Considerations of Climate Change Mitigation and Adaptation in National Development Plans in Tanzania

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Research Report 2023/28

Published by:

REPOA
157 Migombani/REPOA Streets, Regent Estate,
P.O. Box 33223
Dar es Salaam.

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Copy-editing & initial layout: Vincent Nalwendela | REPOA

Suggested citation:
Shimwela, N (2023). Considerations of Climate Change Mitigation and Adaptation in National Development Plans in Tanzania. REPOA, Dar es Salaam.

Research Report 2023/28

Suggested Keywords:
Climate Change, Development Plans, Tanzania.

ISBN 978-9987-753-35-2

ACKNOWLEDGEMENT

Firstly, I would like to express thanks to REPOA for all the support on this study as part of policy research capacity building efforts. I would also like to express thanks to the following for their cooperation in providing key inputs. Mr. Prosper Buchafwe, Director of Policy and Planning (DPP) in the Ministry of Water; Yasin Lusheke, Economist, Ministry of Water; Mr. Manyama Bwire Bukori, Chief Commercial Officer, Department of Policy and Planning, Ministry of Industry, Trade and Investment and Oscar Kashaigili, Acting DPP in the Ministry of Energy.

LIST OF ABBREVIATIONS

CCD	Climate Compatible Development
CDM	Clean Development Mechanism
DPP	Director of Policy and Planning
FYDP	Five-Year Development Plan
GDP	Gross Domestic Products
GHGs	Greenhouse Gases
INDC	Intended Nationally Determined Contribution
IWRM	Integrated Water Resources Management
IPCC	Intergovernmental Panel on Climate Change
NAPA	National Adaptation Programme of Action
NCCRS	National Climate Change Response Strategy
NEMA	National Environment Management Act
NEMC	National Environment Management Council
NEP	National Environment Policy
OECD	Organisation of Economic Cooperation and Development
TDV	Tanzania Development Vision
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
URT	United Republic of Tanzania
VPO	Vice President's Office
WMO	World Meteorological Organisation

ABSTRACT

This study intended to understand the extent of climate change considerations in national development plans in Tanzania. The specific objectives were to examine the extent of policy coherence across priority sectors, national development plans and national climate change adaptation goals. A mixed research design employing sequential methods was adopted. Both primary and secondary data were used. Primary data was obtained through interviews with the relevant ministry's policy experts and national climate change focal points authorities. Secondary data was obtained through a content review of sector policies, national development plans, and climate change adaptation planning documents. Purposive sampling was used to select key informants and policy documents. Qualitative content analysis was used to assess text data using a scoring matrix to generate descriptive information. The descriptive information was further standardized using percentages for each sector as well as the percentage score for the overall plans. The findings revealed a moderate extent of climate change considerations in national development plans. However, a weak alignment between national development plans and national climate change adaptation goals was found, that was attributed to weak alignment between sector policies, and it was recommended therefore, that strategies to strengthen the alignment between sector policies, development plans and national climate change adaptation goals be put in place.

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CHAPTER ONE
INTRODUCTION

1.1 Motivation and Rationale of the Study

Climate change has emerged as one of the key social economic and developmental challenges confronting policymakers in Africa, with the potential for the reversal of the significant gains made in poverty reduction, economic growth and development (Fatemi, Okyere, Diko, & Kita, 2020).The adverse impacts of climate change severely affect all sectors of the economy, such as agriculture, forestry, fisheries, tourism, health, water, energy and infrastructure, and threaten African economies and therefore pose serious risks to poverty reduction efforts. The impacts are expected to increase in both frequency and severity of extreme weather events such as floods and droughts. African countries will be most vulnerable due to high levels of poverty, low adaptive capacity, and over-dependence on rain-fed agriculture, which accounts for about 15% of African GDP, with some countries deriving 50% of their GDP (IPCC, 2007). However, the impacts are not limited to agriculture but also present a challenge to infrastructure and the energy sector and pose negative implications for trade and development (Dellink, et al., 2017).

To enhance mitigation and adaptation to climate change and offer the opportunity to build adaptive capacity and resilient development, African governments are required to make major structural investment and policy decisions that can influence the rate, structure and character of economic growth and development for the long term (Ataga, et al., 2017 and Vincent & Colenbrander, 2018). With this regard, mitigation refers to anthropogenic measures to reduce or prevent the impacts of climate change through strategies to reduce the emission of greenhouse gases and their sources, as well as enhancing their sinks while adaptation can be explained as a deliberate policy decision based on the awareness that conditions have changed or are about to change and that actions are required to maintain or achieve the desired state(IPCC 2007).Given the cross-cutting issue of the phenomenon, mitigation and adaptation to climate change need to be incorporated in the broader context of the country's policies and plans and across different levels of governance (England, et al., 2018). This is likely to be more successful than addressing it in isolation through sector climate change policies or plans (Vincent & Colenbrander, 2018).

The National Development Plans are formal implementation tools of the country's development strategies that consider overall national development goals, policy objectives and sector initiatives(URT, 2011). To achieve resilient and sustainable development outcomes, climate change adaptation planning needs to be aligned with national development plans. However, most developing nations have prepared National Adaptation Programs of Action (NAPAs) and National Climate Change Response Strategies (NCCRS), as long-term, national climate change adaptation planning strategies, but climate change considerations in development plans at both

national and sub-national levels, is inadequate and often treated as a normal planning issue or as a business-as-usual scenario (Ataga, et al., 2017 and England, et al., 2018). This can be attributed to poor policy alignment and structural differences between NAPAs and NCCRS, sector policies and national development plans.

Like other African countries, Tanzania is vulnerable to the impacts of climate change, causing severe and recurrent extreme weather events such as floods and droughts, resulting in severe loss of human, natural, financial, social and physical resources (URT, 2007and2021).For instance, the high frequency of the record-breaking amount of rainfall and temperature in six recent years 2015,2016,2017,2018,2019, and 2020, severely affects key economic sectors such as agriculture, infrastructures, water, energy demand and supply, tourism, wildlife as well as the business sector. These negatively impact economic growth and poverty reduction efforts (URT, 2021). Since, Tanzania's economy is vulnerable to the impacts of climate change, major structural investment and policy decisions to incorporate climate change mitigation and adaptation in key economic sectors and development planning, both in the short and long-term, are of great importance to achieve resilient development.

