitalize on the strengths of both older and younger generations, fostering an environment of collaboration that can drive innovative solutions to the community's most pressing climate-related challenges.

The data from the community provides valuable insights into the structure and dynamics of these groups. The variation in the age and duration of the associations, coupled with the diverse membership criteria, presents both opportunities and challenges for building climate resilience in the community. The inclusion of both long-standing and newer organizations creates a fertile ground for innovation and resource mobilization, while the diversity in membership could help ensure that the perspectives of a broad cross-section of the community are considered in environmental planning. However, the exclusionary nature of land ownership as a membership criterion remains a key issue that needs to be addressed to ensure that all residents, regardless of property status, can participate in climate resilience initiatives. The literature on community-based environmental planning emphasizes the importance of inclusivity in building resilience,

and this principle should be applied in Okebaale to ensure that all residents have a voice in shaping the community's future. Furthermore, leveraging the diverse age groups within Okebaale's CBOs can create an effective, intergenerational approach to environmental planning. By fostering collaboration between older and younger members, the community can harness the strengths of both experience and innovation, ultimately contributing to a more resilient and sustainable future in the face of climate change.

Table 5. Community-Based Environmental Planning in Osogbo Slums

Category	Frequency	Percent
Years of Existence		
1-5 years	20	29.4%
6-10 years	23	33.8%
11 and above	12	17.6%
No idea	13	19.1%
Total	68	100.0%
Criteria for Membership		
Land Ownership	26	38.2%
Community Dweller	35	51.5%
No idea	7	10.3%
Total	68	100.0%
Population Distribution		
Less than 20 years	13	19.1%
20-40 years	11	16.2%
41-60 years	17	25.0%
61-80 years	8	11.8%
80 and above	6	8.8%
No idea	13	19.1%
Total	68	100.0%

Source: Authors' work, 2025

4.5. Community-Based Environmental Planning and Resource Mobilization in Okebaale Slum, Osogbo

An overwhelming 83.8% of respondents confirmed that their community-based organizations have engaged in environmental planning and infrastructural development projects (Table 6). This indicates a community deeply involved in improving their living conditions, tackling issues such as waste management, road infrastructure, water access, and electricity provision. The active involvement of CBOs in these areas demonstrates their essential role in addressing gaps left by formal government services, especially in informal settlements (Haque, 2021).

The most commonly undertaken projects focus on critical infrastructure improvements. The provision of electricity (43.1%) and road construction (35.4%) were prioritized, showing that basic infrastructure needs are central to Okebaale's community-based efforts (Table 6). Borehole projects (15.4%) were also reported, reflecting an attempt to address water scarcity, although this issue remains under-prioritized compared to others. These findings highlight the community's focus on improving immediate, practical needs, which are crucial for building long-term environmental resilience, especially in informal settlements across the Global South (Neumayer & Plümper, 2007). However, the less frequent focus on water-related projects indicates a potential gap in the region's climate adaptation strategies, particularly as clean water is essential for resilience against climate change.

The financial sustainability of these community-driven projects primarily relies on internal donations, with 51.5% of funding coming from community members themselves. This reflects a strong culture of solidarity and local investment, where residents contribute financially to address shared challenges. However, the reliance on internal resources also reveals potential risks, as external funding sources are limited. Government grants (32.4%) and philanthropic donations (16.2%) provide additional support, but these are not enough to cover the full costs of larger-scale environmental projects, which could hinder the scalability and sustainability of these efforts. Research by Satterthwaite et al. (2020) supports this finding, emphasizing that while informal settlements often exhibit strong community resource mobilization, this reliance on internal resources can limit the capacity to scale up and address more complex environmental issues like climate adaptation. External funding—through government initiatives or partnerships with NGOs—will be crucial for ensuring the long-term sustainability of these community-driven projects.

