

## **Land use land cover change analysis and prediction of carbon sequestration using InVEST model in Viti Levu Island, Fiji**

**(フィジー、ビティレブ島におけるInVESTモデルを用いた土地利用土地被覆変化分析  
と炭素隔離予測)**

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This study was conducted to capture the land-use land cover changes and monitor the carbon sequestration on forest class in Viti Levu Island, Fiji. A combination of Remote Sensing (RS), Geographical Information System (GIS), and modeling approach was utilized for this purpose. Landsat 7 and Landsat 8 satellite images of the years 2000 and 2020 were analyzed using object-oriented image classification techniques to produce Land Use Land Cover (LULC) maps and detect the associated changes and also project the LULC map for the future year 2040. The LULC maps from these three different years (2000, 2020, and 2040) were used as input in the Integrated Valuation of Ecosystems Trade-off (InVEST) model to monitor the carbon sequestration and calculate its economic valuation. The results show that changes in LULC occurred significantly among all classes. Agriculture and built-up areas increased from the year 2000 to 2020 by 7% and 1% and are predicted to further increase in the year 2040 by 3% and 2% respectively. On the other hand, Forest and Shrubland reduce correspondingly from the three different years with Forest reduces by 3.2% in the year 2000-2020 and 3.5% in the year 2040. Shrubland also reduces by 5% and 1% respectively. Total carbon loss for 2000 to 2020 in the forest area of Viti Levu was 10.3 Teragram (Tg) carbon and a further 11.1 Tg of carbon loss for the year 2020 to 2040. The economic valuation of this loss is equivalent to USD 288.4 m and \$312.8 m respectively. In this study, monitoring and future projections of variation in forest cover and biomass in Fiji have been done while considering a business as usual (BAU) scenario. The forecast results can be used to assist as a reference in establishing a national baseline and reference level for implementing the REDD+ mechanism in Fiji, and sustainably managing the limited pristine forest especially on a small island nation like Fiji.