1.2 Statement of the Research Problem

In response to the growing concern about the adverse impacts of climate change on the social, economic and physical environment, Tanzania has undertaken several efforts, including the development of effective, strategic and institutional frameworks to enhance the country's expertise, climate change governance and technological and infrastructural developments. These include the preparation of the Initial National Communication to the United Nations Convention on Climate Change (UNFCC), in 2003 and 2014, Clean Development Mechanisms (CDM), for investors in 2004,the preparation of the National Adaptation Program of Action (NAPA) in 2007, the preparation of the National Climate Change Response Strategy (NCCRS) in 2012 and the revised version of 2021 and the preparation of the Intended Nationally Determined Contributions (INDC), in 2015 and the revised version of 2021(URT, 2012 and 2021).

The National Adaptation Program of Action (NAPA), and the National Climate Change Response Strategy (NCCRS), were prepared as part of the overall integrated development plans, policies and programs for sustainable development at the national level. The public sector and major stakeholders were given a central role to plan, implement and enforce the implications of climate change in their strategic plans and programs. Furthermore, these documents were informed by the aspirations of the Tanzania Development Vision (TDV) 2025, implemented into three interlinked Five Year Development Plans (FYDP) 2011/2012–2015/2016, 2016/2017–2020/2021, and 2021/2021–2025/2026, accompanied by a series of policy, institutional and systematic reforms based on a specific theme and the scale of economic challenges experienced by the country (URT, 2007). However, knowledge gaps exist in understanding the extent climate change is considered in the National Development Plans (NDPs). The existing studies have focused on the extent of climate change considerations in

national sector policies(Daly, Yanda, & West, 2015; Stringer, Sallu, Dougil, Wood, & Ficklin, 2017; Pilato, Sallu, & Michalczenia, 2018 and England, et al., 2018).This creates knowledge gaps in the concrete approach to addressing climate change in development plans. Therefore, this study intends to understand the extent of climate change considerations in NDPs in Tanzania.

1.3 Objectives of the Study

The general objective of the study was to understand the extent of considerations of climate change mitigation and adaptation in national development plans in Tanzania. This general objective was achieved through the following specific objectives:

i) To examine the extent of coherence of climate change mitigation and adaptation in priority sector policies.

ii) To examine the extent of coherence of climate change mitigation and adaptation in national development plans.

iii) To examine the extent of consideration of climate change mitigation and adaptation in national development plans.

1.4 Significance of the Study

The study finds to be significant as the findings will help to identify gaps and entry points in the governance framework and establish knowledge on how to incorporate climate change in development plans in Tanzania. The study will also generate a policy-relevant knowledge base that will deepen understanding and strengthen the national capacity of relevant ministries to effectively govern and coordinate climate change mitigation and adaptation and enhance the national adaptive capacity.

CHAPTER TWO
LITERATURE REVIEW

2.1 Definitions of Key Terms

2.1.1 Climate Change

According to the IPCC (1990), climate change is defined as a statistically significant change in properties of weather elements such as temperature and rainfall, in a given area over a long period. According to the World Meteorological Organisation (WMO), it is usually at least thirty (30) years. The statistical properties of weather elements include averages, variability and extremes.

2.1.2 Climate Change Adaptation

Climate change adaptation is defined as an adjustment in natural, social, and economic systems in response to actual or expected climatic stimuli or their effects, with the purpose of reducing the impacts of climate change or exploits beneficial opportunities (IPCC 2007).

2.1.3 Climate Change Mitigation

Climate change mitigation is defined as anthropogenic measures to reduce or prevent the impacts of climate change. It involves strategies to reduce the emission of greenhouse gases and their sources as well as enhancing their sinks (IPCC 2007).

2.1.4 Climate Change Incorporation

Climate change incorporation is defined as an ongoing process of integrating considerations of climate change mitigation and adaptation in policy making, planning, budgeting, implementation and monitoring processes at the national, sectoral and sub-national levels (UNDP - UNEP, 2011).It involves the inclusion of different climate change goals, objectives and strategies into existing policy domains and governance arrangements. The process can be horizontal or vertical. Horizontal is when climate considerations are integrated into different policy sectors, while vertical is when the consideration is at different hierarchical administrative levels(Fatemi, Okyere, Diko, & Kita, 2020).These result in avoided policy conflict, reduced climate change risks and vulnerability, and greater efficiency in climate change governance compared to managing it in isolation(Lebel, et al., 2012).

2.1.5 Policy Coherence

Policy coherence is defined as the systematic promotion of mutually reinforcing policy actions across government departments and agencies to create synergy toward achieving agreed objectives (England, et al., 2018).

2.2. Measures Adapted to Address Climate Change in Tanzania

In response to the growing concern about the adverse impacts of climate change on social, economic and physical environments, Tanzania has undertaken several efforts as indicated in table 2.1.

