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Urban Quality Indicators for Assessing Sustainability in Informal Settlements in Mozambique:
A Case Study of Nampula City

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Abstract
Informal settlements in fast-growing cities frequently develop with uneven access to essential services and infrastructure, creating persistent constraints on living conditions and on the achievement of SDG 11. In Mozambique, national policy has recognised the need to improve these areas, including through the National Strategy for Intervention in Informal Settlements. What remains less developed is a locally grounded procedure for selecting, testing and ranking urban-quality indicators before they are used for assessment. This article examines Namutequeliua and Muatala in Nampula using a sequential assessment framework. A mixed-methods design brought together expert consultation through Delphi, prioritisation with the Analytic Hierarchy Process (AHP), and neighbourhood assessment with the Sustainability Barometer (SB). Service infrastructure received the highest thematic weight (0.25). The SB classified the two neighbourhoods within the lower, potentially unsustainable range. From 2017 to 2022, the energy and transport dimensions registered improvement, while water supply, waste and wastewater moved in the opposite direction. The resulting framework is intended to support evidence-based planning, the ordering of investment needs and the monitoring of upgrading interventions in informal settlements.

Keywords: Analytic hierarchy process, informal settlements, Mozambique, Nampula, sustainability barometer, urban quality indicators, neighbourhood sustainability assessment

INTRODUCTION

During the 1990s, growing urban poverty in the Global South brought informal settlements increasingly into the agendas of governments, international agencies and other organisations (Riley et al., 2000; Nijman, 2008, cited in Cavendish & Lima, 2017). In the terminology used by the United Nations, the category includes occupied land without secure legal tenure and housing areas developed outside applicable planning or building regulations (UN, 2020). Its scale is considerable: estimates cited by Boanada-Fuchs and Kuffer (2024) place the number of people living in slums at 723 million in 1990 and 928 million in 2014. UN-Habitat (2013) estimated that 61.7% of Africa's urban population lived in informal settlements. Mozambique faces a comparable situation: the country had a relatively low urbanisation level, while about 70% of its urban population was reported to live in informal settlements (UN, 2014; MICOA, 2011).

The 2030 Agenda, particularly Sustainable Development Goal 11, has strengthened the place of informal settlements within debates on sustainable urban development. Earlier indicator initiatives, including Agenda 21, have been questioned because of their predominantly top-down design and the large number of measures they generate, which can reduce their practical usefulness in developing-country settings (Zakerhaghighi et al., 2015). There is therefore a need for assessment procedures that can retain analytical rigour while remaining applicable to the realities of Mozambican cities.

Mozambique already has a national strategy addressing informal settlements, but indicator frameworks specifically constructed for diagnosing urban quality under local conditions remain scarce. Against this background, the study asks which sustainability criteria and indicators are

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most suitable for evaluating informal settlements and identifying directions for improvement in relation to the 2030 Agenda.

The research constructs and applies sustainability criteria and indicators for two complementary purposes: supporting the improvement of existing informal areas and informing the planning of future settlements. The analysis pursues three objectives:

i. Determine and validate indicators of urban quality appropriate to informal settlements in Nampula;
ii. Establish the relative priority of the validated indicators using the Analytic Hierarchy Process (AHP); and
iii. Determine the sustainability condition of Namutequeliua and Muatala through the Sustainability Barometer (SB).

The study offers both an empirical contribution for Nampula and a methodological contribution. It links local evidence to three sequential analytical stages - Delphi validation, AHP weighting and Sustainability Barometer assessment-thereby providing a procedure that may be used to structure urban diagnosis and support decisions concerning informal-settlement intervention.

The paper begins by discussing the literature on urbanisation, informal settlements and indicators of urban quality. It subsequently introduces the case-study area and the research design, reports the findings, interprets their implications for planning and public policy, and closes with conclusions, recommendations and avenues for further investigation.

THEORY

Urbanisation Worldwide, in Africa and in Mozambique

Urbanisation takes different forms according to the territory in which it occurs. Economic organisation, demographic change, institutional arrangements and spatial characteristics all influence urban development, which makes place-sensitive approaches particularly relevant to questions of sustainability (Tian et al., 2022).

The process is shaped by the interaction of economic, cultural and political forces. Migration, access to economic opportunities and the level of local development affect the direction and form of urban expansion; consequently, urban spatial structures are continuously transformed and show substantial differences across places and periods (Couch et al., 2007, cited in De Oliveira & Dos Santos, 2022).

World urbanisation has advanced markedly over recent decades. According to the figures cited by Effiong (2018), the proportion of the global population living in urban areas increased from 30% in 1950 to 54% in 2014, with a further addition of approximately 2.5 billion urban residents projected by 2050, mainly in developing regions of Asia and Africa. United Nations projections also pointed to continued expansion of major African urban centres and the associated growth of informal settlements around them (UN, 2015).

Africa is experiencing a sustained shift towards urban living. ONU-Habitat (2016) estimated that the continent could reach an urban share of about one half of its population by 2035, compared with roughly one third in 1990. Such demographic change has implications for where employment, residents and public facilities are located. UN-Habitat (2008) characterised the continent's urban transition as closely connected with poverty rather than with the industrialisation-led pathway observed in many other regions, an aspect that should be considered when urban-growth responses are formulated (Obeng-Odoom, 2010).

African urban growth does not translate automatically into economic development or poverty reduction. Turok and McGranahan (2013) show that limited development capacity can restrict the benefits associated with urbanisation. Meanwhile, informal activities remain important for livelihoods, while networks providing water, sanitation and energy often fail to satisfy basic requirements and formal employment has not expanded in proportion to population growth (Pieterse & Parnell, 2014, cited in Murphy & Carmody, 2019).

