

RHINE CITIES – (UFI) URBAN FLOOD INTEGRATION

Urban Flood Integration (UFI) along the Rhine – Spatial Strategies is an investigation of urban development in combination with flood management. Is it possible to combine urban river front renewal with spatial flood management strategies? Could these programs be capable of producing urban qualities and reducing economic damage potential while obliging to the constraints set by the river as a navigation channel? Between the Alps and the North Sea, between Basel and Rotterdam, the Rhine as an economic development corridor since Roman times has been subject to severe anthropogenic manipulations. Considerations of its role as a public realm and as a host to the iconographic have only in the phase of declining production found their way back into the arena of river front developments. In the often resulting context of Mediterranean B-side analogies in the temporal and tendencies towards musealizing not only its aligning medieval cities, developments are only beginning to combine programs of river front development and flood management in a productive way. Synergetic developments may be capable of reintroducing a spatial complexity missing in the modernist entities which these agglomerations are composed of.

The PhD research Rhine Cities – Urban Flood Integration (UFI) aims to classify different urban river front segments regarding their negotiable border between city/urban landscape and river. The case studies try to cover a spectrum of interactions in order to show the broadness of themes involved. Beyond the conflict between urban development and flood management, navigation adds additional spatial parameters. Scalar time and space relations shall be visualized and investigated in order to show

- how developments today evolve in relation to theories of path dependency and the specific spatial constellations / heritage on site,
- where and by whom along the river such measures are initiated and
- how they perform regarding the periods before, during and after a flooding
- as a sum, what urban typologies they produce at the border between city and river

The case studies are:

Karlsruhe Rappenwoert, steered retention in urban landscape

Mainz Zollhafen, inner city harbour conversion (Interreg IVb FRC)

Leverkusen, groyne adaptations within industrial context

Nijmegen, bypass/dike setback Lent in combination with urban expansion plan (Interreg IVb FRC)

Dordrecht, outer dike development of Dutch Delta city

All four case studies are based on the presuppositions that

- the prototypical urban river front developments in synergy with flood management are based on an expansive (vs. a defensive) approach
- navigation should not be confined by proposed measures Novelty (systems approach)
- economic damage potential should be minimized
- programmatic complexity is a quality

The research takes on four scales:

X-LARGE (global river scale)

LARGE (initiation and installation)

MEDIUM (local/regional context)

SMALL (performance)

EXTRACTION / As a synthesis of these four scales

- transformative capacities
- flood mitigation and the reduction of economic damage potential (local or as part of an accumulative measure)
- Interdependencies up and down river (i.e. storage capacity)

UFI aims to zoom out to investigate the sequential capacities of specific structures related to expansive/flood adaptive approaches and to analyze their contextual correlations. Based on a generic catalogue and a site evaluation (graphic), spatial solutions in relation to the scales River / City / Waterfront will be visualized.

Mappings of these different scales (S-XL) and their interdependencies will visualize the relationship between river typology and urban form from morphological transformations to the objects/programs these developments are capable of hosting. Extracting information and mapping these four layers will result in a synthesis of data to visualize interdependencies.

Towards a systematic approach the resulting classification system will show the potential between local and global parameters in order to define strategies for urban design and architecture in urban flood management projects and contributes to a broader understanding of the border dynamics between city and river within a specific geographic context.