
An Integrated Approach for Evaluating Adaptation Options to Reduce Climate Change Vulnerability in Coastal Region of the Georgia Basin

Y. Yin¹, Y. F. Huang² and G. H. Huang²

¹AIRG, Environment Canada, and Sustainable Development Research Institute, University of British Columbia, 2029 West Mall, Vancouver, B.C., Canada V6T 1Z2

² Faculty of Engineering, University of Regina, Regina, Sask., Canada S4S 0A2,

Abstract

This paper presents an integrated approach that integrates climate change impact assessment/vulnerability identification, adaptation option evaluation, and multi-stakeholder participation. The integrated approach was applied in the Georgia Basin (GB) for identifying desirable adaptation options to reduce climate change vulnerabilities. Different computer-based and non-model based methods were adopted to form the integrated approach. These tools include environmental simulation modeling, geographical information system (GIS), internet multi-stakeholder consultation, and multi-criteria decision making (MCDM). The research started with the identification of vulnerabilities of ecosystems, coastal areas, and economic sectors to climate change. This was followed by an online survey and interviews that allow stakeholders to conduct a multi-criteria evaluation of adaptation options. The analytic hierarchy process (AHP), an MCDM technique, was adopted to develop an adaptation evaluation tool to identify the priorities of sustainability goals/indicators and to rank desirability of adaptation options.

The case study in the Georgia Basin of Canada provides some articulation on how the integrated approach can provide an effective means for the synthetic evaluation of the general desirability levels of a set of adaptation options through a multi-criteria and multi-stakeholder decision making process. Thus, the study contributes to the science on adaptation option evaluation. While the case study identified and evaluated a number of adaptation options to deal with potential vulnerabilities to climate change in several key sectors in the region, this paper focuses on sea level rise (SLR) impacts and adaptation options for the coastal region management. The completed research results of the case study are described in the final report submitted to Climate Change Action Fund of Canadian Government (Yin, 2001).
