Enhancing water management for climate resilience and sustainable agricultural production in Vietnam

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Vision

- To improve water resources monitoring and management that ensures long-term climate resilience and water and food security

Issue to solve

- Impacts of climate change.
- During the 2015 drought, about 60,000 hectares of agricultural land in the Central Highlands was affected to varying degrees of severity, including permanent loss of perennial crops such as coffee and pepper.
- The impact was most severe on smallholder farmers who rely on rainfed surface water sources for irrigation.

Technology features

- Conventional data acquisition methods (, i.e. ground stations, in-situ measurement) exhibit often disadvantages to capture significant spatial variability of key hydrological processes, i.e. precipitation, evapotranspiration, river flow, storage in lakes and reservoirs etc.
- This technology presents how remote sensing, hydrological modelling and cloud-based computation can be used in an integrated manner to achieve better understanding of these processes and thus, flood and drought severity

Possible implementation

- Agriculture, irrigation, water management sector
- Water managers, small to large-scale farmers, academia
- Seeking for research partners, implementors and potential donors
- Smart Water Management Market worth $22.4 billion by 2026

Abstract

Vietnamese river basins are particularly vulnerable to the impacts of climate change. Climate change is expected to be one of the biggest drivers of hydrological transformation in the area, affecting rainfall, temperature, evapotranspiration, and salinity intrusion. Changes in precipitation are expected to result in shorter more intense wet seasons and longer dry seasons with a reduction in flows expected in hotter years due to higher evapotranspiration. The ENSO induced drought in South Central Coastal and Central Highlands region of 2014−2016 was the most severe in 40 years, and rainfall during the 2015 monsoon period was 40%−70% below the long-term average. About 60,000 hectares of agricultural land in the Central Highlands was affected to varying degrees of severity, including permanent loss of perennial crops such as coffee and pepper. The impact was most severe on smallholder farmers who rely on rainfed surface water sources for irrigation. Improving water resources monitoring and management, water use efficiency and water productivity, is a current priority of the Government of Vietnam, focusing primarily on the agricultural sector which consumes most available surface and groundwater. However, conventional data acquisition methods exhibit often disadvantages to capture significant spatial variability of key hydrological processes, i.e. precipitation, evapotranspiration, river flow, storage in lakes and reservoirs etc. This study presents how remote sensing, hydrological modelling and cloud-based computation can be used in an integrated manner to achieve better understanding of these processes and thus, flood and drought severity. The inclusion of these technologies is deemed necessary to improve water resources monitoring and management that ensures long-term climate resilience and water and food security.