Urban Water

Sustainable Development of Water Management in Urban Space

The international project **Urban Water**

A European cooperation within the **INTERREG III B-programme**

INTEGRATION OF SPATIAL PLANNING, URBAN WATER MANAGEMENT AND COMMUNICATION STRATEGIES

Content

1. Preface

Water in urban space rises the attractiveness of our metropolitan, densely populated cities.

But water close to urban settlements also is a threat in case of flooding.

Metropolitan areas in Northwest Europe are still continuously growing. The demand for land and insufficient coordination between sector planners lead to development planning which often lacks sustainability. The same problem becomes obvious in existing settlements. Usually no legal instruments exist to force a change in planning culture.

The shortfalls of integrated surface water management in our densely populated urban regions cause problems related to water quality, flooding and water resource management. As the global climate changes in the longer term, the problems will grow unless we act now to change the situation.

Eight authorities from four countries in North-West-Europe – Scotland, France, the Netherlands and Germany – cooperate in the international project **Urban Water** to identify innovative and sustainable solutions in urban water management. A main aim is to foster the integration of water management and urban development. In this brochure the common approaches and the underlying philosophy are shown, as well as a description of activities and of the progress made so far.

Urban Water is co-financed by the European Regional Development Fund (ERDF) by means of the European Community Initiative INTERREG which is a European programme to facilitate transnational development.

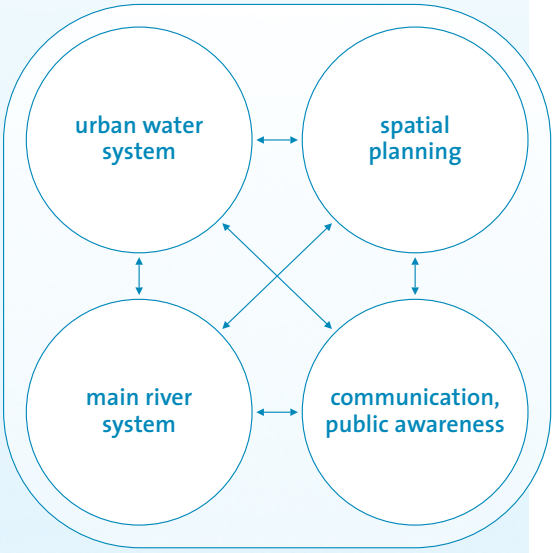
2. What is Urban Water about?

The problems to overcome include aspects of water quantity (floods and droughts) and quality (pollution of ground water and surface waters). At present traditional methods of water management in urban areas focus primarily on so called "end of pipe"-approaches. This means trying to solve water management problems within the water system alone. However, urban water systems normally are very complex and they need to be fully integrated into the process of urban planning.

Urban Water tackles these problems while integrating them with territorial planning of urban settlements. Utilising the possibilities of sustainable water management shall accomplish a higher attractiveness of the urban space. Besides technical aspects **Urban Water** concentrates particularly on communication. This means increasing the awareness of involved parties and promoting the development and acceptance of methods which go beyond the traditional ones.

Thus, the project aims at integrated approaches for the sustainable development of existing urban water systems. The vision is to develop a holistic approach for surface and waste water systems and to implement this in exemplary locations. In this way close reference is made to practical cases.

The project supports both – the exchange of the partners' comprehensive experience as well as the actual implementation of pilot activities at the partners' locations.



Umbrella themes

FIVE MAIN OBJECTIVES
■ *Improvement of water systems in quality and quantity*
■ *Improving cooperation and understanding between spatial planners and water managers*
■ *Improving regulation and policies stimulating the implementation of sound water management practices in spatial planning*
■ *Transnational exchange of experience and knowledge transfer to regional, national and supranational bodies*
■ *Raised awareness in the public for challenges and needs related to water in urban areas*

IMPLEMENTATION PERIOD AND FUNDING	
■ *Duration of the project*	*July 2003 until June 2008*
■ *Project budget*	*11.9 million Euro*
■ *Of which European funding (ERDF)*	*5.9 million Euro*

3. Why international cooperation?
Benefit from European cooperation

Having similar projects allows working on joint solutions.

International Know-how transfer is essential for creating new approaches.

Cooperation rather than working alone leads to better solutions. In addition, some problems cannot be worked out alone, so cooperation becomes crucial:

- Extraordinary flooding of the rivers Oder and Elbe happened in 1997 and 2002, the Rhine was flooded in 1993 and 1995 – facing these catastrophes, organising the emergency aid as well as working out a preventive flood protection programme would not work without cooperation of the neighbouring countries.

