The Role of the Rain

rainwater and urban planning

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Perhaps nothing is absolutely true
and even that may not be true.

Multatuli

1. Introduction

From the roof to the river valley rainwater runs through the city. For a long time the related issues of floods, shortage and pollution used to be addressed by technical specialists and remained invisible for the general public. Water planning was more or less an underground activity as invisible as the sewers that were considered the water planners' core business. That time is over. Rainwater has surfaced in many streets, squares and parks and becomes a visible quality of the city. For designers this implies that water has become an input and inspiration to *water sensitive urban design*. This is the spatial integration issue.

For a long time, urban planners and politicians treated rainwater and other water flows as a closing entry or a *limiting condition*. After a catastrophic flood, water is high on the political agenda: investment in protection will be substantial and rules become tough. If nothing happens for a long time, priorities are shifting and risky activities such as building in floodplains are tolerated again. Kathrina in New Orleans and other catastrophes have taught us to think about prevention, about a more stable role of water policy and water planning as a *carrying condition* for *sustainable urban development*. This is the temporal integration issue.

Both the spatial and the temporal integration ask for a break with the modernist tradition of conquering and commanding nature. In pre industrial times land use followed the natural environment. The hydrological situation, including the availability of hydropower and waterways for transport largely determined the place of the early settlements. In the last century, however, technology driven modernisation increasingly made urban development, and land use in general, independent of the natural landscape. Water sensitive design and sustainable urban development, however, seek to reintegrate natural processes in urban and regional development. This is the nature integration issue.

These three integration issues, concerning space, time and nature, emerge from critical assessments and reflections of urban and regional planning experiences with a more prominent role of rainwater and other water flows. The paper first describes the guiding principles that emerge from these practical planning with water experiences. Then it explores the underlying theories in the three dimensions of integration.

2. Guiding Principles

In the second half of the twentieth century water management primarily focussed on improving drainage, building higher dikes and constructing sewage-treatment-plants. Towards the end of the century, however, it became increasingly clear that the straightforward

implementation of safety and quality standards and a technical approach was no longer the self-evident road to follow. The dilemma with respect to water was well illustrated by the situations in many urban areas. The urban fringe, cities and urban regions cannot be described as networks of reliable cause-and-effect relationships. Hence, as a rule, there are only indirect links between goals and means. It is difficult therefore to predict what standard of water quality can be reached within a given period, by undertaking a fixed set of activities, requiring a fixed sum of money. Perhaps only something is absolutely true. Increasing awareness of this problem raised questions regarding the feasibility of the traditional blueprint approach for water planning. The European Water Framework Directions (EU, 2000) are also facing this problem. On the one hand they urge us to make real progress in terms of water safety and water quality. On the other hand they invite the member states to make integrated catchment plans.

The guiding principles and guiding models approach addresses this dilemma by developing tools to make real progress in interactive processes leading to integrated plans for local conditions an local people. In The Netherlands the analysis, the guiding principles and some guiding models were first published as a general toolkit in a book published jointly by the Dutch Union of Water Boards and the Union of Municipal Public Works Departments (De Kwaadsteniet et al., 2000). Later, an extended version of the toolkit was formulated in a EU Interreg project: Planning for Urban – Rural River Environments (PURE). Between 2002 and 2006, PURE focussed on planning and management issues of river valleys in four cities: Göteborg (Sweden), Newcastle (UK), Groningen and Deventer (The Netherlands). Practitioners, researchers and consultants analysed planning practice, addressing technical, spatial, public participation and governance aspects. Promising combinations of these aspects create the *guiding models*, conceptual planning tools resulting from a learning process (Kuypers et al. 2006).

The guiding principles reflecting the change in thinking regarding water management can be summarised under the following headings:

from cleaning up to keeping clean

In the traditional approach to water quality management, the emphasis lies on water treatment – on *making* water clean. However, there are good reasons for shifting the emphasis towards *keeping* it clean. Paradoxically, sewage treatment plants, built to purify water, pollute the surface waters that receive their effluent. It is simply too expensive to remove all pollutants. The choice of sewer system is highly relevant in this context. The traditional *combined sewer system* of most urban areas carries both rainwater and wastewater. Although everything seems to be under control, the irregular flows of rainwater disrupt the purification process. Rainwater that needs no treatment at all leads to lower quality effluent. Moreover, mixing rain water with waste water in sewers that have limited capacity leads to overflows from the combined sewer, during heavy rainfall, and hence to irregular discharges of sewage pollutants into surface waters, as in the river valley case. The new approach, therefore, is to *keep the rainwater clean*, which implies a clear preference for a *separated system,* sewers for wastewater and, if possible, open gutters for rainwater, leading to the nearest surface water or to infiltration sites. The small quantities of pollution that rainwater picks up from the streets can easily be treated in dry road verges and by filtration and purification in wetlands, which can be part of the urban surface-water system.

