

# Capacity Building Workshop for Countries of the Africa Region. Data Ethics, Governance, and Quality in a Changing Data Ecosystem

Nairobi, Kenya – September 2025



## 2.4 DA.14

### Economy, Environmental and Statistical Capacity Building in Africa

Progress, Lessons Learned, and Sustainability of Activities

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# Agenda

1

## Global Initiatives

Overview of global webinars and collaborative efforts in environmental monitoring

2

## African Climate Data Compendium

Development of comprehensive climate data resources for Africa

3

## National Statistical System Strengthening

Case study of Eritrea's Master Sampling Frame update

4

## Capacity Building Initiatives

Training programs and knowledge transfer activities

5

## Implementation Challenges & Way Forward

Cross-cutting challenges and strategies for sustainable implementation



# Global Initiatives in Environmental Monitoring

The United Nations Development Account (DA.14) launched in September 2022 to enhance capacity building in developing countries, with a focus on environmental monitoring and statistical capacity.

# Global Webinar on Geospatial Data Sources

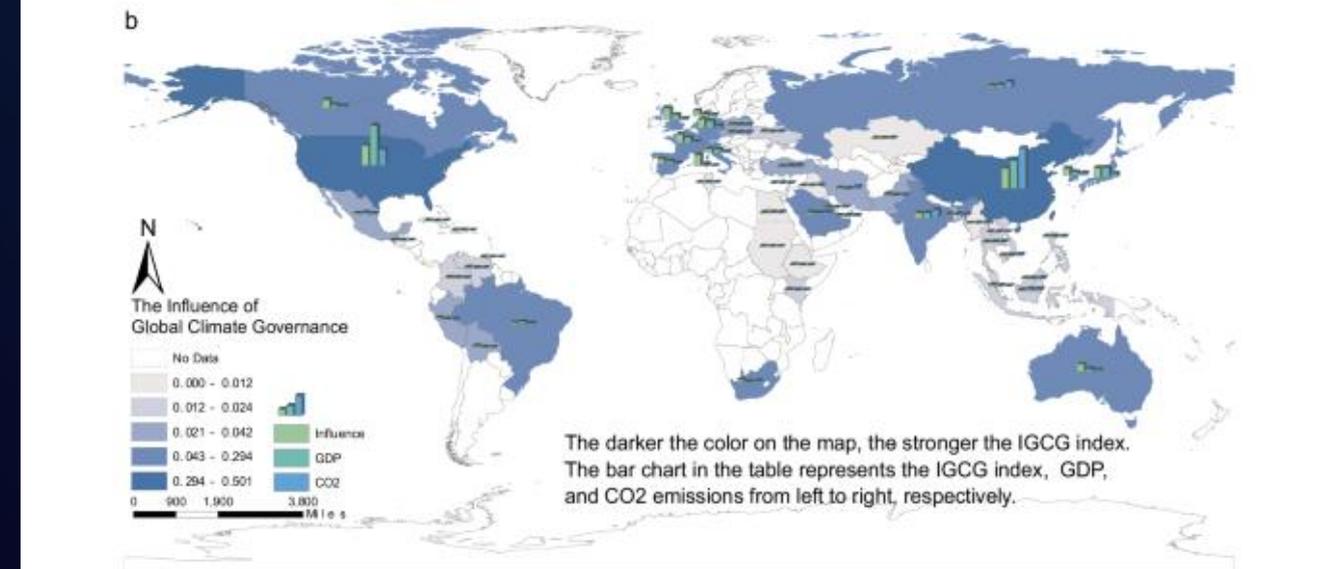
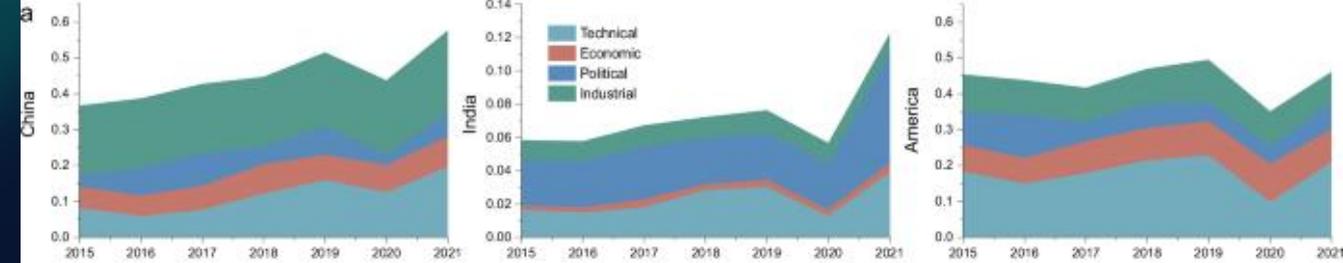
## Key Details

- Held 21-23 March 2023
- Collaborative effort between UNEP, UNODC, and ECA
- Focus on economic impacts on environment
- Part of workstream 2.4 "Assessing the Impact of the Economy on the Environment"

## Broader Context

Component of the Statistics and Data Project: "Resilient and agile National Statistical Systems to meet post-COVID-19 data needs to recover better"

Supports the 14th tranche of the United Nations Development Account launched in September 2022





# African Climate Data Compendium Initiative

A Compendium of Data Sources for Monitoring Climate Change Impacts in Africa: A Geospatial Perspective

# Development of the Climate Data Compendium

## Key Developers

- African Centre for Statistics (ACS) within ECA
- Climate Change, Food Security and Natural Resource Division (CFND)

## Primary Purpose

Serves as an evidence-based tool for policymakers, researchers, development practitioners, and stakeholders working to understand and address climate change impacts throughout Africa

## Core Objectives

- Address critical need for accessible climate monitoring data
- Provide comprehensive resource for climate change analysis
- Support evidence-based policy development
- Facilitate better understanding of climate impacts across Africa

# Development Challenges & Solutions



## Challenges

- Coordination among data providers
- Identification of relevant data sources
- Harmonization of data formats
- Ensuring data accuracy
- Managing data privacy and accessibility



## Solutions

- Systematic source identification
- Provider coordination frameworks
- Dataset harmonization protocols
- Appropriate metrics development
- Visualization tools implementation
- Quality assurance processes



# Current Implementation: Geoportal Development

## Consultant Responsibilities

- Curating climate change data
- Geoportal development
- Data analysis
- Systematic desktop downloading
- Geospatial data management

## Technical Tasks

- Identifying reputable data sources
- Assessing data quality
- Searching for specific datasets
- Downloading and organizing data
- Verifying files
- Documenting metadata
- Conducting initial data reviews
- Preparing for analysis
- Establishing data backup systems

# Geoportal Features



## Search & Filter Options

Comprehensive search capabilities allowing users to filter data by region, time period, climate variable, and data source



## Visualization Tools

Advanced data visualization tools enabling users to create maps, charts, and graphs for better understanding of climate patterns and trends



## API Integration

Capabilities for seamless data integration with other platforms and applications through standardized API protocols