Table 2.1: Measures Adapted to Address Climate Change in Tanzania

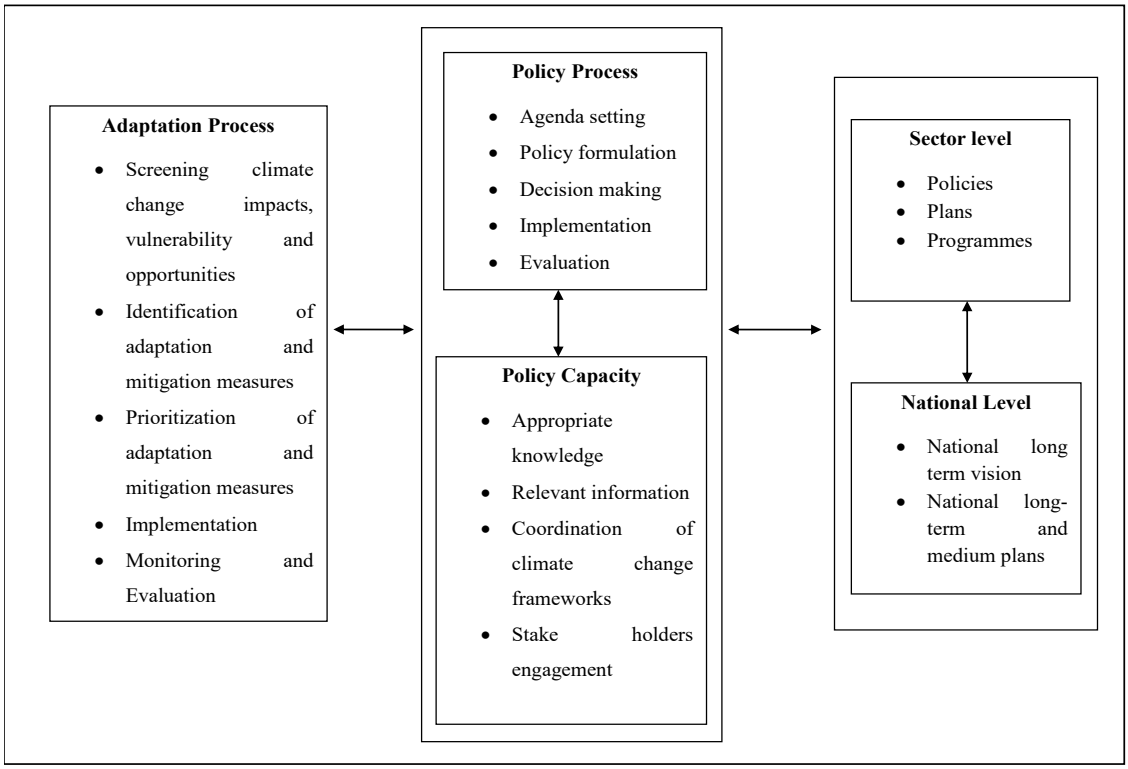
Measure	Year	Purpose
The Initial National Communication to United Nations Convention on Climate Change.	2003	Ratification to UNFCCC information regarding human-induced emissions by source and removal by the sink of GHGs, technological and policy options for mitigation and assessment of vulnerability and adaptation to the impacts of climate change (URT 2003).
Clean Development Mechanisms (CDM) for investors.	2004	To guide Clean Development mechanisms and initiatives in the country (URT 2012).
National Adaptation Program of Action (NAPA).	2007	To identify and promote activities that address urgent needs for climate change adaptation by focusing on climate-sensitive sectors (URT 2008).
Measure	**Year**	**Purpose**
National Climate Change Response Strategy (NCCRS).	2012	To allow Tanzania to address climate change adaptation and participate in the global agenda of reducing the emission of greenhouse gases.
Intended Nationally Contributions	2015	Provides a set of interventions on adaptation and mitigation to build resilience on impacts of climate change and contribute to global efforts to reduce the emission of greenhouse gases.

2.2 The Conceptual Framework

The conceptual framework was adopted from Howlett (2009) and Bierbaum et al., (2013). These were relevant as they guide the assessment of the policy process, capability and adaptation process. Howlett (2009), recommends that the policy process and policy capacity of the country needs to be incorporated in the climate change adaptation process. The policy process involves agenda setting, policy formulation, decision making, implementation and evaluation, while policy capacity forms the organisation and stakeholders within which various stages of the policy process take place, such as relevant climate change knowledge and awareness, available and accessible information for decision-making and resources. In the context of climate change, agenda setting involves considering the impacts of climate change.

(Bierbaum, et al., 2013), recommends that the climate change adaptation process consists of five stages, which are the identification of climate change impacts and vulnerability, identification of adaptation and mitigation measures, prioritization of strategies, implementation and monitoring, and evaluation. The process requires the involvement of stakeholders with relevant climate change knowledge and awareness and relevant information to define the problem and design mitigation and adaptation strategies. It also requires improved coordination and implementation of national, regional and multilateral environmental agreements and frameworks. In this process, participatory approaches support the incorporation of stakeholders' perspectives, altitudes and context-specific information in decision-making.

Figure 2.1: A Conceptual Framework of the Key Entry Points and Components of Adaptation Process in National Development Plans Adopted from Howlett, (2009) and Bierbaum, et al., (2013)



2.3 Empirical Literature Review

Integration of climate change in different levels of decision-making has received significant attention in Tanzania (Daly, Yanda, & West, 2015; Stringer, Sallu, Dougil, Wood, & Ficklin, 2017; Pilato, Sallu, & Michalczenia, 2018 and England, et al., 2018). These studies have insisted on the need to incorporate climate change mitigation and adaptation in sector policies and development plans at the national and sub-national levels. The study by Daly, Yanda, & West(2015), assessed the extent of climate change concerns and climate services consideration in national policy documents, to identify how policies respond to the objectives and priorities outlined in the National Climate Change Response Strategy (NCCRS).The study used key policy documents that guide national development, such as the National Growth and Poverty Reduction Strategy II, first Five Year Development Plan 2011-2016, food security, agriculture, disaster management, risk reduction and health. The study found that climate change concerns and climate services were not well incorporated in reviewed policies and legislation. Furthermore, the study established that climate change policies, such as the National Climate Change Response Strategy (NCCRS) and NAPA, were designed to build upon the institutional structures and mandates put in place by the National Environment Policy (NEP) and the National Environment Management Act (NEMA).

A study by Stringer, Sallu, Dougil, Wood, & Ficklin (2017), assessed how climate change response measures are integrated into agriculture, energy and forestry national policies, by examining the operationalization of Climate Compatible Development (CCD) frameworks and the underlying existing institutional arrangements and barriers and opportunities. The findings revealed that CCD was a new concept and the term was not used in reviewed national policies.

A study by Pilato, Sallu, & Michalczenia (2018), assessed how climate change response measures are integrated at the local level of development planning in Muheza District. This study examined the operationalization of Climate Compatible Development (CCD) frameworks and existing institutional arrangements across local levels and sectors, barriers and opportunities. Findings revealed that a lack of guidelines for climate development in key national policies hinders climate change integration at local levels. This is because national policies do not include efforts to manage climate change(Daly, Yanda, & West, 2015).

A study by England, et al. (2018), examined the extent of coherence and mainstreaming of climate change adaptation in the water and agricultural sector policies in southern Africa. The study involved a review of sector policies from Malawi, Tanzania and Zambia. The findings revealed a partial extent of coherence of climate change adaptation in sector policies. Further climate change was not explicitly addressed in any of the water policies in all three countries.

