CLISWELN

Climate **S**ervices for the **W**ater-**E**nergy-**L**and **N**exus

October 2017 – September 2020

Clisweln.info/#CLISWELN

A project funded under JPI Climate and ERA4CS

What is the CLISWELN project about?

We need to understand what are the factors that imperil the economy, factors that will play a role together with climate change, in order to transform climate scenario data into information useful for planning and decision making for stakeholders. In this context, drought risk plays an important role, as we saw during the summer of 2018 in Germany. This project aims to provide climate services for drought affected sectors and systems of sectors, like agriculture, forestry and cities, using climate change projection data in integrated models and decision-making tools in order to analyze the complex water-energy-land-food nexus (see Figure 1). CLISWELN analyses the drought because it has a significant impact on water supplies, but in socio-economic terms, a drought is the imbalance between supply and demand, so it is necessary to understand what demand factors play a role, together with climate change, and to analyse the entire system of demand and supply including all the involved sectors in each case study.

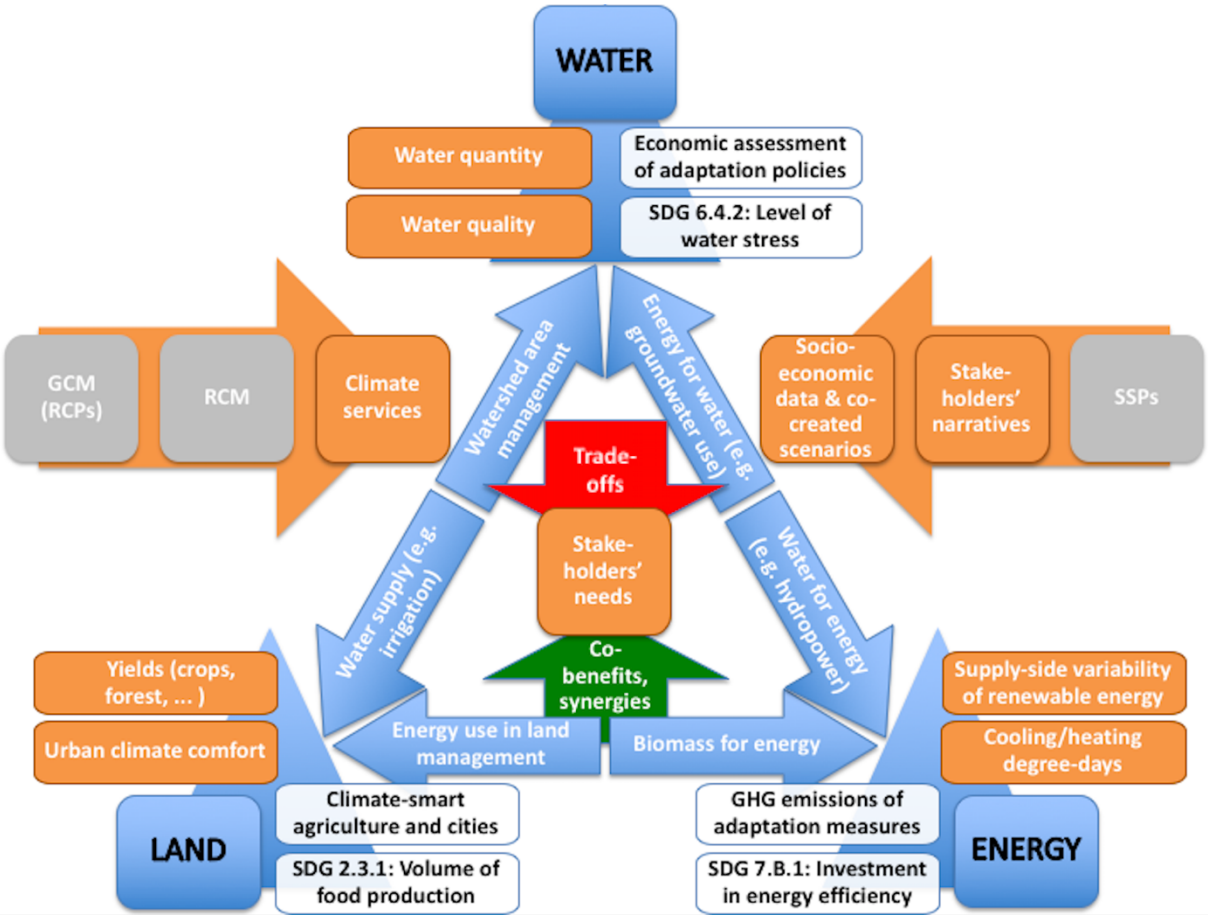


Figure 1: Technical scheme of the integration of climate services with the water-energy-land nexus in the project CLISWELN (Source: Cremades et al., 2019*; STOTEN.*).