Urban water management is concerned not only with the sources of pollution, but also with the sources of clean water. Clean water only stays clean, if water flows from clean to polluted areas. This principle is grounded in a sustainable differentiation of water quality, as expressed in the water plants and fish population. Thus, designing a sustainable water system begins by identifying sources that are potentially clean, such as sites where clean ground water seeps up to the surface, or where clean precipitation can be retained. If upstream waters are already polluted, as in the river valley case, a clean-up action should be given priority, of course.

from rapid drainage to retention

In the traditional approach to water-quantity management, emphasis is placed on the rapid *drainage* of rainwater, but its rapid removal in urban areas creates dry conditions for green areas and the higher peak discharges cause downstream problems. Thus, there are good reasons to shift the emphasis from rapid drainage to *retention*. The increased area of hard surfaces in urban areas leads to different impacts in upland and lowland landscapes.

In the *upland* landscapes, many of the woods and forests have been felled, and many rivers have been regulated to make them navigable. A more rapid run-off, drainage and discharge of rain water results, made worse in the course of time, in urban areas, by the ever increasing area of hard surfaces. Upstream areas become drier as the water table falls, while there is flooding downstream. Such floods have caused much damage and disruption, for example, in the drainage basin of the Rhine and Maas, in recent years. Events, such as these, have strengthened the growing insight that it is best to *retain clean rainwater as close as possible to the place where it falls.* Therefore, priority should be given to creating more on-site *peak storage* in urban areas, rather than increasing downstream storage. Once the water has reached the main rivers, however, its flow should be unobstructed. Thus, floodplains should be kept free of buildings. This, of course, is a highly important guiding principle for planning in urban areas built on flood plains.

The situation is different in *lowlands* like the Dutch delta. Traditionally, water management in the polders is concerned with maintaining the water levels: if the level is too low, water is let in; if it is too high, the pumps are turned on. Letting water both in and out is possible, because a water network at a higher level, the so-called *boezem* system surrounds the polders. This system receives water from the rivers and carries water to the sea. During the winter, large quantities of clean rainwater from the polders are pumped away to the *boezem,* but in summer, *boezem* water has to be let in to prevent drought. Unfortunately, the quality of the *boezem* water is generally bad. To counteract this, the water planner's response is to provide *seasonal storage* in the polders: preventing the inlet of water by retaining part of the winter surplus to compensate for the summer shortage. Whether seasonal or peak, storage is the key concept in urban water planning. Green roofs, water butts, infiltration ditches in green spaces, allowing the periodic flooding of low lying areas in parks, catering for fluctuating water levels in ponds and canals; these are all measures that can increase the water retention capacities of urban areas, thereby providing more storage.

from 'tabula rasa' to 'design with nature'

Between 1954 and 1970, the post-war rebuilding and expansion process was dominated by modernist ideas that inspired many town planners. In The Netherlands, the builders of new developments started by creating a thick layer of sand: This *tabula rasa* is an extreme expression of human control over nature. In the years that followed, these districts were built in the same way in all cities, natural characteristics were ignored, river valleys were built over. In reaction to this loss of urban identity, some urban designers turned again to landscape as a source of inspiration for achieving identity. They adopted a new, *design with nature,* approach. Pioneers such as Mc Harg (1969), Hough (1990, 1995) and Spirn, (1998) already saw water planning as a key factor in this approach. Utilising the local hydrology and morphology, water can make an important contribution to an attractive urban landscape, with its own identity. This implies that water should be viewed as an active force rather than a passive ingredient in urban design. From the point of view of water management and safety, The Fourth Memorandum on Water Management (Ministerie van V&W, 1998) came to the same conclusions. It is stated there that water should become a *structuring principle* in spatial planning.

Designing with nature also means creating and sustaining wildlife habitats. One way of doing this is to use sources of clean water within the area being planned and exploit the opportunities for retaining rainwater, thereby preventing the gradual degradation of diversity in valuable wetlands and other water-dependent habitats. Water from the area must not be mixed with more or less polluted water from other areas. Another good reason for not doing this is that each area has its own type of clean water, influenced by the characteristics of the bedrock and soils. These natural qualitative differences add to the diversity of the flora and fauna within and outside nature areas.

from top-down to interactive planning

Water planning is still a technical domain, dominated by engineers with a strong desire to control the urban water system. This is their task, and they are held responsible if anything goes wrong. Understandably, they prefer solutions that keep the control in their own hands. This leads to a preference for *end-of-pipe* approaches as in the river valley case. Nevertheless, water also falls on private property and diverse agents are responsible for its pollution. Water management requires public support and the co-operation of many actors. Increasingly, therefore, urban water plans seek to establish a basis for co-operation, and co-operation requires interactive communication. The complex nature of water issues requires stakeholder participation and a process-oriented interactive planning. In a planning perspective, the difficulty with co-operation is that it entails many uncertainties about the results and about the time and budget required to carry it out. This is why it is extremely difficult to reconcile the need to control risks with the need to create support by co-operation. In this respect, innovative pioneer projects create the conditions for shared learning: to see it is to believe.

seven guiding principles

This discussion of a new approach to water planning and design can be summarised in the list of seven guiding principles. The list does not claim to be exhaustive but the analysis shows these principles are essential.