2.4 Synthesis of Research Gap

An empirical literature review has revealed the need to examine gaps and entry points in climate change considerations in national development plans. Although many studies have examined the integration of climate change in national frameworks, their gaps, entry points and recommendations were limited to sector policies. Also, the studies did not examine the strategic link and coherence of climate change adaptation goals outlined in NAPAs and NCCRS and development priorities in national development plans to influence the resilience of development outcomes. A study by Fatemi, Okyere, Diko, & Kita (2020), examined the extent of climate change consideration in the national, sector and city development plans in Bangladesh. However, the study used analytical frameworks adopted from UNDP guidelines for mainstreaming climate change. While a study by Daly, Yanda, & West (2015), used national adaptation goals outlined in NCCRS, their analysis was based on policy context. Therefore, this study intends to establish knowledge of how climate change mitigation and adaptation goals outlined in NCCRS and NAPA are considered in national development plans to identify gaps and entry points within national development plans.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Research Design

The study adopted a mixed research design, employing sequential methods. A qualitative research design was used to assess and describe text data on the extent of climate change considerations to generate descriptive information. This was followed by a quantitative analysis of descriptive information, involving the scoring matrix to explore the level of coherence and the extent of climate change consideration in policy and development plans.

3.2 Data and Data Types

The study used NAPA (2007), NCCRS (2021), recent sector policy documents and three FYDP plans. Both primary and secondary data were used. Primary data was obtained from the respective ministry expertise and national climate change focal point authorities, the National Environment Management Council (NEMC) and the Vice President's Office (VPO), while secondary data was obtained from policy and national development plans. This was in line with an earlier study by Daly, Yanda, & West (2015).

Table 3.1: Reviewed FYDP III Priority Sector Policies

S/N	Name of the Policy	Publisher	Year
i.	National Energy Policy	Ministry of Energy and Minerals	2015
ii.	Construction Industry Policy	Ministry of Works	2003
iii.	National Transport Policy	Ministry of Communication and Transport	2003
iv.	National Water Policy	Ministry of Water and Livestock	2002
v.	Sustainable Industrial Development Policy (1996-2020)	Ministry of Industry and Trade	1996

3.3 Data Collection

3.3.1 Sample and Sampling Techniques

The study used purposive sampling techniques to select the policy and KII. Sector policies were selected based on their sensitivity to climate change, the primary role to determine mitigation and adaptation and aspiration in the plan on increasing the country's production capacity and building a competitive economy to stimulate the country's participation in trade and investment. These sectors are energy, construction, water and industry. The climate change frameworks were selected because they were the main existing guiding framework documents during the formulation and

implementation of the plan. The KII was based on individuals who undertake policy work.

3.3.2 Data Collection Methods and Instruments

Secondary data was collected through an internet search to locate sector policies on government and ministry websites, followed by an in-depth content review of documents. To assess and describe text data on the extent of coherence of climate change across sector policies and in the plan, assessment criteria were developed from NAPA and NCCRS and refined by the latest literature. To ensure the validity of secondary data collected through content analysis and explore the country's policy process, policy capacity and adaptation process, Key Informant Interviews (KII) were conducted with four (4) policy experts from the respective ministries using semi–structured interviews. This also enabled the examination of climate change knowledge and awareness among planners. Interviews were conducted with policy experts from the Ministries of Water, Energy, Industry & Trade as well as the Ministry of Works. The process of data collection was conducted for the period from January to April 2022.

3.3.3 Data Analysis and Presentation

The data collected from documents was analysed using a quantitative content analysis approach involving a scoring matrix developed based on national adaptation goals. The consideration criteria in the analytical framework were assigned scores between zero (0) and two (2) informed by specific text data that relate to the consideration criteria from the documents reviewed (Tables 3.2 and 3.3). To ascertain the coherence of consideration criteria relative to each document, the analysis was based on calculating the average of the scores for each sector as well as for the overall plan. To assess the extent of consideration, the scores were standardized using percentages for each sector as well as the percentage score for the overall plan. Interviews from KII were transcribed and then triangulated according to relevant themes.

Table 3.2: Scoring Criteria for Extent of Coherence

Score	Level of Coherence	Description of Coherence
0	No coherence	Climate Change strategy poorly aligns across policy or FYDP III plan.
1	Partial Coherence	Climate Change strategy weakly aligns across policy or FYDP III plan.
2	High coherence	The Climate Change strategy strongly aligns across policy and the FYDP III plan.

Table 3.3: Scoring Criteria for Extent of Consideration

S/N	Score	Extent of Consideration
1	< 50%	Poor consideration
2	50 – 59 %	Weak consideration

3	60 – 79 %	Moderate consideration
4	80 – 100%	Strong consideration

CHAPTER FOUR
RESULTS AND DISCUSSION

4.1 Results

Table 4.1: Score Matrix of the Extent of Coherence of Climate Change Mitigation and Adaptation in FYDP III Priority Sector Policies

S/N	Priority Sector		Consideration Criteria	
			Mitigation Measures	**Scores**
1	Energy	1	Enhancing the use of renewable energy share in the grid and off-grid	2
		2	Enhancing off-grid power supply to rural areas	2
		3	Promoting diversification of energy sources	2
		4	Promoting energy-efficient technologies and practices	2
			Adaptation Measures	
		5	Promote diversification of energy sources	2
		6	Promotion of application of cogeneration in the industrial sector	2
		7	Improved integrated basin catchment management	0
		8	Supporting development and utilization of community off-grids/ mini-grids	2
		9	Promotion of development and use of energy-efficient technologies	2
			Sub-total Score (9)	16
			Level of Coherence	2
			The extent of Mainstreaming %	89
2	Industry		**Mitigation Measures**	
		1	Enhancing cleaner production practices and technologies	0
		2	Promoting diversification of energy sources and fuel switching technologies	0
		3	Enhancing the adoption of clean and energy-efficient technologies	0
		4	Promoting efficient production technologies	0
			Adaptation Measures	
		5	Promote alternative and renewable energy sources	2
		6	Promote the adoption of energy-efficient technologies	0
		7	Enhance climate-related assessments for industrial development	0
		8	Location and zoning of industry in the context of climate change	2
			Sub-total Score (8)	4
			Level of Coherence	0.5

