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POLICY BRIEF

Towards successful implementation of preventive drought risk management in Europe!

MAIN MESSAGES

- The European Commission report on the implementation of the Water Framework Directive (2019) has shown once more: drought risk management is still not where it should be. Still, only few Member States have either set-up drought risk management plans or have otherwise covered the topic extensively within river basin management plans. At the same time, climate change increases the pressure to act on making Europe more resilient to droughts and water scarcity.

- Appropriate acknowledgement of the importance of preventive drought risk management by Member States and the European Commission (EC) is needed, paired with respective concrete steps, such as:

  - On EU-level: setting up a firm policy framework for drought risk management, providing improved guidance and support for its implementation, and paying sufficient attention to local features in assessing drought risk across Europe

  - At Member State level: increasing capacity to adequately respond to current and future drought risk, e.g. by enhancing the drought monitoring and forecasting infrastructure at basin level, to, among other, monitor and develop basin-specific drought indices that can complement regional stakeholder assessments; or by improving anticipatory operational drought risk management

- The research project IMPREX has developed innovative tools and approaches that support improved drought risk management at various administrative levels.

BACKGROUND – EU POLICY FRAMEWORK ON DROUGHTS

Summer 2018 has shown once more that drought risk is not only limited to Mediterranean regions but can also affect Northern Europe, a region that is not known for frequent water scarcity issues. Climate change will increase the severity of water stress across Europe further in the next years and decades, in some regions more than others. Timely adaptation is of major importance to make Europe climate-resilient.

It can be argued whether Europe is up for this task. The latest implementation report of the Water Framework Directive (2019) concluded: the implementation of preventive drought risk management in Member States is still not where it should be. Apart from a number of positive exemptions, in most Member States systematic approaches to drought risk management were still lacking. Whereas half of Member States have by now at least acknowledged the relevance of the matter for their territory, only six Member States (Cyprus, Czech Republic, Spain, Italy, The Netherlands and United Kingdom) have provided drought risk management plans. The European Commission urged the remaining Member States to develop and adapt such plans and to monitor droughts by means of established and agreed drought indicators.

The need for a systematic approach to Drought Risk Management in Europe was first acknowledged by adopting the non-binding 'Communication on Water Scarcity and Droughts' (EC droughts communication) in 2007, which promoted, among other, the set-up of drought management plans, monitoring of drought and water scarcity indicators and systematic knowledge and data collection. In successive years several revisions followed, an expert group started working on indicators, the European Drought Observatory (EDO) was initiated and guidance documents were formulated. In spite of these actions a first implementation review of the droughts communication in 2012 (the 'Blueprint to safeguard Europe's Water resources') concluded that Member States had not progressed sufficiently in adopting the promoted measures. Instead of enhancing attempts to improve drought management or making drought management binding after this review, it appears as if not many concrete follow-up actions have been initiated since then. Also the emphasis on the need of drought management within the European Climate Adaptation Strategy in 2013 was not followed by a release of mandatory regulations for Member States to attend to drought management.

LESSONS LEARNED FROM IMPREX ON IMPLEMENTATION OF DROUGHT MANAGEMENT AT BASIN LEVEL

Besides the unbinding nature of the EU policy framework on droughts, also the implementation of drought risk management at river basin level faces practical barriers related to the development of drought indicators, drought risk plans, or agreement on water allocation schemes. The work of the research and innovation project IMPREX provides some valuable insights for improved implementation of the existing policy framework on droughts at basin level.

Defining basin-specific impact-based indices is essential to efficiently manage local drought risk

The EC droughts communication stresses the need for the development of drought management plans and drought indicators. While the focus of the European Commission as well as EDO has been put on developing continental-scale drought indicators, hydro-meteorological characteristics are varying widely between different river basins. This variability has to be accounted for by establishing locally appropriate hydrological and meteorological indicators and thresholds (indices). This is also stressed in the Guidance Document 'Drought Management Plan Report' published by the European Commission. However, until now insufficient tools and approaches are available for this.

IMPREX developed a framework for index-based drought analysis (FRIDA) which allows the customized design of basin-specific impact-based indices. The framework, based on advanced machine learning algorithms, offers an automated procedure for selecting the most relevant hydroclimatic variables to design an index that reflects the actual local impact of a drought. The tool can be applied in all European river basins and Member States and can be complementary and supportive to draw-up drought management plans.