Flow related principles

1. *Retain water and keep it clean*.
2. *Ensure that water flows from clean to polluted areas*.

Area related principles

3. *Use water to enhance the identity of the area*.
4. *Use local water resources to create area-specific wildlife habitats*
5. *Use water as a spatial planning principle.*

Actor related principles

6. *Communication between all the actors.*
7. *Create a learning organisation in water management*.

3. Working with nature

The analysis leading to the guiding principles touches the basic attitude of man towards nature. Reintegrating natural processes in urban planning, or *making the city more ecological* is a sentiment that comes close to the objective of Ecological Modernisation Theory, which is to highlight basic questions concerning sustainable development.

Ecological Modernisation Theory

In the 1970s and 1980s, the dominant paradigm among politicians and policy makers was the perceived need to protect the environment against the negative impacts of development. The Brundtland Report of 1987 and the Rio Conference of 1992 then brought a new paradigm to the fore. This new approach no longer positioned ecology in an opposing position to development, but explored the options for making development itself more sustainable, or, as it is sometimes called, more ecological. Huber, Jänicke, and Hajer describe the paradigm shift as a change towards a new discourse: *ecological modernisation* i.e. making processes of production and consumption more ecological in themselves (Spaargaren et al., 2000). For policy makers and industrial leaders this new discourse '… puts the meaning of the ecological crisis upside-down: what first appeared a threat to the system now becomes a vehicle for its very innovation' (Hajer 1995: 32). 'The main achievement of the ecological modernisation perspective as we have it, is that the theory provides new concepts to think through the relationship between economy and ecology, between society and its sustenance base; … ecological criteria, procedures and norms … are gaining relative autonomy *vis-à-vis* economical, socio-cultural and political rationalities' (Spaargaren et al., 2000: 64). The new approach did not provide a definitive solution to the conflict between ecology and economy, as is clearly demonstrated by the USA's refusal to sign the Kyoto Agreement on substantially reducing CO_2 emissions. Yet, in many fields of national and local policy-making, the decisions concerning ecology and economy are gradually beginning to move from an 'either/or' to a 'both/and' standpoint.

In the eyes of the general public, the media and in both national and municipal practice, *ecology* equates with protection, especially the protection of wildlife. However, the very concept of sustainable development demonstrates the view that development itself can be sustainable or, for that matter, ecological. This view is the heart of the ecological modernisation debate that has generated new approaches to interaction between the social and the natural world (Hajer, Spaargaren et al., 2000; Sutton, 2004).

In a planning perspective, it makes a difference as to whether the conflicts between man and nature, or economy and ecology are addressed by *protecting nature* or by *strengthening the role of ecology* in industrial and urban development. Opting for both strategies is choosing to adopt a broad understanding of ecology that corresponds with the classical textbook definitions of ecology as the study of the interaction between living organisms and their environment, or the study of ecosystems (Odum, 1971). The practical importance of this point for urban planning is that it gives the option to escape from that circle of reasoning that views the urban environment as the source of evil and sustainable development as leading to sacrifices with respect to comfort and affluence.

Breaking with the contradiction between economy and ecology also breaks with the assumption that development is fundamentally good and can only be limited by ecological facts if these facts are absolutely true. Ecology, in this view, is only a *limiting condition,* and only absolute proof may urge us to accept this condition. Thus, some economic growth protagonists reject any restrictions of CO_2 emissions as long as there are still doubts about the human influence on Global Warming. But also some environmentalists follow the limiting condition philosophy. The Ecological Footprint Approach (Rees, 1999) calculates how economic growth in one area may cause depletion and pollution of resources in other areas. Thus the footprint seeks to prove the need for limits to growth. The approach confirms the myth that economy and ecology and also town and country are enemies. In an Ecological Modernisation perspective, however, ecology can be a *carrying condition.* This does not mean that limiting rules are completely unnecessary, but the emphasis is on the positive side of development, the focus is on *design with nature* (Tjallingii, 1996, 2000).

Ecological Modernisation Theory appears to have something to offer the central issues of integrating the role of the rain in urban planning in that changing discourses and making every-day working practices more ecological appear to be highly relevant both for water management and for urban planning. How does this relate to the emerging practice of making urban development more sustainable?

