Impacts of Climate Change on Urban Infrastructure & the Built Environment

A Toolbox

Tool 3.6: Risk Tools – Linkages to Hazard Assessment, Adaptation Options and Decision Tools

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1. Introduction

The Tools in Tray 3 of this Toolbox provide an overview of climate change risk assessment good practice, two tools for assessing risk (RiskScape and a Quantified Risk Analysis Tool), and an example of how it is possible to include urban growth scenarios within a climate change risk assessment.

These risk assessment Tools build off analyses of the potential impacts on infrastructure performance and capacity, as described in Tray 2. Following on from a risk assessment of potential hazards, work can be done on assessing adaptation options to reduce the risk (see Tray 4). This assessment should, if possible, include some form of cost-benefit analysis. The Tools highlighted in the next section demonstrate some of the links from the Tray 3 risk assessment Tools back to hazard assessment, and forward to adaptation options and cost-benefit methodologies.

2. Linkages to Other Assessment Tools

Table 2.1 outlines the Tools in this Toolbox that can be used to build on a climate change risk assessment, and what information is required before performing such a risk assessment. In particular, the Tools shown here demonstrate various approaches to hazard assessment, identifying adaptation options, and analysing costs and benefits. It is recognised that other approaches are available which can be used to perform functions similar to those described here.

Table 2.1: Linkage Tools associated with hazard assessment, adaptation options and cost-benefit

Tool Name	Tool Reference	Purpose of the Tool
Council Policy and Plan Auditing Tool	[Tool 1.5]	Provides the basis for undertaking a 'health-check' audit of existing planning provisions to take account of climate change effects and to identify gaps and needs for additional planning instruments.
Sensitivity Matrix Prioritisation Tool	[Tool 1.6]	Provides the basis for structured subjective assessment of the vulnerability of an entity (e.g. a Council) to climate change effects across its assets and service responsibilities.
Hazard Bins	[Bins 2.1 to 2.6]	Provide overviews (with worked examples) of key issues, data collection and quality, model choice and complexity, and assumptions associated with assessing climate change impacts on flooding, sea level rise and storm surge, landslides, potable

		water supply and demand, and other hazards.
Overview of an option screening tool	[Tool 4.2]	The Options Screening Tool is specifically designed to assist in the identification of plausible risk reduction measures, and the short-listing of these prior to a more formal assessment of options. Options can also be screened against sustainability and other guiding principles when faced with an uncertain future.
Rapid cost/benefit evaluation of impacts and adaptation options	[Tool 4.3]	The rCBE tool is specifically designed to allow prioitisation of actions to prevent or reduce the impact of a hazard (in this case, flooding) based on the level of risk these types of event present, taking account of climate change.
Individual house flood mitigation measures - benefit/cost tool	[Tool 4.4]	Example application of the classical Benefit Cost Analysis process to explore the balance of economics versus performance of alternative building design adaptations for particular valued buildings.
Setting priorities using a multi-criteria analysis approach	[Tool 4.5]	The MCA-based tool is specifically designed to allow prioitisation of actions to prevent or mitigate the impact of hazards (in this case, landslides) based on the level of risk they present, taking account of climate change.
Policy-based (top down) decision making	[Tool 4.6]	Often resource consents are sought in areas prone to flooding. The Top-down Decision Tool will need to be applied in such circumstances. If there are many applications, leading to concern about cumulative effects, or adequacy of plan policy or other provisions, this may also lead to application of the Policy and Plan Audit Tool [Tool 1.5]