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Exploring the Role of Governance Frameworks in Fostering Climate Change Adaptation in Zanzibar

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List of abbreviations

APC	-	Adaptation Policy Credibility
CFP	-	Community Forest Pemba
CSOs	-	Civil society organisations
D-by-D	-	Decentralisation-by-Devolution
DoE	-	Department of Environment
EIAs	-	Environmental impact assessments
FGDs	-	Focus group discussions
FVPO	-	First Vice President's Office
KIIs	-	Key informant interviews
LGAs	-	Local government authorities
MDAs	-	Ministries, departments and agencies
MER	-	Monitoring, evaluation and reporting
MKUBA	-	Mfuko wa Kuhifadhi Bahari (Fund to Care for the Sea)
NAPs	-	National Adaptation Plans
NDCs	-	National Determined Contributions
NGOs	-	Non-governmental organisations
O&OD	-	Opportunities and Obstacles to Development
PORALGSD	-	President's Office, Regional Administration, Local Government and Special Departments (RGoZ)
RGoZ	-	Revolutionary Government of Zanzibar
SDGs	-	Sustainable Development Goals
TASAF	-	Tanzania Social Action Fund
UNDP	-	United Nations Development Programme
UNFCCC	-	United Nations Framework Convention on Climate Change
URT	-	United Republic of Tanzania
VPO	-	Vice President's Office
ZACCA	-	Zanzibar Climate Change Alliance
ZADEP	-	Zanzibar Development Plan
ZCCSC	-	Zanzibar Climate Change Steering Committee
ZCCS	-	Zanzibar Climate Change Strategy
ZDV	-	Zanzibar Development Vision
ZEMA	-	Zanzibar Environment Management Authority
ZNCCIA	-	Zanzibar National Chamber of Commerce, Industry and Agriculture

Abstract

Climate change presents significant challenges to Zanzibar, threatening its socio-economic stability due to its reliance on climate-sensitive sectors like agriculture, fisheries and tourism. The archipelago is increasingly vulnerable to rising sea levels, coastal erosion and unpredictable weather patterns, undermining livelihoods and intensifying socio-economic disparities. Strengthening governance frameworks to address climate change impacts is critically important to enhance adaptive capacity, strengthen resilience and reduce the vulnerability of affected communities.

Employing the Climate Change Adaptation Policy Credibility (APC) framework embedded within a mixed research design, this study explores the adequacy of Zanzibar's governance frameworks in fostering climate change adaptation. Key findings indicate that while Zanzibar has made commendable progress in developing policies and legislation, including the Zanzibar Environmental Policy (2013), Zanzibar Climate Change Strategy (2014) and Zanzibar Environmental Management Act (2015), persistent gaps hinder their effective implementation. The gaps include weak institutional coordination, inadequate funding, limited technical capacity and a lack of comprehensive monitoring, evaluation and reporting (MER) mechanisms. Presently, coastal communities benefit more from adaptation initiatives, leaving inland shehias disproportionately vulnerable. Community-led efforts such as mangrove restoration and upland farming demonstrate resilience but require better support and integration into broader governance frameworks.

To address these issues, the study recommends several actionable measures. These include:

- Strengthening institutional coordination through delineation of roles and responsibilities, enhancing public awareness and fostering public-private partnerships for climate initiatives.
- Tailoring adaptation strategies to address geographic disparities and integrating local knowledge into national planning.
- Establishing a dedicated climate adaptation fund and accelerating carbon trading frameworks to improve financial resource mobilisation.

Additionally, initiatives to build institutional capacity (both national and local) and the development of a robust MER system are vital to track progress and refine strategies effectively. The findings underscore the urgent need for cohesive and inclusive governance systems that empower local communities while fostering stakeholder collaboration. By addressing these gaps, Zanzibar can enhance its resilience to climate impacts and align its adaptation efforts with global policies and initiatives.

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1 | Introduction

1.1 Background information

Climate change is a pressing challenge that significantly impacts socio-economic development and well-being worldwide. Its effects are especially severe in developing countries, undermining poverty reduction and sustainable development efforts. Small island nations are particularly vulnerable due to their reliance on climate-sensitive sectors and limited adaptive capacity (URT 2012).

Zanzibar exemplifies the vulnerabilities faced by small island nations. The archipelago is already experiencing severe climate impacts, including rising temperatures, extreme weather events, floods, droughts, saltwater intrusion and increased health risks from vector-borne and waterborne diseases. Rapid urbanisation, unsustainable natural resource use and poorly planned tourism exacerbate these challenges, imposing significant socio-economic and livelihood pressures on the population (Chen et al., 2016; Omar 2019). Strengthening governance frameworks to address climate change is a key challenge that must be prioritised (Brasseur & Van Der Pluijm 2013; Williams et al. 2020). Globally, frameworks like the United Nations Framework Convention on Climate Change (UNFCCC) and National Adaptation Plans (NAPs) aim to enhance adaptive capacity, strengthen resilience and reduce vulnerability (UNFCCC 2017; Williams et al. 2020). The NAPs guide the implementation of climate adaptation actions by identifying medium- and long-term priorities, particularly for low-income regions disproportionately affected by climate change (Brasseur & Van Der Pluijm 2013; Williams et al. 2020). However, in many African countries, including Tanzania, weak institutional capacity and limited resources hinder effective implementation, particularly at the local level. Recognising the urgency of climate adaptation, the Revolutionary Government of Zanzibar (RGoZ) has introduced governance frameworks to address these challenges. Key initiatives include the 2013 Environmental Policy with a climate change focus, the 2014 Climate Change Strategy to promote resilience and sustainability, and the revised Zanzibar Environmental Management Act of 2015. These measures aim to integrate climate change adaptation into policies, plans and activities across sectors and governance levels, aligning with the Zanzibar Development Vision 2050 (ZDV 2050) and the United Nations Sustainable Development Goals (SDGs). Despite these governance frameworks, Zanzibar still grapples with the impacts of climate change, showing an adaptation deficit.

Zanzibar's efforts highlight the critical need to strengthen governance mechanisms to effectively support its climate adaptation efforts to reduce vulnerability and ensure the sustainability of its ecological and socio-economic systems.

1.2 Research context

Zanzibar, a semi-autonomous region of Tanzania, comprises two main islands, Unguja and Pemba, along with 53 islets covering 2,654 square kilometres. Administratively, Zanzibar is divided into five regions, 10 districts and 380 shehias . Based on data from the 2022 census, the archipelago has a population of 1,889,773 with a population growth rate of 3.7 percent annually (URT 2022a, 2022b). Urbanisation and tourism have increased population density, especially in areas like Zanzibar Town, which houses nearly 50 percent of the population.

Zanzibar relies heavily on activities related to the blue economy, with coastal and marine resources central to its socio-economic development. Key economic sectors include agriculture, fisheries and aquaculture, tourism, trade, industries and services. Although the COVID-19 pandemic caused GDP growth to plummet from 7 percent in 2019 to 4.7 percent in 2020, data from the International Monetary Fund (IMF) indicate a recovery in economic growth with GDP rebounding to 6.1 percent in 2024 and per capita income rising to USD 1,200 (TanzaniaInvest 2025). However, women and youth in rural and coastal areas, particularly those who are reliant on agriculture, fisheries and informal tourism activities, remain disproportionately vulnerable to economic shocks and environmental changes. Zanzibar's climate, shaped by monsoonal winds from the Indian Ocean, features distinct wet and dry seasons

A tourist feeding giant turtles at the Prison Island, Zanzibar

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critical to agriculture, fisheries and tourism. However, this reliance on natural resources, coupled with rising sea levels, coastal erosion and unpredictable weather patterns, makes Zanzibar highly susceptible to climate change impacts. These challenges threaten livelihoods, disrupt economic pillars and exacerbate vulnerabilities among densely populated and marginalised communities. Therefore, addressing climate change is essential to enhance resilience and ensure sustainable development within Zanzibar's unique socio-political and environmental context.

1.3 Research problem

The Revolutionary Government of Zanzibar's efforts to address climate change through policies, strategies and regulatory measures are commendable. However, persistent environmental challenges and the continuing impacts of climate change highlight a significant adaptation deficit that hampers the island's ability to respond effectively to these threats (RGoZ 2013). This deficit risks Zanzibar's long-term development goals and disproportionately affects local communities whose livelihoods depend on climate-sensitive natural resources (Greene et al. 2020; UNDP 2024). Research indicates that policy formulation alone does not adequately address climate vulnerabilities (Esteve et al., 2018; Goodwin 2003). Olazabal et al. (2019) emphasise that policies often fail to translate into actionable strategies, and Millard-Ball (2013) notes that local authorities frequently reiterate existing approaches without achieving tangible reductions in emissions or resilience improvements. Although considerable research has been conducted on topics such as the economics of climate change (Watkiss et al. 2012), climate impacts and adaptation in Zanzibar (Azzan, 2016; Omar 2019; Cleyndert et al. 2021), and practical measures for addressing climate change (Mustelin et al. 2019), few studies have examined the role that governance frameworks play in guiding and monitoring adaptation at the local level.

Recognising the urgent need to address these adaptation challenges, this study was conceived to examine the adequacy of Zanzibar's governance framework to support effective climate change adaptation strategies. The study assesses the effectiveness of institutions, policies, laws, regulations and plans in driving climate adaptation strategies, with particular emphasis on their integration into local government planning processes. The analysis explores whether the observed adaptation deficit arises from gaps in policy design, shortcomings in implementation approaches, limitations in institutional capacity or a combination of these and other factors. Furthermore, the study situates climate adaptation within Zanzibar's distinct socio-economic, cultural and political contexts. This comprehensive approach aims to provide actionable insights for optimising governance systems to enhance resilience and foster Zanzibar's sustainable development.

1.4 Research objectives

The principal objective of the research is to broaden the understanding of how governance frameworks can effectively promote climate change adaptation strategies in Zanzibar. The specific objectives of the study are to:

- Assess the adequacy of governance frameworks in mainstreaming locally-led adaptation strategies into the local government planning cycle;

- Examine the current practice and locally-led adaptation measures implemented at the community level; and
- Analyse the opportunities and challenges that hinder the effective implementation of the planned adaptation strategies and activities at the local level.