4. Integrated and Sustainable: Hydropolis meets Ecopolis

If water evolves from a limiting condition to one of the carriers of urban development, water planning necessarily should become more integrated in planning processes for sustainable development. Thus naturally, the findings of the first Hydropolis Conference (Van Engen, Kampe & Tjallingii, 1995) contributed to Ecopolis, a study about strategies for ecologically sound urban development (Tjallingii, 1995). A practical case from the PURE project may precede a discussion of the theoretical basis.

the river valley story

In an urban fringe of a big city various people and organisations are responsible for or committed to the quality of a small river valley. One of the *actors* is the regional Environmental Authority that defines the river as *Class B*, a category of limited water quality and moderate targets for improvement. The Authority's quality standards are policy instruments to direct their budgets towards measurable improvement of environmental quality in many river valleys. In this particular case the chemical and biological water quality parameters, measured twice per year, demonstrate no acute health risk. In the Authority's view the quality of this river is not a real problem and they prefer to spend their money on other valleys with more serious problems and better prospects for improvement. At the same time a local residents' group of a village downstream takes great efforts to have car wrecks removed and muddy footpaths improved in their part of the valley. To them the problems of the valley are urgent and they see their efforts can have visible results. For further improvement, however, they need the help of others. A third actor is the local Water Board, responsible for sewerage and surface water management. Their quality objective is to reduce the number of combined sewer overflows by 50% in five years. After heavy rainstorms the sewers are unable to carry all the water and discharge diluted sewage into the river. This is one of the main causes of organic pollution and the Water Board has decided to build special concrete basins to temporarily store the overflow water and let it flow back into the sewers. Although largely invisible, the new storage basins will significantly reduce pollution from the sewers to the river. Other sources of pollution, like fertilisers and pesticides from agriculture and heavy metals from the old mines in the area remain untouched. The local planners are aware that the improvement of the downstream situation, both the visible litter and the invisible pollutants, depends on a possible partnership with upstream actors. Quality can only result from combined efforts. What makes it difficult for the actors to join forces is not only a lack of resources, but even more a lack of a common language to develop an integrated strategy.

good planning concepts

The strategy, or planning concept, that emerges from the first stages of the planning process should carry further detailed planning, realisation and finally use and maintenance of the complex system that is the object of the plan. In the context of sustainable urban development a good planning concept should integrate the aspects of *actors, areas and flows*. In an urban fringe situation both water and traffic *flows* are crucial. The story demonstrates the variety of *actors* that play a role and the *area* -aspect draws the attention to questions about place-bound

qualities of the fringe zone, the city and the urban region, but in this case the catchment area deserves special attention. The *actors-areas-flows* view stems from assessment and planning studies concerned with sustainable urban development (Tjallingii, 1995,1996; European Commission, 1996). Figure 1 shows the resulting triangle, representing three perspectives to look at a planning concept. In this form the triangle is part of the Ecópolis Strategy, a collection of conceptual tools made for making urban development more ecological and more sustainable (Tjallingii, 1995, 1996, 2004).

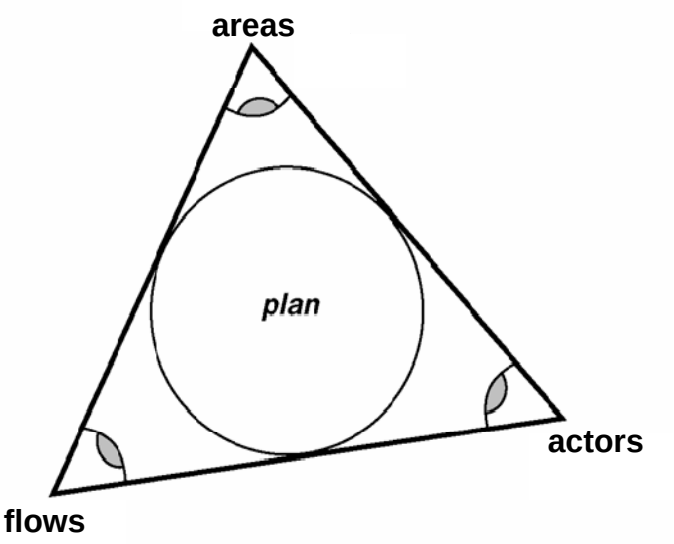

Figure 1. Ecópolis: Plans in three perspectives (Tjallingii, 1996).