Enhancing monitoring infrastructures on basin level is key to manage present and future drought risk

The need for improved drought monitoring has been stressed repeatedly, e.g. in the EC droughts communication. The Guidance Document on 'River Basin Management in a changing climate' furthermore urges that 'priority' should be given to monitoring and detecting the effect of climate change on water resources. In this context, a big effort has been taken by the European Commission to provide space-based/earth observation data with the help of Copernicus and to support the development of hydrological modelling as well as global GIS datasets. However, in order to adequately manage drought risk locally, extensive monitoring of variables at basin level, such as streamflow data or information on agricultural productiveness and water consumption is indispensable. IMPREX has emphasized once more: even the most innovative approaches, such as machine learning approaches (FRIDA), or advanced less data intense modelling approaches (Water Accounting Framework) still require availability of extensive basin-specific data. Investing in the set-up of basin-level monitoring remains indispensable.

Considering seasonal forecasts when developing decision-support-tools for drought risk management helps manage drought situations in time

Decision-support-tools help in adequately managing available water resources and managing water allocation, specifically in times of droughts. However, even the most advanced tools mainly utilize monitored historical data. Consequently, upcoming climatic developments and weather patterns are not included routinely in decision-making. Making use of seasonal forecasts, especially climate model-based forecasts, in drought risk management tools can support more foresighted water allocation and water management approaches.

IMPREX developed additional methodologies based on the decision-support-tool shell AQUATOOL, which is applied in Spanish basins and other parts of Europe, that allow integration of tuned seasonal forecasts into the system. AQUATOOL allows for a more anticipatory management of scarce water resources on river basin level and allows for more sustainable allocation of available resources.

Harmonizing water accounting approaches between basins while integrating local climate impact assessments allows for more evidence-based decision making at EU-level and at the same time enhances acceptance at basin level

The 'Blueprint to safeguard Europe's Water resources' urged Member States to pursue water accounting targets on river basin level. While water accounting is typically based on monitoring of historical water resources, the 'guidance document on the application of water balances' stressed the need of incorporating climate change scenarios into water accounts. However, even though water balance indicators and climate impact studies are available for most basins in the EU, practical approaches of integrating basin-specific climate impact assessments into water accounts are still missing.

Local water accounts or climate impact assessments of European basins miss comparability and therefore don't provide a basis for effective EU policy action on water scarcity and droughts. European/global scale climate impact assessments, in turn, often lack local system information on e.g. water abstraction or additional information on water management practices, and are therefore not readily adopted by local stakeholders.

Thus, a single framework is necessary that i) translates basin-specific information and climate studies into homogenous drought indicators for all major European basins (providing a common ground for EU-level decision making) and ii) provides a tool to integrate climate impact studies into water accounting frameworks.

IMPREX developed an innovative Water Accounting Framework that allows the assessment of climate change impacts on blue and green water resources for agriculture across Europe. This approach has the great advantage that it creates comparability between different basins in terms of climate (change) effects on water resources and therewith provides a useful decision-support-tool for European policy makers. Novel to the approach is that it allows building on existing basin-level studies that are backed-up by local stakeholders and expert knowledge. So far, this is missed in large pan-European modeling studies. Applying the IMPREX tool may pave the way for creating greater acceptance of EU-level information and policies among local decision makers.

