ASSESSMENT OF FOREST COVER CHANGE IN *WILPATTU* FOREST COMPLEX USING REMOTE SENSING AND GIS TECHNIQUES

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The *Wilpattu* Forest Complex (WFC), composed of nine adjacent forest reserves spread over the North West, North Central and Northern provinces, is considered as the largest protected forest complex in Sri Lanka. The WFC is widely known as its numerous forest ecosystems, archaeological sites, and geographical features. Over the last few decades, the forest cover has been changed and widely debated as it directly impacted habitat change, loss of biodiversity, and watershed degradation. Tropical deforestation constitutes a danger to the subsistence and cultural heritage of forest-dependent communities and the availability of forest products to future generations. Hence, it is vital to assess the change of forest cover through past decades to manage it sustainably. This study used remote sensing data to classify the forest cover in 1988, 1997, 2009, and 2019 by maximum likelihood classification using machine learning classifiers provided by R software. The classified maps were used to detect the forest cover changes. The spatial metrics were used to quantify the changes in landscape patterns using FRAGSTATS software. The analysis found that forest cover has changed by 0.33%, -5.83%, and 7.55% from 1988 to 1997, 1997 to 2009, and 2009 to 2019 periods, respectively. Results confirmed that the greatest forest cover change has happened in the recent time step, which coincides with the post-war period. Both class level and landscape-level results revealed higher patch density with smaller patches, which results in more fragmented and complex land cover during the 2009 – 2019 period compared to other periods. This study concluded that the forest cover of WFC had been dramatically affected during the last three decades, especially during the last decade with a high risk of fragmentation. Hence, WFC reveals insights regarding government management plans and stakeholder partnerships at the practical level. Therefore, it is essential to give priority in conservation activities for the identified most susceptible areas for forest loss. Furthermore, immediate actions as law enforcement and regulatory measures must be enforced in the most vulnerable areas of the protected areas.

Keywords: Deforestation, Landscape pattern, Remote sensing, *Wilpattu* forest complex