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Bridging the gap between qualitative and quantitative: scenario development in a participatory process

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The future of Europe's waters will be influenced by a combination of many important environmental and socio-economic drivers as well as policy and technology responses affecting these drivers. In the "Water Scenarios for Europe and Neighbouring States" (SCENES) project a set of both qualitative and quantitative scenarios has been developed to describe freshwater futures up to 2050 in pan-Europe, an area covering the Mediterranean rim countries and reaching from Caucasus to the White Sea in the East.

The overall scenario approach is based on the Story-and-Simulation Approach linking storyline development and modelling work in an iterative process. The qualitative scenarios were constructed during three consecutive stakeholder workshops (SCENES pan-European panel meetings). They comprise a set of plausible futures in the shape of narrative storylines which address both socio-economic and environmental drivers and consequences for water quantity and quality. The quantitative scenarios in turn are based on modelling results taking up information on drivers provided by the storylines and questionnaires filled out by the stakeholders. Quantitative scenarios indicate the consequences for water quantity and quality mainly in form of maps and charts.

Four narrative storylines, namely Economy First (EcF), Fortress Europe (FoE), Policy Rules (PoR) and Sustainability Eventually (SuE) were developed. Results indicate that the stories are complex, integrated, and rich in detail. A characteristic feature in all storylines is the focus on climate change impacts as a major trigger to changes in human and thus societal awareness and behaviour. As an example for including water issues, the storylines describe the future of the Water Framework Directive in Europe as a delayed compliance (PoR), a restricted compliance, i.e. only in areas where a good ecological status is of economic interest (EcF) or as a change into a Water Security Framework (FoE).

The questionnaires filled out by the stakeholders describing the future trends in and magnitude of change of selected key drivers resulted in information on changes in e.g. population, GDP and technological change. For pan-Europe this information was retrieved for seven regions. To cover the whole study area, the global WaterGAP model was used to project hydrology and water resources, utilising the information on key drivers which in turn are linked to the storylines. The major factor affecting freshwater availability is climate change. In SCENES, available Global Circulation Model – emission scenario combinations were selected but the stakeholders played a key role in finally concentrating on the IPCC SRES A2 scenario emphasising the trigger role of climate change in all storylines. This leads in general to a decrease in annual water availability in large parts of pan-Europe, especially in Southern Europe and Western Asia but also to an increase in Northern Europe. The effect of driver changes on water use differs between regions and scenarios but overall the total water withdrawals are expected to increase in pan-Europe by 2050 under EcF and FoE and decrease under PoR and SuE.

A feedback questionnaire amongst the stakeholders showed that overall there was a widespread satisfaction with the scenario development process that was mentioned as one of the most useful things they had learned. Some doubts were raised whether sufficient understanding could be collected for policy actions. On the other hand, also the analysis of the storylines themselves gave examples of participative elements in future water management.

In this presentation we portray (i) the participative storyline development process and the resulting SCENES storylines, (ii) the process of deriving key driving variables connected to these storylines, and (iii) resulting consequences when using these variables as input to modelling exercises. We will conclude with some key

findings and lessons learnt from the SCENES process.