Preparation of a Policy Framework and Action Plan to Support Climate Change Mitigation and Adaptation in the Digital Sector of Guinea-Bissau

Inception Report

(Deliverable 01 – October 14, 2024)

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1. EXECUTIVE SUMMARY

The Government of Guinea-Bissau aims to digitalize its economy as a means of overcoming the numerous internal adversities marked by successive periods of instability and, consequently, weak governance. The current political context has constituted one of the major handicaps to the implementation of effective reforms and the creation of a stable business environment in the country.

Guinea-Bissau is one of the countries most vulnerable to climate change, with an extensive coastline and a vast, discontinuous territory formed by an archipelago of 88 islands and islets (the Bijagós Archipelago), which extends over a maritime area of approximately 10,270 km² and occupies a submerged perimeter of about 90,000 hectares.

This bioclimatic context alone highlights the risks and vulnerabilities to which the country is exposed. Furthermore, the current situation constitutes both a warning of the urgent need for a paradigm shift and a motivating factor for the creation of a reference policy framework that helps mitigate potential vulnerabilities, threats, and climate risks.

1.1. Project Overview and Its Importance

This project aims to develop a policy framework and an action plan to support climate change mitigation and adaptation in Guinea-Bissau's digital sector. With the ongoing digitalization of the economy and the World Bank's USD 60 million investment under the WARDIP Project, it is essential to ensure that telecommunications development is both sustainable and climate-resilient.
Being highly vulnerable to climate change, Guinea-Bissau faces significant challenges that affect not only its economic growth but also the well-being of its population. Therefore, implementing policies that integrate climate resilience into the digital sector is a top priority to promote a more sustainable and inclusive future.

1.2. Main Objectives and Deliverables

The main objectives of the project include:

- **Policy Development:** To create a policy framework that guides mitigation and adaptation to climate change, aligned with the specific needs of the digital sector and local realities.
- **Stakeholder Engagement:** To engage multiple stakeholders, including government institutions, civil society, and the private sector, ensuring that proposed policies are both relevant and effective.
- **Assessment and Analysis:** To conduct a detailed analysis of international best practices and assess existing policies and regulations.

The project's deliverables include:

- **Inception Report:** Establishing the project's foundations and methodology.
- **Analytical Report:** Presenting the analysis of best practices and policy recommendations.
- **Policy Framework and Budgeted Action Plan:** Providing clear guidelines and an implementation plan with priority actions and success indicators.

1.3. Summary of Methodology and Expected Results

In accordance with the Terms of Reference (ToR), this report presents the methodological proposal for the elaboration of a **Policy Framework and Action Plan to Support Climate Change Mitigation and Adaptation in the Digital Sector of Guinea-Bissau**.

Given the dual nature of the work—undertaken by a mixed team composed of national and international consultants—the proposed methodology is structured in two phases, ensuring close engagement between both teams.

The preparation of this Policy Framework and Action Plan, with its respective budget, seeks broad social participation and qualified input. It involves a joint effort among technical stakeholders, researchers, and civil society organizations, while primarily giving voice to the public. This requires participatory methodologies in management, knowledge sharing, and dialogue-building.

International experience shows that such strategies and plans require an implementation proposal that allows for continuous monitoring and adjustments throughout the process. As with any project of this nature, the Action Plan design is dynamic and can be improved as results are obtained.

Therefore, special emphasis is placed on the organization of **two workshops** (kick-off and final), as presented in our Technical Proposal, serving as key mechanisms for stakeholder ownership and for ensuring the sustainability of actions and knowledge.

For the team, the first step in accomplishing this task is to identify the stakeholder landscape and prioritize participants to be involved in the strategy formulation process.

The project methodology combines qualitative and quantitative research methods, including stakeholder interviews, focus groups, and participatory workshops. Data analysis will identify gaps and opportunities in existing policies and help understand stakeholder needs.

The expected results include:

- The formulation of a robust policy framework aligned with Guinea-Bissau's sustainable development goals;

- A detailed action plan outlining mitigation and adaptation strategies to be implemented in the digital sector;
- Enhanced awareness and engagement among stakeholders on climate issues and their implications for the digital sector.

In summary, this project represents a crucial opportunity to strengthen climate resilience in Guinea-Bissau, promoting sustainable and inclusive development that benefits both the economy and society as a whole.

2. INTRODUCTION

2.1. Project Context

Guinea-Bissau, a West African country, faces significant climate challenges that affect all sectors of its economy, including telecommunications. The growing digitalization and development of the telecommunications sector are essential for the modernization of the economy and for social inclusion. However, the country's vulnerability to climate change—manifested through rising temperatures, coastal erosion, soil salinization, and irregular rainfall—poses a serious threat to the continuity of digital services and existing infrastructure.

In this context, the **World Bank** has granted a **USD 60 million** fund to support the development of telecommunications and the digital economy in the region through the **West Africa Regional Digital Integration Program (WARDIP)**. This project aims to transform Guinea-Bissau into an integrated and competitive digital market by removing barriers to connectivity and promoting policies and regulations that foster innovation and economic growth.

2.2. Importance of Addressing Climate Change in the Digital Sector in Guinea-Bissau

Addressing climate change in the digital sector is crucial to ensure that investments in technology and telecommunications are sustainable and resilient. When properly implemented, the digitalization of the economy can drive growth, innovation, and job creation. However, the absence of policies that integrate environmental sustainability can compromise these achievements.

Integrating climate change mitigation and adaptation into digital sector policies not only promotes a safer environment for investments but also ensures that vulnerable communities benefit from the opportunities of the digital economy. This approach is vital for guaranteeing sustainable and resilient development for Guinea-Bissau.

2.3. Objectives of the Inception Report

The **Inception Report** aims to establish the foundation for developing the Policy Framework and Action Plan. Its main objectives are to:

- Clearly define the project's scope and expectations;
- Identify key stakeholders and their respective needs;
- Establish a timeline of activities and deliverables;
- Define the methodology to be applied for policy analysis and development.

3. PROJECT CONTEXT AND JUSTIFICATION

3.1. Overview of Climate Change Impacts in Guinea-Bissau

Guinea-Bissau is highly vulnerable to the effects of climate change, with direct impacts that threaten infrastructure, the economy, and the population's well-being. Climate phenomena such as increasing temperatures, rainfall variability, and sea-level rise can severely affect agriculture—the backbone of the national economy—and telecommunications, which are essential for connectivity and access to information.

According to the **World Bank** and **UNDP**, without the implementation of effective policies for mitigation and adaptation, the country may face rising poverty rates, population displacement, and social instability.

3.2. Current State of the Telecommunications Sector

Guinea-Bissau's telecommunications sector is growing but faces critical challenges related to infrastructure and accessibility. Low internet penetration, especially in rural areas, limits access to digital services and economic inclusion. Moreover, existing infrastructures are vulnerable to extreme climate events, which can disrupt essential services and hinder business continuity.

As the digitalization of the economy progresses, it is crucial that telecommunications policies incorporate climate resilience measures, promoting energy efficiency and minimizing environmental impact. The **WARDIP Project** seeks to support the development of policies and regulations that enable a resilient and sustainable digital market.

3.3. Relevance of a Policy Framework and Action Plan

Developing a **Policy Framework and Action Plan** is essential to integrate climate considerations into digital sector policies. Such a framework should:

- Establish clear guidelines for the design, construction, and operation of climate-resilient infrastructure;
- Promote the use of sustainable technologies within the telecommunications sector;
- Facilitate coordination among different stakeholders, ensuring that the perspectives of both communities and the private sector are heard;
- Identify sources of financing to support adaptation and mitigation initiatives.

A well-defined framework will not only help Guinea-Bissau address the challenges posed by climate change but may also serve as a model for other countries in the region, promoting a collaborative and effective approach to sustainability within the digital sector.

4. OBJECTIVES OF THE CONSULTANCY

The main objective of this technical assistance is to elaborate a comprehensive **Policy Framework and Action Plan** that supports the mitigation of and adaptation to the impacts of climate change in Guinea-Bissau's telecommunications sector. This policy framework shall provide clear guidance and direction for decision-making and the implementation of concrete actions aimed at reducing climate-related impacts and risks in the sector.

4.1. Specific Objectives

4.1.1. Detailed Analysis of Best Practices in Climate Change Mitigation and Adaptation through Digital Technology

This objective consists of conducting a global comparative analysis of best practices for mitigating and adapting to the impacts of climate change through digital investments. It also aims to identify relevant initiatives and policies—both at regional and national levels—that address climate change adaptation and mitigation within Guinea-Bissau's digital sector and the wider West African region.

4.1.2. Assessment of Existing Policies and Regulations Related to the Digital Sector and Climate Change

This objective involves a detailed evaluation of existing policies and regulatory frameworks in Guinea-Bissau, focusing on their capacity to implement adaptation and mitigation activities. Additionally, it includes an estimation of the potential impact of digitalization in the public sector and digital investments on climate change in Guinea-Bissau over the next 5 to 10 years, with particular attention to interventions under the **WARDIP Project**.

4.1.3. Stakeholder Consultations

Within this scope, open and collaborative consultations will be conducted with a diverse range of stakeholders, including government agencies, academic institutions, civil society organizations, and the private sector. The objective is to identify the specific needs and priorities of these groups regarding climate change mitigation and adaptation in the digital sector. Furthermore, two in-person validation workshops will be organized—one for the **Analytical Report** and another for the **Policy Framework and Action Plan**—involving representatives from government, the private sector, and civil society to discuss the importance of mitigation and adaptation in the digital sector.

4.1.4. Development of a Policy Framework

This objective involves analyzing the climate context and existing policies, as well as incorporating stakeholder inputs. A comprehensive **Policy Framework** will be developed, containing specific mitigation and adaptation strategies for the digital sector, ensuring that the Government of Guinea-Bissau's investments are aligned with advanced methodologies and international best practices in climate change adaptation and mitigation. The framework and action plan will also align with Guinea-Bissau's **Sustainable Development Goals (SDGs)** and the **United Nations Sustainable Development Agenda**, prioritizing infrastructure sharing and strengthening institutional arrangements within the government.

4.1.5. Preparation of a Detailed Action Plan

Finally, a detailed and budgeted **Action Plan** will be developed, defining the concrete steps required for the implementation of the policies, categorized by responsible institution. This plan will include clear targets and performance indicators that will enable monitoring of progress and the success of mitigation and adaptation initiatives in the digital sector over time.

These specific objectives aim to provide a solid foundation for policy development in the technology and telecommunications sectors, effectively addressing climate challenges and promoting resilience and sustainability in Guinea-Bissau. Through a comprehensive and collaborative approach, this consultancy seeks to contribute to building a more climate-resilient and resource-efficient digital future for the country.

5. TECHNICAL APPROACH AND METHODOLOGY

To develop a comprehensive **Policy Framework and Action Plan** that supports climate change mitigation and adaptation in the digital sector, it is essential to adopt a structured technical and methodological approach based on a combination of recognized methods and practices, carefully adapted to the specific needs and challenges of Guinea-Bissau's telecommunications and digital technology sectors in the context of climate change.

The main elements and stages of this approach are described below.

5.1. Diagnosis and Context Analysis

5.1.1. In the Digital Sector

The diagnosis of the digital sector involves a comprehensive assessment of existing conditions, capacities, and challenges in Guinea-Bissau. It is fundamental for understanding the current state of the digital economy and identifying opportunities for growth. This diagnosis includes the following key areas:

- **Organizational Structure:** Understanding the institutional framework and organizational structure of digital sector governance in Guinea-Bissau, as well as the responsibilities of each stakeholder involved.
- **Digital Infrastructure:** Assessing the quality and coverage of telecommunications infrastructure, such as high-speed internet networks, availability of cloud services, and connectivity in both urban and rural areas.
- **Digital Access and Inclusion:** Analyzing the level of access to the internet and digital technologies among the population, including issues of digital inclusion such as disparities between socioeconomic and geographic groups.
- **Innovation Capacity:** Assessing the country's innovation ecosystem, including the presence of startups, research and development centers, and investment in technology and innovation.
- **Education and Skills Development:** Evaluating the digital skills and training of the workforce, including the availability of educational programs that teach relevant competencies for the digital sector.
- **Regulation and Public Policy:** Analyzing the legal and regulatory framework governing the digital sector, including legislation on data privacy, cybersecurity, e-commerce, and intellectual property protection.
- **Digital Economy:** Evaluating the contribution of the digital sector to the national economy, including the growth of digital industries such as e-commerce, fintech, digital health, and media.

- **Digital Entrepreneurship:** Analyzing the ecosystem for digital startups and entrepreneurs, including access to financing, incubators, and support networks.
- **Cybersecurity:** Assessing cybersecurity and data protection practices, as well as the country's capacity to address digital threats and cyberattacks.
- **Public–Private Sector Participation:** Analyzing collaboration between the public and private sectors in developing and implementing digital policies, as well as civil society participation in technology discussions.
- **Future Trends and Challenges:** Identifying emerging trends and potential challenges for the digital sector, such as digital transformation, artificial intelligence, automation, and ethical considerations.

5.1.2. In the Environmental Sector

A comprehensive understanding of Guinea-Bissau's climate vulnerabilities—through the analysis of existing interdisciplinary diagnostics and studies—is essential to guide the project's context analysis and to ensure an integrated approach.

This will enable a deeper understanding of the following dimensions:

- **Risk Magnitude:** Understanding current and future climate-related risks and identifying priority areas for adaptation actions.
- **Climate Data:** Collecting historical and projected data on climate variables, including temperature, precipitation, sea-level rise, coastal erosion, extreme weather events, and future meteorological patterns.
- **Socioeconomic Data:** Gathering demographic, economic, social, and public health data to understand population structures and vulnerabilities.
- **Environmental Data:** Collecting data on ecosystem conditions, including biodiversity, land use, and natural resource management.
- **Risk Mapping:** Accessing available geographic information systems (GIS) or databases that map areas and assets exposed to climate hazards such as flooding, landslides, and sea-level rise.
- **Identification of Sensitive Sectors:** Compiling data and information on sectors or communities most susceptible to adverse climate impacts due to their economic dependence—such as rain-fed agriculture in arid regions.
- **Institutional Assessment:** Analyzing the effectiveness of public policies and institutions responsible for climate change management and adaptation promotion.
- **Resource Identification:** Assessing the availability of financial, technological, and human resources allocated to adaptation strategies.
- **Community Engagement:** Analyzing local community perceptions, engagement levels, and adaptive capacities regarding climate vulnerabilities.

- **Socioeconomic Diversity:** Examining the influence of poverty, access to basic services, and social inequality on community vulnerability levels.

5.2. Detailed Analysis of International Best Practices

- **Global Case Studies:** Conducting a comprehensive analysis of international best practices in climate change mitigation and adaptation in the digital sector, focusing on successful experiences from countries and regions facing climate challenges similar to those of Guinea-Bissau, including small island nations and developing countries.
- **Specialized Literature Review:** Performing an extensive review of specialized literature, including academic publications and reports from international organizations such as the **International Telecommunication Union (ITU)**, **World Bank**, **UNFCCC (United Nations Framework Convention on Climate Change)**, and the **Convention on Biological Diversity (CBD)**.
- **Consultations with Experts:** The evaluation will be further enriched through consultations with global experts in climate policy and digital technologies, ensuring that the strategies adopted are aligned with the latest and most effective international approaches.

5.3. Qualitative and Quantitative Research Methods

- **Interviews and Focus Groups:** Qualitative methods will be employed, including in-depth interviews with key stakeholders — such as government representatives, private sector actors, civil society organizations, and academia — along with focus groups to gather detailed insights into stakeholder perceptions and experiences.
- **Document and Indicator Analysis:** Complementary quantitative methods will be applied through the collection and analysis of key performance indicators for the telecommunications and digital technology sectors, climate data, and other relevant information.
  Advanced statistical techniques will be used to identify patterns and trends, ensuring that the analysis is data-driven and evidence-based.

5.4. Assessment of Existing Policies

- **Analysis of Regulations and Strategies:** A detailed assessment of existing policies and regulations in Guinea-Bissau will be conducted to identify gaps to be addressed, strengths to be leveraged, and opportunities for improvement — focusing on optimizing these frameworks to enhance climate change response capacity.
- **Partnerships and Initiatives:** The assessment will include a review of development strategies, private sector initiatives, and international partnerships to map how these

policies interconnect and how they can be more effectively integrated to achieve cohesive results.

5.5. Collaborative Consultations with Stakeholders

- **Comprehensive Engagement:** Open and collaborative consultations will be conducted with a wide range of stakeholders, promoting an inclusive dialogue that involves government agencies, private sector representatives, NGOs, local communities, and academic experts.
- **Workshops:** Workshops will be organized to ensure that the needs, concerns, and suggestions of all stakeholders are considered. These sessions will facilitate a more democratic, participatory, and representative policy development process, fostering collaboration, knowledge sharing, and consensus-building. The ultimate goal is to co-create policy solutions that are not only effective but also inclusive and reflective of diverse perspectives.

5.6. Development of Realistic Strategies

- **Objectives and Priority Actions:** Based on the analyses and consultations, realistic and feasible strategies will be developed to mitigate climate impacts in Guinea-Bissau's telecommunications and digital technology sectors. Clear objectives, priority actions, resource allocation, and progress indicators will be defined to monitor and evaluate implementation.
- **Detailed Action Plans:** Each strategy will be accompanied by a detailed action plan, specifying timelines, responsibilities, and continuous mechanisms for monitoring and evaluation to ensure accountability and performance tracking.

5.7. Integration of National Experts and Validation Workshops

- **Collaboration with Local Experts:** The consultancy team will work in close collaboration with national experts, including local professionals, academics, and government representatives, ensuring a context-specific and locally relevant approach.
- **Strategy Validation:** Validation workshops will be organized with stakeholders to review and validate proposed strategies, guaranteeing ownership, acceptance, and effectiveness within the local context.

5.8. Interdisciplinary and Multidimensional Approach

- **Integration of Disciplines:** The approach integrates knowledge from various disciplines — including Information and Communication Technologies (ICT), e-Government, climate adaptation and resilience, climate finance, management and economics, environmental education, environmental justice, and public policy design and evaluation.This multidisciplinary approach ensures a comprehensive and holistic perspective.

This integrated and participatory methodology seeks to guarantee that the policies developed are based on solid evidence, aligned with international best practices, and simultaneously adapted to Guinea-Bissau's specific needs and realities regarding climate change and the digital sector.

5.9. Methodological Approach for Vulnerability and Adaptation (V&A) Assessment in the Digital Sector

It is increasingly evident that the interconnection between the digital world and the physical environment makes the digital sector particularly vulnerable to the impacts of climate change. Extreme weather events can cause prolonged disruptions to digital services, with significant consequences for the economy, society, and security.

Therefore, it is essential to understand the vulnerabilities and impacts of climate change on digital infrastructures and assets to propose appropriate solutions that enhance climate adaptation and resilience.

A **Climate Risk and Vulnerability Assessment** is proposed for Guinea-Bissau's digital sector, based on the **IPCC Risk Framework**, which defines risk as a function of **hazard[1], exposure[2], and vulnerability[3][4][5]**.

The assessment framework is grounded in the interaction between observed and projected hazards, the degree of exposure, and vulnerabilities to these hazards — to determine the risk posed by climate change to digital sector components (e.g., infrastructures, assets, etc.).

[1] A **climate hazard** is a natural climate-related event or process that can cause harm or damage. These are extreme atmospheric phenomena that can vary in intensity and frequency and may have significant impacts on communities, ecosystems, and infrastructure

[2] **Climate exposure** refers to the degree to which a human or natural system is subject to a specific climate hazard. In other words, it is the extent to which people, properties, ecosystems, or activities are located in areas susceptible to extreme weather events such as droughts, floods, heatwaves, or storms.

