Name of Organization and Blurb

Sokoine University of Agriculture -- ACHE Project (AI, Climate and Health):
The ACHE (AI, Climate and Health) Project is the project that is run by Sokoine University of Agriculrure. The ACHE project is supported by the Lacuna fund. This project is led by five scientists; Dr Neema Nicodemus, Dr Joseph Telemala, Dr Kadeghe Fue, Dr Ndimile Kilatu and Dr Sylivia Materu. Sokoine University of Agriculture (SUA) in Tanzania is becoming a leader in research at the intersection of health and artificial intelligence (AI). The university tackles public health challenges linked to climate-sensitive diseases and waterborne illnesses through multidisciplinary collaboration and advanced data analytics. SUA employs AI and machine learning to analyze data, predict disease outbreaks, and optimize healthcare resources. The university's interdisciplinary approach integrates expertise in agriculture, health, and AI, aiming to improve human and planetary health while fostering innovation in Tanzania and beyond.

Name of the Project Selected for Round 2

ACHE Project: Predictive Machine Learning for Climate-Sensitive Waterborne Diseases in Tanzania.

Short Description of the Project

The ACHE Project (AI Climate and Health) employs machine learning techniques to address climate-sensitive waterborne diseases in Tanzania, with a specific emphasis on typhoid fever, diarrhea, schistosomiasis, and dysentery. The project seeks to develop a comprehensive dataset aimed at enhancing the healthcare system and facilitating the prediction and characterization of disease outbreaks.

Data has been systematically collected across five critical domains: demographic health information, locations of sanitation facilities, waste management sites, meteorological patterns, and water source locations. This dataset is further augmented by global climate data derived from ASDI's CAFE60 reanalysis and the ERA5-Land reanalysis, thereby providing a comprehensive understanding of the environmental and infrastructural factors influencing disease prevalence.

The project intends to develop advanced machine learning models utilizing this data to predict disease outbreaks and identify hotspots, ultimately supporting proactive public health interventions. These tools are specifically designed to mitigate the disproportionate impact of waterborne diseases on women and children, thereby empowering decision-makers to implement targeted solutions.

By integrating predictive models into early warning systems, the ACHE Project aspires to deliver real-time insights for healthcare providers and policymakers. Leveraging the cloud-based platforms of AWS and ASDI, along with the expertise of IRCAI in artificial intelligence, the project aims to demonstrate how technology and data can catalyze transformative improvements in public health within low-income regions and enhance resilience against the effects of climate change. This initiative is expected to significantly benefit children, underrepresented groups, and women, who are particularly vulnerable to the adverse effects of climate change.

The project outcomes include:

- A **comprehensive dataset** incorporating demographics, sanitation, waste management, meteorology, and water source locations.
- **Predictive machine learning models** to identify and characterize disease outbreaks.

- An **early warning system** to inform healthcare providers and policymakers, enabling targeted interventions.

The project will utilize **AWS sustainability resources** for cloud-based climate database, data processing and storage and **IRCAI support** for refining machine learning models and ensuring scalability.

Team Photo and Inforgraphics

- Please find attached photos and project's logo.

Dr Kadeghe Fue at the centre with project colleagues from Left Dr Ndimile Kilatu, Dr Joseph Telemala, Dr Sylvia Materu and Dr Neema Nicodemus.

ACHE Project Team at the one of the Municipal offices in Tanzania.

ACHE Project team with research assistants while in one of cities in Tanzania collecting Data

ACHE Project studying one of the dumpsites located near the private premises in a city located in Tanzania.

ACHE Project Logo