

Workshop 2 : The Whimsical Meuse

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Introduction :

- *Colin Green, CONHAZ project*

CONHAZ is a Coordination Action project funded by the EU 7th Framework Programme.

Cost assessments of damages, prevention and responses to natural hazards supply crucial information to decision support and policy development in the fields of natural hazard management and climate change adaptation planning. Significant diversity in methodological approaches taken and terminology used in costs assessments of different natural hazards and impacted sectors makes it difficult to establish comprehensive, robust and reliable costs figures, and to compare costs across hazards and impacted sectors. ConHaz will provide more insight into cost assessment methods, which is needed for integrated planning, budgeting and policy action prioritization for the various natural hazards. In order to comprehensively capture this variability in cost assessment methods, CONHAZ will assess current knowledge, including use of terminology, on calculation methods for individual cost types (such as direct damages to housing and indirect losses in the macro-economy) and consider these methods as they are used in the context of specific climate and hydro-meteorology related hazards. This comprehensive approach enables CONHAZ to clearly identify overlaps, commonalities and knowledge gaps in cost assessments of natural hazards.

Aim of the Workshop 2 “The whimsical Meuse”:

The aim of the workshop 2 was to develop ideas, methods, roadmaps, networks or even project proposals to close the remaining gaps in terms of water management and climate adaptation. Mainly, the management of extreme events of our whimsical Meuse was addressed. We worked on three main questions :

- We start from the results of the AMICE project : What are the future actions needed to improve the management of extreme events?
- What are the possibilities to increase the resilience of human settlements and activities to extremes events?
- Among the different uses/effects of the water during extreme events **which one do we have to consider in the future??** Where do we start? How do we start to improve the resilience-instead of reduce the vulnerability-?

In the workshops, the achievements of AMICE will be point of departure, so that the workshops can lead to specific recommendations (who does what at which moment?).

Organization of the Workshop:

- Post-it method mixed with pyramidal discussion...

Each participant writes a key idea to answer each question on a sticker. Everybody works on its own. Then the stickers are placed on the three boards, each one dedicated to one question. Then the participants split into three groups and stand in front of the question of their choice. During the following minutes, the participants organize the ideas on the board. They can use some criteria we suggested like the followings:

- Is the action focused on high-flow/low-flow/both extremes?
- Is the action useful whatever the scenario (dry, wet)?
- Is the action easy to realize at short term or more complicated, only for long term?
- Is the action cheap and realistic or expensive and difficult?
- Other criteria are necessary to deal with this question

Then one representative of each group presents the main conclusions and the whole audience of the workshop makes comments in order to reach an agreement on the three answers.

Background:

Results demonstrated by the AMICE project (in relation with this topic):

- *Cf WP2 written contribution*
- *Cf written contribution by Benjamin Sinaba*
- A common transnational flood damage calculation approach, which made it possible to have a consistent flood risk assessment for the whole river basin.

- The major cities along the river are the most vulnerable to future floods. Though our basin is largely covered by forest and agricultural land, human settlements account for the major part of the total flood damage. Human settlements are (too) close to rivers.
- Drought is one of the hazards expected to be exacerbated by climate change. Impacts have been studied on 4 sectors. Low flows are now better understood at the end of the project.
- Agriculture : some crops will be penalized by climate change, like maize, others will be enhanced, like wheat and barley. Meadows will also be favoured due to an earlier growth.
- Some strategies adapting agricultural practices have been tested using modeling in the Vesdre sub-catchment. It has been shown that agricultural systems could adapt in order to reduce losses resulting from climate change by 50%.
- Navigation : inland shipping already suffers restrictions in summer due to insufficient water depths in the rivers and canals. Costly solutions like pumping will be more and more used.
- Energy : nuclear power plants and hydropower stations require minimum water discharges for their functioning. Energy production would have to stop if the droughts last too long.
- Drinking water production could be affected (less water and a lesser quality) but many alternative solutions exist, like water storage or ground-water pumping. A data inventory of the water intakes has revealed that the storage capacity for the abstracted surface water is very limited on the Meuse.
- Project in the Naives basin (Belgium) : management of hydrological extremes.
- Project on the SteenbergseVliet (Netherlands) : give more space for the river.
- Project in the Ardennes (Belgium): wetlands restoration.