Within Mozambique's planning framework, urbanisation is understood in relation to the servicing and transformation of urban land through infrastructure, facilities and buildings, with the objective of enabling access to education, transport, sanitation, commerce, leisure and other services (MICOA, 2006). The cited national data

place the urbanisation rate at approximately 36% (UN, 2014). The National Territorial Development Plan, approved in 2021, gives particular attention to increasing the formal availability of urban land, improving informal areas and strengthening territorial knowledge through an observatory (Decreto Lei, 2021).

Informal Settlements Worldwide and in Mozambique

Informal settlements commonly display deficiencies in sanitation and housing conditions and may be exposed to environmental hazards, including those associated with disasters and climate change (Güzey, 2016, cited in Amado et al., 2016). Informality is nevertheless not confined to poorer households; studies also document informal land acquisition and construction among elite and upper-middle-income groups (Olaniran & Aule, 2025).

The measurement of informal settlements is complicated by differences in definitions, data-collection techniques and institutional decisions concerning the areas included in official statistics. These differences can produce significant gaps between the population actually living in deprived areas and the population recorded in available datasets (Kuffer et al., 2018).

Public intervention is influenced by political and institutional conditions as much as by technical considerations (Roy, 2005). Basile and Ehlenz (2020) group common responses into three broad strategies: provision of social or public housing, physical upgrading through infrastructure and basic services, and regularisation of occupation through land titling. Although each can benefit residents, none constitutes a complete response to the multiple dimensions of informality.

In Mozambique, informal areas have continued to expand despite their often-inadequate living conditions. Their location close to employment and service centres can nevertheless make them attractive to households (MICOA, 2011). Housing nationalisation, rapid urban growth and rural-to-urban migration during and after the civil-war period altered settlement patterns. These processes, together with weak maintenance of inherited housing and infrastructure, contributed to the formation and consolidation of informal areas in Nampula (CEDH, 2006).

Government responses have included the Mozambique Housing Policy and Strategy and the National Strategy for Intervention in Informal Settlements, yet informal occupation has remained widespread. MOPHRH (2016) estimated that approximately 70% of urban areas displayed characteristics of informality. Spatially, these areas often surround consolidated urban cores and may also occur as intermediate zones between expanding urbanised areas, as illustrated in **Figure 1** (CIMES, 2016).

Informal Settlements, Technology and Local Participation

The challenge of informal settlements extends beyond municipal planning. It is also a concern for international organisations and for national and local institutions seeking approaches that can improve living conditions while promoting inclusion (Almeida & Gonçalves, 2019).

Studies of urban informality in the Global South reveal a tension between two broad perspectives. One regards informality primarily as an unregulated condition that should be brought within formal systems; another draws attention to the agency and resilience of residents living under social, economic and spatial exclusion (Banks et al., 2020). Planning processes frequently give insufficient weight to resident knowledge and locally initiated practices. Recognising community participation can therefore make interventions more responsive to the diversity of informal settlements (Jones, 2017).

For governments in developing countries, the financial and infrastructural scale involved means that eliminating informal settlements is often impractical (Wekesa et al., 2011). An alternative is to combine upgrading with infrastructure and technologies that are affordable, environmentally appropriate and suited to local ways of living (Arup & EAP, 2009, cited in Degert et al., 2016; Wekesa et al., 2011).

The performance of an intervention should be examined after implementation because different upgrading strategies can produce different effects. Measurement systems are most informative when they are used alongside local knowledge and locally generated evidence rather than treated as substitutes for them, since each indicator represents only one part of a wider urban reality