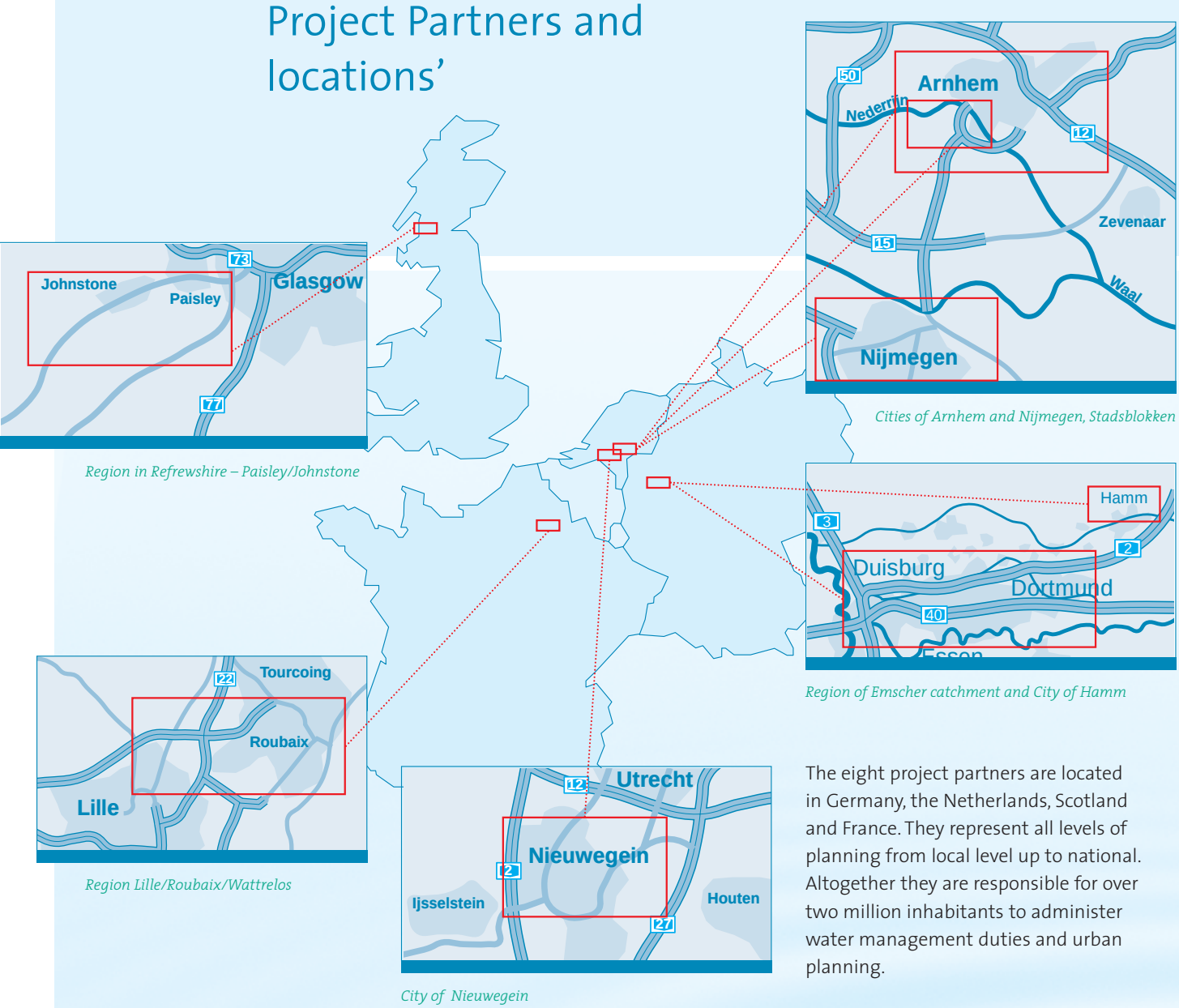
- Participation of the public plays a central role within urban planning processes. Widespread experiences in participation processes existe in the Netherlands since years – that can be used by other countries in Northwest Europe.

- In the German Emscher region the affected public and private bodies work together to organise sustainable storm water management on a regional level. The experiences gained over 10 years should not be wasted but made accessible for other regions.

Urban Water makes use of each project partner's know-how and experiences. Each of the involved partner regions are densely populated, industrialised areas which face similar problems. Therefore each partner region offers best practise solutions which are of value for the others. In **Urban Water** the individual approaches and today's solutions are compared, further developed and improved, tested at pilot sites as well as ensuing transferability. Finally the generated best practice methods produce recommendations that are universally valid. Thus, the international cooperation fosters improved regulation and policies.

The project partners give mutual input to local studies and plans to develop joint strategies, instruments and planning methods. The partners benefit directly from the advice of other partners through close international cooperation. This valuable pool of expertise and newly developed insights and visions are furthermore shared with other regions in Northwest Europe through the personal exchange of involved parties, public conferences as well as written reports and publications.

Project Partners and locations'



Cities of Arnhem and Nijmegen, Stadsblokken

Region in Refrewshire – Paisley/Johnstone

Region of Emscher catchment and City of Hamm

Region Lille/Roubaix/Wattrelos

City of Nieuwegein

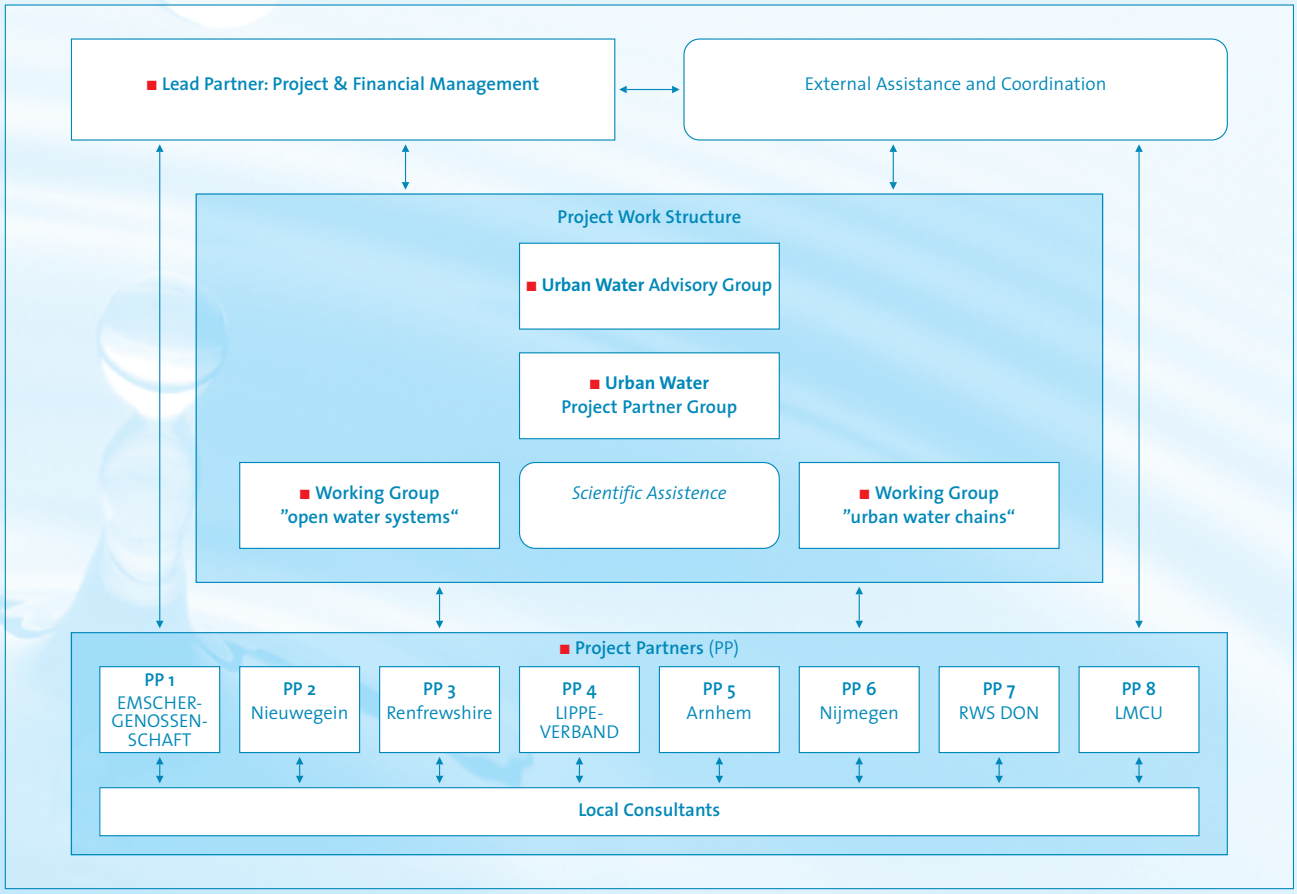
The eight project partners are located in Germany, the Netherlands, Scotland and France. They represent all levels of planning from local level up to national. Altogether they are responsible for over two million inhabitants to administer water management duties and urban planning.

