Decision scaling

Challenge: Unknown climate risks **Adaptation response:** Vulnerability assessment

Description

Decision scaling is an analytical approach for climate vulnerability assessment, and further for climate adaptation planning, that focuses on assessment of uncertainties and identification of those key parameters in the system that require further analysis. The approach combines data analytics tools with stakeholder engagement processes to identify priorities for further analysis. The main aim of the approach is to focus the vulnerability assessment on those key parameters that are most significant to avoid system failure, in that way focusing the time and financial resources on key analysis only.

Implementation

The decision scaling approach contains three main steps:

1. Bottom-Up Analysis: Identification of key concerns and decision thresholds – the appraisal of the key climate concerns and thresholds, based on stakeholder inputs.
2. Modeling the response to changing climate conditions – creating models (e.g. simple statistical models) to relate the climate conditions to the key climate concerns and performance indicators of the system identified in step 1.
3. Estimating relative probability of changing climate conditions - the estimation of probabilities for the climate sectors in relation to step 2.

At the centre of the decision scaling approach is the undertaking of a 'stress test' – i.e. identification of the factors or combinations of factors that may cause that system to fail – these are forming the main system vulnerabilities. It is then these identified key vulnerabilities (ex post scenarios) that are further subjected to probabilistic assessment of risk. The scenarios are thus only focused on the priority sensitivities of the system, and not comprehensive future scenarios as such.

Key element of the approach is the combination of the data analytics with stakeholder processes. This means that stakeholder inputs are key to various stages of the analysis, and particularly identifying the thresholds for undesired climate impacts. Inputs may also include stakeholder inputs to identification of objectives, thresholds and performance indicators that are of interest for the decision-makers and managers of the specific system. These then form the focus of the detailed analysis.

Environmental Benefits

- Can help to identify key vulnerabilities of the ecosystem to climate change and the main thresholds/sensitivities creating the risks that can then be prioritized for action

Socioeconomic Benefits

- Resource prioritization for key necessary analyses for decision-making
- Helps develop robust strategies for tackling vulnerability, focusing only on key sensitivities
- Less resource and time consuming due to the limited focus for in-depth analysis

Opportunities and Barriers

Opportunities:

- Opportunities to engage stakeholders in planning processes early on – increased ownership of analysis products

Barriers:

- Requires the stakeholders to have a thorough understanding of the system in question for best results
- May be more time consuming to replicate in response to unexpected system or climate changes, due to the stakeholder input requirements.

Implementation considerations*

Technological maturity:	2-3
Initial investment:	2-3
Operational costs:	1-2
Implementation timeframe:	2-3

* This adaptation technology brief includes a general assessment of four dimensions relating to implementation of the technology. It represents an indicative assessment scale of 1-5 as follows:
Technological maturity: 1 - in early stages of research and development, to 5 – fully mature and widely used
Initial investment: 1 – very low cost, to 5 – very high cost investment needed to implement technology
Operational costs: 1 – very low/no cost, to 5 – very high costs of operation and maintenance
Implementation timeframe: 1 – very quick to implement and reach desired capacity, to 5 – significant time investments needed to establish and/or reach full capacity
This assessment is to be used as an indication only and is to be seen as relative to the other technologies included in this guide. More specific costs and timelines are to be identified as relevant for the specific technology and geography.

Sources and further information

Brown, C., Y.Ghile, M.Laverty, and K.Li (2012), Decision scaling: Linking bottom-up vulnerability analysis with climate projections in the water sector, Water Resour. Res., 48, W09537, doi:10.1029/2011WR011212. ort, Washington DC

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