Fire and weather in 2022: Assessing the Econimic Impact of Drought and Fire on the Bulolo Plantation.

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Abstract

In 2022, the Bulolo Forest Plantation in Papua New Guinea experienced one of its most severe droughts in recent years, leading to extensive forest fires and significant economic losses. This study examines the relationship between changing weather patterns—specifically prolonged drought—and the resulting fire outbreaks within the 12,000-hectare plantation. Using meteorological data collected from the Davis Vantage Pro 2 weather station and mapping tools such as Drone Deploy, NASA FIRMS, and DJI Mavic 3 drone imagery, the study documented a 45% decrease in annual rainfall compared to 2021 and identified five consecutive months of drought. A total of 172.42 hectares were burned, destroying approximately 9,713 trees of various commercial species and ages. Salvage operations yielded 7,256 m³ of timber, valued at K624,192.26—K199,840.21 less than potential clear-fell rates. Additional overtime wage costs exceeded K11.2 million. Contributing factors included poor communication, uncoordinated crew movements, and equipment limitations. The findings highlight the urgent need for improved weather forecasting, strategic fire management, and investment in infrastructure. Recommendations include revising the fire management plan, enhancing communication systems, training personnel, and acquiring new firefighting equipment. The study underscores the broader implications of climate variability on forest operations and the importance of proactive management.