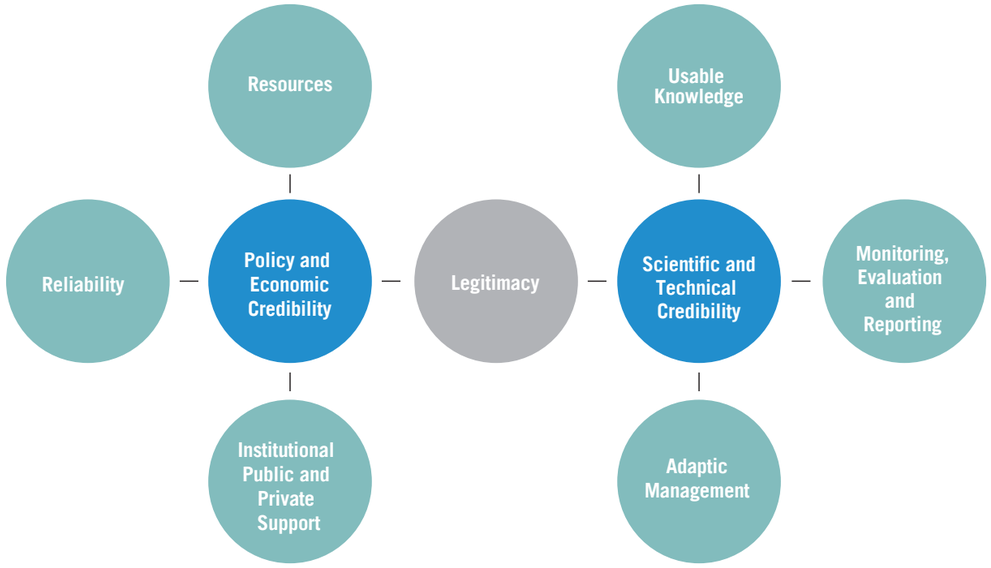
1.5 Conceptual framework

Governments worldwide, including developing countries like Tanzania, have implemented various strategies to address climate change impacts. The effectiveness of these strategies depends on the reliability of policies and regulatory frameworks guiding their implementation and monitoring. This study adopted the Climate Change Adaptation Policy Credibility (APC) Framework developed by Olazabal et al. (2019) to evaluate the likelihood that these frameworks in Zanzibar effectively respond to climate impacts and remain sustainable over time (Figure 1).

The study assesses Zanzibar's governance frameworks through three key dimensions: Policy and Economic Credibility, Scientific and Technical Credibility, and Legitimacy. Policy and Economic Credibility examines resource availability, reliability of past and current implementation efforts, and institutional and stakeholder support. Scientific and Technical Credibility focuses on generating usable knowledge, establishing monitoring and evaluation systems, and enabling adaptive management to refine strategies as conditions change. Legitimacy integrates these dimensions, ensuring a holistic evaluation of the governance system's ability to drive and sustain climate adaptation efforts.

By focusing on these governance dimensions, the study comprehensively analyses the strengths, gaps and opportunities in Zanzibar's climate change adaptation framework. It highlights how effective governance systems, grounded in credible policies and robust stakeholder engagement, can enhance resilience and support sustainable development. The findings inform future improvements in policy design, implementation approaches and institutional capacity to address climate challenges effectively.

Figure 1: Climate Change Adaptation Policy Credibility (APC) Framework



Source: Adopted from Olazabal et al (2019), p. 281.

2 Study approach and methodology

2.1 Study approach

This study adopted an exploratory research design, employing qualitative methods to meet its objectives. Integrating theoretical and conceptual perspectives with practical realities in evaluating Zanzibar's policies and governance structures for climate change adaptation ensured that the study was firmly rooted in established knowledge while remaining responsive to the island's distinct socio-political and environmental contexts. This approach enhanced the study's relevance and applicability, addressing Zanzibar's unique challenges and leveraging its specific opportunities for effective climate adaptation.

The methodology and data collection tools were informed by a comprehensive literature review, which examined relevant studies (Göpfert et al. 2018; Magnan 2016; Ojwang et al. 2017; Rosendo et al. 2018) on climate change adaptation, the concept of credibility in adaptation policymaking and the factors influencing policy effectiveness. This review provided the foundation for assessing the credibility of the governance frameworks in fostering climate change adaptation in Zanzibar. For the APC Framework, Olazabal et al. (2019) identified 17 indicators and 53 assessment metrics (Annex I). These metrics were used to develop the study's assessment tools (unstructured questionnaires for interviews and focus group discussions), which were further refined and customised to reflect the unique context of Zanzibar. This contextualisation process ensured that the assessment framework accurately captured the island's specific governance, socio-economic and environmental conditions (RGoZ 2013, 2014, 2015, 2021; Omar 2019). Detailed descriptions of the indicators and metrics and interview questions guided data collection and analysis.

2.2 Data collection methods

The study employed qualitative methods for data collection, including key informant interviews (KIIs), focus group discussions (FGDs) and semi-structured interviews across governance levels and sectors in Zanzibar. Officials from 12 ministries, departments and agencies (MDAs) participated in the KIIs, and they also responded to the evaluation tool as part of the semi-structured interviews. With the aid of research assistants for note taking, the co-researcher led the discussion by reading out the questions with adequate clarification for the interviewees to understand and respond. The KIIs and completion of the evaluation tool questions took about one hour and thirty minutes. In addition, representatives from 5 non-government organisations (NGOs) and 4 community groups in Unguja and Pemba participated in the KIIs (Annex III). Prior to data collection, stakeholder and institutional mapping were conducted to identify key actors in climate change governance. Then, purposive sampling was employed to ensure the inclusion of participants and locations with relevant knowledge and involvement in climate adaptation policies and strategies.

Data collection was conducted in four regions: two from Unguja and two from Pemba. The selection of the four regions was based on geographic representation, ensuring coverage of Zanzibar's main islands. From each region, two districts were selected. In this way, eight of Zanzibar's eleven districts were included in the study to capture administrative and environmental variations. Five shehias (the lowest administrative unit in Zanzibar) were purposively selected within each district (40 shehias in total) for local-level data collection. At the shehia level, the sampling strategy also prioritised diversity, incorporating the perspectives of women, youth and elderly groups. This purposive sampling ensured a comprehensive understanding of climate-related issues across different demographic groups.

2.3 Data analysis_

The evaluation tool was designed using qualitative indicators and metrics framed as closed questions (e.g., Yes or No). Positive responses, which indicated a contribution to the policy's credibility, were awarded 1 point, while negative responses received 0 points. For

open-ended questions, such as those addressing the plan's budget or the number of measures included, a specific evaluation method was developed to translate quantitative data into binary scores of 1 or 0. A lack of information or clarity in the documents or official responses from authorities was interpreted as low credibility, resulting in a score of 0.

The data were analysed to measure policy credibility in fostering adaptation, with the accompanying graph displaying each indicator's performance against its maximum potential as a fractional score. These scores are defined on a Likert scale where 0-0.2 is "very poor", 0.3-0.4 is "poor", 0.5-0.6 is "average", 0.7-0.8 is "good" and 0.9-1.0 is "very good". Each indicator's score was calculated as a ratio of the total number of positive scores that scored 1 to the total number of anticipated scores for the indicator in that particular component. For example, the "Funding" indicator scored 0.4 based upon 3 of its 7 anticipated scores in the "Resources" component being positive. The descriptions of the final indicator and metric scores are presented as Annex II. The scores from all metrics across the indicators were aggregated to construct the composite credibility index (Olazabal et al. 2019). The maximum positive credibility score was 40 out of 68 anticipated scores from the metrics developed. Qualitative data from KIIs and FGDs were documented through field notes and verbatim transcripts.

Transcripts, originally in Kiswahili, were translated into English and compiled with field notes according to emerging themes centered around awareness of climate change adaptation strategies, perceived climate impacts and local adaptation measures, including associated challenges and opportunities. The dataset was cleaned by removing personal identifiers, eliminating stop words and filler expressions, and standardising text to lowercase to ensure consistency and minimise distortion. The processed texts were then subjected to textual frequency analysis using wordclouds.com, which generated word clouds to visually highlight the most recurrent themes. In-depth content analysis was further performed to complement the thematic analysis, thereby strengthening the interpretation of findings with nuanced insights and contextual depth as argued by Eriksson and Kovalainen (2016).

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3 Results and discussion

3.1 Zanzibar Climate Change Governance Framework

In Zanzibar, governance frameworks encompass a range of policies, legislation and regulations designed to address climate change-related risks. Key instruments include the Zanzibar Environmental Policy (2013), the Zanzibar Climate Change Strategy (2014) and the Zanzibar Environmental Management Act (2015). Additionally, sector-specific policies and legislation, including those related to forestry, tourism, fisheries, land use, agriculture and water resources, have been developed. These frameworks establish institutional mechanisms to oversee, implement, coordinate and monitor climate change initiatives at both national and local levels, ensuring a cohesive approach to managing climate-related challenges.

3.1.1 Policy and legal framework

Zanzibar's approach to sustainable development is guided by the Zanzibar Development Vision 2050 (ZDV 2050), which outlines a long-term strategy for green and blue economic growth. The ZDV 2050 prioritises climate resilience, sustainable natural resource management and the establishment of climate financing mechanisms. It also emphasises the need to strengthen research capacities to address climate challenges, aligning with broader national and global development goals.

The Zanzibar Environmental Policy (2013) recognises the region's vulnerability to climate change and sets objectives to mitigate associated risks. It focuses on enhancing climate governance, fostering stakeholder coordination and promoting public awareness. The policy also advocates for international cooperation and the establishment of financing mechanisms to support climate adaptation and mitigation efforts.

The Zanzibar Climate Change Strategy (ZCCS) (2014) provides a road map for addressing climate change impacts across key sectors. It identifies strategic priorities, including disaster risk management, resilient coastal ecosystems, climate-smart agriculture, sustainable forestry and low-carbon tourism. The strategy integrates cross-sectoral themes to build adaptive capacity and address Zanzibar's unique vulnerabilities.

In 2024, the RGoZ launched the Green Legacy Programme to promote tree planting to build a green and climate-resilient Zanzibar. This initiative aims to enhance environmental integrity, improve social livelihoods and foster a green economy. The programme is considered a game changer for encouraging long-term commitment to addressing the impacts of climate change and aligning with global trends in environmental sustainability. Additionally, it provides significant opportunities for employment and investment in Zanzibar. The programme focuses on four strategic areas: stakeholder involvement and participation, sustainable tree planting and management, alternative energy sources, and partnership and resource mobilisation. Together, these efforts complement the government's initiatives to implement environmental policies and climate change strategies in Zanzibar. Anchoring these efforts is the Environmental Management Act (2015), which establishes the legal framework for environmental and climate change governance. The Act established the Zanzibar Environmental Management Authority (ZEMA) and required the creation of climate change units within ministries and local government authorities (LGAs). This institutional structure ensures coordinated implementation of climate adaptation and mitigation initiatives, reinforcing Zanzibar's commitment to sustainable development.