			The extent of Mainstreaming %	25
S/N	**Sector**		**Consideration Criteria**	**Scores**
3	Infrastructures		**Mitigation Measures**	
		1	Promotion of low carbon-intensive infrastructures	2
		2	Promote integrated Urban Transport systems	2
		3	Importation and manufacture of new transportation technologies	2
			Adaptation Measures	
		4	Adoption of appropriate technology in infrastructure planning, designing, and development	0
		5	Sectors to mainstreaming climate change adaptation measures in infrastructures designing and development by sectors.	0
		6	Development of national building standards and code of practices.	0
		7	Assessment of climate change risks and vulnerability in the infrastructure sectors.	0
			Sub-total Score (7)	6
			Level of Coherence	1
			The Extent of Mainstreaming	43
			Adaptation Measures	
4	Water	1	Promote rainwater harvesting technology	2
		2	Facilitating and promoting water recycling and re-use technologies	2
		3	To invest in the exploration and extraction of groundwater resources	2
		4	Operation of water flow monitoring stations and demarcation of water sources in all 9 basins	2
		5	Promote flood control in the water basins	2
		6	Installation of integrated water resources management (IWRM) tools in all 9 basins	2
		7	Operation of water flow monitoring stations and demarcation of water sources in all 9 basins	2
		8	Protecting and conserving water catchment in all basins	2
			Sub-total Score (8)	16
			Level of Coherence	2
			The Extent of Mainstreaming	100
			Total Score (32)	**42**
			Level of Coherence	**1**

			The Extent of Mainstreaming	**66**

Table 4.2: Score Matrix of the Extent of Coherence and Considerations of Climate Change in National Development Plans

S/N	Priority Sector		Mainstreaming Criteria	Scores		
			Mitigation Measures	**FYDP III**	**FYDP II**	**FYDP I**
		1	Enhancing the use of renewable energy share in the grid and off-grid	2	2	2
		2	Enhancing off-grid power supply to rural areas	2	2	2
		3	Promoting diversification of energy sources	2	2	2
		4	Promoting energy-efficient technologies and practices	2	0	0
			Adaptation Measures			
1	Energy	5	Promote diversification of energy sources	2	2	2
		6	Promotion of application of cogeneration in the industrial sector	2	0	0
		7	Improved integrated basin catchment management	0	0	0
		8	Supporting development and utilization of community off-grids/ mini-grids	2	2	2
		9	Promotion of development and use of energy-efficient technologies	2	0	0
			Sub-total Score (9)	16	10	10
			Level of Coherence	**2**	**1**	**1**
			The Extent of Mainstreaming	**89**	**56**	**56**
			Mitigation Measures			
		1	Enhancing cleaner production practices and technologies	0	0	0
		2	Promoting diversification of energy sources and fuel switching technologies	0	0	0
		3	Enhancing the adoption of clean and energy-efficient technologies	0	0	0
		4	Promoting efficient production technologies	0	0	0
2	Industry					
			Adaptation Measures			
		5	Promote alternative and renewable energy sources	0	0	0
		6	Promote the adoption of energy-efficient technologies	2	0	0

		7	Enhance climate-related assessments for industrial development	0	0	0
		8	Location and zoning of industry in the context of climate change	2	0	0
			Sub-total Score (8)	4	0	0
			Level of Coherence	**0.5**	**0**	**0**
			The Extent of Mainstreaming	**25**	**0**	**0**
	Sector		**Mainstreaming Criteria**	**Scores**		
3	Infrastructures		**Mitigation Measures**			
		1	Promotion of low carbon-intensive infrastructures	2	0	0
		2	Promote integrated Urban Transport systems	2	2	2
		3	Importation and manufacture of new transportation technologies	2	0	0
			Adaptation Measures			
		4	Adoption of appropriate technology in infrastructure planning, designing, and development	0	0	0
		5	Sectors to mainstreaming climate change adaptation measures in infrastructures designing and development by sectors.	0	0	0
		6	Development of national building standards and code of practices.	0	0	0
		7	Assessment of climate change risks and vulnerability in the infrastructure sectors.	0	0	0
			Sub-total Score (4)	**6**	**2**	**2**
			Level of Coherence	**1**	**0**	**0**
			The Extent of Mainstreaming	**43**	**14**	**14**
4	Water		**Adaptation Measures**			
		1	Promote rainwater harvesting technology	2	2	0
		2	Facilitating and promoting water recycling and re-use technologies	2	0	0
		3	To invest in the exploration and extraction of groundwater resources	2	2	0
		4	Operation of water flow monitoring stations and demarcation of water sources in all 9 basins	2	2	2
		5	Promote flood control in the water basins	2	2	0
		6	Installation of integrated water resources management (IWRM) tools in all 9 basins	2	2	2
		7	Operation of water flow monitoring stations and demarcation of water sources in all 9 basins	2	2	2

		8	Protecting and conserving water catchment in all basins	2	2	2
			Sub-total Score (8)	**16**	**14**	**8**
			Level of Coherence	**2**	**2**	**1**
			The Extent of Mainstreaming	100	88	50
			Total Score (32)	**40**	**26**	**20**
			Level of Coherence	**1**	**1**	**1**
			The Extent of Mainstreaming	**66**	**41**	**31**

4.2 Discussion

4.2.1 Coherence of Climate Change Mitigation and Adaptation in Sector Policies

Based on the score matrix 4.1, the study found a partial extent of coherence of climate change mitigation and adaptation in priority sector policies with an average score of 1. This implies that most of the climate change mitigation and adaptation strategies that were detailed in NAPA and NCCRS were not adequately considered in priority sector policies. This can be attributed to delayed policy revisions and institutional inflexibility to accommodate the recent developmental challenges. It was observed that most of the reviewed sector policies, with the exception of the energy policy, were formulated when climate change was not recognized as a developmental challenge. These were in line with Daly, Yanda, & West (2015), who found that there were different levels of integration of climate change adaptation across sectors because most of the reviewed sector policies were drafted in the 1990s or early 2000, when climate change was an emerging global developmental challenge. Based on the findings, it was revealed that priority sector policies align weakly with national climate change adaptation goals. The findings of partial policy coherence were in line with England et al (2018). These may have implications in the governance of climate change mitigation and adaptation and address the impacts of climate change effectively.

