

Assessing the climate-induced vulnerability and adaptive capacity of cutaneous leishmaniasis disease in Sri Lanka

J.A.D.D. Jayakody^{1*}

¹Faculty of Graduate Studies and Center for External Examinations, Buddhist and Pali University,
Colombo 07, Sri Lanka

Leishmaniasis is a neglected tropical disease in the world. Just like other vector borne disease, it is linked with climatic and associated factors. Climate change has emerged as a significant driver of health challenges globally, influencing the incidence and distribution of vector-borne diseases. Although climatic-induced vulnerability for other vector-borne diseases in Sri Lanka has been assessed, no attempt has been made to assess incidence of leishmaniasis disease. Therefore, this study was focused on assessing the climate-induced vulnerability and adaptive capacity for cutaneous leishmaniasis disease in Sri Lanka. Forty-one variables encompassing epidemiological, climatic, land-use, and socio-economic data were selected for all 25 administrative districts of Sri Lanka. These variables served as the candidates for creating three indices; exposure, sensitivity and adaptive capacity to calculate the vulnerability index. Principal component analysis (PCA) facilitated the selection and weighing of indicators within each index. The Gesellschaft für internationale zusammenarbeit (GIZ) approach was used for the vulnerability assessment. Thirty-six of the initial 41 variables were retained, forming 10 indicators for the exposure index, 15 for the sensitivity index, and 11 for the adaptive capacity index. Hambantota district exhibited the highest exposure index (0.90), while Nuwara-Eliya district had the lowest (0.06). The sensitivity analysis revealed Polonnaruwa district with the highest sensitivity index (0.63) and the Colombo district with the lowest (0.34). The adaptive capacity index was highest in Colombo district (0.91) and lowest in Mullaitivu district (0.16). Overall, Polonnaruwa district had the highest vulnerability index (0.75), and Colombo district had the lowest (0.25). Districts like Anuradhapura, Polonnaruwa, and Hambantota require strengthened health facilities, enhanced disease surveillance, and intensified vector control strategies due to their heightened vulnerability to cutaneous leishmaniasis.

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*deshakadilshan@gmail.com
ORCID ID: <https://orcid.org/0000-0002-2690-8565>