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A scenario-based approach to sustainable land management: case of republic of palau

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Abstract:

Sustainable land management is a vital issue for small and isolated islands in the Pacific. Islands in this region have often suffered environmental degradation amid globalization and modernization. Notably, soil erosion and sediment runoff due to deforestation, urbanization, and other development have affected both terrestrial and marine ecosystems. Tourism is a key driving force of this outcome, but degradation of ecosystems may destroy tourism resources. Therefore, it is important to consider the direction of tourism development and sustainable land management collectively. This study aimed to develop possible scenarios for tourism development and land management strategies, and assess the subsequent impacts on ecosystems. Babeldaob, the largest island in the Republic of Palau and second largest island in Micronesia, was taken up as a case study. A four-step procedure was employed. 1) Develop scenarios based on a combination of mass tourism or ecotourism patterns and land management strategies (unregulated or ecosystem-based). 2) Use Geographic Information Systems to estimate land use and land cover changes of each scenario. 3) Apply the Soil and Water Assessment Tool (SWAT) and use a climate forcing dataset developed by combining a downscaled atmospheric reanalysis dataset and field observations in order to calculate the amount of sediment runoff for each scenario as an indicator of the impact on ecosystems. 4) Assess the scenarios from economic and environmental standpoints. This collective approach would be effective for supporting decision-making aimed at sustainable land management.