

# Hydrological and hydraulic Study of the IJse River Catchment



**Financed by:** Ministry of the Flemish Community, AMINAL, Water Management

**Client:** Ministry of the Flemish Community, AMINAL, Water Management

**Date:** 1998 – 1999

**Budget:** € 170 000

**Location:** IJse river catchment, Brabant (Belgium)

**Partners:** University of Ghent (Hydrology)

## Assignment:

Numerical modelling is used to study the hydrological and hydraulic response of the IJse river catchment to intense precipitation and to study flood mitigating measures.

## Scope of Services:

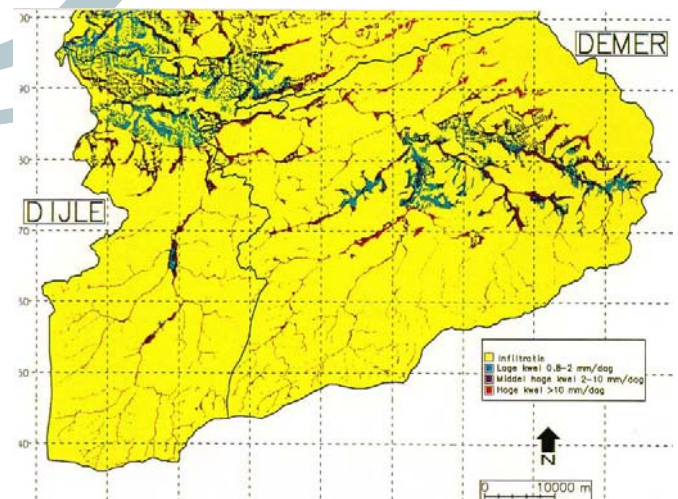
Hydrological and hydraulic modelling to support integrated river basin management.

- Hydrological study
- Rainfall – run-off modelling
- GIS inventory of the actual system
- Hydraulic modelling
- River basin management

## Technical Description:

The IJse river is draining a rather narrow hilly catchment. Typical feature in the area is the high concentration of greenhouses for growing grapes, inducing a high level of non-infiltrating area. As a consequence, precipitation is directly transformed in a quick run-off response of the water system. Together with uncontrolled river cross section adaptations and a systematic lack of maintenance, these features result in a frequent flooding in the catchment. This problem is becoming more severe with the development in the last years.

A distributed hydrological model WETSPAS is used to study the rainfall run-off characteristics of the catchment.



*Seepage and infiltration areas identified with the hydrological model WETSPAS*



*IJse river basin*

The grid based nature of the model allows to study hydrological response of different types of soil, urbanisation and vegetation cover and vegetation types.

Simulated rainfall – run-off relations for continuous time series corresponding to typical statistically derived return periods are routed to the hydraulic model set up with the 1D river modelling system ISIS of HR Wallingford. The flood response is studied in both summer and winterbed.



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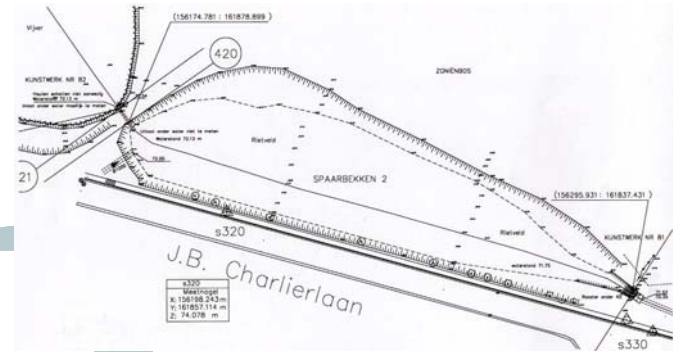
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The modelling of the actual water system is calibrated and validated through both an intensive synthesis of field records of water stages and local river flow and flood observations in the river catchment.

Based on the calibrated model, several scenarios to improve the river management are studied (changed hydraulic structures, use of separated sewage systems, retention basins, natural flood plains, ...) to support its policy and to justify the choice of mitigating measures. Doing so, a number of suggestions are formulated to manage the flood appearances in the river catchment in a proper way.



*Use near Neerijse*



*Flood management retention basin in a reed field*

