

RIVER NEIGHBOURHOODS - LOCAL FORMS OF PARTICIPATION IN RIVER DEVELOPMENT

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ABSTRACT

River neighbourhoods (RN) are voluntary associations of people who are interested in the development of selected rivers in Germany. River neighbourhoods were founded to improve the distribution of information concerning the existing situation on rivers and river meadows as well as to present and promote the work on rivers in the direction of the development goals. Further on river neighbourhoods provide advanced training and exchange of experience between the participants of the meetings.

The RN Sieg, the eldest river neighbourhoods in the federal state of Northrhine-Westfalia, has been founded in 1992. A retrospective glance at the development on the river Sieg is possible by considering the topic of the RN Sieg meetings over the past ten years. The future work of river neighbourhoods will be very much influenced by the goals of the European Water Framework Directive.

KEYWORDS

River neighbourhoods, public participation, round tables, restoration of rivers, river basin management, European Water Framework Directive

INTRODUCTION

Many of the streams and rivers in Germany have been altered by past activities. There has been a reasonable and continuously available removal system for unwanted substances. Sections of watercourses that were once meandering and lined with vegetation are now straight and often designed with concrete or pavement. The losses of retention volume have generally increased the flood risks, and changes in agricultural and urban land use have resulted in erosion problems and disappearance of natural morphologic structures.

SHORT HISTORY OF RIVER RESTORATION

In Germany the first river restorations were set up in the early seventies as pilot projects. They were more a trial and error approach to improve the ecological behaviour of some specific waters rather than a restoration plan for the entire river (ATV-DVWK, 1991). In the early eighties the restorations were extended to small rivers and their adjoining terrestrial areas. Depending on the local circumstances goals of planning were the design of riparian areas on the river banks to create a minimum distance between water body and human uses.

With the success of small rehabilitation projects the ecologic improvement of bigger reaches and an extension of development into the river meadows arise. River meadow programs were set up within nature protection programs and promoted financially by federal or state governments. Usually such programs are composed of four parts: water resource management, nature protection, agriculture as well as leisure and recreation on rivers.

Within the water resource management part such different goals as the recovery and improvement of fish migration, the re-opening of former flood plains, the reduction of impacts from river maintenance, implementation and design of riparian areas (ATV-DVWK, 1992), the development of leisure and recreation on rivers and the development of natural river dynamics could be found on most program schedules.

Since December 2000 the key aims of the European Water Framework Directive and their implementation influence the work on rivers. All objectives have to be set out in "river basin management plans". Such plans include a detailed account of how the objectives are to be reached within a required timescale.

RIVER NEIGHBOURHOODS

River-neighbourhoods (*in German: Gewässernachbarschaften - GN*) are regular reunions of people on voluntary basis. The participants of the meetings want to be informed about the present situation on a specific river and on the expected future development as well. They want to discuss themes of immediate interest and to learn more about their river in general.

Different types of interest groups join the meetings. There are citizen either involved or interested in the development of rivers and river meadows, members of public water authorities, nature protection associations, consulting and planning companies as well as fisherman, politicians and scientists.

RIVER NEIGHBOURHOOD SIEG – AN EXAMPLE FOR A VERY WELL WORKING GROUP

The river Sieg is a highland river with a total length of around 150 km (Fig. 1). The size of the catchment area is around 2.800 km². The difference in altitude is around 550 m (source at around 600 m asl; discharge in the river Rhine at around 50 m asl) The medium slope is around 3,6 ‰. At the gauging station *Menden*, which is situated around 10 km before the river Sieg discharges in the river Rhine (*Rhein*), the minimum discharge between 1965 and 1999 (NQ₁₉₆₅₋₁₉₉₉) came to 2,2 m³/s and the maximum flood flow in the same period (HQ₁₉₆₅₋₁₉₉₉) is equal to 1.053 m³/s.

Different political constellations in the two federal states concerned as well as different water laws and nature protection laws had to be taken into consideration in the face of managing the Sieg river.

