REQUEST FOR PROPOSAL (RFP)

CONSULTANCY SERVICE FOR DEVELOPMENT OF DSS DASHBOARD IN NBS FOR URBAN CLIMATE ADAPTATION PLANS AND PROGRAMS IN DIRE DAWA CITY ADMINISTRATION

1. BACKGROUND

The Haramaya University (HU) is an implementing partner for the SUNCASA Project (Scaling Urban Nature-Based Solutions for Climate Adaptation in Sub-Saharan Africa) in Dire Dawa. Funded by Global Affairs Canada (GAC), the SUNCASA project is led collaboratively by the International Institute for Sustainable Development (IISD) and the World Resource Institute (WRI).

In Dire Dawa, the SUNCASA project focuses on rehabilitating the degraded watersheds within the Dechatu River catchment. This rehabilitation will be achieved through the implementation of gender-responsive Nature-based Solutions (NbS), aiming to enhance climate change adaptation, promote biodiversity conservation, and advance gender equality and social inclusion. The Project's key activities include afforestation, agroforestry, buffer zone rehabilitation and establishment, urban tree planting, establishment of model community green spaces, Decision Support System (DSS) dashboard development, and capacity building in NbS.

A critical component of this effort is the development of a Decision Support System (DSS) dashboard, which will serve as a centralized platform for analyzing, predicting and visualizing key environmental and socio-economic data. It will provide an overview of the data in an easy-to-read format, allowing users to explore and analyze trends, identify areas of improvement, and make informed decisions. The DSS dashboard aims to provide actionable insights into urban planning and sustainable development efforts, particularly in areas such as water management, land use planning, environmental conservation, and soil health. By leveraging Geographic Information System (GIS) technologies, machine learning, and advanced data analytics, this initiative seeks to improve evidence-based decision-making and enhance the resilience of the city to climate-related challenges.

The Terms of Reference (TOR) outline in this RFP addresses the critical need for a Decision Support System (DSS) dashboard to facilitate the design, monitoring, and evaluation of NbS interventions within urban climate adaptation planning and programming. The DSS dashboard will empower decision-makers by providing tools to analyze climate risks, visualize NbS strategies, assess their impacts, and optimize resource allocation for climate resilience in urban planning.

2. PURPOSE OF THE CONSULTANCY

Within the framework of the SUNCASA Project, the Haramaya University seeks a qualified **system developer** to develop an **intelligent and scalable DSS dashboard** that integrates multi-source data, AI-powered analytics, and machine learning models to support evidence-based decision-making in urban climate adaptation of Dire Dawa City Administration. The intended DSS is going to be unique in its nature for the administration. The consultant will work closely with key stakeholders (Haramaya University SUNCASA project team, IISD dashboard team, City Agriculture Bureau, and City Environment, Climate Change and Forest Authority) to define system requirements, develop a comprehensive data model, select appropriate technology stacks, and identify data elements that integrate key performance indicators (KPIs) for monitoring various environmental and urban sustainability parameters. This initiative is expected to streamline integration of real-time and historical data from multiple sources, including meteorological systems, environmental sensors, GIS databases, and multimedia inputs (text, images, videos). This system will process data for extracting insights and information, enable data manipulation as needed, and visualize the results through charts, graphs and tabular forms, allowing evidence-based decision-makers to implement effective adaptation strategies and monitor their impacts over time.

The dashboard should support:

- **Integration with real-time sensor data** (weather stations, IoT environmental sensors, etc.)
- **Multi-format data handling** (structured data, geospatial data, images, videos, and text)
- **Advanced machine learning models** for predictive analytics and knowledge extraction
- **Standard APIs** for interoperability with other climate and GIS systems
- **High-performance computing (HPC) and cloud-based infrastructure** for data processing.

The dashboard will enable advanced data analytics, visualization, and decision-making for urban climate adaptation strategies.

3. OBJECTIVES

3.1 General Objective
To develop a next-generation DSS dashboard with advanced data integration, AI-powered analytics, and predictive modelling for improved urban climate adaptation evidence-based decision-making on NbS.

3.2. Specific Objectives
The consultancy service will focus on achieving the following objectives:

1. Define the specific requirements for the DSS dashboard, including essential functionalities and data display needs.
2. Develop a robust and scalable data integration framework, high performance data schema that efficiently organizes and stores spatial, tabular, and time-series data from location maps, meteorological system, remote sensors and IoT devices.
3. Select and implement an appropriate technology stack, incorporating GIS libraries, relational database management systems, web development frameworks, and dynamic visualization tools.
4. Establish a structured approach for defining and tracking key performance indicators (KPI) in collaboration with HU and IISD team related to water quality, land use, soil conservation, afforestation, agroforestry and environmental sustainability.
5. Design and implement standardized data extraction, transformation, and loading (ETL) processes to ensure seamless integration of data from diverse sources.
6. Develop a modern, AI-enhanced web interface for visualizing complex climate and geospatial data by implementing interactive 3D GIS maps, dynamic charts, and AI-powered insights.
7. Implement Artificial Intelligence/Machine Learning models for predictive analytics, pattern recognition, text-based knowledge extraction and risk assessment.
8. Implement interoperability standards to integrate data with external GIS data and climate monitoring system.
9. Implement multi-level authentication & role-based access for secure data handling and ensure compliance with global data protection policies (GDPR, ISO 27001).
10. Suggest the specification of server that will host the DSS Dashboard at local interface, install and test the server.
11. Capacity Building and Training to train end users on dashboard functionalities and facilitate a smooth transition for sustained utilization.

4. SCOPE OF WORK

The consultant will undertake the following activities:

4.1. Inception Report
The consultant will develop an Inception Report that outlines the approach for developing the next generation DSS dashboard to Dire Dawa City Administration under the SUNCASA NbS program. The report will detail the methodologies used to collect, analyze, and utilize information from different sources including, but not

limited to, those specified in this Scope of Work. The Inception Report will outline a comprehensive understanding of the project objectives, refine the methodology, and provide a detailed work plan with timelines for the detailed activities planned under each deliverable.

Additionally, the report will include an assessment of available data sources based on the information gathered from clients and preliminary observation of the project site, potential integration challenges, and recommendations for addressing technical and operational constraints. The report will also review the suggested key performance indicators (KPIs) from the client side for monitoring progress and ensure alignment with stakeholders' expectations. The Inception Report will serve as a baseline document to guide project execution and will require approval from the project steering committee before moving to the next phase. The consultant will present the inception report to the Haramaya University SUNCASA Project team, IISD Dashboard Team, and a group of selected stakeholders from the institutions in Dire Dawa. Feedback from these presentations should be thoroughly reviewed and incorporated into the final Inception Report, which will serve as a comprehensive guiding framework for the overall Decision Support System (DSS) dashboard, ensuring alignment with project goals and stakeholder expectations.

4.2 Development of DSS Dashboard

4.2.1. Analysis and Planning
- Requirement Analysis: Collaborate with stakeholders to define user needs, dashboard functionalities, and data visualization priorities.
- KPI Definition: Identify and define critical indicators to assess environmental and urban sustainability progress.

4.2.2. Data Management
- Database Development: Create a database schema incorporating data categories such as hydrology, environment, land use, and monitoring data. Implement GIS data structures for spatial analysis.
- Real Time and Batch Processing: design data pipelines for real-time and batch processing of text, image, video, and GIS data.
- Data Collection & Integration: Collect and process data from meteorological systems, remote sensors, IoT devices, and satellite images, and monitoring stations, ensuring compatibility with the DSS framework.
- Data Processing & Storage: Implement ETL pipelines for efficient data transformation and storage.

4.2.3. Technology and Tools Selection
- Choose appropriate tools, including relational databases, GIS libraries, and web development frameworks, ensuring compatibility with different systems.

4.2.5. Development and Implementation
- Dashboard Development: Develop a web-based dashboard with features for interactive visualization, geospatial analysis, scenario modeling, and collaboration tools.
- Ensure Standardized APIs & System Interoperability: Develop RESTful APIs to connect with external GIS and climate monitoring systems. Implement interoperability standards (OGC, WMS/WFS for GIS data, ISO for climate data).
- Security & Access Control: Implement authentication and authorization mechanisms to safeguard data integrity.