CHARACTERISTICS OF PARTNERS		
■ ***EMSCHERGENOSSENSCHAFT***	*Water board for the Emscher catchment*	*Germany*
■ ***Nieuwegein***	*Municipality, water management and urban planning*	*The Netherlands*
■ ***Renfrewshire Council***	*Local authority for the Renfrewshire region in charge of flood management and urban/ regional planning*	*Scotland*
■ ***LIPPEVERBAND***	*Water board for the Lippe catchment*	*Germany*
■ ***Arnhem***	*Municipality, water management and urban planning*	*The Netherlands*
■ ***Nijmegen***	*Municipality, water management and urban planning*	*The Netherlands*
■ ***Rijkswaterstaat Oost-Nederland***	*Department of the national Ministry of Transport, Public Works and Water Management, responsible for water management along national rivers*	*The Netherlands*
■ ***Lille Métropole Communauté Urbaine***	*Municipal association for water management and urban planning*	*France*

Key elements of working structure

The working structure within **Urban Water** consists of five key elements:

- The Project Management Team at the Lead Partner EMSCHERGENOSSENSCHAFT (Germany) has overall responsibility for the project.
- The Project Partners are members of the Project Partner Group, the Working Groups and are responsible for their local pilot activities.
- The **Urban Water** Project Partner Group is the central steering body where general decisions are taken.
- In the **Urban Water** Working Groups common results are elaborated. In the two Working Groups local activities are presented and discussed. Joint recommendations are given to each single Project Partner. The process is supported by scientific assistance. The Working Groups are set up according to the two main topics of **Urban Water** "open water systems" and "urban water chains".
- The **Urban Water** Advisory Group gives support through guidance, advice in planning procedures and fosters the implementation of new tools and scientific matters.



Organisation of the mutual work

*The **Urban Water** Project Partner Group is the decision making board of the partnership (Duisburg, September 2005).*

The core of the joint work are the Working Group meetings, here in Lille, September 2004.

In order to reach the project's aims continuous mutual work is organised in four key components.

- The **Urban Water** Working Groups meet twice a year.
- The results are shared and further discussed at five public conferences which are held each year from 2004 to 2008. Members of the Working Groups, external experts and stakeholders are involved.
- The **Urban Water** Advisory Group meets once a year.
- Continuous exchange takes place among members of the **Urban Water** Project Partner Group.

A very practical insight into other partners' activities is realised through the method "training on the project". Each partner has the opportunity to send staff to another partner's site and learn in depth from the experience.

The common results will be published in a joint documentation of findings and approaches.

In the Urban Water Conference in Arnhem/Nijmegen, March 2005, the effects of the EU WFD (Water Framework Directive) on urban water projects were discussed.

4. What is in the international work's focus
Working Group 1 – "open water systems"

Members of Working Group 1 discuss the optimisation of integrated planning (Duisburg, September 2005).

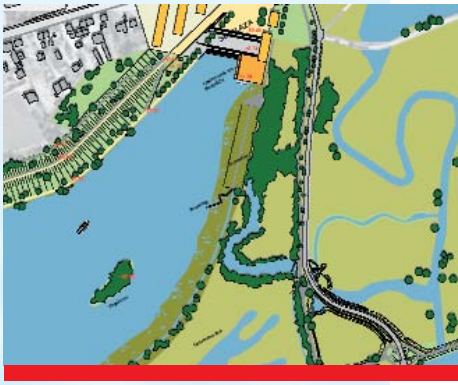
Urban water bodies have manifold functions such as recreation and basis for a sound ecosystem (City of Nijmegen).