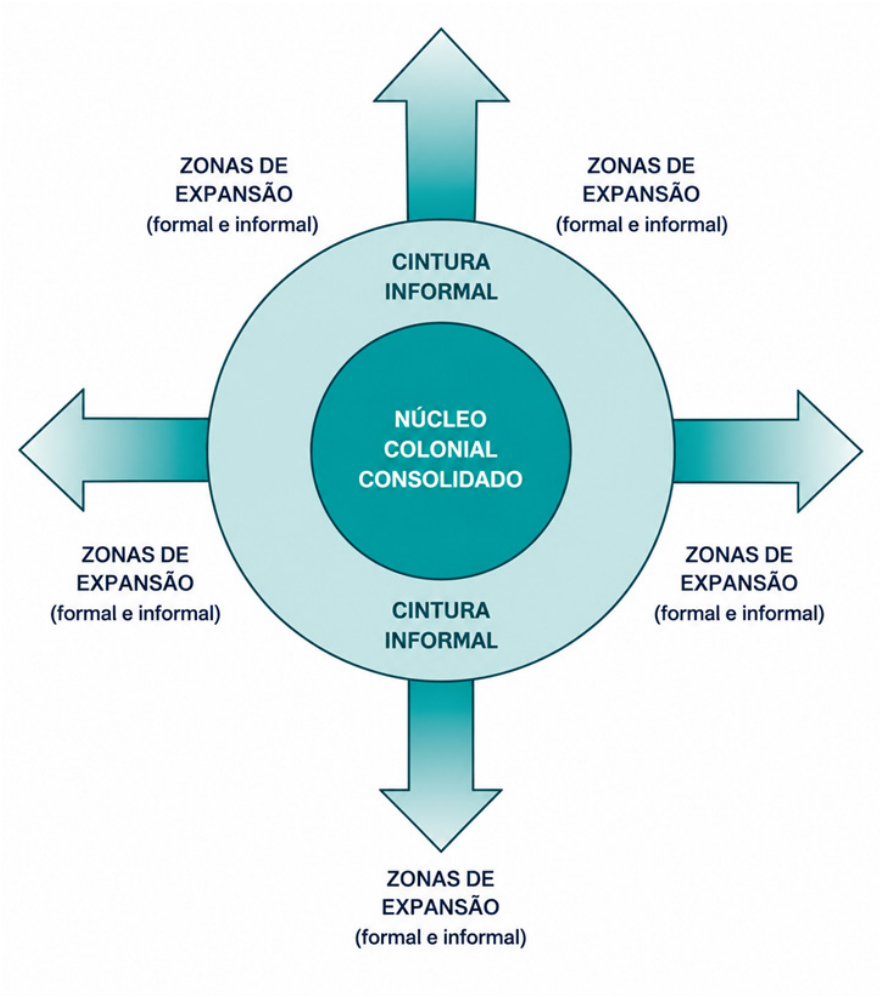


FIGURE 1
Distribution of informal settlements in Mozambique
Source: Nampula Basic Plan (2016).

(Klopp & Petretta, 2017). Existing assessment systems may also give greater visibility to formal urban areas, leaving important characteristics of informal settlements underrepresented. Dawodu et al. (2019) further note the limited availability of neighbourhood sustainability assessment tools in Africa and the problems that can arise when standardised, top-down approaches are applied without sufficient contextualisation.

Urban Quality Indicators

Urban quality is inherently multidimensional. Siche et al. (2007) identify environmental, economic, socio-political, human and cultural components within sustainable development, while Montoya et al. (2020) frame urban sustainability through economic, social, environmental and built-environment dimensions. Taken together, these approaches indicate that the condition of an urban area cannot be adequately represented by a single dimension or measure.

Indicators provide a means of converting broad objectives into observable evidence for assessment and decision-making at different territorial levels. They can refer to a single variable or combine information from several observations. Their usefulness depends on qualities such as clarity, measurability and a coherent relationship with the phenomenon being assessed (Mueller et al., 1997, cited in Romero et al., 2005).

Several institutional approaches have been developed to organise sustainability information. The OECD's Pressure-State-Response model distinguishes measures associated with pressures, prevailing conditions and responses (OECD, 1993). Other indicator frameworks arrange urban concerns into thematic fields that include governance, transport and connectivity, services,

environmental conditions, economic activity, housing, and the social and built environment (Egan, 2004).

Urban sustainability and quality-of-life assessment have generated a broad family of tools, among them iiSBE and SBTool approaches, URBENERE, LEED-ND, ISO 37120, BREEAM Communities, the Emerging and Sustainable Cities Initiative and CITYKeys (Bragança et al., 2016; Bragança et al., 2017; Gomes et al., 2017; Haapio, 2012; Huovila et al., 2017).

The usefulness of these instruments outside their original settings cannot be assumed. Differences in urban form, institutional capacity and living conditions can affect both the relevance and the feasibility of a given indicator system. Ameen and Mourshed (2019) consequently question the universal transferability of sustainability indicators. For informal settlements, more targeted variables have been proposed, including those discussed by López (2016, cited in Montoya et al., 2020), alongside the community-oriented work of Ameen and Mourshed (2019) and the Mozambican intervention strategy (MICOA, 2011).

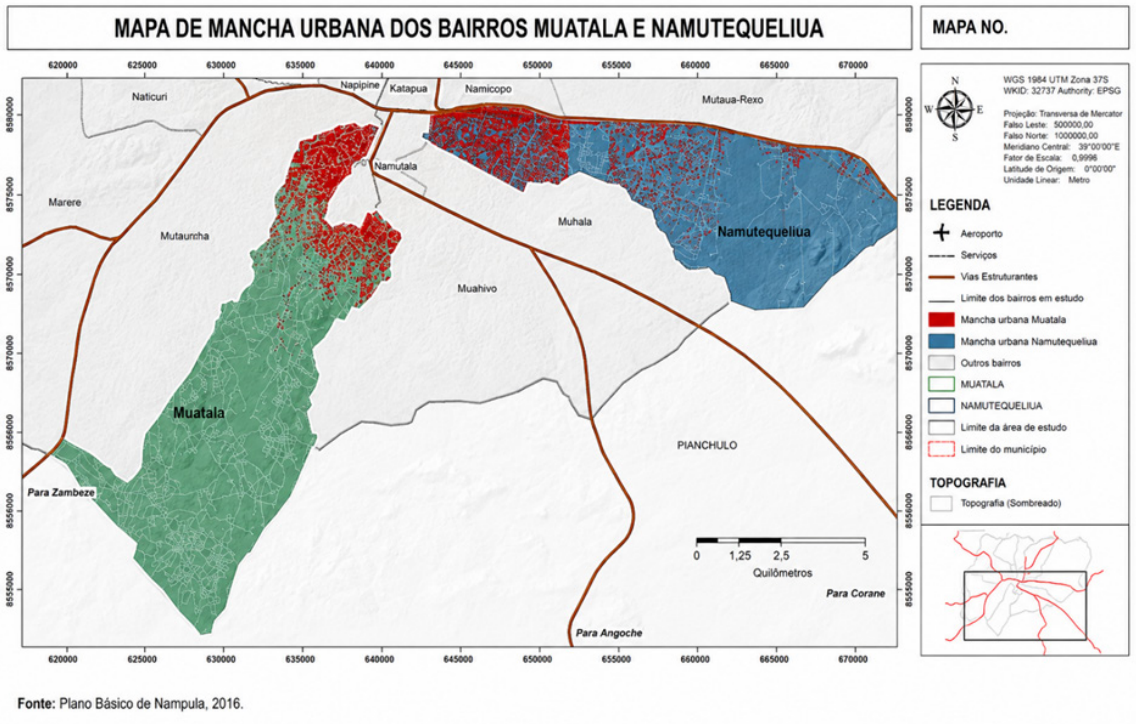
Case Study

The case study comprises Namutequeliua and Muatala, two neighbourhoods in Nampula. According to INE (2019), Namutequeliua was organised into six communal units and had 89,547 inhabitants, whereas Muatala comprised ten communal units and had 61,712 inhabitants. In both neighbourhoods, population density is higher around the central administrative post. Their pattern of urban expansion is shown in **Figure 2**.

Both study areas combine unregulated land occupation with deficiencies in infrastructure. Several interior sections are difficult to access and some cannot be reached by motor vehicles. Water supply and refuse collection are insufficient, while drainage facilities are limited. These conditions are documented by the field photographs presented in **Figures 3a-c**.

Research Gap

Previous research demonstrates that urban sustainability and quality can be evaluated with a variety of indicator systems, but their application to informal settlements continues to present important limitations. Some frameworks give



Fonte: Plano Básico de Nampula, 2016.

FIGURE 2
Urban sprawl of the neighbourhoods under study
Source: Author´s elaboration (2022)



FIGURES 3a, b & c
Drainage, access to drinking water and waste treatment in the study neighbourhoods
Source: Field survey, 2026

insufficient attention to informal areas, while African neighbourhood sustainability tools remain relatively scarce and can reproduce top-down approaches that do not adequately reflect local conditions (Klopp & Petretta, 2017; Dawodu et al., 2019). Although indicator proposals and national intervention strategies are available (Ameen & Mourshed, 2019; MICOA, 2011), there is still limited evidence in Mozambique of a complete procedure that moves from local indicator identification through expert validation and prioritisation to an integrated sustainability assessment. The present research addresses this gap by combining context-sensitive indicators with Delphi, AHP and the Sustainability Barometer, in the neighbourhoods of Namutequeliua and Muatala in Nampula city.

Conceptual Framework

The conceptual framework brings together the principal theoretical elements used in the study (**Figure 4**). It treats sustainability as a multidimensional construct (Siche et al., 2007; Montoya et al., 2020) and adopts the Pressure-State-Response model as an organising perspective for indicator information (OECD, 1993).

The analytical sequence begins with the conditions observed in informal settlements, which guide the identification of relevant dimensions and indicators of urban quality. Expert judgement is subsequently used to validate the proposed indicators through Delphi. The retained indicators are then prioritised using AHP, after which the Sustainability Barometer is employed to produce an assessment of neighbourhood conditions. The resulting evidence is intended to support spatial planning, the definition of intervention priorities and public policy.

RESEARCH METHODS

The research used a mixed-methods design because the assessment of informal-settlement sustainability involves both measurable attributes and context-dependent experiences. Qualitative procedures were used to understand local circumstances and priorities, while quantitative procedures made it possible to measure and compare selected indicators. Their combination provided an additional basis for methodological triangulation.

The initial indicator pool was assembled from published research, characteristics of the urban fabric identified through spatial analysis, satellite imagery and participatory workshop involving neighborhood leaders from Namutequeliua and Muatala. Conducted in March 2021, the workshop brought together 14 unit heads and two neighbourhood secretaries and sought to identify local concerns and priorities. Two field visits were also carried out that month. ISO 37120 was used as an initial reference, supplemented by indicators concerning sustainable communities and by measures contained in the Mozambican strategy for informal settlements. The resulting long list contained 197 indicators.

A three-stage Delphi exercise was subsequently conducted on the 197 proposed indicators. Seventy-one indicators were retained for the next analytical stage. The expert panel consisted of 15 professionals involved in municipal urban