How does this triangle relate to the mainstream discussion about sustainable development? In a global perspective, sustainable development is defined in three widely accepted dimensions derived from the Brundtland Committee Report: the *social,* the *ecological* and the *economic.* These dimensions are sometimes called the *people-planet-profit* triangle *(PPP)*. Campbell (1999: 253) reviews the debate and summarises the common priorities of the three dimensions as *social justice*, *environmental protection* and *economic growth*. The *PPP triangle* may be useful in discussing policy issues, urban planners only indirectly address the priorities set by the social-ecological-economic triangle. The direct influence of the urban planning profession is through decisions about *areas* of different scale. A second field of direct influence is through decisions about *flows* of energy, waste materials, traffic and water. Here urban planners have to work with specialist planners from technical sectors. The third field of direct influence is related to the different *actors* involved, and to whether or not they take part in the negotiations. This practical situation led to the *actors-areas-flows triangle*. Making a plan for an urban area, for example building houses or creating a park, involves decisions that can be assessed using social, ecological and economic criteria. The link with areas enables us to make these criteria more specific. Likewise, making plans for flow management or direct actor-oriented policy can be assessed using the *PPP triangle*. In this way, the widely accepted, but rather general, triangle of objectives for sustainable development is used to specify criteria for *assessing* plans in a wider policy context; the *actors-areas-flows triangle* produces the specific actions and guiding principles for *making* plans.

sustainable plans

To integrate actor, area and flow perspectives is a condition for a plan if we want it to contribute to sustainable urban development. But this, of course, is not the whole story. What is sustainable flow management? And in which way a good plan should cope with the area and actor issues?

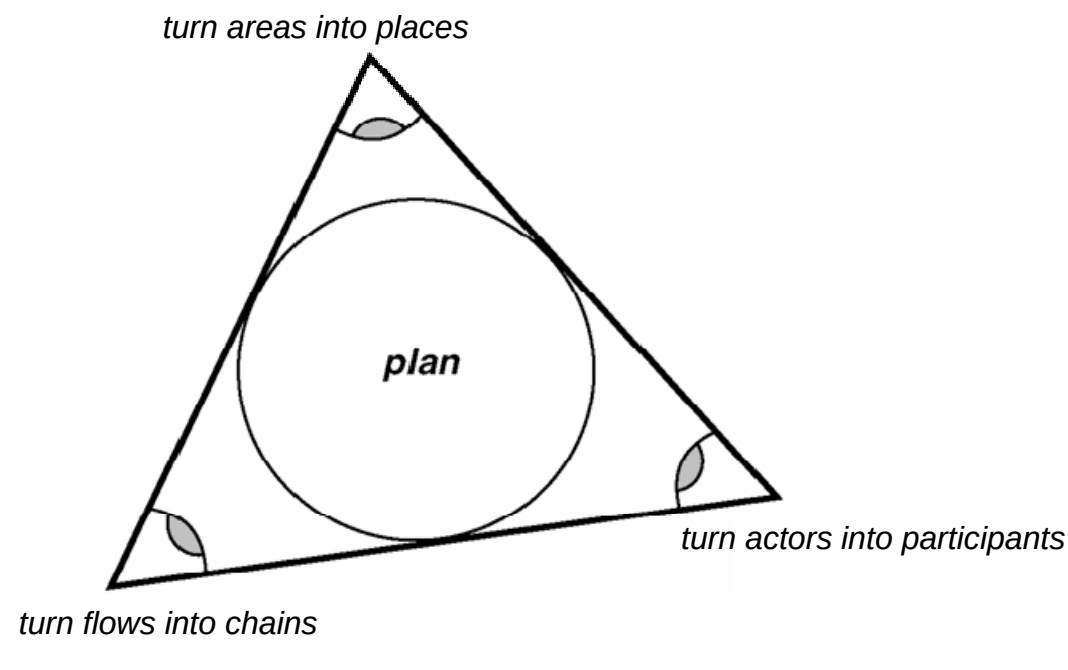

Fig. 2. From perspectives to strategies.

Turn areas into places is the planning strategy to use existing site qualities of nature and cultural history to develop the area into a place with identity and beauty. We may call this the ecological continuity of the urban landscape story. New functions may introduce a new chapter, but in some way the story of the place should be sustained.
The key question is: does the plan fit?

Turn flows into chains is the planning strategy to connect upstream and downstream elements by responsible management. Each link has a responsibility for the whole chain and this implies that problems should not be shifted to the neighbours. Sustainable flow management requires assuming responsibility for self-regulation and co-operation.
The key question is: is the plan effective and efficient?

Turn actors into participants is the planning strategy aiming at involving stakeholders (investors, businesses, government agencies, users, residents, ngo's) in the planning process. This implies that plans should combine financially feasible with socially just and ecologically sound activities, thus creating sustainable commitment to the area and flow qualities. The key question is: is the plan legitimate and does it create commitment?

These general *guiding principles* for sustainable urban development direct the making of planning concepts, the backbone of strategic plans, leaving specific standards, lines on the map and allocated budgets to the stage of operational planning. A more elaborate discussion of these strategic guiding principles is given in Tjallingii, (1996, 2004).