[3] **Climate vulnerability** refers to the propensity or predisposition of a system (whether natural or human) to be adversely affected by climate change. In other words, it is the extent to which a system is likely to experience harm or loss due to extreme weather events or gradual climate changes.

[4] The concept of risk in the IPCC Sixth Assessment

[5] AR5 Summary for Policymakers. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects.*

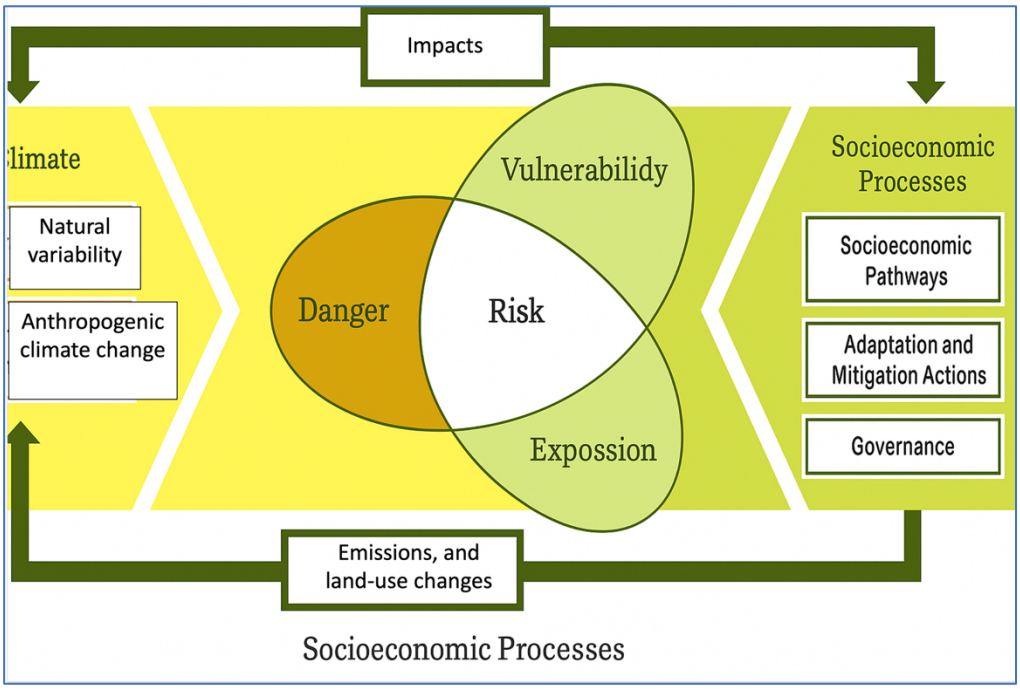


Figure 1: Risk Components as Defined by the IPCC (Source: IPCC AR5)

Based on this framework, the **Climate Risk and Vulnerability Assessment** will be conducted according to the following steps:

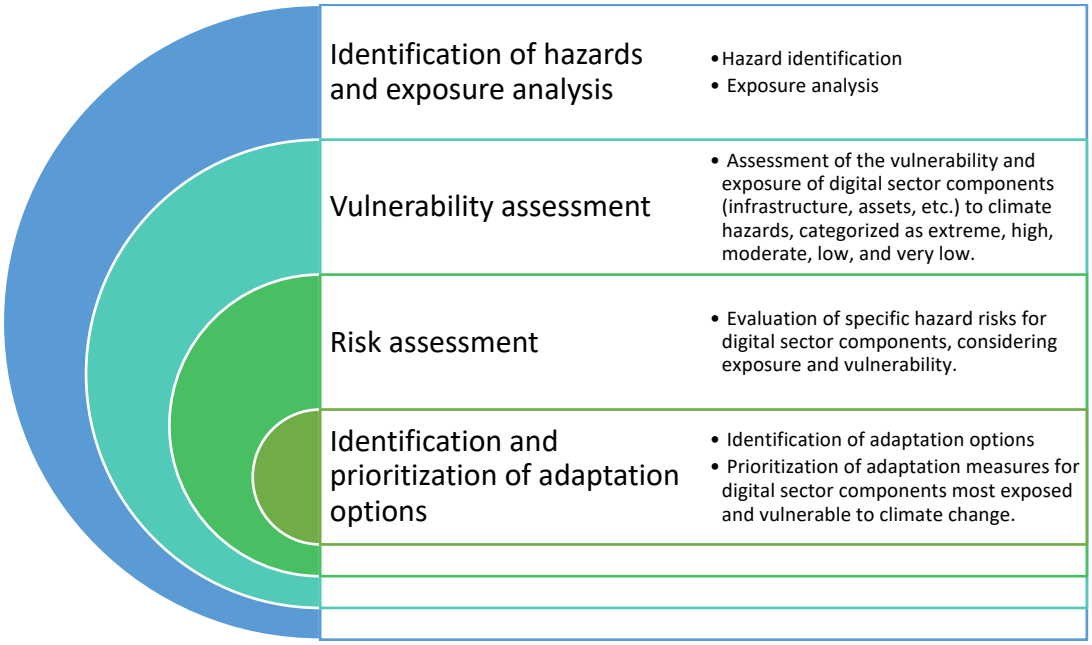


Figure 2: Framework for Climate Risk and Vulnerability Assessment

Step 1: Hazard Identification and Exposure Analysis

Hazard identification and exposure analysis are critical stages in assessing climate risk vulnerability and adaptation.

- For hazard identification, the analysis will include:
- A review of past extreme weather events;
- Climate modeling projections for Guinea-Bissau;

An assessment of the likelihood of concurrent climate events (observed and projected). Exposure assessment will include:

- Mapping the location of digital infrastructures and assets;
- Identifying geographic areas most exposed to climate hazards;
- Estimating the magnitude and frequency of expected impacts.

Observed changes in major climate trends will be considered, based on sources such as the World Bank Climate Change Knowledge Portal for Guinea-Bissau, ThinkHazard!, and other relevant tools.

The objective is to identify existing hazards that may pose risks to digital sector components in the present and/or future. Hazard probability and exposure will be characterized using a five-color scale to illustrate relative importance and intensity.

Hazard Probability	
Very High	
High	
Medium	
Low	
Very Low	

Table 1: Hazard Probability Scale

Historical impacts and projected changes in climate hazards affecting the digital sector are reflected in the classification of hazard exposure.

It is proposed that this classification be based on the climatic conditions of the mapped digital infrastructures and assets, combined with stakeholder consultations. When assessing hazard exposure, if the current exposure is classified as “High” and a significant change is projected or detected for the future scenario, the exposure will be categorized as “Extreme.”