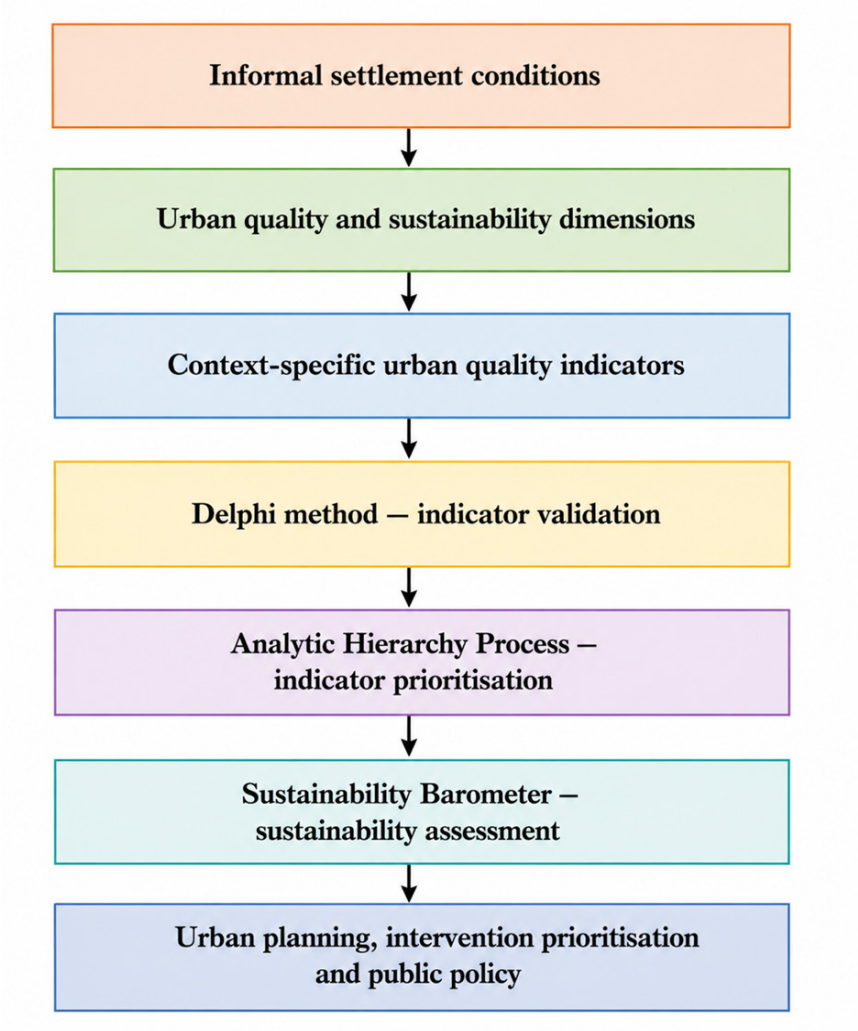


FIGURE 4
Conceptual framework for assessing sustainability in informal settlements
Source: Authors' conceptualisation based on selected sustainability literature, 2026

management in Nampula. They had backgrounds in architecture, urban planning or spatial planning, at least five years of relevant professional experience, and current responsibilities in urban or spatial planning. The questionnaire was implemented through Google Forms during three periods: February-May 2021, August-November 2021, and January-April 2022.

Before participating, experts provided informed consent for the questionnaire and workshop activities. The collected responses were treated as confidential research data, and identifying information was not disclosed.

Indicator judgements were recorded on a Likert agreement scale. During the first Delphi round, the retention decision considered the combined proportion of responses in the 'partly agree' and 'fully agree' categories. In the second and third rounds, absolute agreement frequencies were used. The predefined retention range was 70% to 100% agreement across the two positive categories.

Several measures were used to reinforce the methodological quality of the indicator-selection process. Established literature and ISO 37120 supplied the initial conceptual basis, while spatial analysis, satellite information, field observation and consultation with neighbourhood leaders contributed local evidence. The three Delphi rounds gave experts successive opportunities to reconsider their assessments, and the 70% threshold was defined before indicator retention. The combination of documentary evidence, spatial analysis, fieldwork, stakeholder input and expert judgement provided methodological triangulation.

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Figure 5 depicts the sequence of Delphi rounds through which the proposed urban-quality indicators were screened and validated.

RESULTS

The results are presented in two main parts. The first concerns the ranking of the urban-quality indicators, and the second examines the sustainability condition of Namutequeliua and Muatala.

Prioritisation of Urban Quality Indicators

The AHP analysis was carried out using the 71 indicators that survived the Delphi process and six thematic categories. Applying Saaty's pairwise-comparison logic produced a priority subset of 26 indicators. Fifteen of this concern service infrastructure and the remaining eleven concern connectivity infrastructure.

Figure 6 reports the expert assessments for the thematic categories together with the relative AHP weights obtained for each category.

Among the thematic categories, service infrastructure obtained the greatest normalised AHP weight (0.25). Connectivity infrastructure was the other thematic category represented among the 26 indicators classified as priorities.

Residents' Assessment of Priority Indicators

The 26 indicators identified through AHP were subsequently considered in the residents' assessment. The survey covered 385 respondents in Namutequeliua and 382 in Muatala. Information for 2017 was drawn from secondary records supplied by local public institutions, while the 2022 data provided the basis for comparison with that earlier situation.

The direction of change differed across the indicators. The energy and transport dimensions registered gains between 2017 and 2022, whereas water supply, waste management and wastewater showed deterioration. **Figure 7** presents the comparative results for the two neighbourhoods.

The indicator set therefore produced a mixed picture rather than a uniform trend. Improvements in some dimensions occurred alongside deterioration in others, resulting in different sustainability profiles across the study period.

Sustainability Assessment of the Neighbourhoods

The sustainability of Namutequeliua and Muatala was examined using the 26 AHP-prioritised indicators. The Sustainability Barometer (SB) was used to calculate the corresponding scores and classify performance at indicator and thematic levels.

Figure 8 compares the two neighbourhoods through the Human Well-being Index and the

