Funded by
UK Government

West Yorkshire Flood Innovation Programme Accelerator Project

Work Package 5: Opportunity Mapping for Nature-based solutions using participatory GIS

The overall aim of this work package was to address flood risks within the Calder catchment area by focusing on Opportunity Mapping, utilising the concept of a "social thalweg" to understand the socio-political dynamics of river systems. This approach integrates participatory geographic information systems (PGIS) tools (specifically the Map-Me PGIS Platform) to engage stakeholders in identifying flood risks and potential interventions. A key activity was designing and implementing the Map-Me survey, which gathered input from local stakeholders through online and face-to-face workshops. This survey captured perceptions of flood frequency, severity, and contributing factors, which were used to create detailed heat maps and sentiment analyses.

Findings highlighted the significant impact flooding has on infrastructure, property, and community wellbeing, with climate change expected to exacerbate these issues. Findings also emphasise the significant disruptions caused by flooding, including road closures, property damage and economic losses. Climate change is expected to worsen these impacts, increasing flood frequency and severity.

The work package recommendations emphasise the need for better stakeholder engagement, the implementation of Nature-Based Solutions (NBS), improved data collection and the development of adaptive policies that effectively manage flood risks and build community resilience. This study underscores the importance of integrating local knowledge and participatory approaches within flood management practices and should be considered in both regional and national policy development. This study serves as a model for innovative, community-driven flood risk management strategies.

Background

While we may often regard river systems and their catchments as one-way systems with upstream to downstream flows of water, sediment and pollutants, they are best regarded as two-way systems in the social, cultural and political context. What happens upstream affects those living downstream, and so affected populations regularly look upstream to see what may have caused flooding or pollution in their local river. For example, recent flooding in Hebden Bridge was blamed on grouse moor management upstream, and poor water quality in the River Wye was blamed on intensive chicken farms located in the catchment. Whether these links are real or not is the object of scientific study, but from a socio-political perspective, they can appear very real to those affected. It is useful

to adapt the concept of a river “thalweg” (German: tal = valley, weg = way) from its physical geography origins to include the social, cultural and political aspects of the river and the complex picture of actors, scale, responsibilities, concerns and motivations.

Using this approach provides a better understanding of the views and relationships people have with their rivers, land and the associated problems of flooding and water quality. Many of these may be regarded as “wicked problems” requiring closer scrutiny of upstream-downstream perspectives to identify conflicts and compromise solutions that may be achieved through a broader recognition of the vested interests between the different communities and stakeholders involved. The well-known DPSIR framework (Driving forces, Pressures, States, Impacts and Responses) can be applied throughout the ‘social thalweg’ using participatory mapping approaches to capture the ‘rich picture’ of upstream-downstream views.

This Work Package aims to apply the concept of a ‘social thalweg’ and existing research experience in participatory GIS (PGIS) to develop an element of spatial collaborative working with stakeholders up and down the River Calder catchment.

Findings

A total of 36 individual responses were collected from the Map-Me survey. Two case studies were developed, one for WP4 (Wyke Beck, Leeds) and one for this work package, focusing on the Calder Catchment. These can be found here:

- Wyke Beck: **scan the middle QR code**
- Calder: **Scan the right QR code**

Read the full report by Prof Stephen Carver and Dr Jonathan Carruthers-Jones, University of Leeds (left QR code)

Supported by
West Yorkshire Combined Authority | Tracy Brabin Mayor of West Yorkshire