Sudan

Technical Assistance: Soil erosion valuation using advanced laboratory measurement methods to support climate resilient agriculture and food security
Location: Northern and semi-arid regions of Sudan
Solution: Advanced atomic absorption spectroscopy and Earth Observation tools
UNEP CTCN grant: USD 250,030

Analyzing soil micronutrients to determine impact of erosion on agriculture. © UNEP-CTCN

In Sudan, soil erosion poses a severe threat to agriculture and food security. To address this, advanced techniques such as Atomic Absorption Spectroscopy and drone-based Earth Observation tools were deployed. These solutions aim to monitor soil health and support climate-smart agriculture, improving the resilience of Sudan's farmers.

Objectives

- The primary objective is to strengthen Sudan's capacity to manage soil erosion and enhance agricultural productivity by employing advanced soil analysis techniques and drone Earth Observation-based monitoring.
- The project aims to improve the understanding of soil health and its role in supporting climate-resilient agriculture.

Social Impact

- The project supported a total of 48,624,072 beneficiaries, including 1,693,639 direct beneficiaries and 46,934,433 indirect beneficiaries.
- Among both direct and indirect beneficiaries, 50% were women, and 17% were youth.
- The project's focus on improving soil management practices has led to enhanced agricultural productivity and livelihoods, with a strong emphasis on supporting women and youth in the region.

Adaptation Impact

- **Improved Soil Health and Agricultural Resilience:** The project enhances soil health by providing detailed assessments of soil erosion in Sudan and its impact on crop productivity. This helps targeted interventions to improve soil conservation and management, thereby increasing agricultural resilience to climate change.
- **Sustainable Land Management:** By using advanced soil analysis and Earth Observation tools, the project supports sustainable land management practices that reduce erosion and degradation, improves the quality of soil and thereby enhances the long-term viability of agricultural lands.
- **Increased Agricultural Productivity:** The project increases agricultural productivity by providing farmers with the information and tools needed to manage soil resources effectively, leading to better crop yields and food security.

Other Co-Benefits

- Reduced land degradation.
- Increased capacity for climate adaptation
- Strengthened community engagement in sustainable land management.
- Conservation of natural resources and protection of ecosystems.

Innovation & Technology

- Atomic Absorption Spectroscopy: Use of advanced laboratory techniques to analyze soil micronutrients and assess the impact of soil erosion on agricultural productivity.
- Earth Observation Tools: Integration of EO tools, including UAVs, to monitor soil erosion and provide real-time data for decision-making.
- Digital Soil Mapping: Application of digital soil mapping techniques to create detailed maps of soil health and erosion risk, informing targeted interventions.

Replication Potential

- The project demonstrates a high replication potential in contexts where the development of sustainable soil management practices requires bridging information gaps on context-specific soil erosion processes and their impact on agricultural productivity.

Key Figures

- USD 250,030 project budget
- 48,624,072 people benefitted in total
- 50 people from various stakeholders participated in the inception workshop
- 28 days spent gathering field UAV data for soil analysis
- The project contributed to the following SDGs:

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