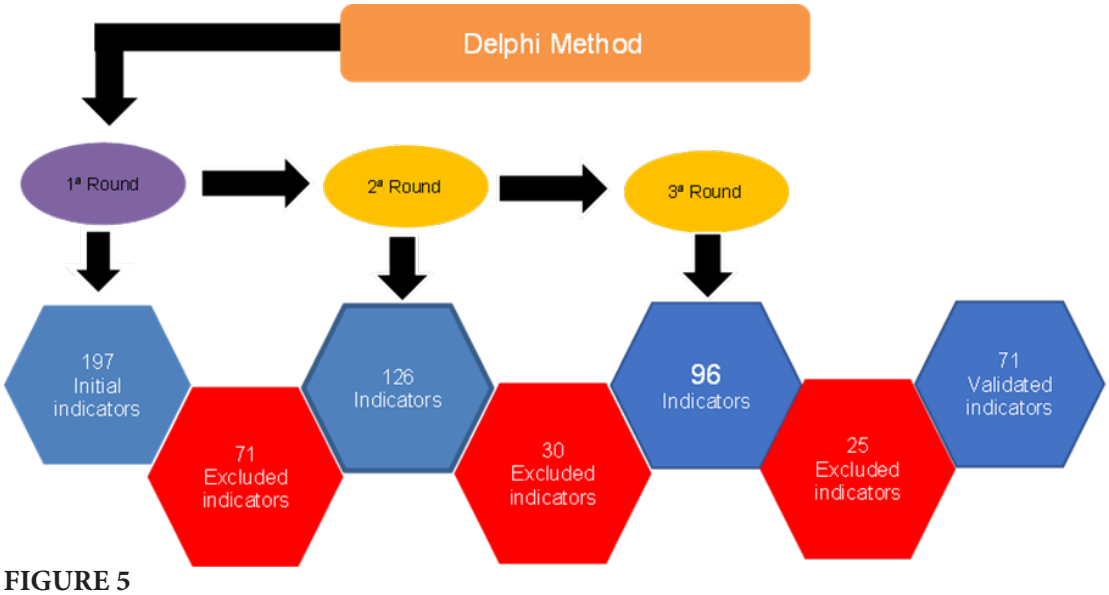


FIGURE 5
Application of the Delphi method in indicator validation
Source: Author, 2026

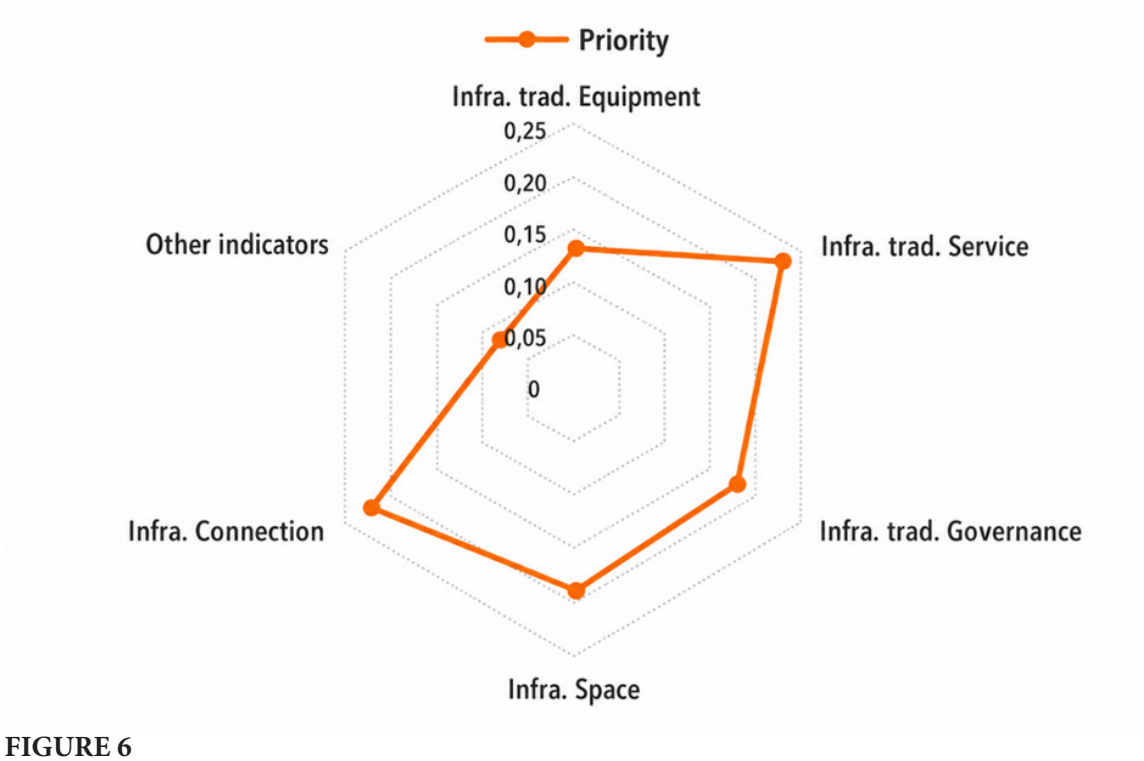


FIGURE 6
Experts' evaluation of indicators by thematic area
Source: Author, 2026

Environmental Well-being Index generated by the Sustainability Barometer.

For both neighbourhoods, the Sustainability Barometer yielded a potentially unsustainable classification in 2017 and again in 2022. The Human Well-being Index decreased from 42.46 to 40.90, whereas the Environmental Well-being Index increased from 21.10 to 22.53. The improvement in the environmental component was therefore not large enough to alter the overall position of the neighbourhoods within the lower sustainability category.

Overall, Delphi reduced the initial pool to 71 indicators, after which AHP identified 26 priorities: 15 related to service infrastructure and 11 to connectivity infrastructure. Between 2017 and 2022, energy and transport improved, while water, waste and wastewater declined. The Sustainability Barometer retained both neighbourhoods in the potentially unsustainable category across the two assessment years.

DISCUSSION

The evidence generated in Namutequeliua and Muatala places basic infrastructure at the centre of the urban-quality problem. Delphi retained 71 indicators, and the subsequent AHP procedure reduced this set to 26 priorities, comprising 15 service-related and 11 connectivity-related indicators. Service infrastructure received the highest thematic weight (0.25). This emphasis is consistent with evidence from African cities showing that deficiencies in water, sanitation, energy and associated systems constrain everyday livelihoods (Pieterse & Parnell, 2014, cited in Murphy & Carmody, 2019).

The prominence of services and connectivity is also understandable in the Mozambican setting. Informal neighbourhoods may benefit from being close to employment and service centres even while their living conditions remain inadequate (MICOA, 2011). At the same time, governments in sub-Saharan Africa face substantial resource constraints when attempting to extend infrastructure to such areas (Wekesa et al., 2011). The priorities identified here therefore point towards upgrading measures based on the particular deficits observed in each locality rather than on a generic package of interventions.

