

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Assessing and Mitigating the Global Freshwater Crisis (6)

Author: Dr. Md Sariful Islam
Massachusetts Institute of Technology (MIT), United States

Prof. Yusuke Kuwayama
University of Maryland, Baltimore County (UMBC), United States

Prof. Dara Entekhabi
Massachusetts Institute of Technology (MIT), United States

Dr. Katlyn Turner
Massachusetts Institute of Technology (MIT), United States

Ms. Catherine Lu
Massachusetts Institute of Technology (MIT), United States

Dr. Zolana Joao
Angolan National Space Program Management Office (GGPEN), Angola

Ms. Vangiliya Filipe Pereira
Angolan National Space Program Management Office (GGPEN), Angola

Mr. Osvaldo Porto
Angolan National Space Program Management Office (GGPEN), Angola

Mr. Luciano Costa Dembue Lupedia
Angolan National Space Program Management Office (GGPEN), Angola

Mr. Ivandro Rodrigues
Angolan National Space Program Management Office (GGPEN), Angola

Prof. Danielle Wood
Massachusetts Institute of Technology (MIT), United States

ASSESSING VULNERABILITY TO DROUGHT IN ANGOLA USING MULTISOURCE SATELLITE
EARTH OBSERVATIONS AND SOCIOECONOMIC DATA

Abstract

Angola is increasingly vulnerable to climate hazards and associated shocks, and has experienced profound impacts from prolonged drought events. Recent data from the World Bank reveal that the country is grappling with its most severe drought in the past four decades, exacerbating food security challenges for over 1.5 million people in the southern provinces. To address and mitigate the impacts of drought in Angola, our study develops a comprehensive Socioeconomic Vulnerability Index (SVI) at municipal level. The SVI will be part of a larger Angola Drought Decision Support System that includes satellite-based drought index estimates and will allow for policy scenario analysis. Drawing on a diverse array of data sources, such as satellite Earth observations, demographic and health surveys, and census data, the SVI aims to quantify the vulnerability of distinct regions and demographic groups to the challenges posed by drought. Using the methodology proposed by the Intergovernmental Panel on Climate Change (IPCC), the index integrates variables related to exposure, sensitivity, and adaptive capacity. These variables span across physical, economic, social, institutional, and technological contexts linked to drought. For example, physical variables include sanitation facilities, drinking water sources, or distance to roads; economic variables include GDP per capita or poverty rates. With the motivation to provide valuable insights into

the intricate mechanisms through which disparities in wealth, education, and resources influence adaptive capacities and recovery strategies, this study uses the Environment Vulnerability Decision Technology (EVDI) framework to address this complexity. This index will serve as a diagnostic tool, identifying areas of heightened vulnerability and guiding targeted policy interventions. Ultimately, our research aims to contribute to informed decision-making and effective strategies to address the pressing challenges posed by climate-induced vulnerabilities in Angola. The goal is to foster socioeconomic resilience in the face of drought, ensuring that policies and interventions are tailored to mitigate its disproportionate effects on different segments of the Angolan population.