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German climate change impact study

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The scientific as well as the public discussion on the topic of climate change frequently oscillates between catastrophism and playing down its threat. As often, the truth probably lies in between since the impacts of climate change are very different in different regions of the world. This will continue to be the case in the future: 2 °C more at global average could, for example, mean 4 degrees more in the Arctic, and less than 2 degrees in the Sahara.

This special issue breaks new ground: for the papers presented here, natural and social scientists coordinated the results of their research. During this interaction it became obvious to all authors that it is more difficult to grasp interactions between climate and social systems than to describe the systems individually. Complex interactions between climatic changes and human society have to be considered. This is because not only the type and force of an event are relevant but also the extent to which prevention and management capacities are present in a society. An extreme weather event only becomes a natural disaster if it meets vulnerable social conditions.

A comprehensive consideration of all social climate impacts was not possible and was not the aim of this special issue. For this reason, the scenario period was confined to the next 30–40 years, and a temperature increase of 2 °C for the period 1901 to 2040 was assumed, along with changes of other important meteorological values, such as precipitation, climatic water balance, or sunshine duration (GERSTENGARBE et al., 2015). The meteorological data are used as an input to specific models describing climatic impacts on particular areas of the environment and society. It is important to note here that, with respect to the climatic development, only *one* possible future will be discussed. Different assumptions could result in an infinite series of other “futures” for Germany.

The results show that under climate change conditions as considered in this study, climate change impacts will be moderate until 2040, and new opportunities may also appear.

In conclusion, the aim of the research presented here is to enhance our understanding of this complex problem and to solicit more interdisciplinary research. For the first time, a plausible scenario integrating environmental and social aspects of the situation in Germany in 2040 is presented. It is a novelty that climatologists, hydrologists, viticultural and forest scientists developed such a climate impact scenario together with social scientists. This has been long overdue. Such an interdisciplinary approach is essential to realistically assess what impacts society will face in future, what worries are unfounded, and how society can today prepare for tomorrow.

The climate scenario consistently used in all impact studies of this volume is presented in GERSTENGARBE et al. (2015). The specific impact models and simulation results for Germany are discussed in LASCH-BORN et al. (2015) for the forest sector, in HATTERMANN et al. (2015) for water resources and by KARTSCHALL et al. (2015) for the viticultural sector. KOCH et al. (2015) investigated the sensitivity of the electricity sector in Germany to climate change, and GUTSCH et al. (2015) analysed the vulnerability and possible contribution of biomass production in the future. These results are taken up and complemented by a sociological analysis of what the complex interactions between climatic changes and human society could look like under such climate scenario conditions. SOMMER and SCHAD (2015) investigated potential societal consequences of climatic changes as modelled for Germany and prospective developments, while the specific values and dynamics of adaptation to climate change are described in WESSELS (2015). It is shown that the question of what will change and what will be preserved is not prescribed by the facts of climate change and technology, but is contingent on choices to be made by society (WESSELS, 2015).

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