Subjects of Working Group 1 are:

- Restoration of urban water bodies and accompanying aquatic ecosystems
- Creation and protection of floodplains
- Multiple use of water bodies and floodplains

WORKING GROUP 1
OPEN WATER SYSTEMS
Topics and crucial questions

- ***Integrated planning strategies**: How to integrate water management, spatial planning, ecology and economy for innovative solutions?*
- ***Planning permission**: What are appropriate planning instruments to reach the aim of sustainable water management and WFD and spatial planning policies?*
- ***Financing**: What are strategies to go for integrated projects when funding is low?*
- ***Communication & participation**: How to ensure projects are accepted and the public's ideas integrated?*

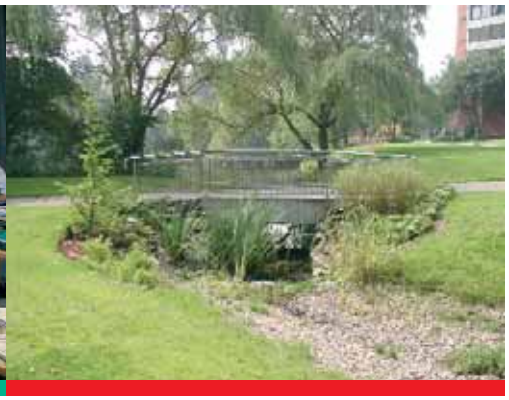


*The integration of water aspects, ecological concerns and urban development is the challenge of integrated planning – the pilots within **Urban Water** seek for best practice examples (planning Lake Lippe).*

The creation and protection of floodplains integrates ecological aspects as well as recreational use (Stadsblokken Meinerswijk, Arnhem).

Working Group 2 – ”urban water chains“

In Working Group 2 experiences regarding disconnection in existing settlements are exchanged (Duisburg, September 2005).



Disconnection surely is water management, but can create a higher amenity (Herten, Emscher catchment).

Keeping the balance between a sound groundwater system and sufficient water supply (City of Arnhem).

Subjects of Working Group 2 are:

- Optimising the functioning of existing sewer and drainage systems
- Decentralised storm water treatment (by disconnection of storm water from sewer system, by decentralised storm water storage, by improving subsoil infiltration)
- Optimising ground water balance for housing and water supply by ensuring adequate ground water tables for water supply, whilst avoiding high ground water tables in housing estates

WORKING GROUP 2
URBAN WATER CHAINS · Topics and crucial questions

- ***Disconnection**: goals of disconnection, costs, financing models, communication*
- ***Illicit connections**: goals, costs, legal aspects, communication*
- ***End of pipe measures of stormwater outlets**: possible measures, costs, communication, effectiveness*
- ***Application of Geographic information systems (GIS) for disconnection**: demands on data management*

Often the change from a combined sewer system to a separate one for waste water and rain water is costly – but worth it.

5. What are the pilot projects and activities?
Giving an overview

The experiences made with the pilot activities are the basis for the Working Groups' discussions. At the same time the planning for the pilot activities is improved through the sharing of experience in the Working Groups.

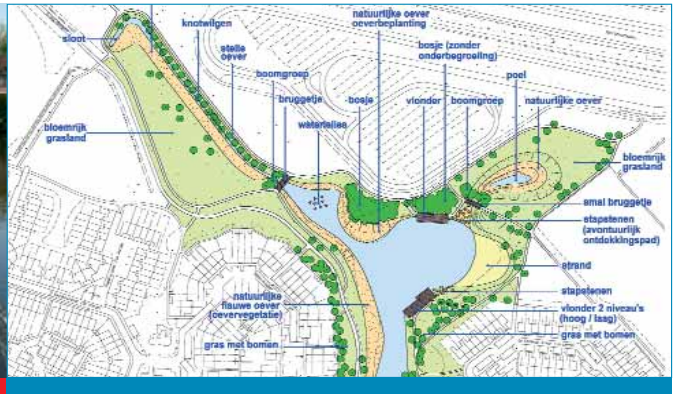
PILOT ACTIVITIES & LOCATIONS	TOPICS OF WORKING GROUPS							
	Integrated planning strategies	*Planning permission*	*Financing*	*Communication & participation*	*Disconnection*	*Illicit connections*	*End of pipe measures of storm water outlets*	*Application of GIS for disconnection*
Water management Nijmegen – ecological improvement of the water system		●		●	●	●	●	
Sustainable storm water management Emscher – Future Convention Storm Water			●	●	●	●	●	●
Upgrading the water system in the southern part of Arnhem		●		●	●	●	●	
Water system Renfrewshire – flooding and surface water management	●	●	●	●	●			●
Storm water management Nieuwegein		●	●	●	●		●	
Opening the Emscher next to Lake PHOENIX	●	●	●	●				
Lake Lippe – merging water management, ecology, recreation and increase of urban attractiveness	●	●	●	●				
Integration of flooding measures & urban recreation – the pilot project Stadsblokken Meinerswijk in Arnhem	●	●	●	●				
Water systems in the region of Lille	●	●	●	●				

All pilot activities contribute to all topics. However, some are of particular relevance. These are indicated by ●.

Water management Nijmegen – ecological improvement of the water system

The Netherlands

Pond Lindenholt old fishing place



Detailed map for the new design of the pond Lindenholt

Example of a gutter in a private garden

New natural design of the two central ponds in Lankforst

The Municipality of Nijmegen has developed a Waterplan in 2001, in which its water policy is described for the next 50 years. The main goal of the Waterplan is:
To ensure all water partners willingly cooperate on a sustainable water chain with the aim of creating a sound and resilient water system and an attractive living environment.

A sustainable water chain will be reached through an ambitious disconnection programme. Large sewer storage basins are not built any more – instead of burdening the sewer the rainwater will refill the deep groundwater storage. The experiences from the disconnection programme are very valuable for all the **Urban Water** Project Partners.

The Municipality of Nijmegen will create a resilient water system incorperating seventy-five ponds in the west of Nijmegen. In the ponds with minor treatment planned, the sludge is removed and the hard bank protection is restored. In some thirty ponds the ambition is even higher and the ecological water system will be improved by reconstruction of the natural banks. In the **Urban Water** project three pilot projects will be implemented. Also recreational aspects are designed such as beaches and playing grounds. All these ponds are reconstructed in the summer of 2006. Also the other two ponds, situated in a special geological zone, will be investigated. The ponds and surrounding park zone shall be transformed into the original natural shape of thousand years ago. In the summer of 2007 the reconstruction takes place.