The river valley story described in the preceding section, may illustrate the role of guiding principles in a practical context. The Environmental Authority and the Water board are water *flow* oriented: the quantity and quality of the flow is their responsibility. However, the Authority's Class

B categorisation for the whole of the river does no right to the chain character of the river flow. Their pragmatic operational approach produces no incentives to other actors for real improvements. The Water board does assume responsibility for downstream pollution by installing sewer overflow control devices. This approach, however, misses the opportunities of disconnecting rainwater from the sewers and, in doing so, preventing overflows altogether. This would be an interesting planning concept, because it combines preventive rainwater retention upstream the rainwater flow with creating new urban places that make rainwater visible and may create commitment of residents to the catchment area project. Feasible or not, in the river valley story such integrated and sustainable options remain out of sight. A guiding principle approach of planning with water intends to explore exactly these planning concepts that combine flows', areas' and actor aspects with a view of sustainable urban development.

Planning concepts alone cannot create continuity. It is the process of making these concepts and making them work that creates a basis for sustainable development. Water planning can be driven by fear or fashion. But fear can fade away and fashion can evaporate. A good concept for sustainable development creates commitment to basic qualities that can carry variety and change.

4. Two Networks as Carrying Structures

It seems natural that integrating water in urban space requires space for water. Currently, Dutch water boards demand that 10% of the site of new developments should be available for surface water. In this way they expect to prevent flooding. Put in this way, it is a one-sided limiting condition imposed by the water-flow perspective. Rainwater rules the plan at high costs. In practice, designers seek to combine rainwater retention with other elements of the plan such as green spaces and public squares. This asks for a design strategy that creates good conditions for potential synergism between the role of water and other elements of the plan. The Two Networks Strategy is a conceptual model that can guide planners and designers to create the spatial structure acting as a carrying condition for effective synergism between urban activities.

the Two Networks Strategy

The strategy focuses on the role of water and traffic networks as carriers of urban development. The *traffic network* can be seen as a carrier of manufacturing industry, trade and commerce, but mass recreation and most types of modern agriculture are also highly dependent on traffic facilities. In this context the polarity between urban and rural is irrelevant. The traffic network feeds economic development on both sides. Traffic is not only linked to production and to noise and disturbance. It also includes public transport and cycle track networks, providing conditions to reduce the role of motorised vehicles in areas that need tranquillity. However, in all these cases the traffic network, as a planning instrument, can be very effective in channelling human activities, either by stimulating them or by preventing them.

The *water network* can be seen as a carrier of functions like quiet recreation and wildlife. By providing space for rainwater infiltration and retention it may create conditions for durable quality of green areas but also for sustainable production of drinking water and for other ways of using groundwater and surface water resources. As a planning instrument, the water network, including brooks and rivers, but also protected areas for infiltration, can be very effective in steering the optimal use of ecological potentialities of the local, more or less urbanised landscape. Thus the identity of the new landscape will reflect the old and the new. It is this combination of steering activities and using the carrying capacity of landscape and resources that makes the water and traffic networks useful as vehicles of the role of spatial planning in sustainable development.

Figure 3. presents the scheme of the *two networks strategy.* The two networks are the carrying structures of a zoning principle that goes from a quiet and clean green area to the left, to a more polluted and noisy business area to the right. Intensive agriculture is to be situated to the right of the area in the diagram; a vulnerable nature reserve is to be to the left.

