



Application of the new scenario framework for climate change research: Future social vulnerability in large urban areas

Guillaume Rohat (1), Johannes Flacke (2), Hy Dao (1,3)

(1) Institute for Environmental Sciences, University of Geneva, Switzerland (guillaume.rohat@unige.ch), (2) Faculty of Geo-Information Science and Earth Observation, University of Twente, The Netherlands (j.flacke@utwente.nl), (3) United Nations Environment Programme DEWA/GRID-Geneva, Switzerland (hy.dao@unepgrid.ch)

It is by now widely acknowledged that future social vulnerability to climate change depends on both future climate state and future socio-economic conditions. Nevertheless, while most of the vulnerability assessments are using climate projections, the integration of socio-economic projections into the assessment of vulnerabilities has been very limited. Up to now, the vast majority of vulnerability assessments has been using current socio-economic conditions, hence has failed to consider the influence of socio-economic developments in the construction of vulnerability.

To enhance the use of socio-economic projections into climate change impacts, adaptation and vulnerability assessments, the climate change research community has been recently involved in the development of a new model for creating scenarios that integrate future changes in climate as well as in society, known under the name of the new scenario framework for climate change research.

This theoretical framework is made of a set of alternative futures of socio-economic developments (known as shared socio-economic pathways – SSPs), a set of hypothesis about future climate policies (known as shared policy assumptions – SPAs) and a set of greenhouse gas concentration trajectories (known as representative concentration pathways – RCPs), which are all combined into a scenario matrix architecture (SMA) whose aim is to facilitate the use of this framework.

Despite calls by the climate change research community for the use of this conceptual framework in impacts, adaptation and vulnerability research, its use and its assessment has been very limited.

Focusing on case-studies (i.e. specific cities as well as specific climate impacts and their associated human exposures and vulnerabilities), the study presented here will attempt to operationalize this theoretical framework for the assessment of future social vulnerability in large urban areas. A particular attention will be paid to less advanced and more vulnerable countries in the global south.

We will discuss how this framework can be implemented for large urban agglomerations. To do so, we will examine: (i) by what means globally-developed SSPs can be extended into sector-specific and location-specific socio-economic development scenarios, (ii) in what manner the quantification of key socio-economic indicators (in accordance with the different SSPs), coupled with regional climate projections under different RCPs, can lead to a quantitative and reliable assessment of the evolution of future social vulnerability, and (iii) to which extent the SMA, i.e. the combination of extended SSPs, regional climate projections (under different RCPs) and various locally-developed SPAs, can answer some of the key questions regarding climate change adaptation policies, from a vulnerability perspective.