Socio-economic scenarios

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

Description

Socio-economic scenarios are various models that represent various assumed developments in key socio-economic drivers. These scenarios are used to characterize the social and economic forces driving climate change, in addition to project the vulnerability and/or adaptive-capacity of socio-economic systems to the impacts of climate change. Employing socio-economic scenarios for adaptation planning can increase understanding of the factors that drive climate change and how they relate to each other, provide important information to calculate the current, as well as project the future, societal footprint (e.g. greenhouse gas emissions) in regards to climate change, and help outline how vulnerable society is to climate change impacts.

The scenarios help identify priority areas for interventions, and, coupled with hydrological and climate assessments, provide greater detail to risk assessments and quantification, in addition to climate impacts and possible adaptation responses.

Implementation

Socioeconomic scenarios utilize current and projected data on different socio-economic factors which may impact climate change, including population size and growth, economic conditions (e.g. GDP per capita, GDP per sector, etc.), land use (e.g. total land cover, forest cover, etc.), water (e.g. water resources per capita, withdrawal rates per sector, etc.), agriculture (e.g. irrigated land cover, domestic animal stock, etc.), energy (e.g. total energy consumption, fuel-based energy consumption, renewable energy consumption, etc.) and environment (e.g. number of species). The various scenarios can further take into account projected technological change and a society's ability to adapt, changes in values, and willingness to act and adapt.

When fed into assessment models, these criteria help project future emissions, climate change impacts and vulnerability to climate change under various socioeconomic development scenarios. The scales can vary from global (e.g. the widely used IPCCC socioeconomic scenarios to project emissions of greenhouse gases, which are used to model future global climate change impacts), to national (e.g. UKCIP's socio-economic scenarios for the 2020s and 2050s) to river basin assessments (feeding relevant socio-economic variables and the predicted change in to relevant models).

Environmental Benefits

- Improves adaptation responses, taking into consideration potential environmental degradation drivers.

Socioeconomic Benefits

- Improves understanding of the socio-economic drivers of climate change that addresses drivers of the change rather than consequences.
- Supports integrated approaches to design of adaptation and mitigation measures.
- Increases preparedness and adequacy of adaptation responses under realistic future conditions.

Opportunities and Barriers

Opportunities:

- Helps design adaptation responses with more flexibility and preparedness for potential future changes in circumstances.
- Help project reliable estimates of short- and long-term climate change impacts (e.g. greenhouse gas emissions) for efficient response-planning

Barriers:

- Most commonly used socioeconomic scenarios provide data on a global scale (or cumulative regional scale), and thus can be harder to downscale with reasonable accuracy
- Can require extensive data processing, as well as a thorough understanding of system linkages and complex system interactions
- Subject to major uncertainties due to the unpredictable nature of future developments

Implementation considerations*

Technological maturity:	4-5
Initial investment:	1-3
Operational costs:	1-3
Implementation timeframe:	3-4

* 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

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