These frameworks collectively highlight Zanzibar's proactive stance in addressing climate change, ensuring that policy and legislation are well-aligned with the region's socio-economic and environmental challenges.

3.1.2 Institutional framework

The authority over environmental conservation and climate change issues in Zanzibar is centralised under the First Vice President's Office (FVPO). This office supervises the Zanzibar Environmental Management Authority (ZEMA) and the Department of Environment (DoE), which houses the Division for Climate Change. The DoE is responsible for developing environmental and climate change management regulations, guidelines and strategies, while ZEMA is tasked with implementing and enforcing these measures.

An Environmental Advisory Committee supports the governance framework by guiding policy implementation, strategies and management plans. This committee includes key stakeholders such as the Director of Environment, representatives from institutions managing non-renewable resources, LGAs, disaster risk management, public health, and the Zanzibar National Chamber of Commerce, Industry and Agriculture (ZNCCIA). The committee is chaired by the Principal Secretary responsible for environmental management.

Additionally, the governance framework mandates the establishment of climate change units in every ministry and LGA. These units coordinate climate-related initiatives and integrate environmental norms and climate change adaptation and mitigation measures into their respective policies, plans, programmes and activities. This ensures a cohesive approach to addressing climate change across sectors.
Government MDAs in Zanzibar play varied but uneven roles in climate-related policy processes. The First Vice President's Office, in collaboration with donors, spearheads the formulation of key strategies, such as the Climate Change Adaptation Strategy (2014) and the National Adaptation Plan (2022-2024), aligning them with broader frameworks like the ZDV 2050 and the five-year Zanzibar Development Plans (ZADEPs). ZEMA supports these efforts through compliance monitoring and conducting environmental impact assessments (EIAs). The President's Office, Finance and Planning, via the Zanzibar Planning Commission (ZPC), consolidates and coordinates sectoral plans, screens project proposals for alignment with national priorities and oversees budget allocations.

Sector ministries incorporate climate considerations into their plans to varying extents. For instance, the Ministry of Agriculture, Irrigation, Natural Resources and Livestock promotes climate-smart agriculture. At the same time, the Ministry of the Blue Economy and Fisheries integrates indigenous knowledge into policies, such as the Blue Economy Policy (2020). The Ministry of Water, Energy and Minerals focuses on renewable energy and waste-to-energy projects. Supporting institutions, such as the Tanzania Meteorological Authority (TMA) Zanzibar, provide critical climate data, and the President's Office, Regional Administration, Local Government and Special Departments (PORALGSD) facilitate local-level planning through LGAs. NGOs and civil society organisations (CSOs) enhance these efforts by raising awareness and advocating for local climate adaptation. Despite these initiatives, coordination, capacity and integration gaps persist, posing significant challenges to effective implementation.

3.1.3 Coordination

In Zanzibar, climate change coordination mechanisms are guided by the 2013 Environmental Policy and the 2015 Environmental Management Act. These mechanisms include procedural and organisational arrangements integrating environmental and climate change issues into decision-making processes.
The approach emphasises vertical and horizontal coordination to mainstream climate change considerations across governance levels and sectors.

3.1.3.1 Vertical coordination

Vertical coordination ensures the integration of climate change issues across governance levels, from national to local. It includes mechanisms such as councils, commissions and committees that facilitate cooperation and the implementation of climate change activities through consultation, awareness-raising and information sharing. The Environmental Management Act supported this by establishing the Department of Environment within the First Vice President's Office, the Zanzibar Environmental Management Authority, and climate change units within ministries and LGAs. Additionally, CSOs, NGOs, community groups and private institutions play a vital role in climate change adaptation efforts at the grassroots level.

3.1.3.2 Horizontal coordination

Horizontal coordination fosters collaboration among MDAs at the national level. In Zanzibar, the inter-ministerial and cross-departmental bodies responsible for coordinating climate change and environmental management activities include the Environmental Advisory Committee and the Zanzibar Climate Change Steering Committee (ZCCSC). The ZCCSC is responsible for coordinating the implementation of the national climate action plans or NDCs, providing policy guidance and ensuring coordination of climate change actions and cross-sectoral participation. The ZCCSC comprises the Principal Secretaries from sector ministries responsible for Energy, Finance, Industry, Natural Resources, Justice and Constitutional Affairs, Land, Agriculture, Livestock Development, Foreign Affairs, and International Cooperation. The Principal Secretary from the FVPO chairs the committee meetings.

Photo credit: iStock / Denys Rzhanov

Vanilla beans at a spicy farm in Zanzibar

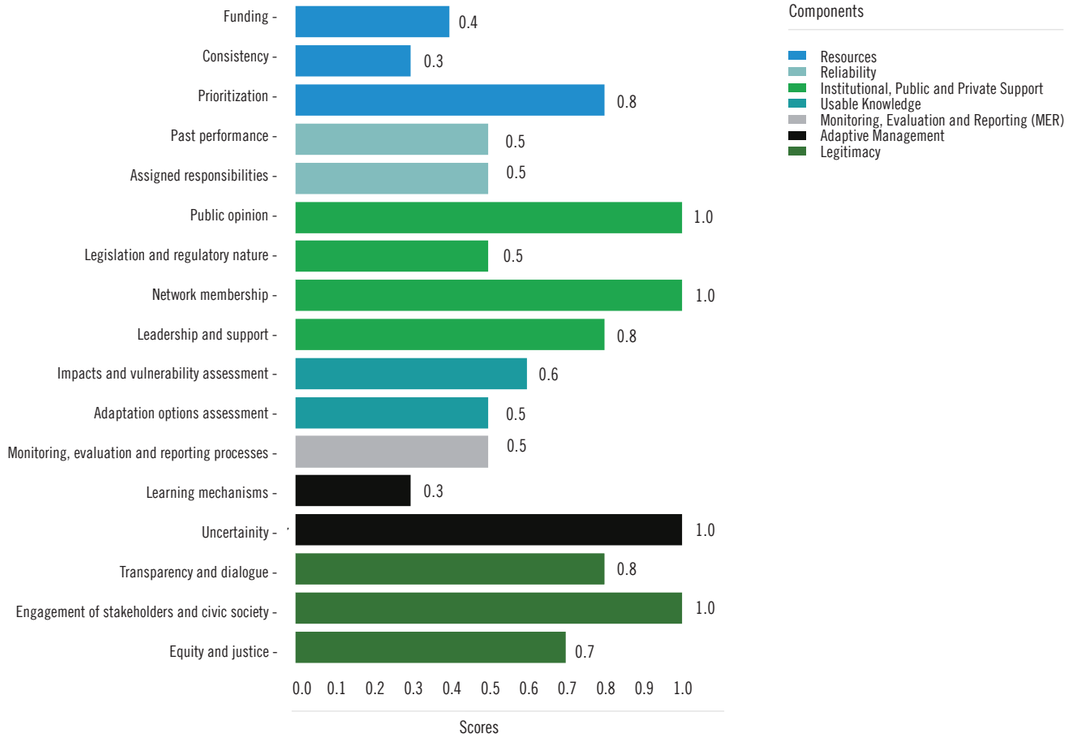
3.2 Credibility of Zanzibar's Climate Change Adaptation Policy Framework

The credibility of Zanzibar's Climate Change Adaptation Policy Framework was assessed through evaluation tools developed from the indicators and assessment metrics scores, interviews and focus group discussions conducted with MDAs, districts and shehias, which captured participants' insights regarding the credibility of the regulatory frameworks that underpin the Climate Change Adaptation Policy Framework.

The assessment recorded an overall credibility score of 0.59 for Zanzibar's climate change adaptation strategy based on the positive responses reported for 40 out of the total of 68 questions in the study evaluation tool (see matrix in Annex II). This average total score reflects a mixed performance across the three key dimensions of credibility, reflecting a moderate but uneven level of readiness and effectiveness in advancing climate adaptation goals.

Strengths were evident in public awareness, stakeholder engagement, international partnerships and uncertainty awareness, all of which received high scores. These demonstrate that Zanzibar benefits from strong community perception of climate risks, wide involvement of civil society, and active participation in regional and international climate networks. However, the study also identified systemic weaknesses that undermine long-term resilience. Resource mobilisation remains heavily dependent on external donors, while domestic budget allocations for climate adaptation are limited and inconsistent. Further discussion of the credibility components is presented in the sub-sections below.

Figure 2: The credibility of governance frameworks



3.2.1 Economic credibility

As illustrated in Figure 1 and detailed in Annex I, Zanzibar's policy and economic credibility in climate adaptation frameworks hinges on the metrics for three components of the model: effective mobilisation of resources, institutional reliability and mechanisms for public-private support.

3.2.1.1 Resources

Results presented in Figure 2 show that both the "Funding Sources" and "Consistency in Funding" for climate adaptation scored 0.4 and 0.3 respectively, which are both considered poor in the credibility index. This is mainly because climate adaptation projects in Zanzibar rely heavily on external funding from development partners like the World Bank, United Nations Development Programme (UNDP), European Union (EU), some projects based in mainland Tanzania and various NGOs, rather than the national budget. "Prioritisation and timing" of this funding scored 0.8, which is rated as good on the credibility index because the majority of the donors (who also provide budget support) prioritise climate adaptation. Constrained funding conditions and limited government budget allocations pose substantial barriers to effective implementation. For example, three out of ten institutions engaged in environmental and climate adaptation activities reported receiving their allocated funds, highlighting a significant shortfall in domestic resource mobilisation for climate-related initiatives. In theory, the source of funds dictates their usage. This is particularly concerning in the context of Zanzibar, where such constraints are reflected in existing challenges.

3.2.1.2 Reliability

The past performance of adaptation policies is important for the credibility of current policies. However, "Past Policy Performance" scored poorly (0.3) in the credibility index, mainly due to insufficient funding, limited scientific and technical capacity within the RGoZ, and low engagement from private entities and businesses. MDAs reported significant gaps in human resources, particularly a lack of climate change experts, who could necessitate clearer responsibilities and enhanced institutional capacity to bolster the credibility of the Zanzibar Climate Change Strategy (ZCCS).