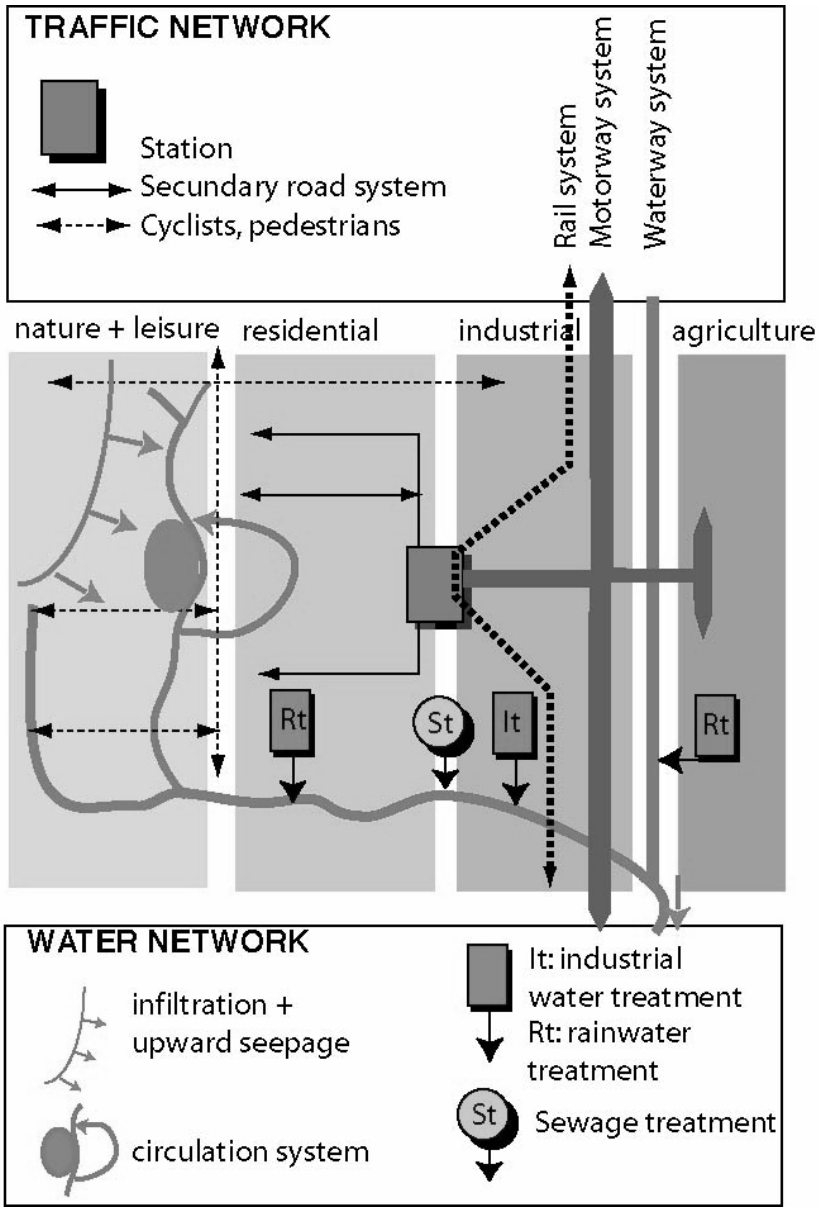

Figure 3. The Two Networks Strategy

Likewise, ecological agriculture can find a place in the left zone of the diagram. The water network's source area is the infiltration zone indicated with 'i' in the upper left corner of the diagram, representing an upland dry area that should not carry polluting functions like intensive agriculture. Upward seepage at the foot of the hill feeds the watercourses that run through the different zones. The ecological approach to water flow management follows the guiding principle that water should flow from clean to polluted. This, of course, does not mean that the business

area can discharge run off water without restrictions. On the contrary, the business area may have a purification system ‘p’ geared to the nature of the pollutants in that area.

The traffic network follows the guiding principles of concentration and zoning. Corridors favour concentrated efforts to abate noise, pollution and congestion. Moreover, the corridor also creates conditions for environmentally friendly public transport and bridging infrastructure barriers. The zoning principle implies that the motorway leads to a city highway entering the city through the business area and ending in a transfer station for goods and people next to the railway station. In the residential zone, of course, traffic is being slowed down and in the adjacent green areas larger spaces are created where cycle tracks and footpaths are the only traffic network elements.

From red and green to blue and grey. The strategy of the two networks, as a guiding model, offers an alternative to the traditional red and green models used to indicate the built-up and green areas in spatial urban planning: the classical concentric, finger, lobe and poly-nuclear city models. The two networks represent a blue and grey approach in which carrying structures constitute a frame for economic and ecological processes. These processes create conditions for contrast and diversity related to the history of the local landscape. The result may be richer and more sustainable than a picture based on the obsolete culture versus nature metaphor painted in red and green.

slow-lane and fast-lane

Central to the two networks approach is the emphasis on the contrasting worlds of dynamics and tranquillity as a basic quality of life. Figure 3. highlights this *slow-lane* and *fast-lane* polarity. The *slow-lane* is the less dynamic zone, quiet and clean, with water as a spatial carrier. It is the upstream area with an emphasis on water retention, slow traffic and slow spatial change.

