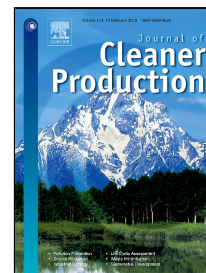


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**Investment decision for coastal urban development projects considering the
impact of climate change: Case study of the Great Garuda Project in
Indonesia**

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Abstract

As the impact of climate change increases, coastal cities are negatively affected by sea level rise, extreme rainfall, and storm surges. To cope with such climate change impacts, it is essential to invest in climate change adaptation procedures in coastal cities. This paper proposes a rainbow option-based methodology to accurately value investments in coastal city development considering climate change. This model is a tool for evaluating the economic feasibility considering the uncertainties of the impacts of climate and urban development projects. The National Capital Integrated Coastal Development (NCICD) project by Indonesian government was used as a case study to validate the effectiveness and applicability of the proposed methodology. The option value of the NCICD project using the proposed model was estimated at US\$ 7,021 million. The rainbow option, dealing with both climate and market uncertainties, enables decision makers to reasonably assess the value of coastal development projects for their successful execution.

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