In addition, the provision of human resources to implement planned actions is essential to demonstrate readiness for adaptation and, hence, credibility of the plan. Despite the average score for "Assigned Responsibilities" of 0.5 in the credibility index, findings from discussants at the district level revealed that the lack of climate change experts/officers to support climate change adaptation efforts at the local level is a significant challenge. Although each district has an environmental officer, their mandate, as outlined in the Environmental Management Act (2015), is primarily focused on compliance and enforcement issues related to environmental management rather than direct support for adaptation initiatives, as they report to ZEMA and not FVPO-DoE. Furthermore, the ZCCS's partial integration into planning departments' roles and resource allocations highlights inconsistencies in its application across sectors.

3.2.2 Institutional, public and private support

3.2.2.1 Public opinion/support

The maximum scores for "Public Opinion and Support" (1.0) and "Network Membership" (1.0) in the credibility index (Figure 2) indicate that public awareness and risk perception of climate change and the connection of FVPO-DoE with networks of international, regional and national level actors who are engaged in climate action were key strengths of adaptation readiness and policy implementation in Zanzibar. Strong public awareness and partnerships with key actors both support policy development and implementation and are important in achieving policy objectives. However, while the Climate Change Strategy emphasises public awareness and community engagement through public meetings, workshops and participatory planning, discussions with key informants revealed inconsistencies in awareness-raising efforts. Efforts to date have been concentrated at the national level. At community level, representatives of the shehias reported limited training or workshops on climate change, while others only encountered the topic during political meetings or media coverage, often without sufficient understanding. Landlocked shehias were particularly disadvantaged, as NGOs primarily focus on coastal and marine-related initiatives. This lack of meaningful engagement and awareness diminishes grassroots support for adaptation actions.

3.2.2.2 Private support

The private sector's role in supporting climate change actions remains underdeveloped despite its acknowledgement in the Zanzibar Climate Change Strategy (2014) and relatively good score in the credibility index (0.8) as part of "Leadership and Support" (Figure 2). Public-private partnerships for renewable energy and resource efficiency are mentioned but are confined mainly to a few sectors, such as tourism, and often lack a direct link to climate change initiatives. Though awaiting formal guidelines, carbon trading was identified as a promising avenue for private-sector engagement in climate change action. However, private stakeholders showed limited understanding of potential incentives and opportunities in climate adaptation efforts. Encouraging investment in low-emission technologies, creating awareness of benefits and establishing clear roles for private actors were highlighted as key attributes that could unlock significant contributions from the private sector to Zanzibar's climate resilience goals.

3.2.2.3 Legislation and regulations

Although the credibility index indicates an average score for "Legislation and Regulations Nature" (0.5), which may be attributed to Zanzibar's existing institutional frameworks, discussants from MDAs identified significant coordination challenges among ministries and local government authorities. These challenges undermine the capacity of institutions to support climate adaptation initiatives effectively despite the high level of public awareness on climate change and readiness to support climate change adaptation. This is likely why many core ministries affected by climate change lack dedicated adaptation programmes. Instead, current initiatives often address climate-related impacts incidentally during the implementation of other activities rather than as part of a deliberate strategy. Furthermore, these activities are rarely reported to the FVPO-DoE, which limits their inclusion in the monitoring of the national climate change strategy.

3.2.2.4 Leadership and support

Climate adaptation plans need strong political leadership and authority that builds external and internal legitimacy. The political support in the implementation of the Zanzibar Climate Change Strategy and plans appears to be good (0.8 score) on the credibility index. This may be due to supporting national regulations and guidelines for the development of plans, which provide a conducive environment to organise action and actors, including non-government partners outside the FVPO-DoE, which is the designated government entity responsible for coordinating climate change and environmental issues in Zanzibar. Despite the existence of FVPO-DoE as a dedicated public climate change body and the support of the upper tiers of the RGoZ and the private sector, the DoE lacks district-level representation and relies on other MDAs to advance climate change initiatives through their district officers. This dependency significantly reduces the DoE's effectiveness in coordinating the implementation of the ZCCS.

3.2.3 Scientific and technical credibility

3.2.3.1 Usable knowledge

The Zanzibar Climate Change Strategy (2014) underscores the significance of vulnerability and impact assessments as a foundation for adaptation actions, which is reflected in the score of 0.6 for the "Impacts and Vulnerability Assessment" and the score of 0.5 for the "Adaptation Options Assessment" in the credibility index (Figure 2). Despite these scores, findings from assessment studies identified gaps in comprehensiveness and integration (e.g., RGoZ 2021, Semboja 2021). For instance, while assessments highlight risks like coastal erosion, flooding and reduced agricultural productivity, they often lack details on cascading impacts and emerging vulnerabilities, such as saltwater intrusion and its effects on livelihoods. Moreover, although local knowledge is sometimes included, it is not systematically integrated with scientific research, limiting the utility of the knowledge produced. Considering climate adaptation research to date, previous local adaptation tracking studies have shown the importance of international climate networks and actors in engaging stakeholders in climate action.

3.2.3.2 Monitoring, evaluation and reporting (MER)

Decision-makers tend to consider uncertainties in their adaptation decisions, and thus, the ability to manage uncertainty is paramount in the design and planning of adaptation strategies. Zanzibar's Climate Change Strategy (2014) emphasises the need to track progress effectively, yet it falls short of providing a clear MER framework. Discussions revealed that while MER systems exist within the government structures, which is indicated in the credibility index score (0.5) in Figure 2, they were developed to cater to the needs of other sectors, such as education and health. MER mechanisms specific to climate change initiatives remain underdeveloped. While some projects, such as mangrove restoration and seawall construction, have sector-specific monitoring, a standardised framework or centralised repository to track climate change adaptation outcomes is missing. This deficiency undermines the ability to assess progress, measure success and identify areas for learning and improvement. Establishing a robust and transparent MER system with clear indicators and timelines is critical to improving technical credibility and ensuring the accountability and sustainability of the adaptation measures.

3.2.3.3 Adaptive management

Adaptive management within the 2014 strategy is hindered by limited flexibility and inadequate planning for uncertainties. Although "Uncertainty Awareness" achieved a high score of 1.0 in the credibility index (Figure 2), primarily attributed to sectoral awareness and stakeholder consultations on climate change-related issues, findings indicate that MER reports are not consistently translated into actionable plans, and evaluation of policies and plans are yet to be conducted to inform decision-making processes. Learning from the MER reports is limited, as indicated in the credibility index with a poor score of 0.3. Learning and adaptive management are goals of the evaluation of climate adaptation processes and progress. Adaptation management requires flexibility so that alternative adaptation pathways can be adopted to replace those that no longer meet the specified objectives. For instance, some strategies, such as the Zanzibar Blue Economy Policy, incorporate risk management processes yet often lack explicit clarity on how diverse scenarios and a broad spectrum of potential outcomes are accounted for. Enhancing the credibility of climate adaptation policies requires a rigorous evaluation of alternative options against multiple criteria and the adoption of flexible management approaches that extend beyond climate-related uncertainties. Moreover, coastal protection measures lack contingency plans for extreme events and insufficient preparation for tipping points where current actions may fail. Although the strategy acknowledges uncertainty, its implementation remains limited. Ministries and departments reported having dedicated desks for adapting to new climate risks, but these efforts need better planning and coordination as well as dedicated experts to enhance effectiveness.

3.3 Legitimacy

3.3.1 Transparency

Transparency in policy processes is important for plans to be legitimate within the administrative entities responsible for creating and implementing the plan. The Zanzibar Climate Change Strategy (2014) recognises transparency as essential for fostering trust and clarity. It also promotes public dialogue and the availability of information. While "Transparency and Dialogue" achieved a high score of 0.8 (Figure 2), significant gaps in promoting transparency were noted. Inter-ministerial meetings and forums for dialogue are inconsistently organised and often underfunded, leaving communities and local governments with inadequate access to information about climate-related policies and projects. Furthermore, legal enforcement of climate change mitigation measures is weak, with offenders, such as those cutting mangroves illegally, often facing little to no consequences. This undermines trust in the governance framework. Structured and adequately funded systems for transparent communication—such as public forums and accessible data platforms—are necessary to enhance legitimacy and public acceptance.

3.3.2 Stakeholder engagement

The participation of the public, communities, organisations and businesses is an important element in adaptation decision-making. Although in the credibility index analysis, the "Engagement of Stakeholders and Civil Society" indicator achieved the highest score of 1.0 (Figure 2), stakeholder engagement has largely been driven by NGOs, CSOs and donor-funded projects, such as Community Forest Pemba (CFP) and CAN

International, which provides technical assistance and raises awareness. Nevertheless, these engagements are often tied to project life cycles, leaving gaps in long-term sustainability and integration into national planning. Engagement with the private sector remains limited, with minimal incentives for participation. At the grassroots level, most adaptation measures are implemented by community-based groups with limited knowledge, funds and institutional support, highlighting the need for sustained capacity building and financial backing. The adoption of the Zanzibar Green Legacy Programme will intensify the engagement of stakeholders in environmental management and the greening process. Importantly, this initiative will foster the involvement of stakeholders and individuals with diverse types of relevant expertise.