## User Support

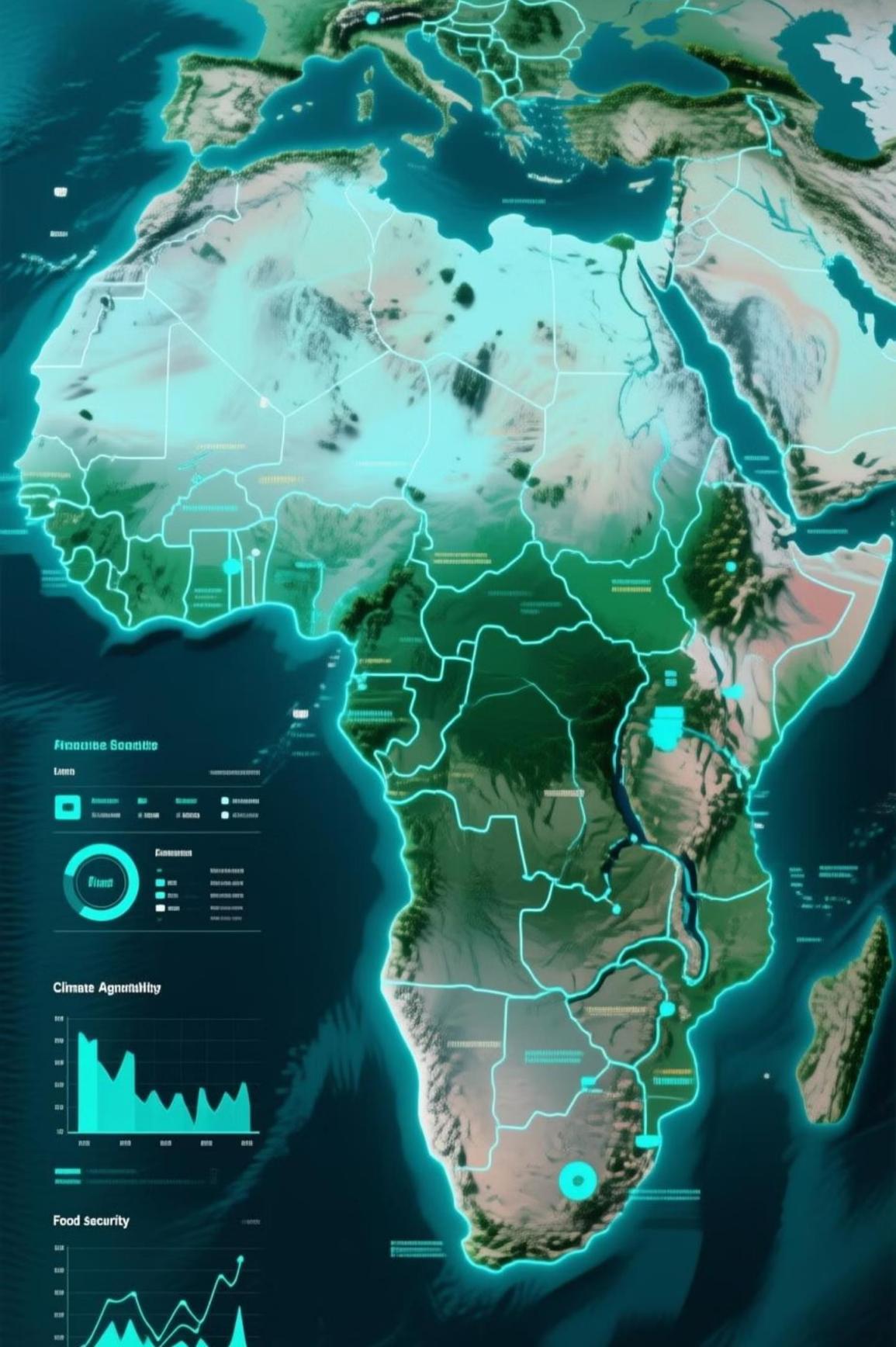
Comprehensive documentation and support systems to assist users in navigating and utilizing the platform effectively



## Regular Updates

Maintenance protocols ensuring data remains current and relevant through systematic update procedures

These features are designed to significantly enhance the availability and usability of climate data across Africa, facilitating better-informed decision-making processes.



# Geospatial Analysis Framework

The analysis component focuses on identifying climate vulnerability hotspots throughout Africa through comprehensive geospatial analysis examining the nexus between:

- Environment
- Agriculture
- Land use/cover
- Food security

This integrated approach provides critical insights into the interconnected challenges facing African communities and ecosystems.

# Expected Deliverables

## Geoportal on Monitoring Climate Change Impacts in Africa

A comprehensive digital platform developed from curated geospatial data, featuring advanced search capabilities, visualization tools, and API integration

Will serve as a centralized resource for climate data access across the continent

## Consultant Report on Monitoring Climate Change Impacts in Africa

A detailed analytical document based on the curated geospatial datasets

Will provide insights into climate vulnerability hotspots and interconnected environmental challenges



# National Statistical System Strengthening

## Eritrea Case Study





# Master Sampling Frame Update Initiative

## Background and Context

### Historical Surveys

- First Demographic and Health Survey (1995)
- Subsequent surveys (2002, 2010)
- Labour Force Survey (2015)

### Current Challenge

The existing sampling frame is now **21 years old** and has not been revised since its creation in 2003

This significantly exceeds the United Nations recommendation that sampling frames should be revised every two years

# Sampling Frame Deficiencies

## Underrepresentation

Certain population segments and geographic areas are not adequately represented in the outdated frame

## Sampling Bias

The outdated frame introduces systematic errors in sample selection, affecting data reliability

## Data Gaps

Critical information missing from the frame, limiting comprehensive population coverage

## Spatial Discrepancies

Geographic boundaries and population distributions have changed significantly since 2003

These deficiencies have led to potential biases in survey analysis and imprecise assessment of the population's health status and needs.