Aims

- *Improving the surface water quality in the urban ponds*
- *Improving the ecological water system to a higher level due to the EU Water Framework Directive*
- *Changing the urban water system into an attractive environment for the citizens*
- *Creating higher public awareness for urban water management*

Activities

- *Disconnecting 200 ha paved surfaces in total (roads and roofs) the next 15 years*
- *Removing the sludge in 14 ponds and the hard banks in more then 30 ponds*
- *Reconstructing natural banks in 30 ponds and additional ecological objects*
- *Creating playing grounds and recreational beaches in the ponds*
- *Involving the citizens in the designing process for the reconstruction of the ponds*

Presentation of the design for the ponds Lankforst on the old estate Dukenburg

Sustainable storm water management Emscher – Future Convention Storm Water

Germany

The Future Convention Storm Water is signed by all Mayors, the Ministry for Environment and the EMSCHERGENOSSENSCHAFT.

The open discharge of rain water links the just upgraded settlement with the surrounding water courses – and gives attractiveness to the houses' environment.

*Members of **Urban Water** get informed about simple measures of disconnection within existing settlements.*

In 2005, an ambitious aim has been concluded for the Emscher catchment: within the next 15 years the sewer runoff will be reduced about 15 % – by disconnection of storm water and clear water runoff from the mostly combined sewer system.

To reach this aim a cooperation of EMSCHERGENOSSENSCHAFT, the environmental government and all municipalities in the Emscher catchment is necessary. On 31st October 2005 all municipalities have signed the "Future Convention Storm Water" of the EMSCHERGENOSSENSCHAFT, which supports the above mentioned aims.

By managing the storm water runoff at its source, the disconnection projects will support a more nature-like flow regime in the new tributaries of the Emscher and reduce financial efforts for end-of-pipe-measures in the conventional drainage systems. Storm water that nowadays disappears underground through the sewers will be drained tomorrow into the ground or feed the brooks and tributaries of the Emscher system.

Within **Urban Water** several measures are going to be undertaken to find intelligent solutions for these new concepts – in settlement structures of housing companies, at business sites, former and active industrial sites as well as design for public spaces.

Aims

- *Strengthen low flow in dry periods*
- *Reduce flood peak flow in small tributaries (for flood events of up to yearly return periods)*
- *Reduce the volume of and the financial effort for end-of-pipe-measures of combined flow treatment*

Activities

- *Conceptual studies, feasibility studies, design solutions to reach higher acceptance at the involved property owners*
- *Information campaigns including conferences, financial support for selected measures*
- *Raising public awareness through pilots on public sites: sports stadiums, schools, churches and administration buildings*
- *Support of municipalities: finding the right tax model, maintaining instructions, software, communication strategies etc.*

„Route of rainwater" – nicely designed measures for sustainable storm water management are realised throughout the whole Emscher catchment.

Upgrading the water system in the southern part of Arnhem | *The Netherlands*

Open water course near the Gelredome stadium

Business areas located next to the water gain attractiveness.

Living area in the southern part of Arnhem

The water system in the southern part of the city of Arnhem encounters several serious problems. In periods of high water levels in the nearby river Rhine, in combination with heavy rainfall, parts of the water system can not deal with the large quantities of water. Water nuisance is close by. On the other hand water levels will fall rapidly during periods of serious summer drought. At the same time the water quality, chemical and ecological, has deteriorated in parts of the system and does not correspond to current standards. Municipality and waterboard decided that a massive upgrading of both water system and water chain is required to reach a sustainable and resilient water system. A system that is ready to encounter the expected effects of the climate change.

Open water course near the old village of Elden, situated in the southern part of Arnhem

Inhabitants discuss the level of maintenance of the water course near their house (2005).

Aims

- *Creating a sustainable and resilient water system that is able to cope with situations of high and low water levels in the river Rhine, periods of heavy rainfall and serious drought*
- *Improving the chemical and ecological quality of the surface water by decreasing the pollution of the water system from the sewer system*
- *Integrating the concept of water as a vital and attractive spatial element in the policy of "urban spatial planning"*
- *Improving the attractiveness and recreational possibilities of water*
- *Improving the water-awareness of residents, corporations and institutions*

Activities

- *Determining which measures in the water system and water chain could and should be utilised to transform the present water system in a sustainable and resilient one*
- *Determining and testing three different measures to decrease the amount of pollution of the water system from the storm water system (divided sewer system); also monitoring the effect the measures have on the local water quality*
- *Determining and testing the possibilities to trace illicit (wrong) connections in the divided sewer system and the effect illicit connections have on the water quality of nearby watercourses*
- *Setting up a maintenance plan for all the water courses, adjusted to the green alongside the water, in close cooperation with the inhabitants*
- *Monitoring the chemical and ecological quality of the water system in the whole project area*

Water systems Renfrewshire – flooding and surface water management

Great Britain – Scotland

Improvements to Renfrewshire's Drainage Assessment guidance have been made by the development of a GIS application.

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The safeguarding of available areas for a sustainable surface water network is becoming a key issue, as development constraints resulting from both sewer and water supply undercapacities increase.

Urban drainage in Renfrewshire is complex and comprises an interrelated network of sewers, pipes, drains and watercourses. Much of the urban drainage system is a legacy of nineteenth century investment in sewer infrastructure. The urban water network has inadequate capacity in its combined sewer system and watercourse network, both being significantly under capacity for the rainfalls experienced in recent years. The problems of urban drainage are both quantitative and qualitative and occur widely in Renfrewshire.

The Johnstone catchment has been used as a test-bed to model the complex interactions in the water environment and develop sustainable surface water management solutions to reduce flood risk and improve the quality of the urban water environment. The project also seeks to explore the potential for integrating surface water management within the development planning process.