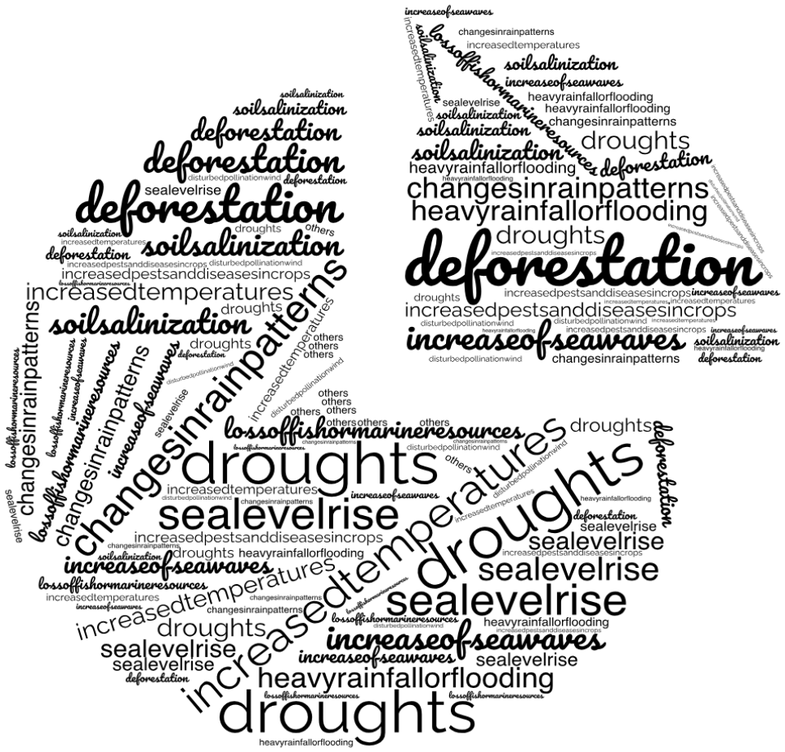
3.3.3 Equity and justice

Equity and justice are fundamental aspects of effective climate change adaptation. Although this indicator achieved a good score of 0.7 in the credibility index (Figure 2), results further show geographic disparity in how climate adaptation efforts are distributed in Zanzibar. Most adaptation initiatives focus on coastal and marine areas, neglecting inland shehias that face challenges like droughts and water scarcity. This imbalance has left inland communities vulnerable, with limited government interventions and civil society support. It is worth noting that adaptation is inherently spatial, and social factors such as equity and vulnerability are often reflected in geographic patterns. Unfortunately, social factors are frequently overlooked in policy decisions compared to physical factors. Achieving social and gender equity in climate adaptation requires meaningful participation, mainly through community engagement and advocacy. Identifying the direct and indirect beneficiaries of adaptation initiatives is crucial for promoting fairness and inclusiveness. However, gender and social equity remain inadequately addressed in climate actions in Zanzibar. Women, who are central to agriculture, seaweed farming and fishing-related activities, face significant climate change impacts yet receive minimal targeted support. Similarly, youth, another vulnerable group, encounter limited opportunities for empowerment. Additionally, declining agricultural productivity and fishing catches have intensified social tensions and psychological distress. To ensure equitable climate adaptation, dedicated initiatives must be implemented to address the specific needs of these vulnerable groups.

3.4 Climate change impacts and awareness

Climate change awareness in Zanzibar varies significantly between local and central government levels and across different geographic locations. While climate change is recognised as an important part of the local development agenda, awareness remains low in many local communities compared to the national level.. Figure 3 highlights the perceptions of shehia members of climate change based on participants' contributions in focus group discussions. As illustrated by the larger and bolded words in the Word cloud, community members most commonly related climate change with environmental changes, such as shifting rainfall patterns (both late-onset and early cessation), rising sea levels, deforestation, soil salinity and increasing temperatures associated with droughts and prolonged dry spells. These challenges are compounded by disruptions to agriculture, fishing activities and other socio-economic practices, as wet and dry seasons lose their distinct characteristics.

Figure 3: Word cloud showing how communities at shehia level perceive climate change impacts in Zanzibar



3.4.1 Spatial variability of impacts on coastal and inland communities

Communities along Zanzibar's coast and those located inland experience varying climate change impacts (Figures 4 and 5), which are also shaped by their geographic and environmental contexts.

Communities in coastal shehias, particularly those near bays and headlands, face heightened challenges linked to sea-level rise. Saltwater intrusion into farmland and freshwater sources is a major issue, with over 200 locations reportedly affected, 80 percent of those in Pemba (Plate 1). This has degraded coastal ecosystems through beach erosion, mangrove deforestation and the loss of fish habitats, severely impacting local livelihoods reliant on fishing and farming. Additionally, the risk of inundation looms large, with projections indicating that a sea-level rise of 0.3 to 1 meter could submerge critical areas, including 19.7 km² in Unguja and 28.9 km² in Pemba, potentially disrupting tourism infrastructure and related economic activities.

In contrast, communities in inland shehias reported rainfall-related challenges, including prolonged droughts and dry spells, which have significantly reduced agricultural yields and strained livestock-keeping activities. Environmental degradation is also a pressing concern, driven by unsustainable practices like quarrying for building materials and deforestation for charcoal production. These activities have exacerbated soil erosion and water scarcity, compounding the vulnerability of inland communities.

Despite their geographic differences, coastal and inland communities share several climate change-related socio-economic challenges. Both report food insecurity and water scarcity as direct consequences of environmental stressors. Health risks, such as waterborne diseases, skin rashes, respiratory problems and stomach illnesses, are prevalent in both regions, underscoring the public health dimension of climate impacts. Additionally, biodiversity loss—manifested in the disappearance of indigenous tree species, birds like ziwade and salile, as well as kanadi and gongola fish species—has disrupted the ecosystem balance across coastal and inland areas.

The key difference is that while coastal communities are more vulnerable to sea-level rise and saltwater intrusion, inland communities bear the brunt of rainfall variability and resource depletion due to deforestation and quarrying. Coastal degradation affects the fishing and tourism industries, whereas inland degradation predominantly undermines agricultural and livestock-related livelihoods.

This spatial understanding of similarities and differences in climate change effects highlights the need for tailored climate adaptation strategies that address the unique vulnerabilities of coastal and inland communities while recognising their shared challenges. This is particularly important given Zanzibar's dependence on the climate-sensitive sectors of tourism, fisheries and agriculture, which amplifies its vulnerability.

Plate 1: Deforestation of mangroves, which led to the intrusion of sea water into Kojani Island, Wete District, Pemba North region

Figure 4: Percentage of inland shehias mentioning climate change impacts affecting their daily lives during focus group discussions with shehia committees

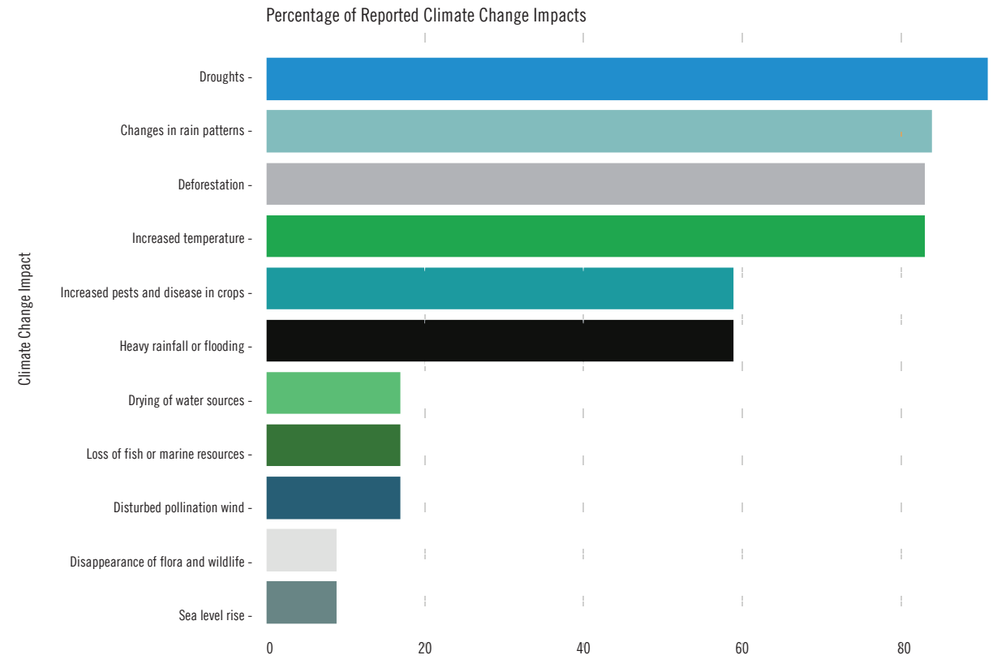
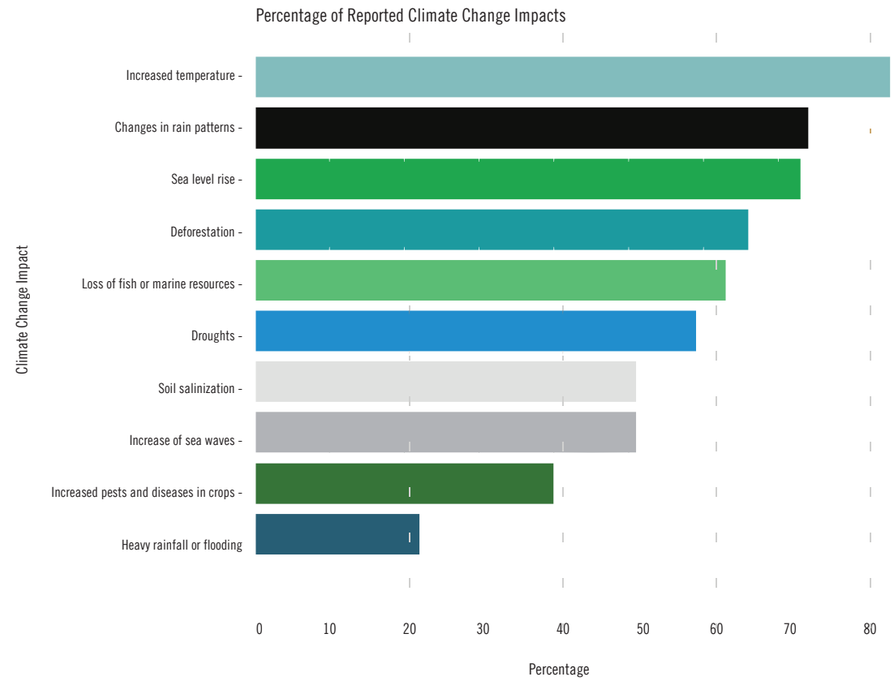


Figure 5: Percentage of coastal shehias mentioning climate change impacts affecting their daily lives during focus group discussions with shehia committees



3.5 Climate change adaptation initiatives in Zanzibar

3.5.1 Community-led adaptation measures

Zanzibar has undertaken various adaptation measures and governance initiatives to address climate change challenges, with communities playing a central role in these efforts. Results illustrated in Figure 6 highlight diverse community-driven adaptation strategies, including tree planting (e.g., mangroves and fruit trees), irrigation and construction of protective walls (Plate 2). These activities are closely tied to livelihood improvement, emphasising environmental conservation, agricultural innovation and infrastructure development.

Communities have adopted upland farming to address saltwater intrusion into lowland farms, embraced drought-resistant crops to withstand dry spells and implemented irrigation farming supported by borehole water systems. Livelihood diversification has been instrumental in building resilience, with activities such as beekeeping, livestock keeping and agroforestry (e.g., planting and cultivation of clove trees) supplementing traditional practices.

