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Land use measures are underused in flood risk mitigation

New research in the Netherlands indicates that spatial planning to manage flood risk, such as the elevation of residential areas and the exclusion of vulnerable land uses from flood-prone areas, is underused. Its use appears to depend on governmental requirements, previous experience of flooding and previous experience of using spatial planning as a mitigation strategy.

The Netherlands has put measures in place to reduce the risk of flooding, mainly dikes. However, despite this protection, the expansion of built-up areas combined with climate change is increasing the both the likelihood and potential impact of flooding. There is a growing consensus that spatial planning measures are required to deal with the impacts of flooding, such as restricting activities in flood-prone areas. However, these measures are very rarely used and there has been very little research into this lack of uptake.

The researchers studied the spatial planning practices in three areas in the Netherlands that have a high risk of flooding. To investigate the reasons for not applying spatial planning, interviews were conducted with representatives of local planning authorities, water boards and municipalities.

The main reasons for the underuse of spatial planning to mitigate flood impacts were linked to higher level government policies. For example, if the national criteria for the design of dikes were met, it was considered that flood risks would be reduced to an acceptable level. Many local planners did not regard the municipality as responsible for additional flood risk reduction measures. They believed water boards were responsible for indicating which land use and design plans would reduce risks.

However, water managers did not consider it their responsibility either and saw their role as reducing flood risks rather than reducing the consequences. Flood risk was mainly managed by reinforcing weak sections of the dikes. Other arguments for not using spatial planning were the lack of alternative building locations that would be needed if land use measures were introduced and the lack of perceived risk.

In some cases, spatial planning was used. For example, changes in land use to protect dikes, elevating residential areas and the use of artificial hills. The areas that introduced these measures were the same areas that evacuated parts of their territory in 1995, as a reaction to the extremely high water levels. This direct experience of evacuation appeared to influence the decision to use spatial planning, as did the recognition of the area's high flood risk by government. The local authorities in the areas also reported expertise in spatial planning and that this experience had motivated them to consider land use strategies.

It appears that national government policies and the local interpretation of these policies explain the low use of spatial planning measures. This is exacerbated by the lack of accountability from spatial planners and water managers, combined with little recent experience of flooding.

The researchers suggest that government should actively integrate flood risk into spatial planning practices and allocate responsibility to local planners to implement measures. Water boards should have the responsibility of providing local authorities with area-specific flood risk information. Public commitment will also play a role and discussions about spatial planning should be extended into the public domain. In order to provide better insight into the effectiveness of spatial planning for flood risk management, more cases need to be studied and for a longer period of time.

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LIFE funds innovative flood risk management tool. A German project funded by the EU's LIFE programme has developed a technology to enable fast and cost-effective identification of present and future flood risk areas. One of the predicted consequences of climate change is that flooding will become more frequent and more severe, however, existing hydraulic calculations on the location of flood plains and flood hazard areas are often outdated. To address this problem, the LIFE FLOODSCAN project undertook large-scale hydraulic 2-D modelling of flood hazard areas, combining laser scanning with remote sensing data. Using this information and an automatic data compression procedure, the FLOODSCAN team in Bavaria has developed a tool that could provide regional planning authorities across Europe with precise and reliable knowledge of flood risks, enabling them to better regulate land use and inform citizens.