However, if the projected change for a hazard currently classified as "High" is not significant in the future scenario, the future exposure level will remain "High."

Step 2: Vulnerability Determination

After analyzing sensitivity and adaptive capacity, vulnerability will be assessed using a matrix approach.

Figure 3: . Vulnerability Determination Matrix

Vulnerability		Sensitivity [from very low (1) to extreme (5)]				
		Very Low / Insignificant	**Low**	**Medium / Moderate**	**High / Probable**	**Very High / Catastrophic**
Adaptive Capacity [from very high (5) to very low (1)]	Very High	Very Low (1.5)	Low (2.5)	Moderate (4.5)	Moderate (5.5)	Moderate (5,5)
	High	Low (1.4)	Moderate (2.4)	Moderate (4.4)	High (5.4)	Elevada (5,4)
	Moderate	Low (1.3)	Moderate (2.3)	High (4.3)	Very High (5.3)	Very High (5,3)
	Low	Moderate (1.2)	Moderate (2.2)	Very High (4.2)	Moderate (5.5)	Very High (5,2)
	Very Low	Very Low (1.5)	High (2,1)	Very High (3,1)	Very High (3,1) (4,1)	Very High (5,1)

Table 2: MATRIZ DE VULNERABILIDADE

The color of each cell in the matrix corresponds to the intersection between **Sensitivity**, on a scale from 1 (very low) to 5 (very high), and **Adaptive Capacity**, on a scale from 5 (very high) to 1 (very low), of the natural or human system under consideration [**Vulnerability = f (Sensitivity, Adaptive Capacity)**].

Step 3: Risk Assessment

Once hazards, exposure, and vulnerability have been classified and evaluated, the final step is to develop the **Risk Matrix**[6]. The overall potential risk imposed by climate change on natural and human systems is determined through this combination of hazard, exposure, and vulnerability.

[6] **Climate risk** is the likelihood that an extreme weather event or a gradual change in climate will cause harm or damage to a natural or human system. In other words, it is the combination of exposure to climate hazards and the vulnerability of the system.

The matrix facilitates prioritization of systems and sectors at risk, supporting decision-making for climate-resilient investments and policies.

Risk		Hazard × Exposure (HE) [Exposure to observed or projected hazards]				
		Very Low	**Low**	**Moderate**	**High**	**Very High**
Vulnerabilidade (V)	**Very Low**	(HE1, V1)	(HE2, V1)	(HE3, V1)	(HE4, V1)	(HE5, V1)
	Low	(HE1, V2)	(HE2, V2)	(HE3, V2)	(HE4, V2)	(HE5, V2)
	Moderate	(HE1, V3)	(HE2, V3)	(HE3, V3)	(HE4, V3)	(HE5, V3)
	High	(HE1, V4)	(HE2, V4)	(HE3, V4)	(HE4, V4)	(HE5, V4)
	Very High	(HE1, V5)	(HE2, V5)	(HE3, V5)	(HE4, V5)	(HE5, V5)

Table 3: Potential Risk Classification Matrix [(Hazard × Exposure) × Vulnerability]

Step 4: Identification and Prioritization of Adaptation Options

Identifying and prioritizing **adaptation options**[7] for the digital sector is critical to ensuring service continuity and resilience against climate challenges.
Before defining adaptation options, specific vulnerabilities identified in previous stages must be analyzed.

The following table illustrates how assessed risks and associated adaptation measures will be summarized:

		Historical / Current Risk	Future / Projected Risk	Adaptation Options
Physical Components of the Digital Sector	PC1	▪	▪	▪
	PC2	▪	▪	▪
	PC3	▪	▪	▪
	Etc.	▪	▪	▪
Non-Physical Components of the Digital Sector	NPC1	▪	▪	▪
	NPC2	▪	▪	▪
	NPC3	▪	▪	▪
	Etc.	▪	▪	▪

Table 4: Evaluated Risks and Adaptation Options

Once adaptation options are identified, prioritization exercises will be conducted considering factors such as:

- **Severity of Risk:** Probability and impact of different climate events.
- **Cost–Benefit Ratio:** Implementation costs versus expected benefits.

[7] **Climate adaptation** is the process of adjusting natural and human systems to current and future climatic conditions. In other words, it is the ability of a system—whether an ecosystem, a community, or an infrastructure—to adapt to climate change and minimize the negative impacts of such events.

- **Technical Feasibility:** Technical viability of each adaptation option.
- **Strategic Alignment:** Consistency with national strategies (e.g., **NAP**, **NDC**, and other sectoral or national sustainable development plans).

Prioritization will follow a structured matrix (Table 4), classifying options from least to most urgent.

Adaptation Options	Adaptation Measures	Option Prioritization					Classification
		Criterion 1	Criterion 2	Criterion 3	...	Criterion n	
Option 1	Measure 1.1						
	Measure 1.2						
	Measure 1.n						
Option 2	Measure 2.1						
	Measure 2.2						
	Measure 2.n						
Option n	Measure n.1						
	Measure n.2						
	Measure n.n						

Table 5: Adaptation Options Prioritization Matrix

Figure 4: Scale from Least Priority (1) to Highest Priority (5)

6. STAKEHOLDER ENGAGEMENT PLAN

Effective stakeholder engagement is fundamental to the success of the project aimed at developing a **Policy Framework and Action Plan** for **Climate Change Mitigation and Adaptation in Guinea-Bissau's Digital Sector**.
A well-structured engagement plan ensures that the voices and concerns of all relevant groups are considered, promoting transparency, collaboration, and ownership of results.

6.1. Identification of Key Stakeholders

The key stakeholders for this project include the following categories:

- **Government of Guinea-Bissau:**
  Relevant ministries such as the **Ministry of Transport, Telecommunications and Digital Economy**, the **Ministry of Environment and Biodiversity**, and the **Ministry of Agriculture**, which play a decisive role in digital sector policy and climate change adaptation.
- **Regulatory Agencies:**
  The **National Regulatory Authority for Information and Communication Technologies (ARN-TIC)** plays a critical role in the implementation of policies and regulations in the digital sector.
- **Private Sector:**
  Telecommunications companies, Internet service providers, and technology startups have a vital role in implementing digital solutions and fostering innovation.
- **Civil Society:**
  NGOs and community-based organizations working on issues related to climate change, sustainable development, and digital inclusion.
- **Academic and Research Institutions:**
  Universities and research centers that can provide data, scientific insights, and technical analyses on climate change impacts and digital transformation.
- **International Organizations:**
  Entities such as the **World Bank**, **UNDP**, and **ITU**, which can offer technical and financial assistance and share lessons learned from similar experiences in other regions.