Infrastructural projects, including the construction of walls and flood barriers, are critical in adapting to the impacts of sea-level rise and saltwater intrusion (Plate 2). Wetland restoration initiatives further combat environmental degradation, reinforcing ecosystem services. Community-led efforts such as tree planting, building embankments, beach cleaning, forming environmental groups and awareness-raising activities are pivotal in fostering collective action.

These initiatives are supported and enhanced by stakeholders like the Tanzania Social Action Fund (TASAF), Mfuko wa Kuhifadhi Bahari (MKUBA) and Pemba Channel Conservation Area (PECCA), which provide technical and financial assistance and ensure the sustainability of community-driven adaptation measures. These collaborative efforts not only address immediate climate challenges but also contribute to long-term resilience and sustainable development in Zanzibar.

Plate 2: Sand embankment constructed by shehia to protect rice farms from seawater intrusion

Figure 6: Word cloud showing mitigation and adaptation measures against climate change taken by shehias in Zanzibar as mentioned by shehia members

Despite these efforts, significant challenges persist. Adaptation remains constrained by limited resources (financial and human resources), weak institutional coordination and inadequate monitoring and evaluation of the adaptation programmes. Coastal protection is hindered by issues such as crab burrowing activities that can loosen sediments and increase erosion as well as insufficient government support. Inland communities face challenges such as the lack of agricultural inputs and alternative livelihoods.

The current study noted Zanzibar's progress in establishing regulatory frameworks and initiatives like solar energy projects, sustainable landfills and clean energy cookstoves. Research participants perceived the urgency of integrated governance, enhanced community engagement and comprehensive adaptation strategies to mitigate Zanzibar's climate vulnerability. Aligning community-led initiatives with broader regulatory frameworks and scaling up efforts in clean energy and resource management are critical steps for building resilience and achieving sustainable development in the face of escalating climate risks.

3.5.2 Stakeholders' involvement and collaboration in climate change adaption

3.5.2.1 Stakeholders' involvement

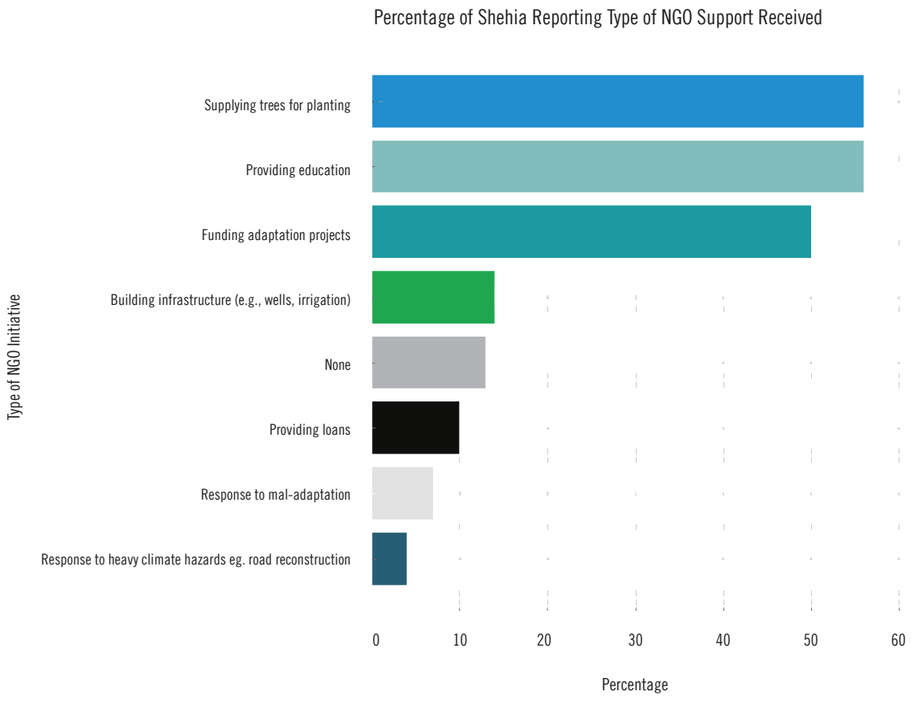
NGOs, CSOs and donors play a crucial role in bridging gaps by providing education, tools, technical expertise and funding for climate adaptation. However, this over-reliance on external support raises concerns about long-term sustainability. Most external efforts are concentrated on coastal shehias due to the high impacts of sea-level rise, coastal erosion and seawater intrusion (Figures 4 and 5 above), leaving landlocked shehias with minimal or no climate change initiatives

at the local level. Additionally, significant interest surrounds the potential carbon trading market, with some NGOs and private companies positioning themselves to invest in carbon projects. Certain communities within coastal shehias have already signed carbon trading agreements for conserving mangroves. At the national level, NGOs and donors have maintained strong partnerships, with a focus on funding strategy formulation and implementation of key initiatives. Community engagement in bottom-up planning, such as the Opportunities and Obstacles to Development (O&OD) system, is constrained by the temporary suspension of the decentralisation-by-devolution (D-by-D) approach by the RGoZ which has removed the autonomy of LGAs' operations in Zanzibar, low awareness of climate adaptation and inadequate funding. Most shehias (91 percent) lack formal plans, including those for climate adaptation and mitigation. Landlocked shehias, in particular, have not undertaken climate initiatives, relying instead on ad hoc meetings to address emerging issues. This lack of structured planning leaves communities poorly equipped to implement resilience measures against climate impacts.

3.5.2.2 Stakeholder collaboration and coordination

Collaboration in local climate adaptation involves partnerships between government agencies, NGOs and community groups (Figure 7). The First Vice President's Office supports educational initiatives and infrastructure projects, while organisations like TASAF and ActionAid engage in tree planting and environmental conservation efforts. Community groups drive grassroots adaptation measures, such as mangrove restoration and small-scale irrigation farming. Despite these efforts, weak coordination remains a major challenge. Most initiatives shown in Figure 7 were reported to be small-scale and ad hoc, lacking structured planning.

Figure 7: NGOs' support to community's adaption initiatives



3.6 Challenges and opportunities for climate adaptation in Zanzibar

3.6.1 Challenges to climate adaptation in Zanzibar

Several barriers hinder effective climate change adaptation in Zanzibar, ranging from resource limitations to institutional weaknesses and socio-economic vulnerabilities. Key challenges include insufficient financial and human resources, weak governance structures and coordination, and environmental degradation. Specific obstacles affecting the credibility and effectiveness of climate adaptation governance frameworks are outlined below.

a) Gaps in institutional arrangements
The Zanzibar Climate Change Strategy identifies gaps in institutional arrangements. While MDAs have defined roles, integration across institutions is limited with responsibilities concentrated in the FVPO-Department of Environment. The absence of district-level representation for the DoE further complicates implementation, as it relies on other MDAs without clear coordination mechanisms.

b) Fragmented coordination
Planning and operations among MDAs and between national and local governments occur in silos, undermining collaboration. Ministries and departments rarely integrate climate considerations into development plans, leading to inconsistent implementation and duplication of efforts. Focus group discussions highlighted the lack of structured inter-ministerial dialogue and weak coordination, particularly at the district level, which reduces the effectiveness of adaptation measures.

There is a disconnect between district-level planning and national-level sectoral priorities. The recent political shifts that suspended the decentralisation-by-devolution approach limit the mandates of local government authorities in the preparation and implementation of local adaptation plans and initiatives. Equally, sector representatives at the district level are inconsistently engaging LGAs in the planning cycles. This top-down approach, combined with limited horizontal coordination among sectors, hampers the mainstreaming of climate adaptation efforts. At the shehia level, the absence of formal annual plans and budgets limits their role to effectively plan and implement climate change adaptation activities. Furthermore, efforts by the Zanzibar Planning Commission to establish a climate finance mobilisation unit are also constrained by a lack of expertise.

c) Local capacity gaps in knowledge and skills
Local capacity limitations in climate modelling, adaptation planning and enforcement hinder the implementation of the strategy. MDAs heavily depend on external expertise, raising concerns about the sustainability of initiatives. Additionally, sector-specific officers working at the district level, shehia committee members and local community groups lack adequate climate change training and awareness, impeding grassroots engagement. Addressing these gaps requires investment in capacity-building initiatives and institutionalised training programmes.

d) Resource limitations
Financial resources. The over-reliance on donor funding limits flexibility and sustainability. Insufficient government budget allocations and stringent procurement processes in donor-funded projects delay project execution. Over the past six years, only 9 percent of the total budget requested by the First Vice President Office for climate change adaptation has been allocated, revealing a critical shortfall in funding (Table 1). Notably, the years 2020, 2021 and 2023 received no allocation at all, raising significant concerns about the commitment to adaptation efforts. Alarmingly, only one year achieved 100 percent of the requested budget. These findings highlight a troubling reliance on donor funds and a limited commitment from the government budget to address climate challenges effectively. Sustainable funding mechanisms, such as a climate basket fund, could help finance climate-related initiatives. Accelerating regulatory mechanisms for such initiatives is essential.

Table 1: Requested budget versus allocated funds to implement government projects for climate change adaptation in Zanzibar

FY	Budget requested (TZS)	Funds allocated (TZS)	Percentage of budget allocated
2019	83,000,000	31,619,600	38%
2020	350,000,000	-	0%
2021	300,000,000	-	0%
2022	300,000,000	300,000,000	100%
2023	4,500,000,000	-	0%
2024	1,430,000,000	268,322,055	19%
TOTAL	**6,963,000,000**	**599,941,655**	**9%**

Source: First Vice President's Office, budget allocation data, FY 2019 to 2024

Human resources. Critical sectors, including agriculture, planning and tourism, as well as the DoE, face acute shortages of climate change experts. District-level officers, such as those from ZEMA and the forestry, fisheries and agriculture sectors, lack specialised training in climate adaptation and mitigation. Strengthening institutional capacity through recruitment and targeted training is crucial for addressing these gaps.

e) Monitoring, evaluation and reporting
The absence of a comprehensive MER system undermines accountability and progress tracking. While some project-level monitoring exists, it is fragmented and lacks standardisation, making it difficult to measure outcomes and adapt strategies effectively. Although the ZCCS (2014) identifies MER as a priority, it remains largely unimplemented. Developing a robust MER framework with clear indicators, timelines and centralised reporting mechanisms is critical for improving transparency and ensuring the effectiveness of climate actions.