# Primary Objectives of the Mission

## Assessment

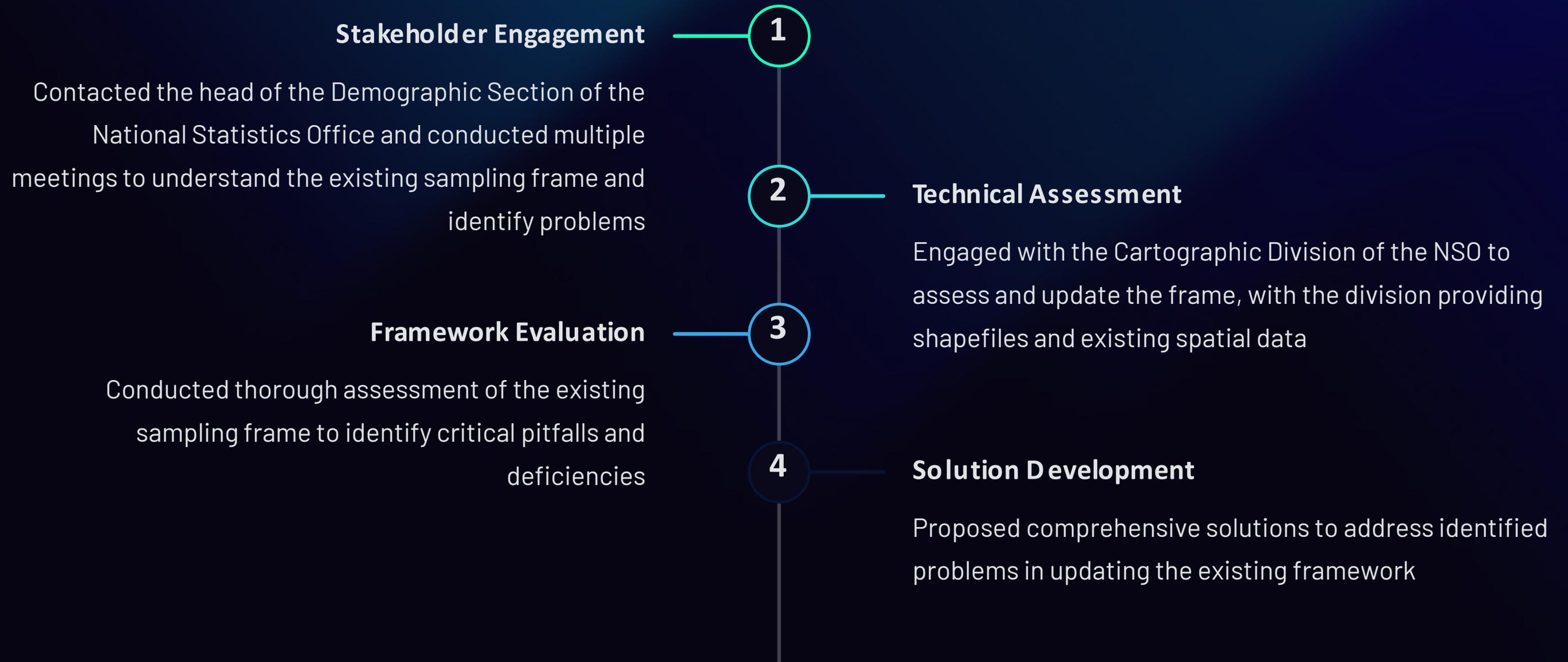
- Evaluate methods for updating the Master Sample Frame
- Identify critical deficiencies in the existing framework
- Assess spatial data availability and quality

## Development

- Create appropriate sampling design for the upcoming Fourth Eritrea Population Health Survey (2024)
- Enhance quality and accuracy of the sampling frame
- Ensure representative coverage of Eritrea's entire population

The primary goal was addressing the deficiencies in the 21-year-old outdated framework that has remained unchanged since 2004, thereby mitigating potential biases in survey analysis.

# ECA Mission Activities: 8-Step Approach



# ECA Mission Activities: 8-Step Approach (Continued)

1

## Frame Modernization

Updated the outdated sampling frame using contemporary methodologies and data sources

2

## Capacity Building

Organized a one-and-a-half-day capacity building workshop on developing a New Master Sampling Framework for Eritrea

3

## Strategic Planning

Developed a comprehensive strategy for creating a New Master Sampling Framework for Eritrea

4

## Reporting and Recommendations

Provided detailed reports on mission outcomes to the NSO and proposed the way forward for implementation



# Capacity Building Initiatives

Spatial Insights: Empowering Decision-Making and Transforming Knowledge into Action



# Capacity Building Workshop in Eritrea

## Workshop Details

- Five-day intensive training program
- Target audience: Staff at the Ministry of Land, Water, and Environment
- Focus: Geographic Information Systems (GIS) and Remote Sensing (RS)
- Logistical support provided by UNDP

## Addressing Critical Gaps

The training targeted specific knowledge and skill gaps identified by the Ministry as significant obstacles to effective performance