WAYS FORWARD – CONCLUSION AND RECOMMENDATIONS

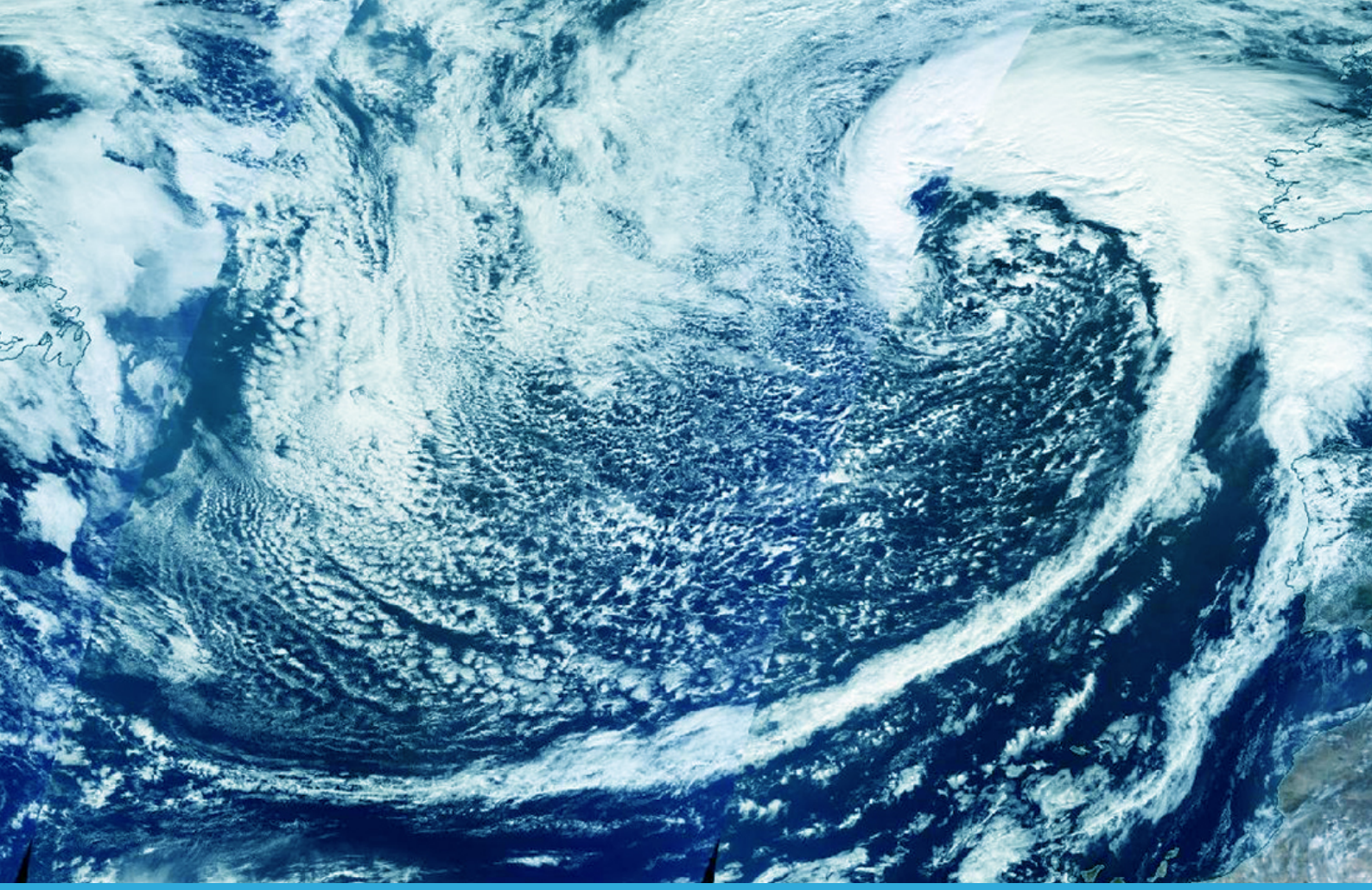
It requires joint efforts of the European Commission, Member States/national water management (authorities) as well as research to build-up preventive drought risk management

AT EU LEVEL

- The European Commission should consider paying more tribute to the importance of preventive drought risk management by putting it back on the political agenda
- A comprehensive and binding policy framework for drought risk management should be developed, e.g. by making drawing-up of drought management plans mandatory
- More guidance and practical support would help implementation of drought risk management; for example by bringing a lively Working Group on Droughts within the framework of the so-called EU Common Implementation Strategy back to life
- Greater attention needs to be paid to local features in determining policy measures and providing support to basins with specific needs (the IMPREX Water Accounting Frameworks is a helpful tool for this)

AT MEMBER STATE LEVEL

- Member States need to acknowledge the importance of preventive drought risk management, e.g. by setting up DMPs and pay tribute by increasing the capacity of adequately responding to drought risk by:
  - setting-up better drought monitoring and forecasting infrastructures
  - monitoring the most significant drought indicators and defining basin-specific indices
  - assessing the regional water balance in the face of climate change and taking into account local expert knowledge to prepare for future water allocation
  - integrating available forecasts, especially seasonal forecasts into decision-support-tools and/or developing such tools at first hand



This policy brief was compiled by Theresa Lorenz and Annika Kramer (adelphi) **based on the work of the research project IMPREX with special contributions by Dr Johannes Hunink** (FutureWater)**, Prof Bart van den Hurk** (Deltares)**, Prof Joaquin Andreu** (Universitat Politecnica de Valencia) **and Dr Matteo Giuliani** (Politecnico di Milano)

COORDINATION AND CONTACT:

BART VAN DEN HURK
Deltares
P.O. Box 177, 2600 MH Delft, The Netherlands
Bart.vandenHurk@deltares.nl

JANET WIJNGAARD
Royal Netherlands Meteorological Institute
P.O. Box 201,3730 AE De Bilt, The Netherlands
janet.wijngaard@knmi.nl

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IMPREX is designed to help reduce Europe's vulnerability to hydrological extremes by achieving a better understanding of the intensity and frequency of potential disrupting events. Enhancing our forecasting capability will increase the resilience of European society as a whole, while reducing costs for strategic sectors and regions at the same time. The research project combines 23 partners from 9 countries and has received funding from the European Union's Horizon 2020 Research and Innovation Programme

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