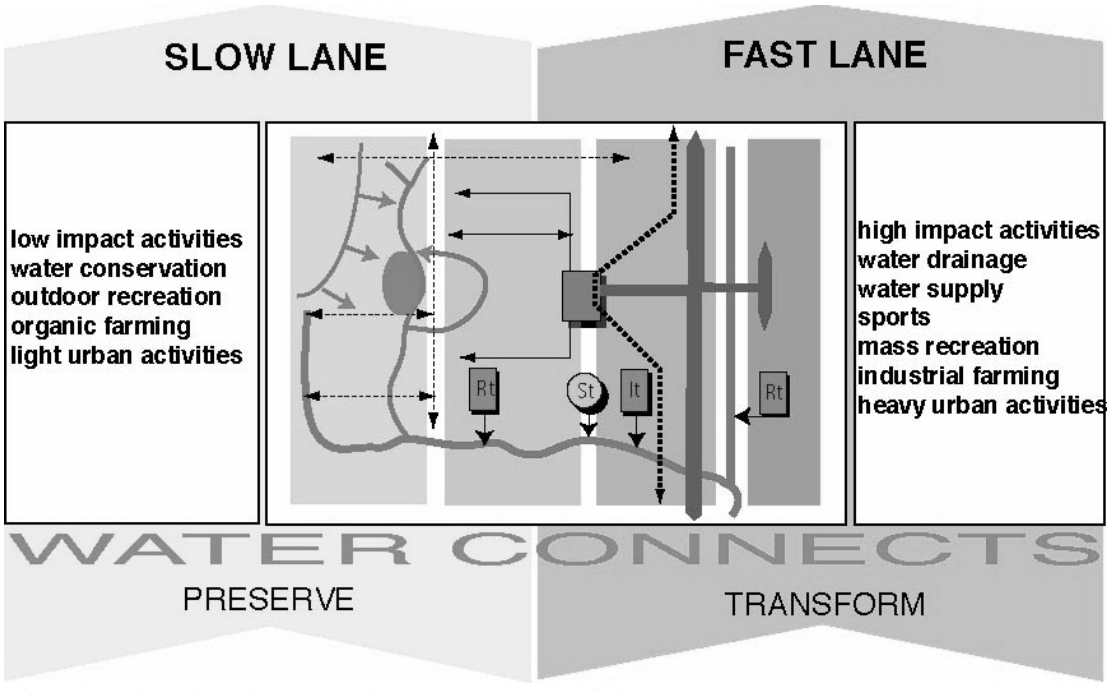

Figure 4 The slow-lane fast-lane strategy model

On the other side is the *fast-lane* world with dynamic economic activities, navigable rivers, high-speed traffic and rapid spatial change. In the slow-lane world the government may have an important management role to play. In the fast-lane world the government may, in the first place, create conditions for market forces.
It is the contrast between these two lanes that creates a diversity of intermediate zones. The guiding model invites planners and designers to structure slow-lane and fast-lane zoning. In this way they can create conditions for a meaningful and integrated role of water in the spatial plan for the urban fringe. In the PURE project the model was used in design workshops with groups of different actors from the four cities.

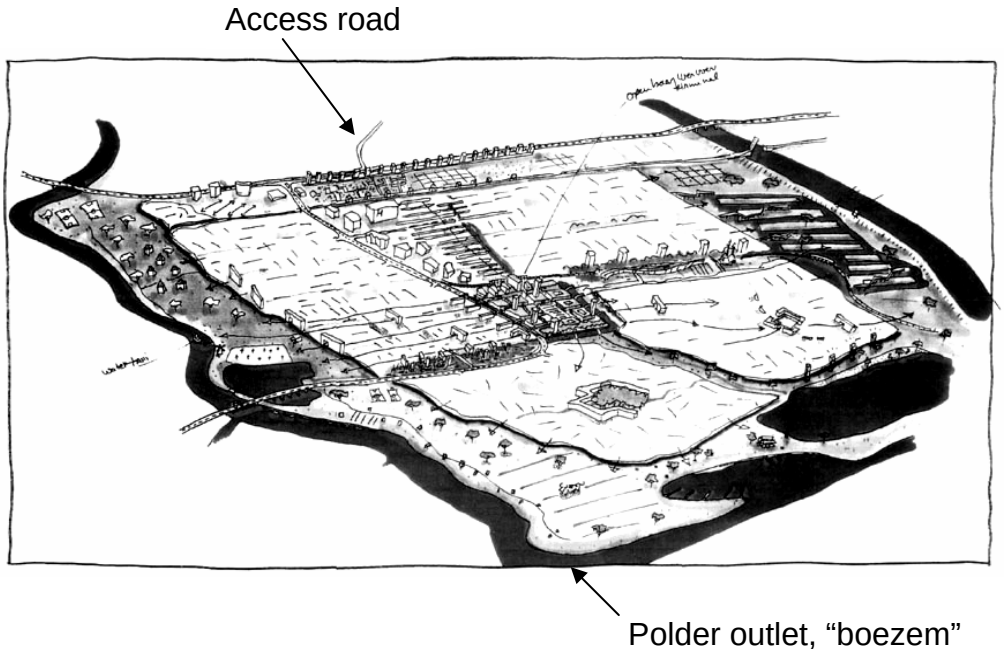

Figure 5. Haarlem Schalkwijk, Two Networks as carriers of a regeneration project.

Figure 5 illustrates how the strategy guided the planning concept of a regeneration project that will give a new future to a post-war apartment building residential development in the city of Haarlem. The plan concentrates traffic in the central corridor around the access road, leading to the revitalised shopping mall in the middle. This creates space in the urban fringe to combine water retention, nature, recreation and new dwellings with a beautiful view.

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