Beyond financial contributions, the residents of Okebaale also actively participate in the labour and material support required for these projects. A significant 75% of respondents reported contributing resources such as labor, tools, and materials. This engagement demonstrates the community's commitment not only in financial terms but also in physical contributions, a critical factor in the success of community-based environmental planning initiatives. The types of resources contributed by community members are varied, with money (31.7%), labour (26.7%), and tools/materials (15%) being the most common. This flexibility in resource mobilization ensures that all residents, regardless of their financial capacity, can contribute to local environmental improvements. Such diverse contributions are vital for building inclusive, community-driven climate resilience (Haque, 2021). The strong collective spirit within the community

enhances the potential for successfully implementing local environmental plans and adaptation strategies.

Despite the active participation of community members, the management of these projects lacks formalized accountability structures. A majority of respondents (66.2%) reported that project management is overseen by informal committees or ad-hoc groups. This suggests that while there is enthusiasm and involvement, the management of these projects may lack transparency and organization. The absence of formal governance structures could lead to inefficiencies and potential mismanagement, particularly as the scale of environmental challenges grows. A small percentage (13.2%) of respondents noted that the government is involved in project management, while 20.6% stated that community members directly manage the projects. While direct community involvement in project management is a positive aspect, it also highlights the need for greater collaboration with government bodies and external organizations to improve the effectiveness of these projects. Stronger partnerships could enhance resource mobilization, project implementation, and the overall success of environmental initiatives in the community.

Table 6. Community-Based Environmental Planning and Resource Mobilization in Okebaale Slum, Osogbo

Aspect	Frequency	Percent
Has the Organization Embarked on Any Project?		
Yes	57	83.8%
No	4	5.9%
No Idea	7	10.3%
Total	68	100.0%
What Type of Project Has Been Undertaken?		
Education	4	5.9%
Roads	23	33.8%
Bore-holes	10	14.7%
Electricity	28	41.2%
Total	65	95.6%
Source of Funding		
Money Donation	35	51.5%
Philanthropic Donation	11	16.2%
Government Grants	22	32.4%
Total	68	100.0%
Has the Association Made Any Contribution?		
Yes	56	82.4%
No	12	17.6%
Total	68	100.0%
Who Manages the Project?		
Government	9	13.2%
Community Dwellers	14	20.6%
Others (likely committees/groups)	45	66.2%
Total	68	100.0%
Do You Contribute Any Resources?		
Yes	51	75.0%
No	17	25.0%
Total	68	100.0%

Aspect	Frequency	Percent
What Type of Resources Do You Contribute?		
Labour	16	23.5%
Material	8	11.8%
Working Tools	9	13.2%
Money	19	27.9%
Others	8	11.8%
Total	60	88.2%

Source: Authors' work, 2025

4.6. Community-Based Environmental Activities in Okebaale Slum: Insights and Analysis

The community-based environmental activities (CBEAs) in Okebaale slum reveal significant engagement among local residents in environmental initiatives, with noticeable positive impacts on their wellbeing and health. By synthesizing the data from various sources, we can offer an in-depth discussion on the ongoing community-driven efforts and explore their implications within the broader framework of community-based environmental planning, resource mobilization, and sustainable development.

The first significant insight is the high level of awareness regarding environmental activities within the Okebaale community, with 89.7% of respondents indicating awareness of these initiatives (Table 7). This figure suggests that environmental programs in the area enjoy strong visibility, which is crucial for fostering community involvement. Effective community sensitization is the foundation of any successful environmental strategy. Studies like Haque (2021) have highlighted the importance of building awareness as a precursor to collective environmental action, particularly in informal settlements, where residents may not initially prioritize environmental issues over more immediate survival concerns like access to basic amenities. Given this strong outreach, the Okebaale community seems to have been effectively informed and mobilized regarding local environmental concerns. However, awareness alone is not enough for sustained engagement. Satterthwaite et al. (2020) stress that outreach efforts must be paired with clear action plans and incentives that reinforce the importance of ongoing participation.

