Science for Environment Policy

Steps to improve flood resilience on the ground

Modern flood risk management is placing more emphasis on improving the resilience of communities prone to flooding. By examining three case studies, a recent investigation has provided insight into how resilience is put into practice, suggesting that clearer identification between the roles of different actors and better communication to the public is needed for successful implementation.

The concept of resilience is a promising framework to prevent and mitigate the impacts of flooding. Measures to increase resilience include better preparation (e.g. supply of sand bags, knowledge of emergency procedures), but also communication strategies for evacuation and emergency management plans. These measures are already known, but they are not often implemented in an integrated and effective way.

The research, funded through the EU ERA-Net CRUE initiative1, analysed three case study areas prone to flooding, which provided more detail on challenges for resilience and highlighted opportunities to bring the concept into practice.

Two of the case study areas are prone to lowland river flooding (Flanders in Belgium, Niedersachsen in Germany), whilst the other (Calabria, Italy) suffers from flash floods, triggered by intense precipitation. The research compared current practices in the case study areas, considering the three main components of resilience:

1. Interplay of actors and sharing of responsibilities. In all three cases, there was some fragmentation of responsibilities. For example, conflicts in Niedersachsen arose because the areas covered by administrative units do not correspond with the natural boundaries of the river basins. In Calabria, it was not clear who was responsible for enforcing water policy. However, this fragmentation does not always lead to 'chaos'. In Flanders, water checks (assessments of the negative impact of planning on water) occur at a regional level and building permits are granted a local level, but there is a good understanding between the different levels of management.

2. Flood risk communication and perception. The perception of flood risk among residents was generally good in all three case studies. As there were no targeted awareness campaigns, this appears to be the result of past experience. However, in Niedersachsen, residents felt they lacked information from authorities. In Flanders, flood maps are available, but residents are not encouraged to use them as there is concern from local officials that the maps may cause alarm. Lastly, in Calabria, attention is mainly given to handling the flood emergencies as they arise, rather than preventing them.

3. Flood management tools. The presence of early warning systems and plans varied between case studies. Calabria has no resources or legal framework for flood risk management tools, while Niedersachsen has an action plan, but communities do not consider the flood maps useful as they need to be at a finer scale. They are also not satisfied with existing early warning systems as they are based on water levels, but do not indicate consequences. In Flanders, integrated water management plans are available for most river basins and are at an appropriate scale.

In summary, it appears from these three case studies that roles and responsibilities of different actors involved with flood management may need to be more clearly defined. Flood management tools are in place, but sometimes remain unused and are often poorly understood by local residents. Better communication and more public participation in flood mitigation could rectify this, for example, by using focus groups of stakeholders to tailor flood management tools to local needs and using the internet to publish plans and risks to trusted partners and the general public. More work is needed in terms of flood modelling and developing flood management maps, and this needs to be better communicated into policy implementation and to the public.

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