3.6.2 Opportunities for strengthening climate adaptation in Zanzibar

a) Regulatory and institutional framework
The existing regulatory and institutional framework in Zanzibar offers a foundation for strengthening climate change adaptation governance. These frameworks, if properly coordinated and resourced, could facilitate the enforcement of environmental regulations, support ecosystem-based solutions and align sectoral priorities with overarching climate goals. Furthermore, national strategies like the Zanzibar Development Vision 2050 create an enabling environment for long-term planning and cross-sectoral collaboration. By leveraging these frameworks, Zanzibar can streamline adaptation efforts, minimise duplication and foster synergies among stakeholders to bolster resilience to climate change.

b) Existing planning process
The existing planning process that is coordinated by the Zanzibar Planning Commission offers an opportunity to integrate climate priorities across sectoral strategic plans and projects, including agriculture, fisheries, tourism, water and energy. This process enables cohesive resource allocation, ensuring targeted investments in under-resourced areas like irrigation and coastal protection infrastructure. Acting as a coordinating body for national plans, the ZPC can enhance collaboration among government agencies, NGOs, private entities and local communities, aligning their efforts with national adaptation goals.

c) Community engagement and local knowledge
Communities across shehias have demonstrated proactive engagement in activities like tree planting, mangrove conservation and irrigation farming. Leveraging this local commitment and local knowledge, such as identifying resilient mangrove species, can enhance adaptation success. Expanding locally-led initiatives through targeted capacity-building programmes and financial support would ensure their sustainability and foster ownership of adaptation measures.


Photo credit: Unsplash I Majkl Velner

d) Stakeholder partnerships
Collaborations with organisations like TASAF, donors, NGOs and CSOs provide a strong foundation for scaling up climate adaptation projects. Strengthening these partnerships and involving additional stakeholders, including private sector actors and academic institutions, can bring technical expertise, funding and innovative solutions to address complex climate challenges.

e) Natural resource management
Several shehias identified the restoration of wetlands, riverbanks and coastal areas as crucial for responding to climate impacts. Coordinating efforts across shehias to manage shared natural resources and enhance the enforcement of environmental regulations can reduce conflicts and amplify the benefits of ecosystem-based adaptation strategies.

f) Diversification of livelihoods
Communities have expressed interest in diversifying livelihoods through beekeeping, livestock keeping and agroforestry activities. Supporting these initiatives through entrepreneurship programmes, subsidies or access to microfinance can provide alternative income sources, reduce vulnerability to climate impacts and enhance overall resilience.

4 | Conclusion

This study employed a mixed-methods research design grounded in the Climate Change Adaptation Policy Credibility framework proposed by Olazabal et al. (2019) to assess climate governance in Zanzibar. The analysis evaluates adaptation policies across three key dimensions: policy and economic credibility, scientific and technical credibility, and legitimacy. This multifaceted approach provides a comprehensive understanding of Zanzibar's climate governance landscape.

The study's findings reveal several critical insights. Despite the establishment of foundational policies, including the Zanzibar Environmental Policy (2013), the Zanzibar Climate Change Strategy (2014) and the Zanzibar Environmental Management Act (2015), considerable implementation gaps persist. These deficiencies include inadequate institutional coordination, insufficient funding, limited technical capacity and the absence of comprehensive monitoring, evaluation and reporting mechanisms. Consequently, while coastal communities benefit from existing adaptation initiatives, inland shehias remain disproportionately vulnerable to the impacts of climate change.

Community-led initiatives, such as mangrove restoration and sustainable upland farming, exhibit resilience and innovative responses to environmental challenges. However, these efforts require enhanced support and integration within broader governance frameworks. The study underscores the urgent need for cohesive and inclusive governance systems that empower local communities and promote stakeholder collaboration. Key recommendations include strengthening institutional coordination through clearly delineated roles and responsibilities, enhancing public awareness campaigns and fostering public-private partnerships. Moreover, the formulation of tailored adaptation strategies is essential to address geographic disparities and to incorporate local knowledge into national planning processes. Establishing a dedicated climate adaptation fund and expediting the development of carbon trading frameworks can significantly enhance financial resource mobilisation. Capacity-building initiatives and the creation of robust monitoring, evaluation and reporting systems are also vital in tracking progress and refining strategies effectively. The study emphasises the importance of recognising the unique vulnerabilities faced by coastal and inland communities. Coastal populations are confronted with challenges such as sea-level rise, saltwater intrusion and environmental degradation, whereas inland communities endure prolonged droughts, reduced agricultural productivity and ecological degradation driven by unsustainable practices. Both regions share socio-economic challenges, including food insecurity, water scarcity and health risks, which necessitate the formulation of specific adaptation strategies.

In conclusion, while Zanzibar has made notable advancements in developing climate change adaptation policies, substantial challenges persist. Addressing these challenges through improved governance, enhanced coordination and active community engagement is imperative for bolstering resilience and ensuring sustainable development amid escalating climate risks. The study concludes with actionable recommendations aimed at optimising governance systems and aligning Zanzibar's adaptation efforts with global climate policies and sustainable development goals.

Photo credit: Unsplash | Kaspars Eglitis

5 | Policy implications and recommendations

The findings reveal a strong foundation for climate change adaptation efforts but underscore the need for systemic coordination, capacity and community engagement improvements. By addressing the identified gaps and leveraging existing strengths, Zanzibar can enhance its resilience to climate impacts and achieve its sustainable development goals. Based on the analysis of findings, the study offers the following recommendations:

i. Strengthen coordination and institutional setup: Establish climate change units (focal points) within MDAs and LGAs. The focal points should have clear roles and responsibilities and conduct regular meetings and forums across levels to share information and experience. To promote effective coordination with various sectors and local authorities, it is important to consider the inclusion of the PORALGSD and Zanzibar Planning Commission within the Zanzibar Climate Change Steering Committee (ZCCSC). This integration will enhance collaborative efforts and streamline communication across all levels.

ii. Enhance capacity: Invest in training programmes and recruit technical experts in climate change-related fields.

iii. Improve monitoring, evaluation and reporting: Develop robust MER frameworks with clear indicators and targets for tracking climate adaptation progress.

iv. Formalise indigenous knowledge: Integrate local knowledge into national policies and strategies.

v. Increase community awareness: Conduct awareness campaigns to improve understanding of climate adaptation efforts at the local level. This should include using social media, radio and television to communicate climate change impacts and mitigation and adaptation actions. Targeted campaigns and community engagement programmes are essential to foster public buy-in.

vi. Diversify funding sources to enhance sustainability: Establish a dedicated Climate Change Fund to reduce over-reliance on external donors and ensure long-term financial stability for climate initiatives. The introduction of forest-based activities, like beekeeping and handicrafts, and promotion carbon trading through clear regulations to actively engage communities in developing sustainable projects that utilise environmental resources, such as mangroves, will also enhance community participation and foster a stronger commitment to protecting and managing these critical resources.

vii. Align policies/linkages: Ensure consistency between climate adaptation strategies and broader development frameworks. The need also exists to link current government initiatives, such as those implemented by the Green Legacy programme, with community adaptation initiatives to avoid duplication of efforts and resources.

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Annexes

Annex I: Indicator descriptions

Major area	Components	Indicators	Metrics	Description
Policy and Economic Credibility	Resources	Funding	4	Funding refers to the allocation of economic resources to the overall plan, and also to each of the specific measures contained in the plan. It is assumed that an adaptation policy that does not assign economic resources to implementation or monitoring would not be credible.
		Consistency	2	This indicator aims to assess the magnitude and coherence of the adaptation economy according to what is contained in the plan and the resources of national or local government authorities. As such, a set of metrics that weight the plan budget against the gross domestic product at the time of plan approval are required.
		Prioritisation and timing	3	Setting priorities is a key to progress on adaptation and is useful to mainstream adaptation into existing policy and reduce competing interests. An adaptation plan that does not clearly say what is important and what is not is likely to be less effective than one that does. For instance, establishing prioritisation criteria among the selected measures at the time of implementation is crutial.
	Reliability	Past performance	3	Past performance of the adaptation policies is important for the credibility of current policies. This indicator takes into account the stage of the adaptation plan under analysis and performance of mitigation policies in place, assuming that mitigation has been addressed before adaptation.
		Assigned responsibilities	3	The provision of human resources to implement planned actions is essential to prove readiness for adaptation and credibility to the plan. It is, therefore, important that responsible parties are clearly assigned with specified responsibilities.
	Institutional, public and private support	Public opinion	1	Public awareness of climate change and perception of risk affect adaptation readiness. Public awareness not only supports policy development and implementation but is also important in the achievement of policy objectives.
		Legislation and regulatory nature	2	In cases where there is supporting national legislation or regulations, this indicator assesses whether guidelines for the development of plans are provided. This is here understood as a factor that strengthens the credibility of local climate plans. Climate policies also need to organise action and actors to be credible, and legally binding policies would help this to become a reality.
		Network membership/partnership	1	Most of the local adaptation studies indicates the importance of networking and partnerships in engaging climate adaptation actions/activities.
		Leadership and support	5	Climate adaptation plans need strong political leadership and authority that builds external and internal legitimacy. The existence of public and private bodies that support climate change action is essential to build credible policies. A dedicated public climate change body and the support of the upper-tiers of government and the private sector is also critical to yield results.
Scientific and Technical Credibility	Usable knowledge	Impacts and vulnerability assessment	4	Vulnerable populations and assets and related climate impacts should be identified and risks assessed independently. Performing an analysis of (cascading) impacts would reduce potential new vulnerabilities and reducing maladaptive behaviours.
		Adaptation options assessment	4	In order to ensure that planned adaptation actions are adequate and reasonable, a preliminary list of potential options should be identified and evaluated. Further, it is important that adaptation actions are connected to climate impacts and the different levels of risks identified to ensure that planned actions are adequate for expected changes.
	Monitoring, evaluation and reporting (MER)	Monitoring, evaluation and reporting (MER) processes	6	The MER mechanisms are necessary to govern implementation processes and ensure that planned objectives are achieved. In the evaluation of local climate adaptation plans, the existence of monitoring systems has been used as an indicator of plan quality and key enabling component in adaptation pathway approaches.
	Adaptive management	Learning mechanisms	3	Learning and adaptive management are goals of the evaluation of climate adaptation processes and progress. Adaptation management requires flexibility so that alternative adaptation pathway to be adopted to replace those no longer meets the specified objectives. Through different operationalising approaches, climate adaptation policies can provide flexibility and better embrace uncertainty.
		Uncertainty awareness	1	There are different kinds of uncertainty in a climate change context which requires different strategies during the design of projects and plans. Some strategies require developing a risk management process, taking into account different scenarios and the widest possible range of outcomes. It also requires evaluating the different options against various criteria, or adopting flexible management approaches beyond climate-related uncertainties.

