



## **The WaReLa network of experimental river basins as basis of a decision support system for precautionary flood protection**

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Central objective of the Interreg IIIB project WaReLa is the development of a decision support system to enable spatial planning authorities optimising water balance concerning flood protection in headwater catchments of low mountain ranges. To assess suitability and efficiency of certain measures, the system has to be fed by information about catchment behaviour and the requirements for a successful implementation of measures. In this aim we implement a network of experimental river basins to provide three categories of information: detailed information on run off generation and mode of operation of measures; catchment behaviour and suitability of measures in different landscapes; influence of spatial properties on catchment reaction.

In our contribution we provide examples for all three approaches. In the Frankelbach catchment - as an example for a detailed study - we assess the runoff generation and their connectivity, the role of soil moisture, sediment transport and the changes introduced to the catchment functioning by implementation of retention measures by the forest authorities. Within the network of representative test basins, spread over typical landscapes of Rhineland-Palatinate the investigations are focused on different catchment behaviour depending on regional catchment properties and the selection of measures, adapted to local hydrological processes. Results support both, the assessment of measures concerning effectivity, costs and effect on ecology and the estimation on regional retention potentials. For a region north of Trier (Bitburger Gutland) mainly under intense agricultural use, we have access to a database on runoff data of 16 catchments, partial nested and in some cases over more than 30 years. In this region

physical catchment properties are comparable. This bears the opportunity to study the influences of land use changes, spatial geometry and size of catchments or exposition to small storm cells in summer on basin reaction.

First results allow the identification of runoff sources at different scales and their open accessibility as part of a hydrological information system (HIS). Knowing the areas prone to rapid runoff generation, their extension as well as their location, makes it possible to plan water retention measures in detail.

The knowledge of the processes involved and their transformation by the applied measures is enhanced by the monitoring programme within each catchment. This gives data to model runoff behaviour and to validate these models. For this, the catchments represent natural laboratories to test the proposed set of retention measures and to provide a broad dataset for evaluation of effectivity under natural conditions.

The combination of the mentioned information about runoff generation, involved processes and techniques for water retention within the headwater catchments gives the possibility to develop a decision support system (DSS) to provide the expert knowledge to planners and stakeholders.