

Development of a Climate Change Induced Environment Index for Ecotourism Based on Climate Change Scenarios: A Case Study in Rekawa Coastal Wetland of Southern Sri Lanka

S.N. Dushani^{1,2*}, M. Aanesen¹ and O. Amarasinghe³

¹The Arctic University of Norway-UiT, P.O. Box 6050 Langnes, 9037 Tromsø, Norway.

²Faculty of Fisheries and Ocean Science, Ocean University of Sri Lanka, Tangalle, Sri Lanka.

³Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya, Sri Lanka.

Abstract

Climate acts as a salient factor in tourist decision-making in destination choice, travelling period, and activity planning at the destination. Therefore, the ecotourism industry may be significantly impacted by climate change, and study aims to ascertain this impact by using a climate change environmental index. The study demonstrates a method for developing a site-specific Climate Change Induced Environmental Index (CCIEI), based on Intergovernmental Panel on Climate Change (IPCC) scenarios, when there is a dearth of climate change prediction data. First, we developed two climate change scenarios, one for short-term (2025), and the other for long-term (2050) effects for Rekawa coastal wetland in Southern Sri Lanka. They encompassed three direct climatic variables; temperature, rainfall, and sea-level rise, all of which were based on IPCC predictions. In addition, there were three climate-induced biophysical variables; number of turtle nests, mangrove cover, and beach inundation. The climate change scenarios predict a rise in maximum temperature, from 27 °C at present to 29 and 29.5 °C under the two scenarios. They also predict less rainfall and increased sea-level rise, the latter leading to lower number of turtle nests and more beach inundation. Finally, they predict less mangrove cover. The three climate-induced variables are all shown to contribute to tourists' welfare, and they all deteriorated under the two climate change scenarios. Second, we estimated percentage change of scenario attributes from the present situation to the scenario level (i.e. percentage change in temperature, rainfall, sea-level rise, turtle nests, mangrove cover, and beach inundation). Third, as all changes were of the same sign, i.e. a deterioration, we aggregated the changes to give a composite climate change index. For the climate change scenarios in 2025 and 2050, the values of CCIEI were 89 and 115, respectively under non-weighted condition. With the equal weight allocation for each variable, the values of index were 18 and 23, respectively. The CCIEI received the values of 20 and 27, respectively under the allocation of different weights to the scenario attributes when referring to the focus group discussions. Although, there is some subjectivity in scientific methodology regarding the allocation of weights to the climatic and climate-induced biophysical variables, such an index is a useful tool for researchers working on climate change effects in data poor-countries.

Keywords: Climate Change, Ecotourism, Environment Index, IPCC

***Corresponding Author:** sndushani@gmail.com