Aims

- *To contribute to the solution to the problem of urban flooding by allowing further understanding of the water network and sources of flooding*
- *To develop cost effective and sustainable solutions to problems of water quantity (floods) and water quality (pollution) for the urban catchments*
- *To incorporate surface water management principles within Renfrewshire's development plan*
- *To demonstrate how improvements to the water environment can contribute to Renfrewshire's Local Biodiversity Action Plan*
- *To demonstrate innovative materials and techniques to mitigate flood risk*

Activities

- *A combined sewer model and the surface water sewer model for the Johnstone test-bed is at its completion. The work has started to produce outline, strategic storage requirements.*
- *Opportunities for disconnection of surface water from the sewer system and complementary storage are being investigated.*
- *Potential virtual watercourses and regional Sustainable urban Drainage Systems (SuDS) have been identified for water treatment, storage and flood mitigation purposes.*
- *The relationship between the identification of water treatment/storage areas and the potential for the spatial planning system to assist implementation over the medium and longer term are being explored.*
- *Renfrewshire's drainage guidelines are being improved to facilitate development and the development control process.*
- *The test rig for the Storage Treatment Unit (STU) is providing some promising results. The unit is seen as a key component to disconnection.*
- *A knowledge management study is being undertaken to improve joint working arrangements, information storage and dissemination.*

Development work has progressed on the identification of virtual watercourses and regional SuDS.

Storm water management Nieuwegein

The Netherlands

Polluted water from the sewer in a living quarter comes up to the surface.

The polluted water from the sewer washes away in the surface water.

Filterbasin, which cleans the first most polluted part of sewer water when an outlet occurs.

In the next few years, the Municipality of Nieuwegein will be executing several water projects nominated as the "New Waterway". These water projects contribute to a cleaner environment and an improved water balance. Zandveld is the first part of Nieuwegein where the new waterway is going to be realised.

Which measures will be taken?

Sewer replacement: In several parts of the town, the sewer has to be replaced and improved.

Disconnection of storm water runoff: A separate system will be built for leading the rainwater to canals and ditches in the neighbourhood. To save costs, the disconnection of storm water runoff will be combined with the sewer replacement.

Realisation of filter basins: Construction of underground concrete basins for temporarily storage as well as cleaning of redundant water after heavy rainfall. These basins of 30 by 5 by 2 metres are built completely underground. Only a regulator will be placed on the ground level.

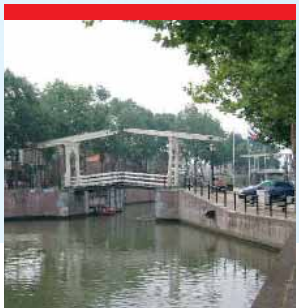
Mud removal: In ditches and puddles the mud will be removed to prevent silting up. The Municipality takes care of that together with the Waterboard Hoogheemraadschap de Stichtse Rijnlanden. In autumn 2004 the removal of mud was started in the part of Nieuwegein which is called batau. In 2005 and 2006 other parts of the town follow: Doorslag and Zuilenstein.

Aims

- *Develop knowledge about the best techniques to achieve disconnection of storm water runoff*
- *Prevention of the sewers' overloading and the risk of overflow of polluted water to the surface water*
- *Cleaning of the first sewers' overflow in filter basins*
- *Mud removal to improve the water flow in ditches and channels*

Activities

- *Producing the Integral Waterplan Nieuwegein with 40 priority measures*
- *Developing pilot projects for disconnection of storm water runoff*
- *Studies on ground water modelling and optimisation of the wastewater chain*
- *Collecting communication experiences: related to the disconnection of storm water runoff, an educational water path and a digital design studio*



Historical inlet, here: water from the river Lek can be led in.

Opening the Emscher next to Lake PHOENIX

Germany

Arial view over the project site for Lake PHOENIX and the Emscher – 2 km² former steelwork

Preplanning of opening the Emscher and the future Lake PHOENIX

3D-animation of the future Emscher and its floodplains

The realisation of this project on two km² brownfields is one of the essential projects for structural change in the Emscher catchment. At the project site a steelwork was located – the "Hermannshütte" which closed in 2001. The heart of the future development will be the Lake PHOENIX. It will be 24 ha big and filled with groundwater. Different design of the banks will allow active recreation at the harbour and the promenade, or relaxation and nature development in ecological zones. The Lake will be surrounded by 800 housing-units with lake-view, business sites, offices, service, recreation, gastronomy and culture.

Today the Emscher flows in a sewer under the PHOENIX area. Tomorrow 2,5 km of the Emscher will be restored, and 50 m wide floodplains will be developed. After bringing the river to the surface cycling, relaxing and nature observation will be possible next to the Emscher.

To display information about the project EMSCHER-GENOSSENSCHAFT and Lake PHOENIX Ltd. have opened the PHOENIX Information Point. Outdoor information boards provide information about the Emscher and the future lake. Indoors at the information point an exhibition explains the background of the project and accompanies the construction work. From the visitor's platform you have a great view over the area, standing on top of the "Emscher cliff".

The EMSCHERGENOSSENSCHAFT participates in this project in close cooperation with the Lake PHOENIX Ltd., the Municipality of Dortmund and the Dortmunder Stadtwerke.

Aims

- *Planning the restoration of 2,5 km of the river Emscher which is currently flowing in a sewer underneath brown fields*
- *Integration with the project Lake PHOENIX: creating 24 ha open water, 6.000.000 m³ volume and 240.000 m³ retention for flooding of the Emscher*
- *Development of a 2 km² area which has been a steelwork into a new urban quarter with green belts, Lake PHOENIX and the nature-like, open Emscher*

Activities

- *Planning of all project-relevant details regarding the water management of the Emscher and the Lake, submit all relevant planning documents in order to reach official planning approval*
- *Achievement of all preparations being necessary to start construction*
- *Informing of the inhabitants and the interested public through an information point, exhibitions and information boards, a telephone hotline and guided tours on the project site*

Start of construction work – ground breaking ceremony on 13.09.2005

Lake Lippe – merging water management, ecology, recreation and increase of urban attractiveness | *Germany*

Arial view of the pilot site – the inner city of Hamm follows directly to the right having crossed the Lippe and the Canal.

