A SYSTEMATIC APPROACH TO LAND-USE AND LAND-COVER MONITORING IN SABAH

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ABSTRACT

The state of Sabah is a front-runner in promoting sustainable development, sustaining people's well-being, and conserving significant natural and cultural values. It is pertinent that the efficiency and accuracy in monitoring land use and land cover be addressed urgently before the implication of climate change and uncontrolled and unsustainable development decimate ecosystem integrity, biodiversity, and human well-being in this region. Various remote sensing methodologies have been attempted to monitor land use and land cover changes across the state since the availability of high-resolution satellite imagery. Unfortunately, resource limitations, especially expertise and funds, and a lack of spatial and temporal monitoring approaches result in meagre standard output or fragmented monitoring efforts. To effectively monitor areas as large as the state of Sabah, the department proposes a systematic monitoring method using fixed 10 km grid points across the state. Using these inventory points, a rapid land cover identification was conducted using freely available Google Earth images and crosschecked with available land use information stored in the departmental archives. Similar work processes were repeated to the fixed 5 km grid (a subset of 4 of the 10 km grid) to test whether there is a difference in sampling resolution. The estimated sampling percentages indicating permanent forest estates (forest reserve, state parks and wildlife sanctuary), stateland and alienated land are 47.8%, 27.0% and 25.2% for the 10 km grid, and 49.2%, 25.4% and 25.4% for the 5 km grid, respectively. Comparing these data to the 5 km points showed slight similarities to the 10 km analysis. Hence, the 10 km grid systematic sampling and analysis allow for quick land cover acquisition that can be repeated over different timeframes. Further application of this systematic inventory method will involve applying modelling techniques in order to fully utilise the advancement of remote sensing, thereby managing resources and manpower more cost-effectively during field campaigns. It also facilitates better planning and readiness for the ground inventory team to collect data.