6.2. Approach to Consultation and Engagement

The engagement approach will be guided by principles of **inclusion**, **transparency**, and **collaboration**, ensuring broad participation and alignment with international best practices.
The main activities include:

- **Open Consultations:**
  Organizing meetings and workshops where stakeholders can express their opinions and contribute to policy formulation.
  These consultations will be essential for identifying specific needs, expectations, and sectoral priorities.
- **Focus Groups:**
  Conducting targeted focus group discussions with different categories of stakeholders to address particular challenges and opportunities.
  These sessions will encourage in-depth dialogue and experience sharing.
- **Individual Interviews:**
  Carrying out one-on-one interviews with key stakeholders to collect detailed perspectives and technical suggestions regarding climate policies in the digital sector.
- **Validation Workshops:**
  Facilitating participatory validation workshops to present and discuss draft proposals and to achieve consensus on the proposed solutions.
  These workshops will serve to strengthen ownership, ensure representativeness, and align recommendations with local realities.

This engagement plan is designed to promote mutual understanding and ensure that all policy and action plan components reflect the diversity of perspectives and experiences of Guinea-Bissau's institutional, social, and economic actors.

7. IMPLEMENTATION PLAN

The implementation plan for the technical assistance project in Guinea-Bissau is structured to ensure the efficient and effective execution of all activities, with a clear focus on delivering results that meet stakeholder expectations.

The following sections describe the key elements of this plan.

7.1. Detailed Project Activity Schedule

The project is organized over a **32-week period**, divided into four main phases. The timeline includes specific activities, defined milestones, and deliverables to ensure continuous progress.

The table below summarizes the project phases, main activities, and corresponding execution periods.

Ref.	Activity	Weeks
PHASE I: PREPARATION		
E-1: Inception Report		
1.1	Kick-off meeting	Oct 1–6
1.2	Initial document review	Oct 7–13
1.3	Configuration of data collection tools	Oct 7–13
1.4	Drafting and submission of Inception Report	Oct 7–13
1.5	Approval of Inception Report by the client	Oct 14–21
Deliverable 1: Inception Report		***Oct 14***
E-2: Draft Analytical Report (preliminary version)		
2.1	Analysis of international best practices (case studies, literature review)	Oct 14–Nov 3
2.2	Consultations with international experts	Oct 14–Nov 3
2.3	Qualitative research (interviews, focus groups)	Oct 28–Nov 17
2.4	Quantitative data collection	Oct 28–Nov 17
2.5	Drafting and submission of preliminary Analytical Report	Nov 11–24
2.6	Approval of preliminary Analytical Report by the client	Nov 25–Dec 1
Deliverable 2: Preliminary Analytical Report*)*		**Nov 25**
E-3: Second version of Analytical Report (complete version)		
3.1	Analysis of existing policies and regulations	Nov 25–Dec 15
3.2	Assessment of development strategies, private initiatives, and partnerships	Nov 25–Dec 15
3.3	Open and collaborative stakeholder consultations	Dec 9–29
3.4	Conduct of workshops	Dec 9–Jan 5
3.5	Drafting and submission of complete Analytical Report	Dec 23–Jan 5

3.6	Approval of complete Analytical Report by the client	Jan 6–12
Deliverable 3: Complete Analytical Report		**Jan 6**
PHASE II: STRATEGY DEFINITION		
E-4: Validation Workshop for Analytical Report		
4.1	Development of mitigation and adaptation strategies	Jan 6–26
4.2	Definition of objectives, action prioritization, and resource allocation	Jan 6–26
4.3	Establishment of progress indicators	Jan 6–26
4.4	Collaboration with national experts	Jan 20–Feb 2
4.5	Conduct of validation workshops	Jan 20–Feb 2
Deliverable 4: Validation Workshop on Analytical Report		**Feb 3**
E-5: Final Analytical Report		
5.1	Finalization of Analytical Report	Feb 3–Mar 2
5.2	Presentation of results and recommendations to stakeholders	Feb 3–Mar 2
5.3	Approval of Final Analytical Report by the client	Feb 17–Mar 2
Deliverable 5: Final Analytical Report		**Mar 3**
PHASE III: POLICY FRAMEWORK AND ACTION PLAN DEFINITION		
E-6: Draft Policy Framework and Action Plan (preliminary version)		
6.1	Development of draft Policy Framework and Action Plan	Mar 3–23
6.2	Collection of feedback from UIP and World Bank	Mar 3–23
6.3	Drafting and submission of preliminary Policy Framework and Action Plan	Mar 17–30
6.4	Approval of draft Policy Framework and Action Plan by the client	Mar 31–Apr 6
Deliverable 6: Preliminary Policy Framework and Action Plan		***Mar 31r***
E-7: Final Policy Framework and Action Plan		
7.1	Conduct of validation workshops	Mar 31–Apr 20
7.2	Revision and refinement of strategies and plans based on feedback	Mar 31–Apr 20
7.3	Finalization of Policy Framework and Action Plan	Apr 21–May 11
7.4	Approval of Final Policy Framework and Action Plan by the client	May 12–18
Deliverable 7: Final Policy Framework and Action Plan		**May 12**

7.2. Milestones for Each Deliverable

Project milestones are essential for ensuring progress tracking and on-time delivery. The following table outlines the milestones for each deliverable:

Deliverable	Milestones
1. Inception Report	1. Kick-off meeting held; 2. data collection tools configured;

Deliverable	Milestones
	3. report submitted and approved.
2. Preliminary Analytical Report	1. Best practice analysis completed; 2. expert consultations conducted; 3. report submitted and approved.
3. Complete Analytical Report	1. Policy analysis completed; 2. stakeholder consultations held; 3. report submitted and approved.
4. Validation Workshop	1. Mitigation strategies developed; 2. validation workshops conducted and documented.
5. Final Analytical Report	1. Report finalized; 2. results presented to stakeholders; 3. report approved.
6. Preliminary Policy Framework and Action Plan	1. Framework structured; f 2. eedback collected; 3. proposal submitted and approved.
7. Final Policy Framework and Action Plan	1. Validation workshops completed; 2. final strategies consolidated; 3. framework approved.

7.3. Roles and Responsibilities of the Consultancy Team

The consultancy team is composed of specialists with complementary technical expertise. Each member plays a crucial role in ensuring that the project's objectives are achieved effectively.

7.3.1. Lead Experts

Position	Name	Main Responsibilities
Team Leader / Public Policy Specialist	Jorge Lopes	1. Overall project coordination; integration and collaboration among team members; 2. supervision of policy and strategy development; 3. facilitation of communication with the client; 4. progress monitoring; 5. leadership of workshops and validation sessions.