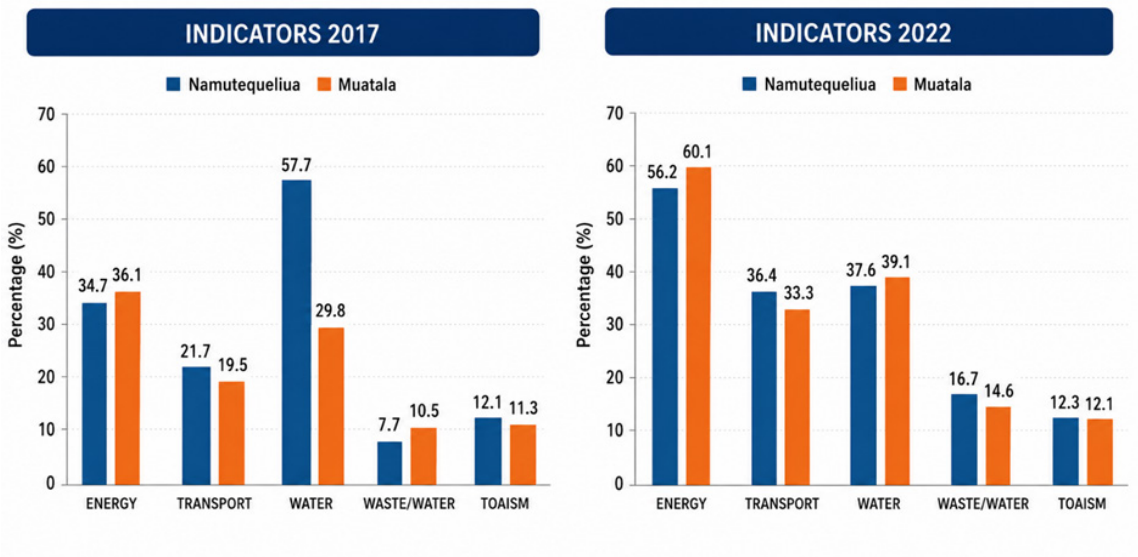


FIGURE 7
Comparative neighbourhood sustainability between 2017 and 2022
Source: Author, 2026

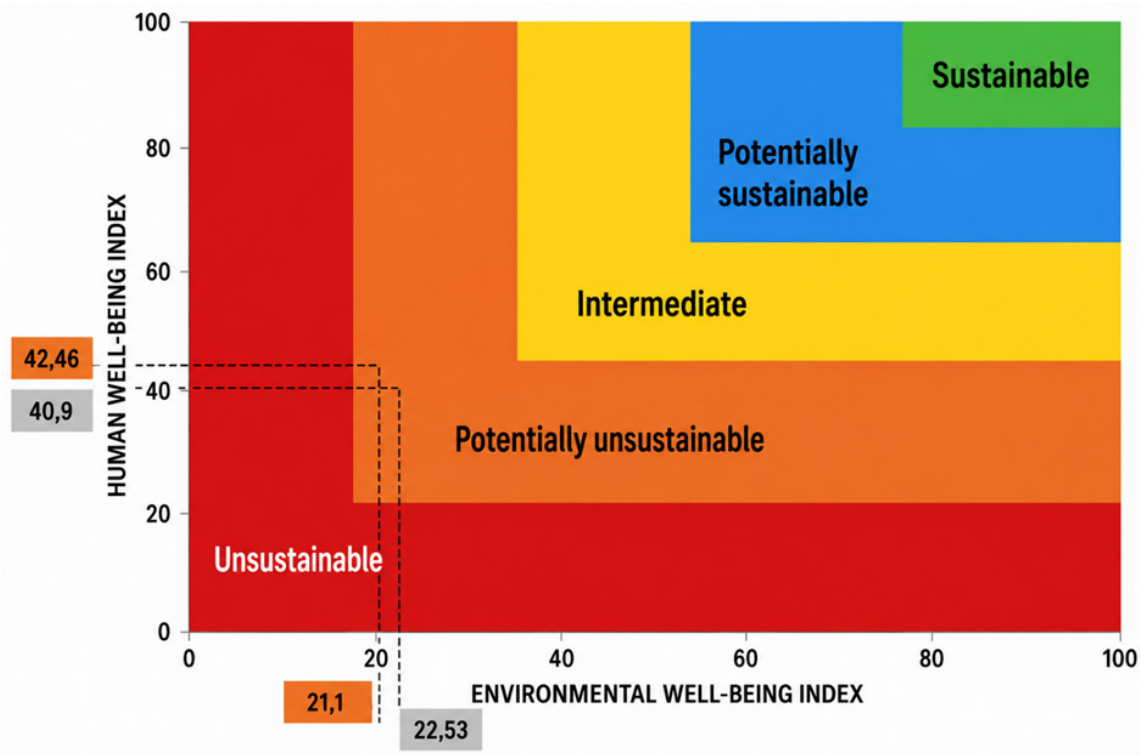


FIGURE 8
Sustainability indices for Muatala and Namutequeliua neighbourhoods
Source: Author, 2026

The comparison between 2017 and 2022 demonstrates that progress was not evenly distributed. Energy and transport indicators improved, but the indicators associated with water, solid waste and wastewater worsened. This uneven trajectory reinforces the multidimensional character of sustainability: performance in one sector cannot, by itself, establish whether urban conditions are becoming sustainable. The assessment needs to consider environmental,

economic, social, political, human and cultural dimensions (Siche et al., 2007), together with the economic, social, environmental and built-environment dimensions highlighted by Montoya et al. (2020).