Lessons learnt by the AMICE Partners :

- In respect to the EU Floods Directive, which demands for an integrated flood risk assessment on basin scale, the aforementioned exchange of knowledge should be intensified in the future.
- The water shortage problem is known for years. Climate change just makes it worse.
- A no-regret measure is good both for floods and droughts situations.
- Wetlands have a role in buffering of water discharge variations on the local scale.
- Conservation of the water retention areas is a good way of combining climate adaptation, sustainable development and involvement of local communities.
- Strengthen the local water cycle to limit huge and costly infrastructures.
- Work with local partners, make good use of the knowledge they gathered.

Gaps not covered by AMICE, potential subjects for new cooperation :

- Strengthen the coordination between the water sector and spatial planning.
- Impacts on socio-economic and ecological development.
- Impact from socio-economic and ecological evolutions on water levels and water management.
- A clearer link drought – agriculture is needed to advise the Agricultural sector.
- Water quality modelling with regard to climate change.
- Study of the combined effect of lower discharge and increasing water temperature.
- Now, it becomes essential to quantify the low-flows impacts on water quality and riparian habitats. In order to be integrated and sustainable, river management will have to take these aspects into account in the same way as flood management, and at a catchment scale.
- A more detailed assessment of the water supply systems vulnerability, including future dry scenarios.
- It is still necessary to develop a joint reflection about sharing water between its various uses and between the different regions in case of shortage. The Meuse Treaty signed between Flanders and the Netherlands is an example of international agreement to share the water. Especially during low-flows, it is important to agree on the priorities given to navigation, drinking water or minimum ecological water levels. But when river discharges are much too low, some needs cannot be met, leading to economical consequences. With climate change, these situations are bound to increase. But can we quantify them?
- Intrusion of salt water (combined effect of sea level rise and river level decrease caused both by climate change or human consumption).
- Morphodynamics and its impacts on shipping, drinking water industry, ecology and climate change, to understand better the evolutions of the Meuse river and tributaries.

The workshop was driven in three parts.

The first part, starting from the results of the AMICE project, aimed to answer to the question “*What are the future actions required to improve the management of extreme events?*” This first analysis of the scope revealed that “transboundary” was the main word. All the actions that are currently taken at country scale should be done at the catchment scale. Some people spoke about data management, other about modeling but the shell

idea was “all management actions should be done at the watershed scale using a common language and all the people involved should trust each other and enjoy themselves together”

Countries need to be linked by trust relationships and fun, pleasure to work together. However, if it is essential that countries keep their self-skills and practical resources to face to their own problems and if the answers need to be adapted to the different territories, it seems that is also quite important for participants to have a common background and language, that language is a linguistic (Swedish with greek letters?! as a funny guy said...) or technical common language to avoid misunderstanding between the different scientific disciplines. The possibility to have a transnational team for early flood forecasting was also mentioned in this workshop, based on one catchment model. The interest of a multi-layer approach is raised.

The second part of the workshop aimed to establish a list of concrete actions which are likely to improve the resilience of human settlements and activities. All the ideas were discussed using the criteria proposed to the beginning of the workshop. They do not exclude each other but should be proposed depending on the local context. Among these actions, it has been cited the public awareness (but which appears useful but not efficient, time and money-consuming, useful in a big scale of time...). The notions of the development of a culture of risk, notably thanks to serious games, appeared in this chapter. Moreover, the improvement of warning systems is also an important aspect of this discussion even if it is an exercise which is considered difficult by participants. Finally, the need to build some adapted infrastructures was also mentioned as a possibility to improve the resilience of human settlements.

Finally, in a third part, participants tried to evaluate the priorities in terms of uses and management of water, and future working tracks. It was recalled that the full hydrological cycle has to be taken into account to manage extreme events using the “buffer functions”. Stakes in floods or in low-flows appeared quite different. Floods ask the questions of safety of people and economical impacts. Droughts threat the drinking water supply (in terms of quantity and quality), the energy supply (need to cool nuclear plants or to feed the hydraulic plants), but also the water quality, which insure the optimized functioning of ecosystems. All these aspects could be working tracks in the future. Biodiversity of ecosystems was deliberately put on the board by the moderator but nobody raised the subject. The main conclusion of this group was to say that it is now necessary to focus and work together on the identified priorities. That’s really important and should be the next step to improve the management of extreme event and particularly low-flows.