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Spatial and Temporal Assessment of Land Use and Land Cover in Wilpattu National Park Restricted Zone, Sri Lanka

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Abstract

The Wilpattu National Park (WNP) is the country's oldest and largest National Park. Aside from the direct destruction of plant and fauna ecosystems that sustain humans with vital resources, removing forest cover throws many crucial natural processes out of balance, which could have several detrimental effects. It is still unknown how the various management alternatives will affect the economic, ecological, and social elements of sustainable forest management because of the diversifying demands on forests that have led to more complicated forest management and planning. Sustainable development and environmental protection are aided by wise land use and resource management. Many of the farmers reside in these marginal, underproductive forest communities. Through scenario analysis and using a forestry decision support system, this study evaluated the effects of several management approaches on crucial aspects of sustainable forest management. Geographical Information System (GIS), such as participatory online mapping, GPS mapping, and satellite image classification (Remote Sensing Technology), was used. The study employs an evaluation model for land use that considers biophysical and human-related variables as part of an integrated land use assessment. Based on the classification of the images, the environment's impact has been evaluated. Forty-nine Grama Niladhari (GN) divisions are in the influenced zone in the national park. Eight sample GN divisions were selected for detailed assessment based on the area's different landscapes and ecological and cultural settings. The current situation and encroachment were studied in each sample GN division. Also, Current threats, land use, and pressure activities were studied. The land use analysis of the Wilpattu restricted zone revealed the area of encroachment. Analyses conducted in the human village clearly show that the restricted area for human settlement is being encroached upon 2019, permanent building/housing units were found in 2003 satellite image categorization within the 1.6 km restricted zone. By 2021, the number mentioned above will be 3,810 instead. The past 20 years have seen an 89% growth in housing units. Land use analysis indicates nine zones of encroachment. Zones are dominant in encroachment in 19 GN Divisions in total. The Wilpattu forest village's Mullikulam and Eluwankulam GN Divisions are the most crucial and quickly encroaching areas. The highest percentages of restricted zone, land use analysis contain Paddy cultivation, and Chena cultivation shows the second highest value. Minimum land used is utilized for abandoned Chena cultivations. The highest percentage of land use agriculture is Kudawilachiya, Dematamalagama, and Nelumvila. In addition, the lowest agricultural land use was utilized in Horawila, Thalgaswewa, Helabawewa, Mirichchukaadi, and Adiyapualwakkulam.

Keywords: Sustainable, Deforestation, Forest management, GIS, Restricted zone

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