4.2.6. Testing and Deployment to Server
- Test individual component, performance, scalability, and reliability under different conditions, user acceptance, entire system functionality data flow between components and ensure compatibility.
- Install required software (e.g., databases, web servers, runtime environments) and configure firewall and network settings for security.
- Migrate the database schema and data to the production server.

- Ensure data integrity and perform backup procedures.
- Deploy the DSS application to the server and verify that all components are running correctly.
- Test the system in the production environment.

4.2.7. Training and Support
- Training & Knowledge Transfer: Conduct training sessions for end-users, ensuring effective utilization of the DSS dashboard.
- Documentation: Provide detailed technical documentation and API manuals.

5. DELIVERABLES AND TIMELINE

This consultancy work is expected to be completed within **10 months** from the start date, as outlined in the table below. The consultancy is expected to deliver the following outputs within the specified timeframe:

No	Deliverables for DSS	2025/2026 Months									
		1	2	3	4	5	6	7	8	9	10
1	Inception Report with Detailed Methodology and Work Plan	▓									
2	System Requirement Specification Document		▓								
3	Database Schema and Technology Stack Selection Report			▓							
4	Prototype DSS Dashboard with Initial Functionalities				▓	▓					
5	Fully Functional DSS Dashboard with Integrated KPIs						▓	▓			
6	System Deployment and Server Configuration							▓			
7	User Training and Documentation								▓		
8	Final Project Report and Handover									▓	▓

Deliverable Descriptions

1. **Inception Report with Detailed Work Plan**
The consultancy will begin with an inception phase, during which the consultant will assess project expectations, review available datasets, and engage with stakeholders. This phase will result in an inception report that provides a refined scope, methodology, and detailed work plan, including timelines, key milestones, and risk mitigation strategies. The report will ensure that all stakeholders are aligned on the project objectives and execution approach.

2. **System Requirement Specification Document**
Following the inception phase, a System Requirements Specification (SRS) document will be developed. This document will detail the functional and non-functional requirements of the DSS dashboard, including user needs, data sources, expected features, security considerations, and performance metrics. It will serve as the foundation for system design and implementation.

3. **Database Schema and Technology Stack Selection Report**
A comprehensive report will be prepared to define the database schema and select the appropriate technology stack for the DSS dashboard. The report will outline the database architecture, including tables, relationships, and indexing strategies. It will also include the selection of programming languages, frameworks, and tools suitable for GIS-based decision support systems, ensuring efficient data storage, retrieval, and visualization.

4. Prototype DSS Dashboard with Initial Functionalities

An initial prototype of the DSS dashboard will be developed with basic functionalities to allow stakeholders to interact with the system and provide feedback. This version will include data integration, a user interface, and preliminary visualization tools for KPIs related to climate adaptation, such as land use, water quality, and environmental monitoring. Feedback collected during this phase will be incorporated into further development.

5. Fully Functional DSS Dashboard with Integrated KPIs

The fully functional DSS dashboard will be completed, incorporating all required features, including advanced GIS capabilities, scenario analysis, reporting tools, and KPI visualization. The dashboard will allow stakeholders to monitor climate adaptation indicators such as erosion control, land-use changes, and water resource management. Extensive testing and validation will be conducted to ensure performance, accuracy, and usability.

6. System Deployment and Server Configuration

Once the DSS dashboard has been finalized and approved, it will be deployed on the designated infrastructure. Deployment will include hosting the system on a secure server, setting up access controls, and integrating it with relevant external data sources. System performance monitoring tools will also be configured to track system stability and security post-launch.

7. User Training and Documentation

To ensure effective adoption of the DSS dashboard, a comprehensive training program will be conducted for end users, including government officials, urban planners, and environmental analysts. Training sessions will cover system navigation, data input processes, analysis tools, and scenario modeling. Additionally, detailed user manuals and technical documentation will be provided for future reference.

