Editorial: Climate change information for Regional impact and risk assessment

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Editorial on the Research Topic
Climate Change Information for Regional Impact and Risk Assessment

Introduction

Regional information about climate risks and the impacts of climate change is vital in decision-making in a wide range of contexts. In distilling such information from multiple lines of evidence, the values and contextual knowledge of the stakeholders are vital for appropriate interpretation and an appreciation of the relevance of the information. Additionally, the knowledge of how the fitness for purpose guides the selection of the sources facilitates decision-making. This Research Topic of Frontiers in Environmental Science with the theme "Climate Change Information for Regional Impact and Risk Assessment" includes nine articles by authors from various parts of the world.

The articles describe the relationship between microclimate and cow behavior and milk yield (Song et al.), methods for the assessment of impacts and risks (Estrada et al.), climate change impact on different sectors and how to alleviate them in some cases (Wu et al., Chai et al., Okeke-Ogbuafor et al., Chen et al.), different aspects of risks (Estrada et al., Sun and Wang), and ways of obtaining different information (Estrada et al., Huang and Li, Agyekum et al.). In relation to greenhouse emissions, there is a study on the impact of climate change and population urbanization in China (Chai et al.). A study on the impact of extreme weather on the poverty vulnerability of farming households in China (Chen et al.) is in the right direction as extreme weather events are projected to increase in intensity and frequency over different geographical areas under a changing climate. Manuscripts on the contribution of weather forecast information to specific sectors (Agyekum et al.) and crop insurance and re-insurance under systemic risk bring to the fore the Research Topic of early warning and insurance. It is about time further research is done to ascertain the role of early

warning coupled with early action vis-à-vis the payment of insurance premiums. A cost-benefit analysis study is recommended in this regard.

The diversity in the manuscripts submitted under this research topic illustrates the different sources of information, the different contexts that could be relevant, the different ways of obtaining information, the different human and ecological systems and the different geographical areas covered. The distillation process become very important when all these different issues pertain for instance, to say a given geographical area. With the growing sources of data and the need to obtain regional information at a relatively high resolution or scale, different tools and different ways of generating information need to be employed in decision making at a much faster rate than is currently being practiced. The distillation process might call for expert systems to handle the increasing range of data sources in addition to decision support systems. These manuscripts only highlight the need for new methods such as Machine Learning and Artificial intelligence, convection permitting models, multi-model ensembles, among others, in generating regional weather and climate information. The manuscripts have illustrated the fact that, in the context of climate change, risks can arise from impacts of climate change as well as from the potential human responses to climate change. This takes cognizance of the IPCC definition of risk as the potential for adverse consequences for human or ecological systems, recognizing the diversity of values and objectives associated with such systems.

Author contributions

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Conflict of interest

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