When examining the types of activities that residents participate in, the data, as shown in Table 7, reveals that 51.5% of respondents engage in waste management and recycling, while 39.7% are involved in drainage and flood control initiatives. These activities align with the pressing environmental concerns of the community, where inadequate waste management and flooding pose significant health risks and environmental degradation. In contrast, fewer individuals (7.4%) engage in water sanitation and hygiene campaigns, which remains a crucial area of improvement, particularly given the known link between sanitation and public health. The prevalence of waste management and drainage projects underscores a community-driven response to immediate environmental hazards. This is consistent with findings from Adelekan (2010), who observed that informal settlements often prioritize waste management and flood control as urgent matters due to their direct impact on residents' health. Additionally, community engagement in these activities signals adaptation to environmental stresses and could be viewed as part of a broader trend of grassroots environmental management in low-income urban areas (Adelekan, 2010).

The frequency of participation in community-based activities further demonstrates the integration of environmental engagement into daily life. 54.4% of respondents participate monthly, and 29.4% participate weekly, indicating that environmental

initiatives are viewed as ongoing commitments rather than occasional undertakings (Table 7). This consistent involvement points to the establishment of a culture of environmental stewardship in the community. This finding resonates with Berkes et al. (2003), who argue that continuous and regular community participation is essential for sustainable natural resource management. The relatively low percentage (14.7%) of residents who participate only yearly suggests that while some initiatives may be more long-term or sporadic, the community is primarily engaged in frequent interventions. The smaller percentage of daily participation (1.5%) might reflect limitations in available resources or the intensity of daily involvement. The high frequency of participation further emphasizes the resilience of the community and its capacity to integrate environmental actions into its lifestyle. Such regular participation contributes not only to environmental health but also to the social cohesion and collective identity of the community.

Examining the motivations for participation provides insights into why residents engage in environmental activities. 44.1% of respondents were motivated by community development, while 20.6% cited personal health concerns, and 23.5% mentioned peer influence (Table 7). These motivations align with broader theories of community-based resource management, which emphasize that individuals are often driven by both altruistic and self-interested motives (Pelling, 2010; Gibson et al., 2005). The strong motivation for community development indicates a collective desire for improvement, a finding that aligns with social capital theory, which asserts that strong local networks and a sense of community identity drive participation in collective action. Moreover, the role of peer influence highlights the importance of social norms in shaping environmental behavior. These insights suggest that future campaigns could leverage existing social networks to increase engagement and build on the community's existing

motivations for mutual support and neighborhood improvement.

The perceived impact of these activities was overwhelmingly positive, with 50% of respondents believing that the environmental initiatives have had a significant impact, and 41.2% perceiving a slightly positive impact (Table 7). These findings reinforce the idea that when communities are actively involved in managing their environment, they are more likely to see tangible improvements in their living conditions. The positive impact reported by residents is consistent with research by Neumayer & Plümper (2007), who found that community-led environmental management often results in enhanced health outcomes, climate resilience, and social benefits. The specific areas where participants reported improvements include better waste management (39.7%), reduced flooding and water stagnation (36.8%), and improved sanitation and hygiene (13.2%). These outcomes reflect the alignment of the community's activities with pressing local needs. Importantly, waste management and flood control efforts are integral to both health improvement and climate change adaptation, as they reduce exposure to hazardous waste and flooding, which are major contributors to public health issues in informal settlements.

A critical aspect of the community's involvement in environmental activities is its effect on health. 39.7% of respondents reported a significant reduction in health problems, while 45.6% noted a slight reduction. This demonstrates that community-based environmental activities in Okebaale are directly linked to improved public health outcomes, especially by reducing exposure to environmental risks such as disease outbreaks related to poor sanitation and stagnant water. This finding supports the One Health approach, which connects human health to the health of ecosystems and the environment (Huq et al., 2007). The improvement in health outcomes through environmental activities is a direct testament to the community's ability to manage their environment

effectively, often in the absence of formal government support. These findings echo those of Haque (2021), who pointed out that in many informal settlements, community-driven environmental management is not only a survival strategy but also a key determinant of health.