However, different extents of coherence were observed at sector levels. National energy and water policies were found to have a highly coherent set of policies with average scores of 2. This implies that most of the climate change mitigation and adaptation strategies that were detailed in NAPA and NCCRS were adequately considered in energy and water policies. This was attributed to the fact that the energy policy was recently developed and the nature of the development of the water sector. The energy policy was revised in 2015 after climate change had been realized as a developmental challenge, while the realization that water forms an integral component of the environment resulted in the adoption of Integrated Water Resources Management principles (IWRM), that emphasize an integrated approach to the management of water resources and the environment. However, climate change was not explicitly addressed in energy and water sector policies. The impacts of climate change were not considered in a sector policy situational analyses, gap identification, policy formulation and identification of direction for implementation and strategic

environmental assessment of the policy. For instance, the role of the energy sector in climate change mitigation and the vulnerability of the sector to the impacts of climate change were not considered in a recent energy policy. This was in line with concerns from an interviewee from the Ministry of Energy, "*The main policy perspective is based on the generation point of view of increasing the share of renewable energies in electricity generation mixes, such as natural gas and wind to enhance availability, reliability and security of supply*. "This can be attributed to the limited climate change knowledge and awareness among planners and stakeholders on the cross-cutting phenomena of climate change and the influence of sustainable planning in policy formulation processes. An interviewee from the National Environment Management Council (NEMC) explained that *"Climate change in the country is still a new phenomenon and awareness is a gradual process. Actors may indirectly address climate change, but they may fail to propose a concrete approach to address it."*

Also, the interviewee demonstrated limited awareness of national climate change policies such as NAPA and NCCRS. Although they demonstrated high awareness of international frameworks such as the Kyoto Protocol, they demonstrated low awareness of the national climate change frameworks. This was attributed to inadequate communication, information sharing and collaboration between the national climate change focal point, NEMC, the Vice President's Office (VPO) and government ministries. Furthermore, the VPO interviewee stated that, "*Limited awareness of national climate change policies can be attributed to inadequate law enforcement. The Environment Management Act (2004), sections 30-35 require ministries to establish environmental management units and associated plans. Also, the VPO has prepared guidelines to integrate climate change into sector policies and plans and there are regular meetings that inform stakeholders on how to implement."* Overall, interviewees revealed that there are Environmental Management Units (EMU) in their sector ministries that work to address environmental issues by subjecting development projects to Environmental Impacts Assessment (EIA).

However, empirical studies have established that EIA is ineffective in addressing climate change mitigation and adaptation due to the absence of legal mandates in EIA legal frameworks, particularly EMA (2004)(Shimwela, 2022).The findings confirm that there is an absence of a coherent policy environment and legal frameworks to create legal mandates to enforce NAPA and NCCRS(Daly, Yanda, & West, 2015).This may have implications for the formulation and appropriate implementation of mitigation and adaptation strategies. With regards to infrastructure and industry, policies have a partial extent of coherence in climate change mitigation and adaptation with an average score of 1.

4.2.2 Coherence of Climate Change Mitigation and Adaptation in National Development Plans

Based on the score matrix 4.2, the study found a partial extent of coherence of climate change mitigation and adaptation in national development plans, with an average

score of 1. This implies that most of the climate change mitigation and adaptation strategies that were detailed in NAPA and NCCRS were not adequately considered in national development plans. This can be explained by the fact that most sector policies did not strongly align with the national climate change adaptation goals. Based on the findings, it was observed that national development plans align weakly with national adaptation goals. The findings differ from Pilato, Sallu, & Michalczenia (2018),who found no policy coherence between climate change goals and development in district development plans, because national policies do not include efforts to manage climate change(Daly, Yanda, & West, 2015), and therefore hindering efforts to address climate change at all levels. This may have implications for the effective implementation of climate change mitigation and adaptation and achieving resilient development in a changing climate. At the sector level, some sectors have stronger, more coherent plans than others. The energy and water sector policies have strong, coherent plans with an average score of 2. This was explained by the high coherence of sector policies with national climate change goals.

The infrastructure sector has partial coherence plans, with an average score of 1. The plans do not adequately consider the adoption of appropriate technology in infrastructure planning, designing and development, development of national building standards and code of practices and assessment of climate change risks and vulnerability. The industry sector has poor coherence plans, with an average score of 0. Also, the plans do not adequately consider enhancing cleaner production practices and technologies, diversification of energy sources and fuel switching technologies, and adoption of energy-efficient technologies are not considered in industry sectors. This can be explained by the global transformational challenges of the energy transition. These imply that climate change considerations in infrastructure and industry are the areas that require tremendous capacity building.

4.2.4 Extent Consideration of Climate Change Mitigation and Adaptation in National Development Plans

Based on the score matrix 4.2, the study found a moderate extent of consideration of climate change mitigation and adaptation, with an average score of 66%. This implies that climate change mitigation and adaptation strategies that were detailed in NAPA and NCCRS were to some extent considered in national development plans. However, the study has found that after the preparation of NAPA and NCCRS, climate change considerations in national development plans progressed incrementally from 31% in the first development plan, 41% in the second development plan and 66% in the third development plan. At the sector level, a different extent of consideration was found. The energy and water sectors have a strong extent of consideration, with an average score of 89% and 100%, respectively. The industry and infrastructure sectors have a poor extent of consideration, with average scores of 25% and 43%. This justifies the alignment that exists between sector policies and national development plans. The finding highlights the planning gaps that exist between national policy environments

and associated legal frameworks and national climate change frameworks (NAPA and NCCRS) and sector ministries. Although the consideration of climate change in development plans progressed incrementally, infrastructure and industry are sectors that were found to have inadequate considerations. The observed planning gap can be ascertained by the absence of a coherent policy environment and legal frameworks that may cause a mismatch of decision-making timescales. These can be attributed to delayed policy revisions, institutional inflexibility, inadequate climate change knowledge and awareness among planners and weak coordination and communication of climate change legal frameworks between national climate change focal points, NEMC, VPO and sector ministries. These may have an implication for the effective implementation of climate change mitigation and adaptation and achieve resilient development. These findings were different from Fatemi, Okyere, Diko, & Kita (2020), who found a strong extent of consideration of climate change in national development plans in Bangladesh.

