

Subject: Consultation on the Green Paper on the Insurance of Natural and Man-made Disasters

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The European Network of Freshwater research Organisations EurAqua welcomes the opportunity to provide input to the European Commission concerning Green Paper on the Insurance of Natural and Man-made Disasters.

As a network focussed on research issues, EurAqua limits its reaction to questions 5 and 13.

Question 5. Do you see any difficulties, barriers or limitations in using information to generate parametric insurance?

Scenarios of future climate and land or water use entail increased frequency and severity of extreme events, such as high intensity short duration precipitation causing flooding and longer low rainfall periods contributing to droughts. This causes hydrologic extremes in river discharge which affects people, infrastructure and businesses, many of which are insured against loss or damage in some way. The non-stationarity in hydrological regime resulting from climate change, may preclude the use of current flood frequency assessment methods and requires an urgent assessment.

Question 13: How could the mapping of current and projected/future disaster risks be improved?

Climate change is expected to alter the frequency and intensity of rainfall events. Such changes were not considered at the time the existing infrastructures were designed and built. Flood protection solutions and water reservoirs have not always been designed, constructed and operated with these enhanced extremes in mind. As infrastructure replacement is costly, and insurance covers any losses, there is an urgent need to develop methodologies for testing the resilience of cities and critical infrastructures to rainfall under future climate change scenarios. System vulnerability and resilience, as well as territory vulnerability and resilience, are poorly understood and more ambitious applied research is needed.

Planning for insurance against future flood and drought losses demands the use of hydrological models which in turn require reliable simulations of the spatial-temporal variability of precipitation. This requires local modelling approaches on sub-diurnal time scales to be able to adequately describe extreme convective events causing flash flood. Hydrological model simulations with a high spatio-temporal resolution are needed to provide estimates of flood peaks under current climate and for climate change projections. Such simulations would provide the required data for estimating insurance schemes and options. A link to assess effects of structural and non-structural measures, both in the field of water management as in the field of infrastructure engineering, is also required.

Research is urgently required to:

- Improve the ability to assess local effects of extreme rainfall events; development/improvement of statistical models to bridge the gap between weather models and urban scale sub-daily precipitation totals (eg. to assess sewer flooding)
- Improve the capability to link local extreme events and failure risk of infrastructures of all types (including energy, transport, etc.);
- Develop harmonized methods for risk assessments, including damage for individual business sectors and casualties and to develop better communications;

- Demonstrate these improvements using case studies, including (cost benefit) assessment of potential adaptation options to enhance resilience of (critical) infrastructures and/or reduce the need for enhanced resilience;
- Develop flood and drought statistical models and references, for different time and space scales, taking into account possible changes in local and global drivers and to develop harmonised risk information and design criteria for flood and drought protection infrastructure.

The objective of the research should be to increase (common) understanding and tools for the dynamic interaction of water/land use systems to the natural water/ecosystems and common understanding of tools for assessing economic and social risks, including a focus on insurance losses. The tools produced should enable stakeholders and managers to make informed and robust decisions on strategies under high uncertainties.

About EurAqua

The aim of EurAqua is to contribute substantially to the development of European freshwater science and technology and its dissemination on a European scale, thus having a significant input on the development of the scientific and economic basis of European water management. The EurAqua Partner institutions are leading, generally public, freshwater research institutes in the Member States of the European Union plus Norway and Switzerland. They extensively support national policies as well as water businesses. Within the country, EurAqua members are closely connected to other relevant institutions. Today, EurAqua consists of 24 partner institutes from 23 countries. For more information on EurAqua and National contacts, please refer to "Contacts".

More information about EurAqua can be found here: www.euraqua.org