Table 7. Community-Based Environmental Activities in Okebaale Slum

Category	Frequency	Percent
Awareness of Environmental Activities		
Yes	61	89.7%
No	7	10.3%
Engagement in Activities		
Waste management and recycling	35	51.5%
Drainage and flood control initiatives	27	39.7%
Water sanitation and hygiene campaign	5	7.4%
None	1	1.5%
Frequency of Activities		
Daily	1	1.5%
Weekly	20	29.4%
Monthly	37	54.4%
Yearly	10	14.7%
Frequency of Participation		
Never	3	4.4%
Rarely	14	20.6%
Occasionally	30	44.1%
Regularly	19	27.9%
Very frequently	2	2.9%
Motivations for Participation		
Personal health concerns	14	20.6%
Community development	30	44.1%
Government incentives	8	11.8%
Peer influence	16	23.5%
Impact of Activities		
Yes, significantly	34	50.0%
Yes, but slightly	28	41.2%
No significant change	6	8.8%
Impact on Wellbeing		
Better waste management	27	39.7%
Reduced flooding and water stagnation	25	36.8%
Improved sanitation and hygiene	9	13.2%
Increased social interaction	5	7.4%
No improvement noticed	1	1.5%
None	1	1.5%
Reduction in Health Problems		
Yes, significantly	27	39.7%
Yes, but slightly	31	45.6%
No	10	14.7%

Source: Authors' work, 2025

4.7. Level of Community Initiative in Oke-Baale Slums, Osogbo, Nigeria

To assess the level of community initiative in the Oke-Baale slum in Osogbo, Nigeria, we evaluated several dimensions of community-based environmental planning and action. These included the degree of participation in environmental programs such as waste management, flood prevention, and tree planting, as well as the extent of local leadership and involvement of external actors like NGOs and government programs. The data gathered revealed that 50% of residents actively participate in waste management programs, 30% are involved in flood prevention activities, and 40% take part in tree planting campaigns (Table 8). Based on these figures, the average score for community participation in environmental programs was 0.4, reflecting moderate engagement.

Further, leadership and local organization within the community were also assessed. Around 30% of residents serve in leadership roles for community initiatives, such as organizing clean-up days and environmental awareness campaigns. However, 60% of residents support these leaders without being involved in planning or decision-making. This level of leadership and organization led to an average score of 0.45. Additionally, the involvement of NGOs and government agencies was examined, with only 25% of residents reporting direct participation with NGOs and 20% engaging in government-led environmental projects. These figures resulted in an average score of 0.25 for external involvement, suggesting that external support is relatively limited.

To calculate the overall level of community initiative, the average scores for each dimension were taken. The scores for community participation, leadership and organization, and external involvement were 0.4, 0.45, and 0.25, respectively, yielding an average Community Initiative Score of approximately 0.37 (Table 8). This score reflects a moderate level of community initiative, indicating that

while there is some active participation, there are gaps in leadership involvement and external support. These findings highlight the need for more comprehensive and inclusive community engagement to strengthen resilience and improve wellbeing in the Oke-Baale slum.

Table 8: Level of Community Initiative in Oke-Baale Slums, Osogbo, Nigeria

Dimension	Indicators	Scores (0–1)	Dimension Average
Community Participation	Participation in waste management programs	0.5	0.4
	Participation in flood prevention activities	0.3	
	Participation in tree planting campaigns	0.4	
Leadership & Local Organization	Residents in leadership roles	0.3	0.45
	Residents supporting leaders (non-decision-makers)	0.6	
External Involvement	Participation in NGO-led programs	0.25	0.25
	Participation in government environmental programs	0.2	
Overall Community Initiative Score			0.37

Source: Authors' work, 2025

4.8. Correlation Between the RWI and the Level of Community Initiative

The correlation between the Resident Wellness Index (RWI) and the level of community initiative in Oke-Baale can provide valuable insights into how collective action impacts the overall wellbeing of residents. As the RWI score of 0.37 indicates significant challenges in health, environmental quality, mental wellbeing, and economic security, it is important to examine how the level of community initiative, reflected in the Community Initiative Score of 0.37, influences these domains. The RWI consists of five interconnected domains—Physical Health, Mental and Emotional Wellbeing, Environmental Quality, Social Participation, and Economic Security—each of which can be shaped by community efforts to address local issues.

Community initiatives play a key role in improving physical and environmental health outcomes. For example, waste management programs and flood prevention efforts contribute to a cleaner and healthier environment, directly impacting the Physical Health and Environmental Quality domains of the RWI. With 50% of Oke-Baale residents participating in waste management programs and 39.7% engaged in drainage and flood control initiatives, these efforts have the potential to reduce the environmental hazards that contribute to waterborne diseases and respiratory problems. The active involvement in environmental management initiatives can help mitigate the risks associated with inadequate sanitation and poor infrastructure, thus enhancing both health outcomes and the overall quality of the environment.

Additionally, community participation in these initiatives fosters a sense of belonging and safety, which can positively influence Mental and Emotional Wellbeing. Studies have shown that people who engage in collective activities tend to experience lower levels of stress and greater psychological resilience (Lombard & Archer, 2021). By fostering stronger social ties and a sense of empowerment, these initiatives can alleviate the mental strain caused by environmental and social uncertainties.

This aligns with the RWI's Mental and Emotional Wellbeing domain, where residents' perceived safety and stress levels are key indicators. Therefore, promoting community-driven projects not only improves the local environment but also contributes to reducing stress and improving the overall emotional wellbeing of the residents.

Furthermore, Social Participation and Economic Security are areas where community initiatives have a significant impact. Active participation in local projects strengthens social cohesion, which is reflected in the Social Participation domain of the RWI. The Community Initiative Score of 0.37 suggests that while there is some engagement in social projects, further efforts are needed to increase involvement, especially in leadership roles. Empowering local leaders and increasing the frequency of community participation could improve the Social Participation score. Additionally, economic activities driven by local environmental projects, such as waste recycling or small-scale agriculture, have the potential to enhance Economic Security by providing income-generating opportunities for residents. These economic activities contribute to reducing poverty and improving resilience, which could subsequently raise the RWI in this domain.

Based on the analysis of community participation and wellness indicators in Oke-Baale, a Pearson correlation coefficient of approximately 0.6 was observed between the Community Initiative Score and the Resident Wellness Index (RWI), with a p-value < 0.01, indicating statistical significance at the 99% confidence level (Table 9). This moderate positive correlation supports the hypothesis that greater community initiative is associated with better wellness outcomes. Increased engagement in environmental programs, local leadership, and partnerships with external actors tends to correlate with improvements in health, social participation, and economic security. However, the impact of these efforts is

constrained by broader structural challenges such as inadequate infrastructure and limited institutional support (Lombard & Archer, 2021; Adelekan, 2010).

Table 9. Correlation Between the RWI and the Level of Community Initiative

RWI Domain	Relevant Community Initiatives	Observed Impact	Relation to Community Initiative Score
Physical Health	Waste management, flood control	Reduces exposure to waterborne diseases and respiratory issues	Positive
Mental & Emotional Wellbeing	Collective participation, improved environmental conditions	Enhances perceived safety, reduces stress	Positive
Environmental Quality	Waste disposal, drainage clearing, tree planting	Mitigates flooding, unmanaged waste, and heat stress	Positive
Social Participation	Engagement in community projects, leadership roles	Strengthens social cohesion and empowerment	Moderate Positive
Economic Security	Income from environmental initiatives (e.g., recycling, agriculture)	Supports livelihoods, improves financial stability	Moderate Positive
Statistical Correlation	Pearson correlation between RWI and Community Initiative Score	$r \approx 0.6$, $p < 0.01$ (statistically significant at 99% confidence level)	Moderate Positive
Overall Insight		Community efforts correlate with improvements in wellness but face structural limits	Requires scaling up participation & support

Source: Authors' work, 2025

4.9. Community-Based Environmental Activities in Okebaale Slum: Challenges, Opportunities, and Future Prospects

Community-based environmental activities (CBEAs) are a powerful tool for addressing environmental challenges in informal settlements like Okebaale slum. These activities often emerge as grassroots responses to problems such as waste management, sanitation, and flooding, driven by residents who are directly impacted by these issues. Despite the community's active involvement and interest, a range of challenges hinders the effectiveness of these efforts. This analysis examines the barriers, motivations, and potential methods for improving CBEAs in Okebaale, drawing upon both the data collected from local respondents and relevant literature on similar community-driven initiatives.

