Newsletter 2 - December 2018

Enhancing the value of climate data - translating risk and uncertainty utilizing a living labs approach

Developing local socioeconomic scenarios using a multi-scale co-creation approach

As one central Co-Design activity, all EVOKED partners have been involved in developing local socioeconomic scenarios for their case study region. These scenarios constitute an important component for assessing the risks that climate change impacts may pose to the local populations. These local-scale socioeconomic scenarios are consistent with the Shared Socioeconomic Pathways (SSPs), which constitute the current standard in climate change scenario and impact analysis.

The SSPs describe five possible pathways for society and society-influenced systems to evolve in the course of the 21st century. They have been developed on global to regional scales based on socioeconomic challenges for mitigation and adaptation (Figure 1).

The highest Gross Domestic Product (GDP) and the lowest population are attained under SSP1 and SSP5. GDP is lowest and population highest under SSP3 and a similar but less extreme trend is followed under SSP4. SSP2 reflects a world with medium assumptions between the other four SSPs.

Local scenario development. For the development of local SSP-based scenarios, all partners have followed a stepwise process for drafting scenario narratives, which are broad descriptions of the socioeconomic developments under each scenario in form of a storyline.

<u>Step 1: Determine global scenarios as boundary conditions</u>

When drafting local-scale socioeconomic scenarios, it is important to not only account for local developments, but also to consider that each case study is embedded in developments at different spatial scales, ranging from global to European, national and regional levels. Therefore, in EVOKED we have decided to adopt the global-scale SSP narrative elements and use these as a starting point for the local scenarios.

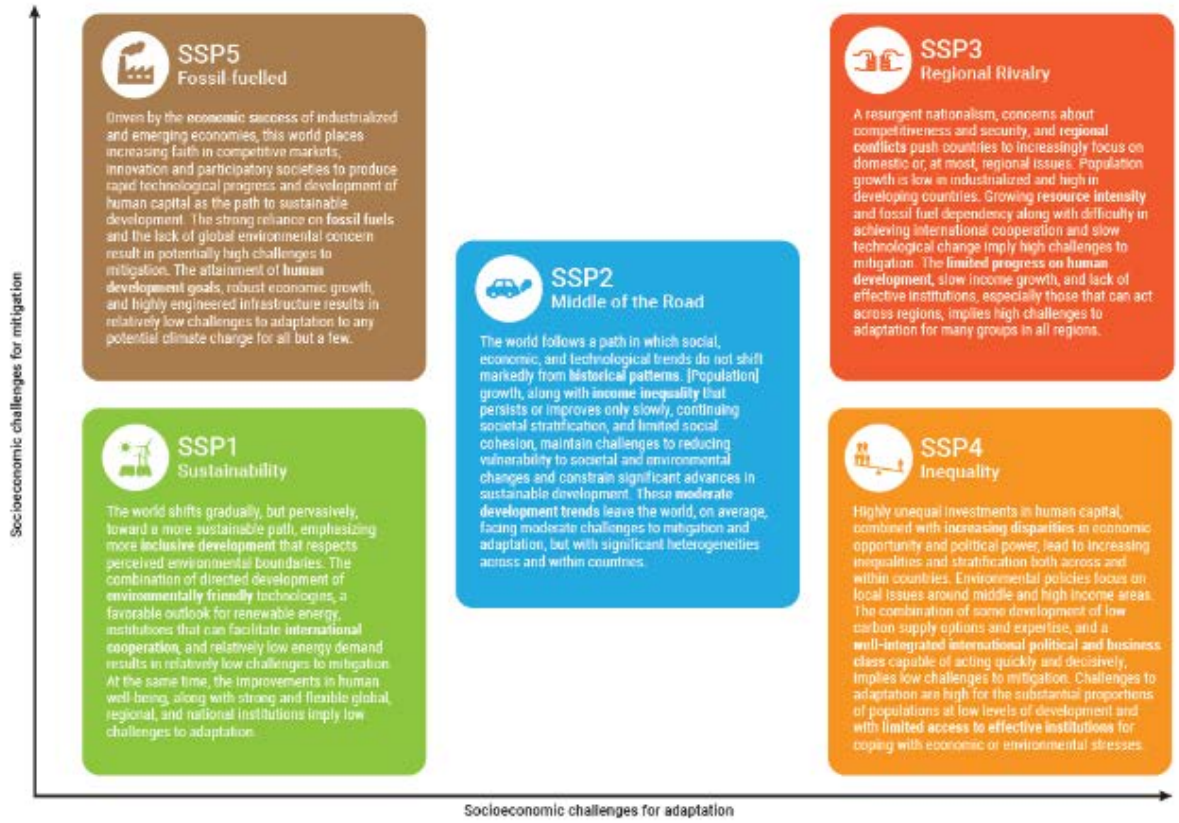

Figure 1. The five SSPs with excerpts of the global SSP narratives and their challenges for mitigation and adaptation (O'Neill et al. 2017, own emphasis added).

Step 2: Establish local scenario elements

To establish local scenario elements that are important drivers of societal development in each case study region, project partners reviewed the locally relevant literature and analysed data of the local and regional administrations and statistics offices. A number of guiding questions for each case study region have additionally driven the process, for example:

- What are recent population trends?
- What are the major issues of political and socioeconomic importance and/or concern in the case study region?
- How are local politics embedded in regional, national and global politics?

Subsequently, the global SSP elements most relevant to the case study region were combined with the local elements.