Given the planning gap and observed extent of climate change consideration in energy, industry and infrastructures, the findings highlight the challenge of achieving the objective of building a competitive economy to stimulate the country's participation in trade and investment, since sustainable development outcomes in a changing climate are products of planned adaptation (Ataga, Inkoom, & Derbie, 2017).For instance, the impacts of climate change may have an implication on the construction of infrastructure by lengthening the time for completion of the country's strategic projects, resulting in high costs of implementation and failure to harness their synergies in a timely manner and reduce the expected rate of economic growth. Also, given the potential role of energy and industry sectors in mitigation, the findings highlight their implications in the emission of GHGs and achieving sustainable development.

CHAPTER FIVE
CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Study

The main objective of this study was to understand the extent of consideration of climate change mitigation and adaptation in national development plans in Tanzania, by comparing mitigation and adaptation strategies in NAPA and NCCRS and their integration in sector policies and national development plans. The general objective was achieved by four specific objectives. The first was to examine the extent of coherence of climate change mitigation and adaptation in priority sector policies, the second was to examine the extent of coherence of climate change mitigation and adaptation in the national development plan, and the third was to examine the extent of consideration of climate change mitigation and adaptation in the national development plan.

The study adopted a mixed research design, employing both qualitative and quantitative research designs. A qualitative research design was adopted to assess and describe text data on the extent of climate change consideration to generate descriptive information. This was followed by a quantitative analysis of descriptive information involving the scoring matrix to explore the extent of coherence and consideration of climate change mitigation and adaptation in sector policies and national development plans. Both primary and secondary data were used. Primary data was obtained from respective ministry policy experts, NEMC and VPO. Secondary data was obtained through an in-depth review of NAPA, NCCRS, sector policies and the FYDP plans. Purposive sampling was used to select sector policies based on their sensitivity to climate change, their primary role to determine mitigation and adaptation, and their aspiration in the plan on increasing the country's capacity production and building a competitive economy to stimulate the country's participation in trade and investment. The selected sectors were energy, transport, construction, water and industry.

5.2 Summary of Major Findings

5.2.1 Coherence of Climate Change Mitigation and Adaptation in Sector Policies

The study found a partial extent of coherence of climate change mitigation and adaptation in priority sector policies, with an average score of 1. Energy and water sector policies have strong, coherent policies, with an average score of 2. The industry and infrastructure sectors have partial coherent policies, with an average score of 1. Based on the findings, it was observed that priority sector policies align weakly with national climate change adaptation goals.

5.2.3 Coherence of Climate Change Mitigation and Adaptation in National Development Plan

The study found a partial extent of coherence of climate change mitigation and adaptation in national development plans, with an average score of 1. Energy and water sector policies have strong, coherent plans, with an average score of 2. Infrastructure sectors have partial coherent plans, with an average score of 1. The industry sector has poor coherent plans, with an average score of 0. Based on the findings, it was observed that the national development plans, align weakly with national climate change adaptation goals.

5.2.4 Extent Consideration of Climate Change Mitigation and Adaptation in National Development Plans

The study found a moderate progressive extent of consideration of climate change mitigation and adaptation in national development plans, with an average score of 66%. The energy and water sectors have a high extent of mainstreaming average scores of 89% and 100%. The industry and infrastructure sectors have a poor extent of mainstreaming, with an average score of 25% and 43%.

5.3 Conclusion

Based on the findings, the study concludes that there is a moderate extent of consideration of climate change mitigation and adaptation in national development plans in Tanzania. However, the national development plans align weakly with national climate change adaptation goals. This is due to a weak alignment between sector policies and national climate change adaptation goals. These were attributed to the absence of a coherent policy environment and legal frameworks caused by delayed policy revisions, inadequate climate change knowledge and awareness among planners and weak coordination and communication of climate change legal frameworks between the national climate change focal points, NEMC and VPO and sector ministries. These may have an implication for effective formulation and appropriate implementation of climate change mitigation and adaptation and achieve resilient development outcomes.

5.4 Recommendations

Based on the findings, the study recommends the following to strengthen the alignment between sector policies, development plans and national climate change adaptation goals:

i) Regular review of sector policies and legal frameworks to accommodate recent developmental challenges and ensure policy coherence.

ii) Build capacity and raise climate change knowledge and awareness among planners and stakeholders, to address global transformational challenges of energy transition and green infrastructure.

iii) Improved coordination and information flow between the national climate change focal points, NEMC and VPO, and relevant ministries. There should be improved coordination and legal mandate in the implementation of national and international climate change frameworks and agreements across sectors and all levels of governance.

iv) Incorporation of climate change in secondary school and tertiary education curricula, to impart culture in future planners to systematically anticipate the impacts of climate change.