The data reveals that the main challenges impeding the success of community-based environmental activities in Okebaale are a lack of government support, community apathy, poor organization, and financial constraints. These challenges are not unique to Okebaale but resonate with those observed in other informal settlements globally (Satterthwaite, 2007). For instance, Table 10 reveals that 32.4% of the respondents reported a lack of government support. The absence of government support stands out as the most significant barrier to effective environmental action. This aligns with the findings of many studies that suggest government neglect, both in terms of infrastructure and financial investment, is a common issue in slums and informal settlements (Rakodi, 2002). When local governments fail to provide necessary resources, such as funding, technical expertise, or policy frameworks, it becomes challenging for communities to scale up their environmental activities or ensure their long-term sustainability. The involvement of external actors, including non-governmental organizations (NGOs) and local authorities, is often crucial in overcoming these gaps (Adelekan, 2010).

Another major issue is the apathy or lack of motivation among community members, identified by 23.5% of respondents. This is a common phenomenon in areas where residents may be grappling with economic hardships, making it difficult for them to prioritize collective action over individual survival (Njiru & Fillion, 2017). The literature also highlights that apathy can stem from previous failed initiatives, where residents may have become disillusioned with the outcomes or feel that their efforts are futile (Moser & Satterthwaite, 2008). The importance of strong leadership and organization is emphasized by 17.6% of the respondents. A well-organized and motivated leadership structure is vital for coordinating activities, mobilizing resources, and ensuring that community members are actively engaged in environmental projects (Pelling, 2003).

Weak leadership or lack of coordination often results in fragmented efforts, inefficiency, and a lack of continuity in community initiatives (Moser & Satterthwaite, 2008). 7.4% of the respondents reported financial limitations as another significant challenge. The high costs associated with environmental management—ranging from waste disposal to improving drainage systems—are often beyond the financial capacity of community members (Davis, 2006). This is particularly problematic in slums, where economic vulnerability is widespread. The need for external funding or public-private partnerships to fill this gap is evident in the literature on slum development and environmental management (Mitlin & Satterthwaite, 2004).

The finding that 85.3% of respondents are willing to participate more in environmental activities is a positive indicator of community engagement. It suggests that despite the challenges, there is significant enthusiasm and interest in contributing to the improvement of the local environment. This finding is consistent with the growing recognition in the literature that residents of informal settlements are often highly motivated to engage in activities that directly affect their living conditions (Satterthwaite, 2007). However, the 14.7% of respondents who are either unsure or unwilling to participate highlight the need for further engagement efforts to address potential concerns. These residents may have reservations due to previous unsuccessful experiences, a lack of trust in leaders, or doubts about the sustainability of the initiatives (Pelling, 2003). Addressing these concerns through targeted outreach and demonstrating the tangible benefits of participation can help convert these individuals into active contributors.

The data reveals that community members are interested in a variety of environmental activities, including volunteering, training others, and participating in advocacy campaigns. These preferences align with the broader findings from studies on community-driven development, where direct involvement, knowledge-sharing, and advocacy are central to fostering sustainable environmental practices (Mitlin & Satterthwaite, 2004). The strong interest in volunteering (33.8%) and training (22.1%) indicates that residents are eager to engage in hands-on, proactive efforts that have long-term benefits. Advocacy campaigns, with 19.1% expressing interest, suggest that there is recognition of the need to raise awareness and mobilize broader action for environmental issues.

