FINSCAPES: Finnish scenarios for climate change research Addressing policies, regions and integrated systems

The need for scenarios

The implications of climate change for society depend on demographic, economic and environmental developments, all of which are uncertain. Since such developments cannot be predicted with confidence, scenarios are useful substitutes for exploring alternative plausible future conditions. Scenarios can be used as a basis for evaluating suitable policy responses and strategies from global to local scales. Several types of scenarios are commonly applied in climate change research and policy (Figure 1).

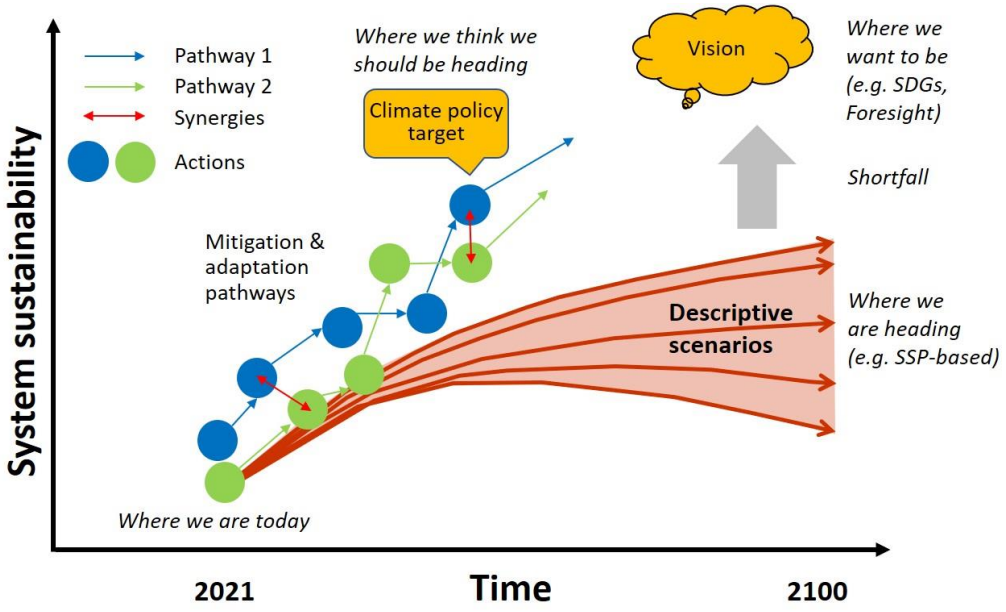

Figure 1: Scenario use in climate change research (adapted from Holman et al., 2017[1])

Descriptive or exploratory scenarios describe pathways that may develop into the future based on information about past trajectories and different assumptions about future trends. For example, the global shared socioeconomic pathways (SSPs) are descriptive scenarios commonly applied in climate change research.

Target-based or normative scenarios describe future goals and visions that society seeks to achieve (or situations to avoid). Examples include the 1.5 °C global warming target of the UN Paris Agreement or the UN Sustainable Development Goals (SDGs).

The ***FINSCAPES project***[2] focuses on co-production of descriptive, SSP-based scenarios for use in Finnish climate change research and policy making, with special emphasis given to regions at the sub-national scale.

[1] Holman, I, et al. (2017) Modelling Climate Change Impacts, Adaptation and Vulnerability in Europe. Available from www.impressions-project.eu

[2] Finnish scenarios for climate change research addressing policies, regions and integrated systems (FINSCAPES) is a four-year consortium project (2021-2024) financed under the Academy of Finland's Special funding for system-level research into climate change mitigation and adaptation. Partners are the Finnish Environment Institute (SYKE, co-ordination), Finnish Meteorological Institute and Natural Resource Institute Finland (Luke).

Aims of the FINSCAPES project

The central objective of the FINSCAPES project is to advance the design, development and effective application of scenarios for climate change analysis at regional and national scales that are relevant both for research and for supporting system-wide climate policy development in Finland. The project has six specific aims:

1) to design a new framework and methodology for representing scenarios in climate change research in Finland;
2) to co-produce, with experts and local stakeholders, socioeconomic pathways for key societally-relevant systems at regional scale out to 2050 and beyond, that are based on and consistent with global SSPs;
3) to co-define, with potential users, a new set of regional climate projections for Finland, based on the most recent global earth system model and high-resolution regional climate model simulations, including novel climate and impact storylines;
4) to combine socioeconomic pathways and climate projections into integrated scenarios for Finnish sub-regions and aggregated national system-wide narratives
5) to provide practical demonstrations of the design, development, application and validity of scenarios in case studies of agriculture and food and urban systems;
6) to disseminate peer-reviewed project outcomes to a wide variety of potential users through various online and printed media, seminars and guidance.

Opportunities presented in FINSCAPES

The project engages regionally with representatives of the Regional Councils and municipalities. In the *short term* this should offer stakeholders opportunities to:

- consider alternative futures affecting livelihoods and environment in their region in the context of alternative international developments defined by global SSPs;
- interpret how their region might look and behave under different realisations of the future, based on their local and professional experience;
- understand what types of regional climate changes and impacts they can expect, assisted by non-technical methods of storyline presentation.

In the *longer term*, for regional actors as well as nationally, there is the possibility to:

- compare scenario building outcomes and experiences with those from other regions in Finland and internationally, all working with the same global narratives;
- enhance education and public awareness by adopting integrated scenarios, in simplified formats, for describing alternative views of the future;
- catalyse scenario-building capacity in Finland, by demonstrating how SSP-based scenarios can be developed and applied to address pressing policy questions;
- apply the SSP-based scenarios in a policy setting to inform assessments of urgency, effectiveness and resilience of adaptation and mitigation strategies.

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