The project plan takes water issues, ecological concerns and recreational aspects into account.

Vision of the future lake

This project is based on the "Masterplan Hamm an's Wasser" ("Hamm closer to water"), adopted by the City Council in 2001. Hamm is a city with about 180.000 inhabitants and is located next to the river Lippe. It is a city with coal mining history that now wishes to develop new urban, natural and social qualities.

Lake Lippe plays a central role in the Masterplan. It will provide the city with a variety of new opportunities for urban development. In addition to flood protection there will also be new business and service-sites, the offer of many recreational and sport activities, areas for living near the water and ecological banks and lake zones.

3D-animation of the future swimming bay with a blue lagoon

The design of the project was developed in a feasibility study September 2002: the lake will have 43 ha water surface. From east to west the length will be about 2 km, the width differs from 100 to 330 m. Being 3 m deep the lake will have a volume of 1,2 mio. m^3. The design includes a variety of banks with urban characteristics near the settlements of Hamm and Heessen and more natural, ecological banks near the Lippe. People will be permitted to swim in one of the bays. The lake will also include a harbour for sailing boats and a regatta route. The ecological improvement of the Lippe is also included in the planning of the lake – altogether these measures are integrated in the Lippe-meadow-concept realised by the Lippeverband as required by the Ministry of Environment of North-Rhine-Westphalia.

The official planning approval procedure started in May 2005.

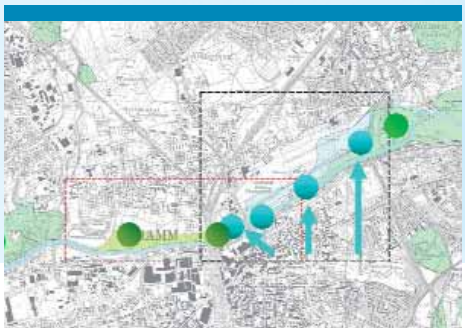
Aims

- *Increasing the retention volume 2 mio. m^3 and improving of flooding protection*
- *Improvement of the ecological pass way belong the river Lippe within urban area*
- *Connecting several parts of Hamm to a blue centre*
- *Increasing attractiveness of the location of Hamm towards better development chances*
- *A key infrastructural project as a part of the structural change to improve the region of Hamm*

Activities

- *Planning the water management of Lake Lippe including urban infrastructure*
- *Environmental Impact Assessment*
- *Link the plans for the lake to the surrounding spatial development*
- *Communication activities towards the public*

The creation of ecological stepping stones improves the terrestrial patency.



Integration of flooding measures & urban recreation – the pilot project Stadsblokken Meinerswijk | *The Netherlands*

Arial view of the pilot project site located directly next to the City of Arnhem

Arial view of the pilot project site during flooding

The future urban parc is located directly opposite to the inner city.

The City of Arnhem is located along the river Rhine. In the floodplain area in the southern part of the city a flood-free area is located, called Stadsblokken. The floodplain has an important ecological function. Until 1995 the urban development plan of the Municipality of Arnhem indicated that the Stadsblokken area would be an important housing area. However, due to the fact that the area is a part of the floodplain the development plans for housing had to be stopped. The "Beleidslijn Ruimte voor de Rivier" (National Policy Directive Room for the River) no longer allows the construction of houses in the floodplains. Rijkswaterstaat will use floodplain areas to enlarge the discharge capacity of the river Rhine. Since the floods of 1993 and 1995 Rijkswaterstaat has developed a national plan to create more space for the river, to prevent flooding of areas behind the dikes, which include the urban areas. This national plan, called "Planologische Kernbeslissing Ruimte voor de Rivier" (Spatial Planning decision Room for the River), has a direct impact on the development of the Stadsblokken area.

The project Stadsblokken is presently investigating what the possibilities are for the development of the Stadsblokken area. Central question is: How can the measures required to prevent flooding of the urban area in and near Arnhem be combined with the development of the area as a city park? Furthermore nature development in the area is an important objective. The main ecological structure should be strengthened, taking into account already existing values in the area.

Aims

- *Lowering the water levels in the river Rhine during high floods*
- *Creation of a city park*
- *Nature development*

Activities

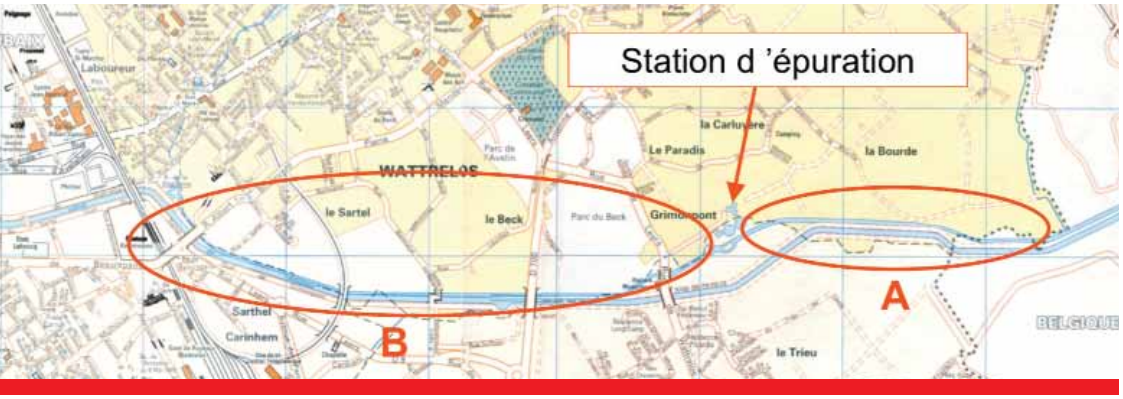
- *Spatial survey*
- *Hydraulic survey*
- *Reconnaissance survey*

Alternative 1a – River Park

Alternative 2a – Leisure Park

Two out of four alternatives for development of the area concentrating on solving the flood protection measures outside the project area and emphasising nature development or creating the maximum effect of flood protection measures in the area.