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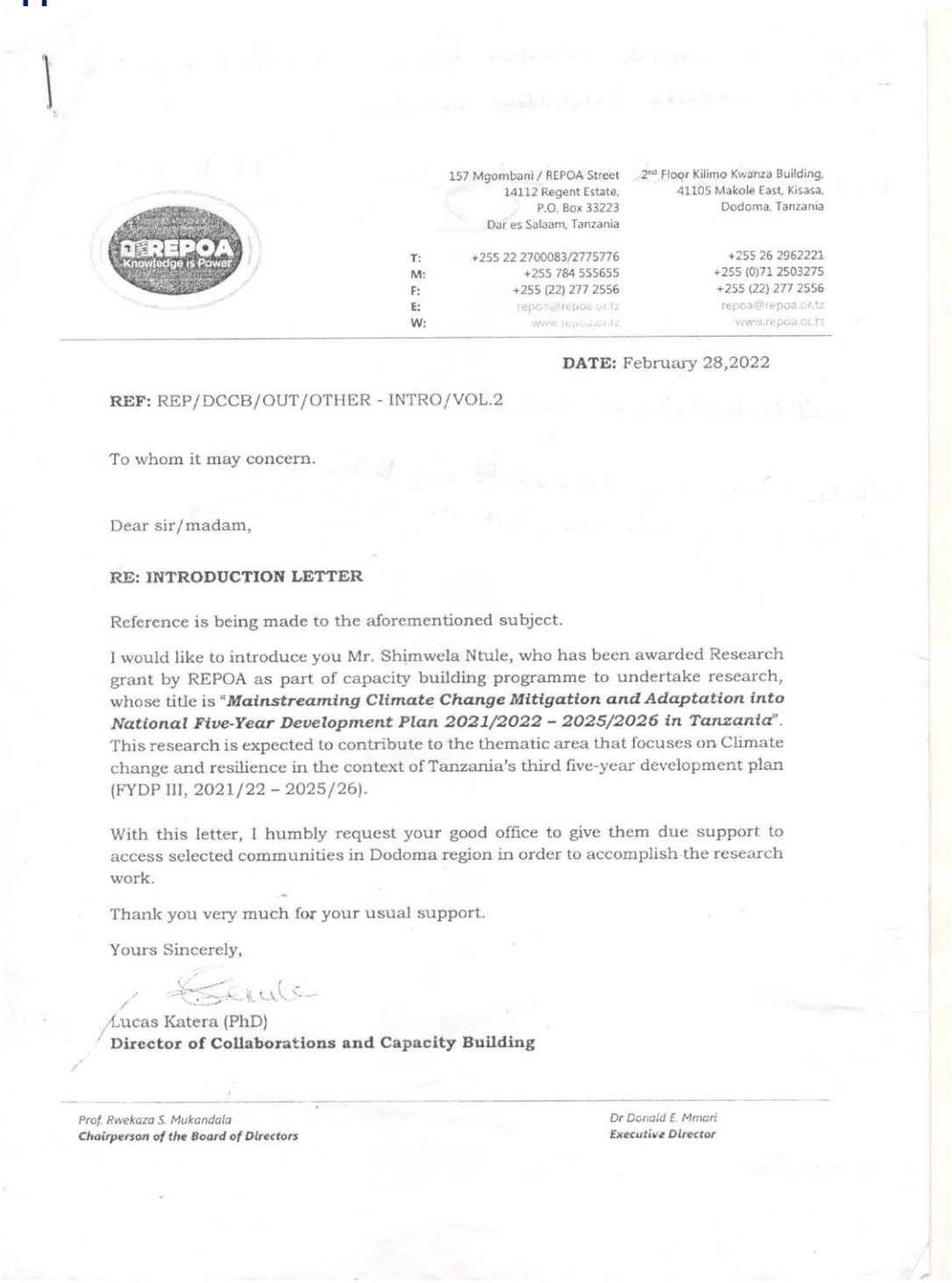
APPENDICES

Appendix 1: Researcher's Introduction Letter



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DATE: February 28,2022

REF: REP/DCCB/OUT/OTHER - INTRO/VOL.2

To whom it may concern.

Dear sir/madam,

RE: INTRODUCTION LETTER

Reference is being made to the aforementioned subject.

I would like to introduce you Mr. Shimwela Ntule, who has been awarded Research grant by REPOA as part of capacity building programme to undertake research, whose title is "***Mainstreaming Climate Change Mitigation and Adaptation into National Five-Year Development Plan 2021/2022 – 2025/2026 in Tanzania***". This research is expected to contribute to the thematic area that focuses on Climate change and resilience in the context of Tanzania's third five-year development plan (FYDP III, 2021/22 – 2025/26).

With this letter, I humbly request your good office to give them due support to access selected communities in Dodoma region in order to accomplish the research work.

Thank you very much for your usual support.

Yours Sincerely,

Lucas Katera (PhD)
Director of Collaborations and Capacity Building

Prof. Rwekaza S. Mukandala
Chairperson of the Board of Directors

Dr Donald E. Mmari
Executive Director

Appendix 2: Letter of Acceptance to Collect Data at the Ministry of Works and Transport

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF WORKS AND TRANSPORT

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In reply please quote:
Ref. No. EA.163/209/01/51

23rd March 2022

Director of Collaborations and Capacity Building,
REPOA,
157 Mgombani/REPOA Street,
14112 Regent Estate,
P. O. Box 33223
DAR ES SALAAM.

REPOA
RECEIVED
DATE 19/4/2022

Re: INTRODUCTION LETTER

Kindly refer to your letter with Ref. No. REP/DCCCB/OT/OTHER-INTRO/VOL.2 dated 28 February, 2022 regarding to the heading above.

2. We would like to inform you that, Mr. Shimwela Ntule has been accepted to conduct research and collect data at the Ministry of Works and Transport (Works Sector). In order for Mr. Ntule to achieve objectives of his research we introduce him to the Safety and Environment Unit where he can get the information required to fulfil his research titles "**Mainstreaming Climate Change Mitigation and Adaption in National Five-year Development Plan 2021/2022 – 2025/2026 in Tanzania.**"

3. Upon arrival he should report to the assigned person for further guidance.

L. Kivenule
For: PERMANENT SECRETARY (WORKS)

Copy: **Mr. Shimwela Ntule,**
157 Mgombani/REPOA Street,
14112 Regent Estate,
P. O. Box 33223
DAR ES SALAAM

Appendix 3: Key Informant Interview

1. Introduction

I **Shimwela Ntule,** a researcher from REPOA undertaking research titled "***Mainstreaming Climate Change Mitigation and Adaptation in National Five–Year Development Plan 2021/2022 – 2025/2026 in Tanzania.*** Kindly assist me to get the necessary information that may enable me to achieve the objectives of this research.

2. The Rationale of the study

Empirical evidence has shown that most developing nations have prepared National Adaptation Programs of Action (NAPAs) and National Climate Change Response Strategies (NCCRS) but climate change mainstreaming in development plans at both national and sub-national levels is inadequate and often treated as normal planning issues or business. This is due to poor policy alignment and structural differences between NAPAs and NCCRS, sector policies, and national development plans.

3. The interview Questions

I kindly need your opinions concerning the following questions

1. Name and position of the respondent
2. For how long has served for the post
3. What sector policy is implemented by the ministry? i.e. Which year was developed and last reviewed
4. What are other potential stakeholders /sectors that you work with in collaboration to implement sector plans/policy?
5. Does your sector policy clearly state how it will work in collaboration with other potential stakeholders/sectors?
6. How does the sector policy align with the global challenge of climate change?
7. What is the strength or weakness of the sector policy concerning climate change?
8. How sector plans in the policies are translated into the national development plan
9. How do you accommodate the translation of recent challenges in national development plans?
10. What is your opinion on what should be done for the successful consideration of climate change at the sector level?

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