Major area	Components	Indicators	Metrics	Description
Common Component	Legitimacy	Transparency and dialogue	5	Policy transparency is critical to raise awareness and provide legitimacy to policy processes. Social acceptance of adaptation options and trust are also important factors together with clarity of the rules, availability of information and the existence of public dialogue. Because of the cultural connotations of this, there are no universal models for creating legitimate policies.
		Engagement of stakeholders and civil society	3	Participation of relevant stakeholders is an important element in adaptation decision-making because it can help to overcome barriers explicit to adaptation and it helps to create legitimate plans. It is also important to bring into the process stakeholders with legitimate reasons to be there as well as individuals with multiple different types of relevant expertise.
		Equity and justice	3	Equity is a central element for successful climate change adaptation. Despite adaptation to climate change being intrinsically spatial, factors related to equity and social vulnerability need to be taken into account in adaptation policies. To achieve equitable and just adaptation opportunities, participation and engagement of the communities and social groups is vital, including identifying those directly or indirectly benefitting from the adaptation actions.

Source: Olazabal et al. (2019), pp.282-283

Annex II: Metric descriptions

Major area	Components	Indicators	Metric description	Metric Score	Indicator total core	Indicator index core
Policy and Economic Credibility	Resources	Funding	1a. How long has the plan existed? (1 if it has existed for more than 4 years)	1	3	0.4
			1. Has an overall budget been assigned for the plan?	0		
			2. Was the plan formation funded by own resources?	0		
			3a. Is the implementation of the plan being funded by own resources?	0		
			4a. Kindly mention the sector priorities contained in the plan (1 if it covers all the related sectors)	1		
			4b. Have specific budgets been assigned for each of the sector priorities contained in the plan?	0		
			4c. Does the plan fully or partially use internal sources for the implementation of the sector priorities proposed?	1		
		Consistency	5. What is the percentage overall plan budget relative to the annual budget (1 if its more than 50%)	0	1	0.3
			6a. Are measures/activities (N) contained in a plan relative to resources?	1		
			6b. Are there funds allocated for each measure/activity (N) contained in a plan?	0		
		Prioritisation	7a. Does the plan set a timetable for adaptation implementation?	1	3	0.8
			7b. How long is the plan implementation period? (1 if more than 4 years)	1		
			8a. Does the plan set any criteria for prioritisation of measures/activities during the implementation phase?	1		

Major area	Components	Indicators	Metric description	Metric Score	Indicator total core	Indicator index core
			9. Has the plan demonstrated capacity to evaluate these criteria on each identified option?	0		
	Reliability	Past performance	10. How is the state of the adaptation plan (Revised/unrevised)?	1	2	0.5
			Performance regarding the level of integration into the local plans and initiatives: Qn 11.1. Has the plan been implemented or being implemented?	0		
			11.2 Is there evidence of any emissions reductions as a result of the plan?	0		
			12. Is there a history of abolishment of previous environmental policies or institutional bodies?	1		
		Assigned responsibilities	13. Plan creation: Has the plan been written by the planning department?	1	2	0.5
			14. Does the plan assign a coordinator of implementation?	1		
			Responsible parties for each sector priority: Qn 15.1 Does the plan assign responsible parties for each measure contained in the plan?	0		
			15.2 Level of specificity: Do the assigned parties cascade into departments, units and section?	0		
	Institutional, public and private support	Public opinion	16. Is the public concerned (not only aware) about climate change according to last surveys?	1	1	1.0
		Legislation and regulatory nature	17. Has the plan been developed in response to any specific national or regional legislative/regulatory framework that makes their development compulsory?			
			18. Legally binding nature: Is the plan a set of recommendations or does it compel implementation?	0		
		Network membership	19. Is the ministry (your organisation) committed to any international or national climate network related to adaptation, i.e., that includes adaptation-related knowledge transfer, commitment or capacitation?	1	1	1.0
		Leadership and support	20. Is the plan framed in a higher-level plan/policy/program?	1	4	0.8
			21. Has the plan been led by an institutional climate champion with institutional power?	0		
			22. Is there a dedicated local public climate change institution?	1		
			23. Are there other supporting public institutions, e.g., regional authorities?	1		
			24. Are there supporting private bodies (e.g. NGOs, business associations)?	1		
	Scientific Credibility	Usable knowledge	Impacts and vulnerability assessment	25. Does the plan develop a risk assessment?	1	3	0.6
				26. What is the geographical level of the assessment?	0		
				27. Does the assessment consider spillover effects?	0		
				Future risks: Qn 28. 1 Are future climate scenarios taken into account?	1		
				Future risks: Qn 28.2 Have social and economic scenarios been taken into account?	1		

Major area	Components	Indicators	Metric description	Metric Score	Indicator total core	Indicator index core
		Adaptation options assessment	29. Has a preliminary list of adaptation alternatives been identified and evaluated?	0	5	0.5
			30. Are adaptation actions connected to the impact and level of risk identified (i.e., are they defined to eliminate the unacceptable risks)?	1		
			31.1 Effectiveness	0		
			31.2 Cost-efficiency (benefits/costs)	0		
			31.3 Integration with broader social goals	0		
			31.4 Environmental sustainability (e.g., by implementing a Strategic Environmental Assessment - SEA)	1		
			31.5 Flexibility and robustness (against different scenarios)	1		
			31.6 Timing	0		
			31.7 Maladaptation (including mitigation trade-offs or other issues not considered above)	1		
			31.8 Resources available (including information, finance, leadership, management capacity)	0		
			32. Does the plan include an assessment or consideration of potential barriers to adaptation?	1		
Monitoring, evaluation and reporting (MER)	Monitoring, evaluation and reporting processes		33. Does the plan define a MEL process?	0	3	0.5
			34. Does the plan specifically assign a responsible party/person for the MEL process?	1		
			35. Has the MEL process been assigned a budget?	0		
			36. Does the plan identify monitoring objectives and indicators?	1		
			37. Does the plan set a method and/or process to evaluate outcomes of the monitoring process?	0		
			38. Does the plan report to any higher-level authority or organisation through an official process?	1		
	Adaptive management	Learning mechanisms	39. Does the plan define a readjustment process, i.e., an iterative process to manage existing adaptation strategies according to results of MER or new scenarios?	0	2	0.3
			40. Does this process include a set of indicators /warning metrics?	0		
			41. Does the plan specifically assign a responsible party for readjustment process?	1		
		Uncertainty	42. Does the plan consider uncertainty in its design (e.g., by using a decision method that includes uncertainty) and in the assessment and selection of adaptation options (e.g., by considering low regret measures, different scenarios, flexible approach)?	1	1	1.0
Common Component	Legitimacy	Transparency and dialogue	43. Is the full process of screening, scoping and definition of the plan and later approval described in the plan or in an attached document or public site?	0	4	0.8
			44. Are the people/groups involved in the process of plan creation (in any role such as developers, designers or participants) named in the document?	1		

Major area	Components	Indicators	Metric description	Metric Score	Indicator total core	Indicator index core
			45. Does the plan or any attached documents related to it refer to which kind and how information (scientific or else) used to lead decisions has been produced and used?	1		
			46. Have different institutions been involved in the design of the plan?	1		
			47. Has the plan been formally exposed to a period of public information and debate?	1		
		Engagement of stakeholders and civic society	48. Did the plan include a process of participation with stakeholders (including other departments) and civic organisations?	1	3	1.0
			49. Did the process of participation include the public?	1		
			50. Is there clear evidence of the multiple expertise brought by participants (in the process of participation)?	1		
		Equity and justice	51. Is there evidence that the plan addresses distributive impacts of climate change (e.g., by considering vulnerability in the most disadvantaged groups) and develops adaptation measures accordingly?	0	2	0.7
			52. Were communities or social advocacy groups involved in the framing and identification of those adaptation strategies?	1		
			53. Does the plan present a full understanding of the beneficiaries of the proposed adaptation measures?	1		
			Total positive scores are 40 out of anticipated 68			

MDAs and NGOs

1. First Vice President's Office (FVPO)
2. Zanzibar Environment Management Authority (ZEMA)
3. Ministry of Agriculture, Irrigation, Natural Resources and Livestock
4. Zanzibar Disaster Management Commission
5. Ministry of Blue Economy and Fisheries
6. Ministry of Tourism and Heritage
7. Ministry of Water, Energy and Minerals
8. Ministry of Health
9. President's Office, Finance and Planning
10. President's Office, Regional Administration, Local Government and Special Departments
11. Zanzibar Planning Commission
12. Tanzania Meteorological Agency Zanzibar
13. United Nations Development Programme (UNDP)
14. Climate Action Network in Tanzania
15. Zanzibar Climate Change Alliance (ZACCA)
16. Zanzibar Volunteers for Environmental Conservation (ZAVECO)
17. Community Forest Pemba (CFP)
18. Community Groups (agriculture, fisheries and forest) in Unguja and Pemba

Districts and shehias

1. North Region –North District A-Unguja

i. Kijini
ii. Mto wa Pwani
iii. Nungwi – Banda Kuu
iv. Kendwa
v. Tumbatu – Uvivini

2. North Region -North District B -Unguja

i. Bumbwini Mafufuni
ii. Fujoni
iii. Zingwezingwe
iv. Kiwengwa
v. Kisongoni

3. South Region –South Districts –Unguja

i. Kizimkazi- Mkunguni
ii. Kizimkazi – Dimbani
iii. Jambiani – Kibigija
iv. Makunduchi - Kijini
v. Michamvi – Kae

4. South Region- Central District –Unguja

i. Umoja Ukuu Kai Pwani
ii. Pete
iii. Uroa
iv. Mgeni haji
v. Cheju – Chuchumile

5. North Region –Micheweni District –Pemba

i. Kinowe
ii. Sizini
iii. Shumba Viamboni
iv. Chimba
v. Maziwa Ng'ombe

6. North Region -Wete District –Pemba

i. Gando
ii. Mtambwe Kaskazini
iii. Pandani
iv. Kinyikani
v. Shengejuu

7. South Region –Chakechake District –Pemba

i. Tibirinzi
ii. Wesha
iii. Ngojani
iv. Mpambani
v. Ng'ambwa

8. South Region –Mkoani District –Pemba

i. Kisiwa Panza
ii. Mtambile
iii. Mgagadu
iv. Makombeni
v. Wambaa

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