From the source in the *Rothaargebirge* the river Sieg it is for approx. 35 kilometres a river in the federal state of Northrhine-Westfalia (*Nordrhein-Westfalen*). That reach is followed by approx. 40 kilometres in the state of Rhineland-Palatinate (*Rheinland-Pfalz*). Again crossing the state border between Rhineland-Palatinate and Northrhine-Westfalia up to the confluence with the river Rhine near the town of *Bonn*, the river Sieg flow for further 75 kilometres in Northrhine-Westfalia The river neighbourhood Sieg takes into consideration these different responsibilities in which the meeting take place in all three areas by turns.

The river neighbourhood at the river Sieg (RN Sieg) is the oldest river neighbourhood in the state of Northrhine-Westfalia and created in 1992 by the former German Association for Water Re-

sources and Land Improvement (DVWK) (now: German Association for Water, Wastewater and Sewage - ATV-DVWK). The first intention was to organise a “river neighbourhood-day” to present and accompany professionally a pilot project on the river Sieg that was called “Restoration of the ecological structures of the river Sieg - Pre-feasibility study for the ecological improvement of the river Sieg with its meadows with the goal of the rehabilitation”. The river Sieg was selected because it fits well with the requirements to present a river development project to general public.



Figure 1. Typical view of the river Sieg – Settlements in the river meadow, sometimes up to the river banks, but a nice landscape

TOPICS AND PROJECTS

The river neighbourhood Sieg meets regular, in general twice at year. Each meeting is entitled with a heading topic that is selected under aspects of topicality. In general the topics cover hydraulic and landscape engineering measurements, planning of nature protection, rehabilitation and maintenance of rivers but also special items like for example the restoration of migration path for salmon, trout and other species (Fig. 2) (PATT ET AL., 1998). Other important topics were the control of impacts due to digging animals like beaver (*Castor fiber*), musk (*Ondatra coypus*) and nutria (*Myocastor coypus*) (ATV-DVWK, 1997).

At the moment the adaptation of river maintenance for the purpose of improving the ecologic conditions on rivers and river meadows, the demands for a natural development, the re-opening of flood plains for flood security, the development of urban rivers (ATV-DVWK, 2000a) and the improvement of river morphology as well as the planning of leisure and recreation on rivers are often on the agendas (ATV-DVWK, 2000b). As a individual project the crossing of the high speed (ICE)-railway line Cologne-Frankfurt has to be mentioned. In the following some details and results of this topics will be described.



Figure 2. New designed weir with fish- ramp and control station for fish migration on the lower reach of the river Sieg

Ecological Aspects of River Maintenance

The development of natural structures is highly influenced by the river maintenance. It is necessary to distinguish between regular and irregular maintenance measures. Typical regular maintenance include mowing and weeding or the maintenance of trees and woods. For the development of rivers the presence of woody debris is very important (ATV-DVWK, 2002).

Changes of maintenance cycles, the adaptation of works to selected areas as well as changes in the technical equipment and their use immediately influence the cost of river maintenance. Investigations showed that the maintenance cost of natural rivers with small riparian areas could be much higher than those of lined channels, especially if there is a lot of handwork (Fig. 3). With increasing width of the riparian areas the maintenance of rivers may be reduced in many cases. This is a very important result taking into consideration the present financial difficulties of the public authorities. There is no use if an expensive rehabilitation is realized but the maintenance of the river cannot be paid after a few years.



Figure 3. Very often river maintenance stands for a lot of handwork - At the river Sieg some populations of foreign plants suppress the growth of domestic species and must be controlled for this reason

Leisure and Recreation on rivers

An rising problem for the protection of nature concerns the increasing number of leisure activities close to rivers (Fig.4). For an systematic approach to the planning process goals, occasions and levels of planning must be identified (ATV-DVWK, 2000b).

Planning of leisure and recreation activities can be but must not be necessary. Sometimes the full planning procedure must be covered, in other cases only some aspects. The whole planning process is characterized by the balance between all existing and future utilizations of rivers and the conservation of sensitive habitats and species.

The value of the ecological structures in these areas and their sensitivity against influence from outside decreases from taboo to urban development zones. Therefore the different zones also represent a scale for possible leisure activities. In nature priority and landscape experience zones the instruments: limitation of users, alterations in spatial and temporal utilization as well as changes in users behaviour are of great importance.