Position	Name	Main Responsibilities
Climate Change Specialist	Mahugnon Serge Djohy	1. Analysis of climate change implications for the digital sector; 2. development of adaptation and mitigation strategies; 3. collaboration on climate-related reports and recommendations.
Climate Risk Financing Specialist	Sandro de Brito	1. Identification and assessment of available financing sources; 2. development of partnership proposals with financial institutions; 3. evaluation of existing mechanisms and funding opportunities.
Technology and Telecommunications Specialist	Edson Pereira	1. Assessment of the current state of the digital sector in Guinea-Bissau; 2. identification of climate-sensitive infrastructures and assets; 3. contribution to integrating digital technologies into climate policies.
Environmental Education and Awareness Specialist	Aidil Borges	1. Development of awareness and capacity-building strategies; 2. alignment of training initiatives with proposed policy recommendations.

7.3.2. Advisory and Support Roles

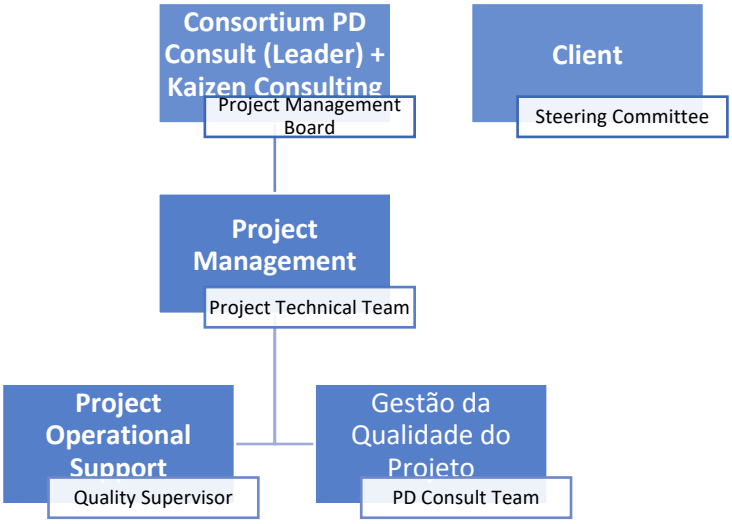
Position	Name	Main Responsibilities
Senior Consultant	Paulino Dias	1. Strategic guidance to the Team Leader; 2. advisory support on international best practices and experiences; 3. supervision and review of critical deliverables.
Project Manager	Samir Pereira	1. Project quality monitoring; 2. compliance with PD Consult standards; 3. coordination of administrative and logistical activities; management of internal and external communications.
Technical Support Officer	Samuel Silva	1. Assistance in data collection and research activities; 2. support in organizing interviews and focus groups; compilation and analysis of information for reporting.

Position	Name	Main Responsibilities
Administrative and Financial Assistant	Maria Ramos	1. Administrative management of the project, including document organization and financial reporting; 2. budget control; 3. liaison with suppliers and partners.

7.4. Technical Assistance Execution Management

Project execution will be managed through a **tripartite governance model** involving the client institution, overall project coordination, and technical/operational management.

This model ensures effective oversight of technical, administrative, and financial teams, guaranteeing compliance with established quality specifications.



Project management, monitoring, and evaluation will follow a structured approach aligned with the detailed work plan and the approved inception schedule.

Performance indicators will include:

- Percentage of completed versus planned tasks;
- Number of project days used versus planned workdays;
- Budget execution aligned with the expected disbursement schedule;
- Number of deliverables approved by the client;
- Level of client satisfaction.

These indicators will support ongoing monitoring and quality assurance throughout the project's life cycle.

7.5. Quality Management System

PD Consult operates under a robust **Quality Management System (ISO 9001)**, with formalized production processes ensuring strict compliance with client specifications.

Recognizing that monitoring and evaluation are critical to project success, an integrated reflection and communication system has been established to support implementation.

This system is designed to identify and address adjustment needs throughout project execution, enabling comprehensive evaluation of methodologies, objectives, processes, deliverables, and overall project relevance and impact.

To maintain high standards of quality, all consultancy deliverables undergo **three levels of quality control review** — involving the **Team Leader**, the **Production Management Unit**, and the **Board of Directors**.

These reviews ensure alignment with the project's objectives, as defined in the **Terms of Reference** and contractual provisions.

At project completion, PD Consult's back-office team will also conduct satisfaction assessments with both the **client** and **beneficiary institutions** using customized evaluation questionnaires.

8. Risk Assessment and Management Plan

Risk assessment is a critical component of project management, particularly in vulnerable contexts such as Guinea-Bissau, where climate change and political instability can significantly affect implementation.

This section identifies potential risks associated with the project and outlines mitigation strategies to minimize their impact.

8.1. Identification of Potential Project Risks

1. **Climate-Related Risks**

   - **Extreme Weather Events:**
     Increased frequency of droughts, floods, and storms may affect project infrastructure, disrupt activities, and hinder consultations and workshops.
   - **Climate Variability:**
     Unpredictable changes in weather patterns could impact work schedules, field activities, and overall project execution timelines.

2. **Political and Institutional Risks**

   - **Political Instability:**
     Internal conflicts and government instability could delay project implementation and limit institutional collaboration.
   - **Institutional Leadership Changes:**
     Shifts in leadership or priorities within ministries or regulatory agencies could disrupt continuity and reduce institutional support for the project.

3. **Social Risks**

   - **Lack of Stakeholder Engagement:**
     Low participation in consultations and workshops could lead to weak ownership and reduced acceptance of developed policies.
   - **Conflicts of Interest:**
     Divergent interests among stakeholders may create resistance or difficulties in implementing policy recommendations.

4. **Technical Risks**

   - **Digital Infrastructure Limitations:**
     Existing telecommunications infrastructure may not adequately support the implementation of proposed solutions.

- **Lack of Technical Capacity:**
  Insufficient knowledge or technical skills among stakeholders could hinder the successful adoption of proposed policies and digital solutions.

8.2. Mitigation Strategies for Identified Risks

1. **Climate-Related Risks**

   - **Contingency Planning:**
     Develop contingency plans to ensure continuity of activities during extreme weather events, including flexible scheduling and backup communication channels.
   - **Continuous Monitoring:**
     Establish a climate monitoring system to track conditions and adjust project timelines or fieldwork activities as needed.

2. **Political and Institutional Risks**

   - **Political Engagement:**

     Maintain continuous communication with political and institutional stakeholders to secure alignment with government priorities and ensure long-term commitment.
   - **Adaptive Planning:**

     Adjust project objectives, milestones, and schedules to accommodate institutional changes or shifts in government policy priorities.