## Practical Applications

- Daily work applications
- Assessment studies and research
- Program and project implementation
- Geospatial information management

# Workshop Objectives and Outcomes



## Skill Development

Strengthen staff understanding and practical abilities in using GIS and RS technologies



## Practical Application

Enable more effective application of geospatial tools in daily work activities



## Research Support

Enhance capacity to conduct assessment studies and research using geospatial data



## Project Enhancement

Improve implementation of various programs and projects through geospatial analysis



## Systems Improvement

Strengthen the Ministry's overall geospatial information management systems

# Knowledge Transfer Methodology

## Theoretical Foundations

Building understanding of core GIS and RS concepts

## Applied Projects

Implementing learned skills on actual ministry tasks



## Hands-on Practice

Practical exercises with actual geospatial tools and data

## Case Studies

Real-world applications relevant to Eritrean context

## Feedback & Refinement

Iterative learning through instructor guidance

This cyclical approach ensures continuous improvement and practical application of geospatial knowledge and skills.



# Cross-Cutting Implementation Challenges

# Data Quality and Integration Challenges



## Quality Assurance and Reliability

Ensuring data quality and reliability across various geospatial data sources remains a primary concern, requiring robust verification and validation protocols



## User Accessibility

Developing user-friendly and accessible data visualization tools for stakeholders to effectively interpret and utilize gathered information presents ongoing technical and design challenges



## System Integration

Integrating API capabilities for seamless data integration with other platforms and applications requires sophisticated technical infrastructure and standardized protocols



## Maintenance and Updates

Implementing regular updates and maintenance of geoportals to keep data relevant and accurate, considering changes in climate data over time, demands sustained resource allocation and technical expertise

# Analytical Complexity

## Multifaceted Analysis Challenges

Performing comprehensive geospatial analysis to identify climate vulnerability hotspots in Africa requires considering the complex nexus between:

- Environment
- Land use/cover
- Agriculture
- Food security

This demands:

- Interdisciplinary expertise
- Sophisticated analytical frameworks
- Advanced computational resources
- Integrated data management systems





# Resource and Capacity Constraints



## Key Constraints

- Limited technical expertise in advanced geospatial analysis
- Insufficient computational infrastructure
- Funding limitations for sustained implementation
- Competing priorities within national statistical systems



## Mitigation Strategies

- Targeted capacity building programs
- South-South knowledge exchange
- Phased implementation approaches
- Strategic partnerships with technical institutions
- Cloud-based solutions to reduce infrastructure needs

# Sustainability Considerations



Sustainability requires thoughtful planning from the outset, with clear pathways for transitioning from external support to local ownership and management.



# Lessons Learned

## Technical Insights

- Geospatial data integration requires standardized protocols and quality control measures
- User-centered design is critical for ensuring tool adoption and utilization
- Modular approaches allow for incremental implementation and adaptation

## Institutional Considerations

- Early stakeholder engagement enhances ownership and sustainability
- Capacity building must be ongoing, not one-time events
- Integration with existing systems and workflows improves adoption
- Clear communication of value proposition increases institutional buy-in

# Impact Assessment

21

Years

Age of Eritrea's outdated  
sampling frame before ECA  
intervention

5

Days

Intensive capacity building  
workshop for Ministry staff

8

Steps

Comprehensive approach  
implemented by ECA for  
sampling frame modernization

2

Deliverables

Major outputs from the African  
Climate Data Compendium  
Initiative

These initiatives represent significant steps forward in strengthening Africa's capacity for evidence-based environmental monitoring and statistical analysis, providing essential tools for sustainable development planning and climate change adaptation strategies across the continent.



# Way Forward : Strategic Priorities

## **Consolidate Existing Achievements**

Document successes, formalize methodologies, and ensure proper knowledge management of completed activities. **Organize Capacity**

**Building Workshop to train target and beneficiary countries**

( Compendiums of Disaster Risk, Climate Change and Environmental Indicators)

## **Strengthen Partnerships**

Deepen collaboration with technical partners, donor agencies, and regional institutions to leverage resources and expertise

## **Scale Successful Approaches**

Identify opportunities to replicate and adapt successful interventions in other countries and contexts

## **Innovate and Adapt**

Continue exploring new technologies and methodologies to enhance environmental monitoring and statistical capacity

# Thank You

## Questions & Discussion

### Contact Information

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### Resources

Full reports and documentation  
available at:

<https://uneca.org/data-and-statistics>

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