Step 3: Determine plausible future developments of each scenario element

The future characteristics of the elements established in Step 2 were determined for each scenario. To do so, each project partner selected a subset of three to four SSP-based scenarios that were found to be most relevant in each case study region:

- Norway: SSP1, SSP2, SSP3
- Sweden: SSP1, SSP2, SSP3/4 (mixed), SSP5
- The Netherlands: SSP1/2 (mixed), SSP3, SSP4, SSP5
- Germany: SSP1, SSP2, SSP3, SSP5

Step 4: Draft scenario narratives

In Step 4, a full-text narrative was drafted for each scenario based on the characteristics in each scenario. The narratives ('storylines') add further context to the scenario elements with the aim to facilitate stakeholders' understanding of each scenario.

Step 5: Facilitate feedback and discussion with local stakeholders

The first draft of the narratives have been discussed (or will be discussed) with case-study stakeholders to guarantee plausibility and acceptance of the local scenarios. These discussions take place in different

Figure 2. Stakeholder workshop in Flensburg in November 2018 (photo: Maureen Tsakiris).

communication formats such as focus groups, interviews, or workshops. In addition to the narrative text, other visualization tools are being used in order to ease understanding of each scenario, for instance pictures, graphs, or comics (Figure 2).

Step 6: Refine scenario narratives based on stakeholder feedback

Feedback from the stakeholders is currently being integrated into the narratives in order to adjust these to the ideas of the stakeholders. The reviewed narratives will be discussed with the local stakeholders in several iterations. This iterative process further increases acceptance of the local scenarios, which is important for developing scenario-relevant adaptation strategies.

Current status and next steps. Each project partner is currently finalizing the local scenario narratives for their case study region. Once these have been discussed with the local stakeholders, the developed narratives will be quantified, e.g. in the form of population projections until 2100, to form the basis for vulnerability and impact assessments.

References.

O'Neill, Brian C.; Kriegler, Elmar; Ebi, Kristie L.; Kemp-Benedict, Eric; Riahi, Keywan; Rothman, Dale S. et al. (2017): The roads ahead. Narratives for shared socioeconomic pathways describing world futures in the 21st century. In Global Environmental Change 42, pp. 169–180. DOI: 10.1016/j.gloenvcha.2015.01.004.

Larvik, Norway - case study site

As a coastal city located in southern Norway, Larvik is exposed to weather and has always experienced floods, strong winds and storms. However, these events are becoming more frequent, more severe and the costs of damages are increasing. As such, there is a present awareness on the effects of climate change and during interviews, respondents easily identified climate adaptation needs for Larvik. This includes the need to increase the awareness of climate change and adaptation in Larvik's strategic planning documents as well as a need to build up knowledge and competence.

Figure 3. Extreme rainfall and storm surge viewed from the inner harbour (photo: Stein Seljeseth, Larvik municipality).

Urban development in a changing climate. Improving the knowledge base is essential for meeting the visions of Larvik as the city has ambitious goals of urban development, including construction projects to build homes for a 1.5% annual growth and influx of residents. To support meeting this goal, the city of Larvik is conducting a feasibility study to assess the development of Martineåsen, an area of 200 hectares situated about 1 km from the city centre. The aim is to create a new neighbourhood at Martineåsen that will have an urban intensity and environmental qualities that attract young and resourceful people of all ages including families.

Key objectives to achieve this vision include a focus on building residential areas and homes that are innovative and green as well as a focus on being sensitive to climate change. One challenge in building these homes is the landscape of Martineåsen which is hilly and quite varied with tall deciduous trees as well as pine and heath forests. A small lake, Kleivertjønn, is located centrally in the area.

Figure 4. Water is the main challenge in Larvik – coastal city, situated by the river Lågen with many small rivers and creeks throughout the area. The lake Farrisvannet, shown above, is the municipality's drinking water source (photo: Larvik municipality).

There are also several bogs which is a type of wetland that accumulates peat. These physical qualities represent important blue-green infrastructure that provide both opportunities and challenges that must be considered in the comprehensive development of the area. Furthermore, the development of infrastructure and outdoor spaces must be designed to have the capacity to accommodate for climate change and to ensure public safety.

Stakeholders and Living Labs. There is a broad range of stakeholders that are impacted by climate change and are central to climate change adaptation interventions in Larvik. Stakeholders having the most interest and influence include local and regional authorities, politicians, landowners, local businesses as well as the national road authorities and national food safety authority. These stakeholders have a keen interest in understanding the risk of flooding and storm surges with regard to planning processes and subsequent city development. Contractors and consultants who are often engaged in the construction activities were identified as also having high interest and influence as they both need the best available knowledge possible to also implement adaptation measures.

For the development of Martineåsen, landowners are particularly important to ensure comprehensive development of the area. Larvik municipality has since 2014 had continuous dialogue and held meetings with this group of landowners. Furthermore, this

group of landowners has been involved in the feasibility study for the development of Martineåsen and will provide a point of departure for further Living Labs in collaboration with EVOKED.

Figure 5. Workshop with Larvik municipality, MAD architects and Martineåsen landowners in November 2018 (photo: Amy Oen).

Living Labs will help address the climate challenges related to water and flooding for the urban development of Martineåsen. Living Labs is an example of a comprehensive approach to operationalize stakeholder involvement and many of the characteristics of Living Labs are present for the urban development of Martineåsen. The Planning Program and Area Zoning Plan for Martineåsen represent both spatial and temporal boundaries that are indicative of Living Labs. Several stakeholders are identified and different methods for their involvement are already in use. Finally, Martineåsen represents an ongoing policy process in a real-life setting which is essential for Living Labs.

EVOKED – project facts

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