Water systems in the region of Lille | *France*



Pilot project's location: A = regrading of upstream Espierre
B = landscaping measures on downstream Espierre

Concrete banks of the Espierre have to be restored for more ecological quality.

As a cross-border river, the Espierre runs through a densely populated area of the Franco-Belgian metropolis of Lille (a catchment area of 400.000 inhabitants). This natural outlet receives rain water and waste water from an area of 5.200 ha, of which 17 % is in Belgium and on the French side in the whole City of Roubaix and some part of the cities of Tourcoing, Wattrelos and Leers. It is part of Lille Métropole's sewage system: These Belgian and French effluents are treated at the sewage plant of Grimonpont adhering to the European standards and flow across the border to the Scheldt. The Espierre is now redeveloped on a large scale. The project is also a complementary and necessary part of the larger project called 'Blue Links', which aims at reopen the Canal de Roubaix to shipping and also runs under the Interreg IIIB programme.

Flood in a street in Wattrelos 4th September 2005

Aims

- ***Flood protection***
  The effluents of this large water basin run to the only natural outlet, the Espierre, which is an open sewer leading to the sewage treatment plant of Grimonpont 2,4 km away. This outlet of about 4,5 km has an insufficient drainage capacity and generates more and more intense and frequent urban floods at times of great rainfalls. The resizing of the 2,4 km length and the development of the river from the plant to the border, are intended to resolve the floods in areas where in parallel Lille Métropole Communauté Urbaine (LMCU) plans to restore attractiveness.
- ***Restoration of the Espierre river landscape***
  The work on the Espierre stream aims at improving a previously highly industrialised area subject to a particularly heavy industrial pollution. The objective of this work is to raise attractiveness of the highly populated Roubaix/ Tourcoing/ Wattrelos/ Leers area and to reduce olfactory and site pollution.

Activities

LMCU is well aware a global treatment of the Espierre is needed; the activities within ***Urban Water*** *deal with the downstream part of it and concern both environmental improvement and landscaping operations.*

- ***Improving the downstream part of the Espierre***
  LMCU wants to control water flows in anticipation of heavy rainfalls. The excavation and the enlargement works have been developed following studies regarding the hydraulic modelling of the 5.200 hectares water basin (including some part of the Belgian side), the interactions between the Canal, the Espierre and the sewage network, and other hydraulic evaluations.
- ***Landscaping***
  These operations (pedestrian ways, trees, etc.) have to restore the natural aspects of the Espierre river and improve the recreational and ecological quality of it. They are plainly part of the whole project downstream and upstream.

6. First successes of Urban Water
Knowledge-transfer

The first concrete outcomes resulting from the process of joint work in **Urban Water** partnership proves the success of cooperation. The following examples represent the benefit for each partner resulting from the international work:

Due to urban water chains Arnhem and Nijmegen work close together.

Stimulated by **Urban Water** the Dutch municipalities of Arnhem and Nijmegen have strengthened their **cooperation also in day-to-day-work**. Both cities have started a mutual exchange especially in water related matters.

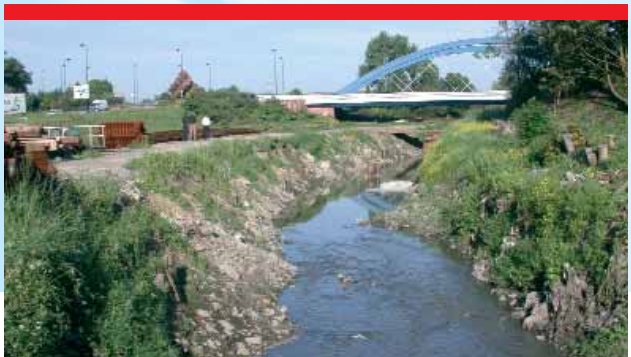
The presentation of international experiences in sustainable storm water management has activated a **policy-making process** in Scotland. The approaches and implementation of disconnection and related planning principles now feed the application of Scottish planning processes.

”Fit for the future“ – integrated, participative planning processes invest into the future.

The observation of a successful Dutch example of **public participation** in integrated, complex planning projects could be transferred to Germany. Offering visualised information combined with the opportunity of discussion with the responsible planners in a balanced way has been tested in the pilot project Lake Lippe and achieved success.

The water management plans for **refining the Espierre** in France were presented in the **Urban Water** partnership. Due to the input made by other partners based on their background of the comprehensive experience the plans were optimised for the French partner's benefits. The newly developed plans will lead to a greater effect on the water quality in the Espierre and more ecological improvement especially downstream of the existing sewage plant.

Revitalisation of the Espierre



Training on the project
Additionally a major benefit for all involved participants is the ”training on the project“. The exchange of people from one partner to another partner's organisation allows direct insight into pilot projects and the gaining of personal experience.

The first training visit of project partners to the Dutch partner Nieuwegein and the German partner EMSCHERGENOSSENSCHAFT in Essen took place in May 2005 on the topic of disconnection of storm water run off.

TRAINING ON THE PROJECT: SUBJECTS AND RESULTS (MAY 2005)

- *Learning about the possibilities of the financial incentive tool ”water tax“ in Germany while the Dutch statutory framework does not provide such a tool*
- *Learning about the application of the tool ”water plan“ in the Netherlands*
- *The Scottish partner from Renfrewshire now prepares a water vision document which is based on the Dutch water plan.*
- *Learning about the tool ”disconnection agreement“ in order to foster disconnection in absence of financial incentives*

7. Project partners & contacts

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Renfrewshire Council	*cover left, page 13 all*
LIPPEVERBAND	*page 7 mid right, page 16 all, page 19 mid*
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Lille Métropole Communauté Urbaine	*page 18 all*
INFRASTRUKTUR & UMWELT	*page 3 right, page 6 left and bottom, page 7 left, page 8 left*

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