Highlights

- CLISWELN is producing tools for urban planning and information for decision makers in agriculture, forestry and cities so that they can understand the implications of management decisions under climate change scenarios.
- CLISWELN links forest land use to water supply availability for cities and greenhouse gas emissions from additional sources of water. In this way it introduces an approach to assure that adaptation options advised by climate services do not increase greenhouse gas emissions.
- CLISWELN provides insights about the resilience of the tourism sector to climate change in areas with high pressures for urban development that could significantly increase water demands, in a context where the nexus between water, cities and agriculture is crucial to understand how to adapt to longer and more intense droughts.
- In some case studies we have been able to install field meteorological equipment that will improve the quality of the research performed by providing better data to calibrate the results of the hydrological simulations.

Keywords / hashtags

Keywords: climate services; nexus; drought; cities; agriculture.
Hashtags: #clisweln; #nexus; #drought

Potential societal impacts

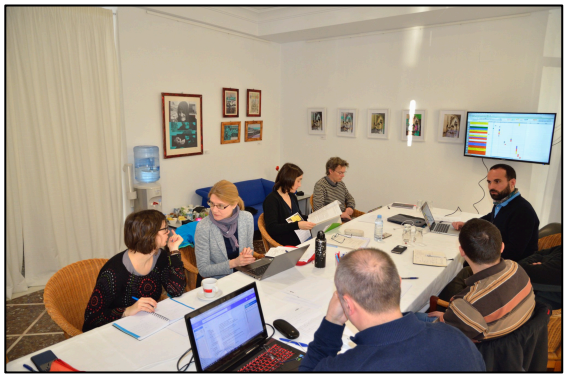
To exemplify the societal impact of the project, the information for urban water supply planning in the Sacele river basin in Romania involves stakeholders from a water treatment plant linked to a dam that is used for urban water provision for Brasov, an important city; in this dam there are sedimentation problems and the dam managers and urban water suppliers are truly eager to see our final results and understand the implications of co-designed land use scenarios and climate change in the sedimentation problem.

About the project leader

I am Dr. Roger Cremades, the leading investigator of CLISWELN, you can drop me an email at roger.cremades@hzg.de. I envisioned this project when droughts were not yet perceived in the media as a present major risk in Germany. I am mostly interested in realistically integrating all economic sectors and their nexus across resources (water, land, energy) in socio-economic tools for climate change adaptation and sustainability. For me 2+2 sometimes can sum more than 4, because the real world is a complex system full of synergies and feedback loops. Traditional methods exclude this complexity. My goal is to improve existing practices by focussing on complex systems applied to climate services.

About the project consortium

Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung GmbH, particularly its Climate Service Center Germany (GERICS), is the lead partner and focuses on the interactions of cities with droughts under climate change in a case study in a Mediterranean tourism hub in Spain. Universität für Bodenkultur Wien, Austria, runs an agricultural model that reproduces land, water and energy use in agriculture and applies it to a case study in Austria. Centre for Ecological Research and Forestry Applications, Spain, does the hydrological simulations for the Spanish case study. And finally, the National Institute for Research and Development in Forestry “Marin Dracea", Romania, prepared a case study linking forestry land use with urban resilience to droughts. The stakeholders in the project are mostly in the urban planning, water management, and agriculture and forestry sectors, depending on each case study.



Figures 2 and 3: Project meeting and field visit during a visit to the Spanish case study in Benidorm. The project partners visited medieval water infrastructure and appreciated that there is a long story in the area about innovations dealing with water scarcity.

The role of JPI Climate

JPI Climate is supporting research on climate services and cross-sectoral complexity, and is helping us to develop the research. JPI Climate gives us the opportunity to attend and organise sessions in major project-related conferences at the global and European scales, particularly CLISWELN organised sessions at Adaptation Futures 2018 and at the European Climate Change Adaptation 2019 conference, on which the project partners collected feedback from multiple international colleagues. JPI Climate also helps us to create synergies with other projects about climate services and about the water-energy-land nexus.