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Assessing Vulnerability to Drought on a pan–European scale

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During the past decade, a number of theoretical frameworks have been defined within the Disaster Risk Reduction and Climate Change communities to assess drought vulnerability at different scales, sectors, socio-political contexts, and geo-climatic conditions. However, there is still little consensus around the criteria, dimensions and factors used in these assessments; and none of them has been applied at a pan-European scale. This is due to a triple complexity. Firstly, drought as a natural hazard is a complex phenomenon due to the difficulty of determining its onset and its multiscale, multifaceted and dynamic nature. Secondly, there is an on-going debate regarding the concept of vulnerability and its constitutive elements, together with an important diversity of theoretical approaches to assess it. Finally, Europe's diversity in bioclimatic conditions, national water use practice and water use policies adds a challenging characteristic for working on pan-European scale.

This work addresses the challenge of defining a methodological approach to the assessment of vulnerability factors to drought at a pan-European scale. For this purpose, we first review existing conceptual frameworks as well as of past initiatives for drought vulnerability assessment. The literature review showed that the high complexity of drought vulnerability assessment requires a clear definition of the concept of vulnerability and the associated terms, and that, before undertaking any assessment, it is necessary to clearly define the "vulnerable unit" i.e. replying to the questions 'whose vulnerability is being assessed?' and 'vulnerability to what type of impact?'. In this context, this work proposes the application of a factor-based approach, consisting in the analysis of significant factors that influence vulnerability in the context of specific situations of potential vulnerability. Those situations are framed within the specific drought characteristics of four different geoclimatic macro -regions in Europe (Southern Europe; Central Europe; Eastern Europe; Northern Europe), to allow for comparison among similar vulnerability units within each region. These 'situations' are proposed as a suitable way to delimit vulnerability conditions, as they make explicit under which assumptions are we operating when undertaking the assessment. Vulnerability factors were determined based on literature review and expert-based validation while the vulnerability situations were derived from a database of registered drought impacts by sectors (European Drought Impact Report Inventory, EDII). The resulting picture is both informative and diagnostic: it provides guidance for the identification of areas and sectors where drought impact needs to be mitigated, and allows for the identification of issues (e.g. adaptive capacity features) that should be addressed to achieve that mitigation of drought impact. The approach is being tested for drought vulnerability assessment on a pan-European scale.