WEB GIS DEVELOPMENT FOR DROUGHT RISK AND DAMAGE MANAGEMENT AT THE FARM LEVEL IN THAILAND

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ABSTRACT

Drought regularly causes devastating impacts on the Thai agriculture sector, where over thirty percent of the country's population is employed. Compensation following a drought disaster by the Royal Thai Government must adhere to the rules and procedures of the Ministry of Agriculture and Cooperatives, with the key condition for payment being the verification of actual crop damage by local committees. However, with limited monetary and human resources, effective management of drought-prone areas and crop damage at the plot level is crucial for Thailand's economic development. This research aims to develop a web GIS application to support the management of drought-risk areas and assess drought-related damage at the farm level in Thailand. The application includes features such as a drought risk map, a drought situation summary, plot-level drought monitoring, and data download capabilities. Accessible through any web browser, this platform enables users to conveniently access and utilize its features from anywhere. The data is meticulously analyzed and processed using satellite imagery and artificial intelligence (AI) technologies, ensuring accuracy, reliability, and timeliness which curated and maintained by GISTDA of Thailand. The system architecture comprises a client-side user interface, webserver, map server, and database, utilizing the Leaflet JavaScript library for web mapping. Users can access the web application at https://cropsdrought.gistda.or.th. The study's findings demonstrate the web application's effectiveness in supporting decision-making and managing drought-prone areas and plot-level crop damage. Users can easily access geospatial information without requiring GIS expertise, empowering agricultural extension officers and farmers to identify drought-prone areas and make informed crop cultivation decisions. Despite the application's effectiveness, user feedback, particularly from farmers, highlights a strong demand for a mobile app. Future iterations should prioritize the development of a mobile application component to enhance usability, especially in remote areas.

Keywords: Agriculture, Drought, Geographic Information Systems, Open source, Web Application.