Table 10. Challenges, Opportunities, and Prospects of Community-Based Environmental Activities in Okebaale Slum

Variable	Frequency	Percent
Challenges Affecting Community Activities		
Lack of awareness	13	19.1%
Lack of government support	22	32.4%
Financial constraint	5	7.4%
Community apathy	16	23.5%
Poor organization and leadership	12	17.6%
Total	68	100.0%
Methods to Improve Activities		
Increased government and NGO support	17	25.0%
Better awareness campaigns	16	23.5%
Incentives for participation	17	25.0%
Stronger community coordination	16	23.5%
More training programs	2	2.9%
Total	68	100.0%

Variable	Frequency	Percent
Willingness to Participate		
Yes	58	85.3%
No	5	7.4%
Not sure	5	7.4%
Total	68	100.0%
Preferred Activities to Participate		
Volunteering in environmental activities	23	33.8%
Donating resources	11	16.2%
Training others on environmental sustainability	15	22.1%
Advocacy and awareness campaigns	13	19.1%
Starting or leading a project	3	4.4%
Total	68	100.0%

Source: Authors' work, 2025

5. CONCLUSION AND RECOMMENDATIONS

The findings reveal a strong foundation for community-based environmental planning (CBEP) in Okebaale, Osogbo, with high levels of community awareness (89.7%), willingness to participate (85.3%), and existing engagement in activities like drainage maintenance and waste management. However, challenges such as poor leadership, limited government support, and infrastructural deficiencies still hinder progress. These insights imply that empowering communities with the right tools, leadership capacity, and institutional partnerships can significantly enhance climate resilience and resident wellbeing. The study also reinforces broader literature that positions CBEP as a viable, people-centred approach to urban climate adaptation in low-resource settings (Pelling, 2011; UN-Habitat, 2020).

Community-Based Environmental Planning in Okebaale presents a viable and sustainable path toward climate resilience and improved wellbeing. By harnessing local knowledge, participation, and leadership, while simultaneously integrating and upscaling external support for local solutions, the community can address its environmental challenges effectively. The data suggests that with targeted interventions in infrastructure, governance, and awareness, slum residents can lead the way in creating inclusive, healthy, and climate-resilient urban futures. The study highlights the following recommendations with implications for formal/informal planning responses, policy-based, institutional, implementation-related urban regeneration and infrastructure development at the local level.

Enhance Community Leadership and Governance: Strong local leadership is essential for mobilizing resources, coordinating projects, and sustaining community-based initiatives. Providing structured leadership and project management training for residents—especially youth, women, and underrepresented groups—can create a more inclusive and effective governance framework. Inclusive leadership not only fosters ownership but also enhances accountability and responsiveness to community needs.

Expand Government and NGO Support: Limited institutional support remains a critical barrier to scaling environmental efforts. Government and NGOs should increase financial and technical assistance to community groups through targeted budget allocations and advisory services. Formal partnerships—such as Memoranda of Understanding (MoUs)—between slum associations and external actors can institutionalize support, improve coordination, and provide long-term strategic direction for climate adaptation initiatives.

Invest in Climate-Resilient Infrastructure: Investments should focus on low-cost, community-managed infrastructure like bioswales, rainwater harvesting systems, shaded communal spaces, and reflective roofs. These interventions are not only affordable and context-appropriate but also encourage local participation and ownership, thereby increasing their long-term sustainability.

Promote Inclusive Participation: Redefining membership criteria to include all residents ensures that environmental planning reflects the realities of the entire population. A more inclusive framework can strengthen civic trust, foster collective action, and expand the labor and resource pool available for projects.

Develop Public Health and Environmental Awareness Campaigns: Public campaigns should be designed using local languages, storytelling traditions, and popular media platforms (e.g., radio, community theatre) to educate residents on key issues such as safe water handling, flood preparedness, and waste disposal. These campaigns should be continuous and culturally tailored to reinforce behavior change.

Leverage Local Contributions with Blended Financing: A blended financing model—combining local contributions with government grants and NGO funding—can unlock larger and more complex interventions. Such models promote sustainability while preserving community ownership and reducing donor dependency.

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