8. Final Project Report and Handover

The final phase of the project will involve preparing and submitting a detailed final report summarizing the entire development process, key challenges, lessons learned, and recommendations for system maintenance and future improvements. The system, along with all necessary documentation, will be officially handed over to the client, ensuring a smooth transition for ongoing use and management.

6. REQUIRED QUALIFICATION

The following expertise is required to carry out activities under this RFP:

- ✓ **Proven expertise in Decision Support Systems (DSS) development** with a strong track record in designing and implementing data-driven solutions for environmental monitoring, climate adaptation, or public sector decision-making.

- ✓ **Experience in developing GIS-based applications** with spatial data analysis, mapping tools, and visualization techniques to support data-driven decision-making.

- ✓ **Strong knowledge of database management and big data processing**, including expertise in SQL, NoSQL databases, and cloud-based data storage solutions to handle large datasets efficiently.

- ✓ **Proficiency in selecting and implementing appropriate technology stacks**, including programming languages such as Python, R, JavaScript, and frameworks for data visualization (e.g., Dash, Power BI, Tableau).

- ✓ **Understanding of key climate adaptation and environmental sustainability indicators**, with experience integrating relevant KPIs into data analysis and reporting systems.

- **Ability to conduct user needs assessments and stakeholder consultations** to ensure that the DSS dashboard aligns with the operational requirements of decision-makers and end-users.

- **Experience in system integration and interoperability**, ensuring seamless connection with external data sources, government databases, and third-party APIs.

- **Proficiency in cybersecurity best practices**, including data encryption, secure authentication, and access control mechanisms to safeguard sensitive environmental and policy data.

- **Proven track record in user training and capacity building**, including the development of user manuals and the delivery of hands-on training sessions for system administrators and end-users.

7. REQUIREMENTS TO SUBMIT PROPOSAL

To be considered for this consultancy, interested qualified firms and/or individuals should submit the following items:

1. Cover Letter outlining relevant professional experience. Please include the name and contact details of the primary contact person at the bottom of the letter.
2. Detailed CV of proposed consultant(s) highlighting the professional experience in DSS, experience in AI and machine learning models, any relevant background in web development, software development, and database management.
3. Technical Proposal outlining how the consultant(s) plans to undertake the assignment, including a proposed Work Plan and Timeline.
4. Financial Proposal that includes a daily rate to carry out the activities for each deliverable outlined in the Scope of Work and any additional costs associated with it.
5. At least two (2) references from previous related projects.
6. A copy of a valid business license, indicating the stream of business.
7. A copy of the organization's most recent registration document.
8. Last physical year's financial statement certified by the firm's bank.
9. Audit Report of the previous year prepared and signed by a recognized/licensed independent auditor
10. Renewed licenses for Lead Consultant to conduct the study.

8. EVALUATION AND SELECTION CRITERIA

The following elements will be the primary considerations in evaluating proposals submitted in response to this RFP:

- Technical Proposal and past experience delivering similar services as it fulfills the requirements set out in this RFP (45%)
- Financial Proposal (20%)
- Evidence of the proposed consultant(s) past experience with similar activities (35%)

Debarment and sanctions – proposals will not be considered from individuals that are presently debarred or named on any restricted parties lists.

The proposals offering the best overall value will be selected. For this procurement, both price and non-price aspects will be considered for evaluating proposals.

The Haramaya University may, at its discretion and without explanation to the prospective consultants choose to discontinue this RFP without obligation to such prospective consultants or make multiple awards under this RFP.

9. SUBMISSION INSTRUCTIONS

All proposals and required documents must be submitted by **After 10 working days of the announcement on the university website, 2025**, **17:00** either by e-mail at <u>suncasa_hu@haramaya.edu.et</u> or physically at one of the following locations:

1. **Addis Ababa:** Haramaya University Liaison Office, Arat Kilo, near Romina Café, Room No. 15. Tel: 0111571847 / 0111571266.

2. **Haramaya University:** Maya City, Bate Kebele, University Main Campus, Office of the Procurement Directorate, New Administration Building, Office No. 03.

Late submissions will not be considered.

This consultancy presents an opportunity to contribute significantly to climate adaptation efforts in Dire Dawa. We encourage capable organizations and individuals to submit their proposals for consideration.