3. **Social Risks**

   - **Proactive Inclusion:**

     Design and implement engagement strategies that encourage active participation from all relevant groups, particularly underrepresented or marginalized stakeholders.
   - **Conflict Management:**

     Establish clear mechanisms for identifying, mediating, and resolving stakeholder conflicts constructively to preserve cooperation and trust.

4. **Technical Risks**

   - **Infrastructure Assessment:**

     Conduct a comprehensive evaluation of existing digital infrastructure to identify limitations and plan necessary upgrades or complementary measures.
   - **Capacity Building:**

     Implement tailored training and technical assistance programs to enhance stakeholder capacity in adopting and managing climate-resilient digital systems.

By implementing this **Risk Assessment and Management Plan**, the project will be better positioned to anticipate, mitigate, and manage potential challenges, ensuring smoother and more effective execution.

Continuous monitoring and adaptive management will be essential to respond dynamically to emerging risks throughout the project lifecycle.

9. DELIVERABLES AND REPORTS

9.1. Detailed Description of Each Deliverable

1. **Deliverable 1 – Inception Report**

   Description:
   This report establishes the foundation of the project, including its scope, objectives, timeline, and methodology. It also identifies key stakeholders and defines the engagement mechanisms to be used.

   Contents:
   Project definition, stakeholder identification, methodology, activity schedule, and stakeholder engagement plan.

2. **Deliverable 2 – Analytical Report (Preliminary Version)**

   Description:
   This document presents the initial analysis of international best practices in climate change mitigation and adaptation within the digital sector, as well as data collected through research and stakeholder consultations.

   Contents:
   Literature review, case study analysis, results from interviews and focus groups, preliminary conclusions, and recommendations.

3. **Deliverable 3 – Analytical Report (Complete Version)**

   Description:
   A revised and expanded version of the Analytical Report, incorporating stakeholder feedback and providing deeper analysis of existing policies and identified gaps.

   Contents:
   Detailed policy and regulatory analysis, evaluation of development strategies, stakeholder consultations, and policy recommendations.

4. **Deliverable 4 – Validation Workshop on Analytical Report**

   Description:
   An event organized to present the results of the Analytical Report and obtain stakeholder feedback. This workshop aims to validate conclusions and recommendations before finalizing the report.

Contents:
Presentations of key findings, discussion sessions, feedback collection, and consensus-building on future directions.

5. **Deliverable 5 – Final Analytical Report**

Description:
The final document consolidating all analyses and validated recommendations.This report serves as a key reference for the formulation of the Policy Framework and Action Plan.

Contents:
Final analytical results, integrated recommendations, and a summary of consultation outcomes.

6. **Deliverable 6 – Policy Framework and Action Plan (Preliminary Version)**

Description:
An initial proposal for the Policy Framework guiding climate change mitigation and adaptation in the digital sector, accompanied by a detailed action plan.

Contents:
Structure of the policy framework, mitigation and adaptation strategies, priority actions, and implementation timeline.

7. **Deliverable 7 – Final Policy Framework and Action Plan**

Description:
The final version of the Policy Framework and Action Plan, incorporating all final stakeholder feedback and adjustments to local and regional contexts.

Contents:
Comprehensive policy framework, implementable actions, monitoring and evaluation mechanisms, and execution guidelines.

9.2. Indicative Structure of the Analytical Report and of the Policy Framework and Action Plan

Indicative Structure of the Analytical Report

1. Executive Summary
2. Introduction
   2.1. Project Context
   2.2. Objectives of the Report

3. Methodology
    3.1. Approach Used
    3.2. Data Collection Methods
4. Analysis of Best Practices
    4.1. International Case Studies
    4.2. Lessons Learned
5. Evaluation of Existing Policies
    5.1. Current Policies and Regulations
    5.2. Gaps and Opportunities
6. Stakeholder Consultations
    6.1. Summary of Consultations
    6.2. Feedback Received
7. Recommendations
    7.1. Proposed Policies
    7.2. Mitigation and Adaptation Strategies
8. Conclusion
9. Annexes
    9.1. Supporting Documentation
    9.2. Data Collected

Indicative Structure of the Policy Framework and Action Plan

1. Executive Summary
2. Introduction
    2.1. Rationale for the Policy Framework
    2.2. Objectives of the Action Plan
3. Context and Challenges
    3.1. Climate and Digital Context
    3.2. Key Challenges Identified
4. Policy Framework
    4.1. Guiding Principles and Policy Directions
    4.2. Mitigation and Adaptation Strategies
5. Action Plan
    5.1. Priority Actions and Implementation Timeline
    5.2. Performance Indicators and Monitoring Tools
6. Monitoring and Evaluation Mechanisms
    6.1. Governance and Institutional Structures
    6.2. Oversight and Reporting Procedures
7. Conclusion
8. Annexes
    8.1. Supporting Documents
    8.2. Reference Materials

This structured approach ensures coherence, transparency, and alignment between all deliverables, facilitating effective monitoring and evaluation of the project outcomes and ensuring compliance with the standards required by the **World Bank** and national authorities.

10. CONCLUSION

The development of a **Policy Framework and Action Plan** to mitigate and adapt Guinea-Bissau's digital sector to climate change represents a crucial milestone on the path toward sustainability and resilience in this strategic domain.

The vulnerability of the country's digital infrastructure to the effects of climate change poses significant risks to economic growth, public service continuity, and social well-being. This underscores the urgent need for an integrated and strategic approach that ensures both the robustness and sustainability of digital services.

The project — combining international best-practice analysis, extensive stakeholder consultations, and a comprehensive assessment of existing policies — provides a solid foundation for the formulation of actionable, evidence-based policies that respond simultaneously to climate imperatives and the nation's digital development priorities.

The **participatory methodology** adopted throughout this process ensures that proposed solutions are context-specific, inclusive, and aligned with Guinea-Bissau's institutional capacities and social realities. By grounding the framework in collaboration and knowledge co-creation, the project reinforces local ownership and institutional accountability.

The expected outcomes of this initiative — including the establishment of **climate-resilient digital infrastructures**, **promotion of sustainable technologies**, and **integration of adaptation and mitigation measures** into national planning — will directly strengthen the country's ability to withstand and recover from climate impacts.

The defined **Action Plan** sets forth clear goals, measurable indicators, and robust monitoring mechanisms to guide implementation and continuous improvement.

Ultimately, sustained collaboration among **government entities**, the **private sector**, **civil society**, and **international development partners** will be essential for the success of this endeavor.

The implementation of this Policy Framework and Action Plan will not only reinforce the climate resilience of Guinea-Bissau's digital sector but will also contribute to a broader vision of **inclusive, sustainable, and innovation-driven economic development**.