The constitutional right to recreation in open country in Germany requires a permanent weighing of each parameter against the others. The increasing number of people in search of recovery in

open country and the equipment for new sport activities present considerable problems for the protection of nature.



Figure 4: Planning and organisation of leisure and recreation on rivers and river meadows is an important aspect in river development

Flood security - Re-opening of former flood plains

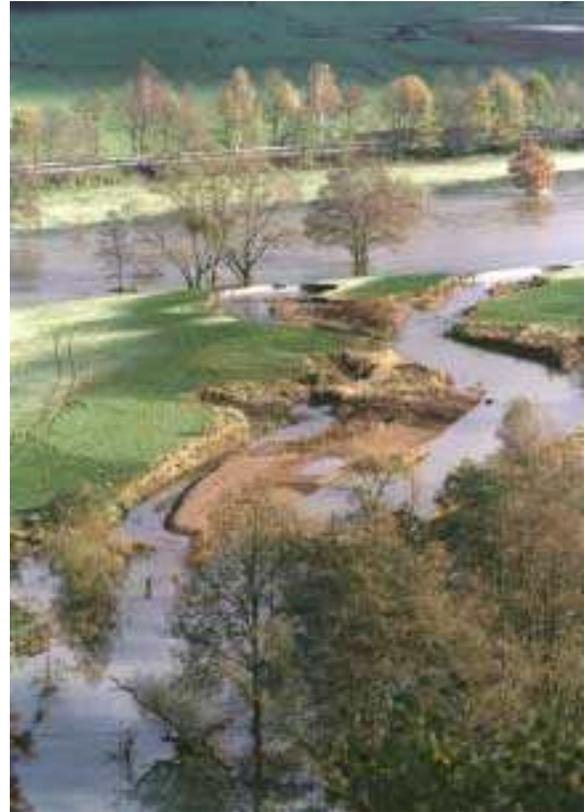
A river needs space for its natural development which is often not available because of the human activities that have expanded into the natural flood plains. Due to dyke constructions many former flood plains are nowadays not longer connected with rivers. The dykes protect settlements, infrastructure and traffic facilities and agricultural areas in the event of flood. In many cases those areas are permanently lost for water retention because the existing dykes can not be set back without an enormous financial investment (PATT, 2001).

In the case of agricultural use of former flood plains there is at least a possibility to partially re-obtain the land for the river and to improve the discharge characteristic of the river especially during flood. The improvements are not always measurable but certainly effective in the case of smaller flood events. Special investigations must include the effects of re-opening the former flood plains on the travel time of a flood wave, water depth etc., as well as the groundwater situation and the sedimentation in the flooded area.

Taking into consideration the local circumstances on the river Sieg some reaches could be developed to improve retention as well as morphologic structures (Fig. 5) (PATT, 2003).



May 1995



November 1998

Fig. 5. Morphologic development of a river bend due to regressive erosion – Changes of land-use and contracts with the farmers were the reason for the fast and cost-covering realization of the project

Important Individual Projects

The high speed (ICE)-railway line Cologne-Frankfurt has significantly shorten the travelling times between the agglomerated areas Rhine-Maine (*Rhein-Main*) and Rhine-Ruhr (*Rhein-Ruhr*). The crossing of the river Sieg was one of the engineering highlights in connection with the realization of the railway line (Fig. 6). The alignment of the railway line had to be compatible with the future development of the Sieg described in the river meadow development concept of the river Sieg (“*Siegauenkonzept*”) (STÄDTLER & PATT, 2002).

The RN Sieg has presented and discussed the different locations of the tunnel building that came into question, the protection against flood during construction, the impacts on groundwater flow due to the tunnel building, the technical layout of the tunnel construction as well as a description of the measurements to compensate the lost of retention volume.



Fig. 6: Crossing of the river Sieg by the ICE-trail Cologne-Frankfurt.

CONCLUSIONS

River neighbourhoods represent the development of specific rivers in Germany. The results of the meetings and the experiences that were gained over the years were consequently published and often used as examples for other river development projects. A brochure has been published to inform about the work of the river neighbourhood in general. More and more important for the acceptance of projects is public consultation and participation. This is an distinguished working area for river neighbourhoods in the future.

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