

{rokbox title=| Sketch of the methodology proposed to accommodate uncertainties in the impact chain framework :: Image:

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Camilo Melo-Aguilar, **Miguel Agulles** and **Gabriel Jordà**, 2022. [Introducing uncertainties in composite indicators. The case of the Impact Chain risk assessment framework.](#) Frontiers in Climate.Climate Risk Management.Volume 4.2022.
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Abstract:The use of composite indices is widespread in many fields of knowledge but a common problem associated to those type of indices is how to introduce uncertain knowledge on them. One example would be the Impact Chain framework for risk assessment. This methodology has proven to be a robust and effective approach to set up the conceptual framework associated to a given risk allowing to naturally consider the different components that shape that risk. However, the operationalization of the impact chain may not be straightforward, in particular due to the inherent uncertainties associated to the selected indicators and the assigned weights. In this paper, we propose to use a probabilistic framework that would allow to consider uncertain knowledge in the composite indicator computation. Moreover, in the framework of the UNCHAIN project, a web-based tool has been developed to ease the task of implementing that methodology. This web-based application is designed as a multidimensional tool to consider uncertainties in any type of composite indicator, thus, its scope goes beyond the Impact Chain and risk analysis framework. For illustrative purposes, the tool has been applied to a case study on the risk of loss tourist attractiveness due to heat stress conditions on the Balearic island, Spain. This case study is used to show how uncertainties in different components of the impact chain can affect the robustness of the final risk assessment. Also, the tool provides an estimate of the sensitivity of the final risk to each component, which can be used to guide risk mitigation strategies. Finally, a proposal for the validation of the risk assessment is presented.

Keywords:uncertainty,climate risk assessment,impact chains,climate change risk,tourism risk management,heat index,composite index.