The deterioration of water, waste and wastewater conditions deserves particular attention because these services simultaneously affect environmental quality and residents' daily well-being. The result is compatible with descriptions of informal settlements as environments where inadequate sanitation, overcrowding and exposure to hazards may occur together (Güzey, 2016, cited in Amado et al., 2016). The continued expansion of informal occupation in Mozambique despite policy responses (MOPHRH, 2016) suggests that infrastructure provision may not be advancing at the same pace as spatial growth. The neighbourhoods Namutequeliua e Muatala provide a concrete local expression of this wider problem.

The Sustainability Barometer adds a composite view to the changes observed at indicator level. Both neighbourhoods remained potentially unsustainable in the two years considered. Human well-being declined from 42.46 to 40.90, while environmental well-being moved upward from 21.10 to 22.53. The positive movement of the environmental index was insufficient to offset the weaknesses reflected in the overall classification.

The results also indicate the need for caution when transferring standardised sustainability tools directly into informal-settlement contexts. Ameen and Mourshed (2019) demonstrate that differences in urban conditions and quality of life can affect the applicability of indicator frameworks across places. Klopp and Petretta (2017) draw attention to the tendency of some urban indicators to underrepresent informal areas, while Dawodu et al. (2019) highlight the limited development of neighbourhood sustainability assessment tools in Africa and the shortcomings of top-down approaches. The local validation and prioritisation adopted in this study therefore provide an important contextual filter before indicators are used for assessment.

The study's methodological contribution lies in bringing together three functions that are frequently undertaken independently: determining which indicators are relevant, establishing their relative importance, and evaluating observed conditions. Delphi serves the validation function, AHP establishes the priority structure, and the Sustainability Barometer integrates the selected information into a sustainability assessment. This sequence is also compatible with the Pressure-State-Response perspective, which distinguishes indicators according to conditions, pressures and responses (OECD, 1993).

Viewed through SDG 11, the results show that both neighbourhoods continue to face difficulties in achieving inclusive, safe, resilient and sustainable urban conditions. The most urgent priorities emerging from the assessment concern water, wastewater and waste services, while the gains recorded in energy and transport should be maintained. Infrastructure responses should be designed around local environmental and community conditions instead of assuming that one standard solution will work across all informal areas (Wekesa et al., 2011).

The assessment demonstrates the value of treating infrastructure, mobility, environmental conditions and human well-being as connected elements of urban quality. The proposed sequence moves from locally grounded indicator identification to expert validation, prioritisation and sustainability assessment. For Nampula, this provides an evidence base that can assist intervention choices and planning decisions in Namutequeliua, Muatala and other neighbourhoods presenting similar characteristics.

CONCLUSION

This study proposes an indicator-based assessment framework tailored to the circumstances of Namutequeliua and Muatala in Nampula. Its principal methodological contribution is to connect the objectives of the 2030 Agenda and national planning concerns with Delphi validation, AHP prioritisation and Sustainability Barometer assessment in a single analytical sequence. The procedure can support diagnosis, monitoring and the ordering of intervention priorities in informal settlements.

One important limitation was the lack of a sufficiently consistent and up-to-date spatial database covering informal settlements. This

constraint complicates regular monitoring and limits the evidence available to municipal authorities for planning and evaluation. Strengthening permanent systems for collecting, managing and updating spatial information is consequently an important institutional requirement.

The findings show that a systematic assessment of informal-settlement sustainability is feasible when the indicators used are supported by empirical evidence and adapted to the local context. The resulting information is useful not only for diagnosing current conditions but also for informing policy formulation, investment decisions, monitoring and urban-regeneration programmes.

The selected indicators and their benchmark values establish a basis for continued monitoring in Nampula. Applying the same measures at regular intervals can reveal whether interventions generate lasting improvements and can progressively strengthen the evidence available for urban planning and management.

RECOMMENDATIONS

The empirical results can be translated into the following actions for the principal institutional actors:

i. Nampula Municipality: Establish a continuing spatial-monitoring system and periodically refresh urban-quality and sustainability information for Namutequeliua, Muatala and other informal neighbourhoods.
ii. Nampula Municipality: Give priority to investments in water supply, wastewater and solid-waste management, while sustaining the improvements identified in energy and transport.
iii. Nampula Municipality: Incorporate the prioritised indicators into municipal plans, budgets, monitoring systems and informal-settlement upgrading programmes so that resource allocation can be linked to measurable conditions.
iv. National Government: Provide for adaptable urban-quality and sustainability indicators within policies, strategies and territorial-planning instruments concerned with informal settlements, including mechanisms for periodic revision.
v. National Government: Strengthen coordination among relevant institutions and support the development of reliable spatial databases that can be regularly updated for monitoring informal settlements and assessing interventions.
vi. Development partners: Support municipalities with technical training, spatial-data infrastructure and practical capacity to apply sustainability assessment methods in planning and monitoring.
vii. Development partners: Direct financial and technical assistance towards basic services and settlement-upgrading interventions whose importance is demonstrated by locally validated sustainability evidence.

Future Research

i. Repeat the measurement of the selected indicators at regular intervals to establish time series for Namutequeliua, Muatala and, where possible, other areas of Nampula Municipality.
ii. Apply the indicator framework in other Mozambican cities and test its reliability under different geographical, demographic and institutional circumstances.
iii. Conduct comparative studies with cities in Africa and other parts of the Global South to identify which components of the framework could support a wider regional approach to urban-quality and sustainability assessment.

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