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EU and international policies for hydrometeorological risks: Operational aspects and link to climate action

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Abstract

Changes in hydrometeorological characteristics and risks have been observed and are projected to increase under climate change. These considerations are scientifically well studied and led to the development of a complex policy framework for adaptation and mitigation for hydrometeorological risks. Awareness for policy actions is growing worldwide but no legal framework is in place to tackle climate change impacts on water at a global scale. With the example of international frameworks and the legislation on EU-level, this article elaborates that hydrometeorological risks are not considered in the framework of one single policy. However, various policy instruments are directly or indirectly considering these risks at different operational levels. It is discussed that a tailor-made framework for hydrometeorological risks would improve coordination at international or national level. A major drawback for a single operational framework is that hydrometeorological risks are scientifically tackled in two large communities: the disaster risk reduction community and the climate change adaptation community, both of which are bound to different research and operational funding budgets. In future, disaster risk reduction and climate change adaptation will need been seen as a complementary set of actions that requires collaboration.

Keywords: Hydrometeorological risks; Disaster risk reduction; Policy; European Union

1. Introduction

The Technical Paper VI of the IPCC highlights that observational records and climate projections provide abundant evidence that freshwater resources are vulnerable toward climate change, with wide-ranging consequences for human societies and ecosystems in Europe and worldwide. Observed warming over several decades has been linked to changes in the large-scale hydrological cycle, such as the effects on atmospheric water vapour content, changes of precipitation patterns with consequences on extreme floods and droughts (Bates et al., 2008). This has been reconfirmed by the IPCC in 2014, and evidence of observed climate change impacts is strongest and most comprehensive for natural systems (IPCC, 2014). It is very likely that hydrometeorological characteristics will change in the future. The impacts of climate change, in particular the increased frequency and severity of extreme hydrometeorological events, may challenge the reliability of our water management systems, although quantitative projections of changes in precipitation, river flows and water levels at the river basin scale remain uncertain.

Nonetheless, these considerations supported the development of a complex policy framework designing adaptation and mitigation options. These options aim at tackling impacts of global warming on water resources and risks to society and

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assets. They are closely linked to a range of policies. This article gives an outline of the major policy framework relevant to hydrometeorological events with some considerations from previous publications of the authors (Gemmer et al., 2011; Quevauviller et al., 2011; Quevauviller, 2011). It discusses the transition from the policy framework to the operational level and identifies major drawbacks.

2. Policy background

The need for policy responses to tackle climate change impacts on water, including hydrometeorological extreme events, is recognised worldwide. This is extensively expressed in the IPCC Technical Paper on Water (Bates et al., 2008), which is addressed primarily to policy-makers engaged in all areas related to freshwater resource management, climate change, strategic studies, spatial planning and socio-economic development. This technical paper evaluates the impacts of climate change on hydrological processes and regimes, and of freshwater resources (availability, quality, uses and management), at a worldwide scale, and highlights their implications for policy, looking at different sectors. In particular, it provides recommendations regarding adaptation measures in regions prone to climate change-related extremes about water resource management, ecosystems, agriculture and forestry, coastal systems, sanitation and human health. Awareness for policy actions is growing worldwide but no legal framework is in place to tackle climate change impacts on water at a global scale.

2.1. International policies

Following the publication of the Fourth Assessment Report of the IPCC in 2007, the impacts of climate change and extreme events, for instance in hydrology, have received special attention in academia and in international management aspects for hydrometeorology. Expert groups supporting the global players such as the UN programmes and the regional development banks have recommended specific measures, but a global policy for hydrometeorological extremes does not exist. So far, two major publications have addressed the need for such a global approach in response to the frequency and intensity of floods and droughts, a guidance document of the UN Economic Commission for Europe (UNECE) (UNECE, 2009) and the IPCC Technical Paper on Water (Bates et al., 2008). UNECE recommends the mainstreaming approach for policy, meaning that any policy needs to reflect climate change and its projected extremes same as any other challenges that are known such as resource scarcity, environmental degradation, economic pressure or demographic change. The challenge to adapt such a mainstreaming approach lies in building cross-sectoral legislation and trans-boundary implementation to allow consideration of cross-sectoral trade-offs, synergies, and investments in mitigation and adaptation measures. Since the publication of the Fifth Assessment Report of the IPCC, uncertainty cannot be mentioned as reason for inaction anymore.

The Hyogo Framework for Action 2005–2015 (HFA) is one of the key policy trends at international level. The UN adopted this programme in January 2005 that commits 168 nations to substantially reduce the loss of life and livelihoods from disasters. The scope of the HFA goes clearly beyond the sole water-related disasters from extreme floods and droughts and includes, for example, earthquakes, tsunamis, volcanic eruptions and storms. The implementation of the HFA is under the responsibility of the UN International Strategy for Disaster Reduction (UN-ISDR) which is the focal point in the UN system for the coordination of disaster reduction and to ensure synergies among the disaster-reduction activities of the UN and regional organisations, and activities in socio-economic and humanitarian fields. More information about the UN-ISDR objectives can be found in the 2010–2011 Biennial Work Programme (UNECE, 2009). The so-called HF2 (post-Hyogo Framework) has recently been negotiated in Sendai in March 2015 and resulted in the Sendai Framework for Disaster Risk Reduction 2015–2030.

2.2. Water policies in the European Union

2.2.1. The water framework directive

The Water Framework Directive (WDF) is European Framework Legislation that, for the first time, sets integrated water resources management principles as its core value (EC, 2000). These principles are implemented in an integrated approach considering risk characterisation (including hydrometeorological risks), monitoring of the water resources, and programmes of measures anchored in river basin management plans (Chave, 2001). The WFD implies classical risks such as water quality deterioration or overexploitation (with the aim to achieve a good status of water by 2015). A novelty is that hydrometeorological risks (in particular floods and droughts) are discussed in light of river basin management plans.

Climate change is a highlight in the development of the first river basin management planning under the WFD, which operationally started in 2010. Technical aspects (risk characterisation, monitoring, and action programmes) and the evaluation of the good status objective's achievements (in 2015) are concerned by the integration of knowledge on projected climate change impacts on water policy implementation. These aspects are currently discussed by a wide range of experts and stakeholders in working groups under the so-called WFD Common Implementation Strategy (CIS).

2.2.2. WFD and climate change: operational aspects

Climate change has to be mainstreamed through all steps of the WFD principles and its status objectives (Wilby et al., 2006; Quevauviller et al., 2011; EC, 2009). The integrated approach of the WFD is the operationalization of Integrated Water Resources Management (IWRM) principles (chemical status for all waters, ecological status for surface waters, and quantitative status for ground waters) with milestones as follows: