

# Green pays with TEEB City

Local authorities reason, reckon and earn  
with the benefits of nature and water



TEEB: The Economics of Ecosystems and Biodiversity

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# Green pays with TEEB City

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## Foreword

When I am asked to explain what 'TEEB City' means, which I have had to do on several occasions, I explain that TEEB stands for The Economics of Ecosystems and Biodiversity and that TEEB City is about the economic importance of nature and water in and around the urban environment. The next question is usually not long in coming:

*"What do nature and water have to do with economics?"*

In this publication you will find the answer to this question. Economics is about needs and scarcity. Everyone who lives in a city recognises the need for nature and water near the living and working environment. Taking a relaxing walk, listening to the blissful sound of singing birds; the beauty of a lake which serves the dual purpose of capturing and storing surplus rainwater, the cooling effect of trees in the street, and so on. Nature and water make a major contribution to the functioning of the city, and therefore also to the economy.

Research has shown that nature and water generate many benefits, for example in terms of health and housing satisfaction. TEEB City is intended to make those benefits visible, and where possible to translate them into clear financial terms. Where that is not possible, those financial benefits are still mentioned.

It is often the case that the government invests, while all kinds of other parties reap the benefits. The outcomes of the calculation tool used in this project could serve as a basis for a dialogue with those parties to persuade them to contribute to the investments. In a time of shrinking government resources, that could help ensure that measures are still taken to increase the presence of nature in our cities. That is good for biodiversity, because nature and water in and around the city provide a habitat for a wealth of valuable plant and animal species. But above all, it is good for everyone who lives, works and spends time in the city!



*Olaf Prinsen,  
Leader of TEEB City project and Apeldoorn municipal District Councillor*



“Everyone now realises that ecology  
and economy are inseparable.”

Loek Hermans, president, Greenport Holland



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Discover



# Discover the benefits

Reasoning, reckoning and earning with the benefits of nature and water

The TEEB City project enabled local authorities to learn through specific projects what benefits ensue from the creation of green spaces and water elements, how those benefits could be quantified and how beneficiaries could be involved as investors.

This taught them that projects in the public space can sometimes produce surprising economic benefits. The hope is that this experience will lead to benefits being included as standard in urban planning decision-making processes in the future.

At present, the social benefits of incorporating green amenities and water elements in spatial designs are often considered only retrospectively – or at least, that is the experience of Ursula Kirchhofes from Witteveen+Bos, the engineering firm that is supporting local authorities in this project. She sees this as a missed opportunity. A better option would be to calculate the potential costs and benefits of such projects in advance. It is then possible to see who benefits from the plan, and those beneficiaries can then be included in the process, enabling the plan to be optimised and increasing the enthusiasm of those beneficiaries to participate as co-investors. “The key is first to work out the benefits of the plan, then to do the calculation, and finally to look at where the opportunities for economic benefits lie.”

## Benefits

Ursula Kirchhofes explains the TEEB method using a fictitious case, in this instance a neighbourhood where flooding is a problem. The creation of a new and improved planting and water structure improves the water storage capacity and increases the size and quality of the area available for recreation. This generates several benefits.

One is a reduced risk of flooding: instead of flooding once every ten years, the cellars of local businesses and homes will flood on average only once every 100 years. That means annual savings of more than € 100,000 per year due to avoided damage, according

## What is TEEB City?

TEEB (The Economics of Ecosystems and Biodiversity) is an international project to study the economic significance of biodiversity and ecosystem services. The Netherlands is taking part through the national TEEB NL programme, of which TEEB City forms part. A number of Dutch local authorities have been participating in TEEB City since 2011, along with two government ministries (the Ministry of Economic Affairs, and the Ministry of Infrastructure and the Environment) and the engineering consultancy Witteveen+Bos, with a view to developing a method for automatically including the social benefits of nature and water in urban planning projects, land and property management and urban design, resulting in faster planning processes and more sustainable choices and financing of green projects.

## Green Pays!

TEEB City is the logical successor to the Green Pays! campaign promoting the great social and economic value of green amenities. Where the emphasis of this campaign in 2011 was on awareness-raising, the focus in 2012 is on how the TEEB method can be used in practice to calculate the value of greening the urban environment. Green Pays! is an initiative by parties working together under the banner of ‘The Green City’ (De Groene Stad) (Plant Publicity Holland, VHG sector organisation, HIC – promotie van Groen, ANWB, Groenforum Nederland, Entente Florale Nederland and Horticulture Marketing Board).

For more information on TEEB City, go to [www.degroenestad.nl](http://www.degroenestad.nl) or [www.omgevingseconomie.nl](http://www.omgevingseconomie.nl).



**"Demand for green construction projects is increasing partly because local authorities are having to balance different interests within a limited space."**

Nico de Vries, Chairman of the Board, BAM

to calculations based on key figures (see box: From social cost-benefit analysis to TEEB).

The benefits in the long term will be even greater, totalling over € 1.5 million. These benefits far outweigh the costs of introducing the new green features and water elements, making it an economically sustainable project.

### Contributions

The next question is to identify who receives these benefits, and whether those beneficiaries could contribute in some way to the costs of creating new nature and water elements. In this example, the local authority and the water board are advised to raise extra money by charging a levy to local businesses and local residents. That is fair, because they will no longer suffer loss and damage due to flooded cellars. A local authority could also save money by deciding not to install expensive technical solutions to store water, but to spend less money on smaller water storage facilities. By providing overflow areas as well, for example allowing sports fields to flood when necessary, it would be possible to create sufficient water storage capacity. Sports clubs would receive compensation from the local authority for the temporary use of their sports fields for the storage of excess water.

### Negotiation

Local authorities will make increasing use of such financing constructions in the future. The insight into the costs and benefits of measures provided by TEEB have made local authorities more aware that they are parties in a negotiation situation. "In the past," Kirchhofes says, "the local authority invested in greening the urban environment and the benefits accrued to local property owners and tenants. That can't continue". In the near future, costs will be shared more fairly. Developers, businesses, citizens and health organisations will be expected to make a bigger contribution to aspects such as liveability, housing, green spaces, nature and water. A clear economic framework that shows what the benefits are and makes clear which parties enjoy those benefits will be of help here.



### Setting to work

Local authorities participating in the TEEB City project applied this method to specific projects within their jurisdictions.

The size and nature of the projects ranged from a large-scale area development in Delft to the construction of a park in Apeldoorn, or the introduction of more green amenities in the inner city, as in Almelo. A number of notable benefits emerged from these projects which the local authority can work with straight away. For example, the costs of measures to improve biodiversity sometimes turn out to be very modest. Ideas for pavement planting or greening a neighbourhood environment by organising a seed-





sowing day are things that citizens can easily do themselves, and local authorities can directly encourage measures such as these. It is also worth remembering that the benefits of green measures are considerable in densely populated neighbourhoods with limited or poor quality green amenities.

In the longer term, the costs of green solutions also turn out lower than the costs of more technical solutions, mainly because green measures are often cheaper when the overall investment and maintenance costs are added together. As an added bonus, green amenities provide additional recreational and natural assets. Where technical, non-green solutions are not strictly



### ***From social cost-benefit analysis to TEEB: sustainability as a guiding principle***

*The social cost-benefit analysis is based on the notion of sustainable development as defined in the Brundtland Commission Report (1987): 'the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'*

*In 2000, the Dutch government decided to make it mandatory to carry out a social cost-benefit analysis for all major infrastructure projects. A standard method was developed for this, the Infrastructure Impact Summary, or OB Guideline. In 2004 this Guideline was expanded to include values for nature, water and soil. In 2006, this was followed by the publication of key figures for ecosystem benefits. This reference work enables the benefits of different ecosystem types, including urban greening projects, to be calculated in euros and to be weighed against the costs.*

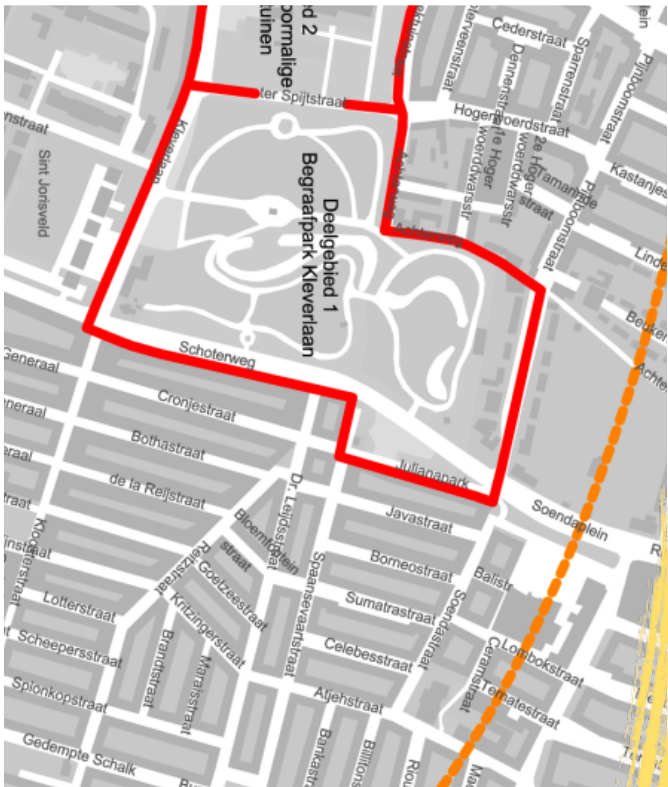
*Using the Guideline and the key figures, many green and non-green projects have been evaluated in 2012. The TEEB method has been developed as a way of costing out the benefits of green amenities during the planning stage, rather than retrospectively, for developments, land and property management operations and spatial design projects.*

necessary, therefore, local authorities can consider cheaper, green solutions.

It also turns out that the financial benefits from greening the urban environment are much greater than local authorities initially thought.

Getting together at an early stage with those who will enjoy the benefits has also been found to contribute to a more socially beneficial project, more public support and a faster process.







# Haarlem

## Kleverlaanzone area development plan

**Goal:** Statistical support for the participative development of the plan.

### Project

The project provides a common thread for the development of the site of the former municipal nurseries in conjunction with the maintenance and strengthening of the historic, green, recreational and educational qualities of the entire Kleverlaanzone area.

The aim is to develop the Kleverlaanzone site as sustainably as possible, in a way which is largely self-sufficient. The project will involve sustainable construction, sustainable energy consumption and recycling. The key question for new developments is 'What will it add to the Kleverlaanzone site?

### TEEB approach

The Kleverlaanzone development plan is a digital participation pilot project by the local authority of Haarlem. A separate website was built for this, with a view to encouraging stakeholders to form an opinion and to garner ideas for the site and its constituent parts. The participation led to four interventions on the site as a whole, together with a growth scenario

for the municipal nurseries.

An implementation strategy was formulated for this growth scenario, entailing projects from a park to a water park (eco), covering the next 20 years. This was costed out using the TEEB method.

### Outcomes

- *Calculated benefits: € 1.3 million*
- *Estimated costs: € 1 million*

### Benefits

- *recreational value*
- *vacancy rates and costs reduced or eliminated*
- *greater housing satisfaction*

### Beneficiaries

- *property owners*
- *local residents*

### Results

The digital participation set-up led to the close involvement of many stakeholders, on both the costs and benefits side. This forced the local authority to keep the participation process open and fair to the end. The result was a broadly supported development plan for the site.

Despite a number of dilemmas and opposing interests, parties were able to talk to each other, both via the local authority and directly, thus generating greater support for the project.

### Follow-up

The result of the social cost-benefit analysis will become clearer as the development of the growth scenario and the detailing of the interventions progress. This means that adjustments can be made if needed.

## Factsheet Den Haag



Discover





# The Hague

## Erasmusveld, the most sustainable neighbourhood in the Netherlands

**Goal:** To implement the plans by involving the beneficiaries and making the benefits of investing in improving the existing ecological corridor visible.

### Project

A master plan has been formulated for the area between the Wateringse Veld housing development and the Den Haag Zuidwest neighbourhood, with the ambition of developing the most sustainable neighbourhood in the Netherlands. The 52 ha Erasmusveld site contains more than 750 homes and a combined sports facility with hockey and football pitches. The project involves further strengthening and extension of the ecological corridor and incorporating approximately half the existing allotments. In the original implementation strategy, the city council played an active role and covered most of the financial shortfall. As a result of the economic crisis, this strategy has been amended to one of facilitating private and market initiatives.

### TEEB approach

In the original approach, the investments in green features were expressed primarily in terms of costs, and to only a limited extent as benefits (via the enhanced open-market purchase price of new-build homes). The same applied for

energy and water. In light of the high sustainability ambition for the neighbourhood, a new financial and organisational model was developed for the aspects energy, water and material flow management. By adopting a longer time horizon and involving parties other than the traditional beneficiaries in the plans, investments in energy, water and material can be made economically viable. This was calculated using a TEEB analysis.

### Results

In spatial development projects, it is important to look at the whole chain. Development and management need to be brought more into line with each other, and a detailed stakeholder analysis needs to be carried out in advance. Based on the TEEB analysis, stakeholders are approached for the joint formulation of a business case in relation to green amenities

### Follow-up

The envisaged development sites are still largely in the hands of property developers and private individuals. Since these parties still hold conventional ideas about area development, the quest for forms of value creation other than property development is a very gradual process.

### Outcomes

*The qualitative analysis has been carried out. The quantitative analysis is not yet complete.*

### Residents:

*More comfort in the home straight away; considerable saving in housing costs over time.*

### Water system:

*Reduced problems from excess water; lower water treatment costs; lower management and maintenance costs.*

"TEEB brings both the social effects and the desirability of a project into sharp focus, as well as the financing options."

Mary-Ann Schreurs, Portfolio Holder for Innovation, Culture and Public Space, Eindhoven





# Reckoning with benefits

Benefits arise through interventions in the environment to bring about a change in physical or social quality. For example, planting trees (measure) generates clean air through the capture of particulates (environmental quality), and people who breathe that clean air are healthier (benefit).

Reckoning with benefits starts right at the beginning, with the problem analysis to identify good and bad site qualities. If measures lead to an improvement in bad environmental qualities, this creates benefits. By estimating who benefits from a quality improvement and how big that benefit is, it is possible to construct a ranking showing which measures generate the highest benefits.

The following rules apply when assessing the size of a benefit:

- **Quality improvement:** The worse the initial situation, the greater the benefit.
- **Effectiveness:** The more effective the measure is, the greater the benefit. Often, the influence of the measure on quality increases if the measure tackles the underlying cause of the problem rather than addressing symptoms. The benefit is also greater when one measure has several different effects.
- **Number of beneficiaries:** The more beneficiaries, the greater the benefits.
- **Size of benefit:** The greater the benefit for each individual beneficiary, the greater the overall benefit.

- **Matching need:** The more demand (need) there is for an improvement in a particular quality, the greater the benefit. If an environmental quality improves but there is no demand/need for it, there is no benefit.

- **Timing:** Benefits are greater if they occur earlier, more often and last for longer. Ensure that the costs of the measure do not run too far ahead of the benefits. Start by tackling the most urgent problems and address the less urgent issues later.

- **Cost saving:** If two measures deliver the same result, choose the cheaper one.

The size of a benefit is related to the degree to which the environmental quality improves and how much the community benefits from this. For example, trees make the air cleaner (reduction in grams of fine particulates per m<sup>3</sup> air). That generates a health benefit that can be expressed as the number of people who do not fall ill with asthma or respiratory complaints, multiplied by the costs of medical treatment that are saved as a result. By deducting the costs of planting the trees from this benefit, it becomes clear whether or not the measure pays.

## The biggest welfare benefits arise at the start of the process

By linking measures to benefits and beneficiaries right at the start of the planning process, a better plan can be realised with higher social value added, greater commitment from stakeholders, innovative solutions and outcomes that meet expectations.

Even though sustainability is frequently mentioned in municipal coalition agreements (2010), the benefits of nature are not automatically incorporated in key municipal planning instruments such as structural concepts, zoning plans and licensing procedures, nor are they included in calculation instruments used for land management, for example. The benefits of green features are also generally only considered late in the planning process, whereas major welfare benefits can actually be made right at the start of the process, when devising solutions that generate benefits.

### Trees help boost retail sales

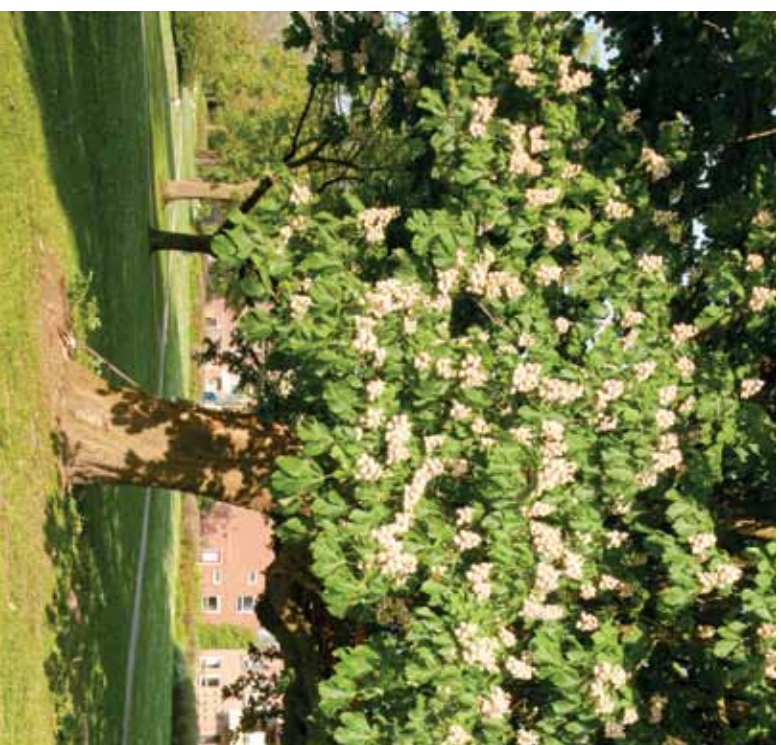
One example can be found in the local authority of Almelo. The town centre needs to be smartened up; the buildings and retail offer leave much to be desired and there is little to make it attractive for people to spend time there. Among the proposed solutions, one idea is to plant trees. However, this turns out to be an expensive measure because the subsoil is full of cables and pipelines. Relocating these would be costly and the local authority is therefore hesitant about the tree-planting plan because it sees it as too expensive.

If only the costs are considered, there is a high chance that the plan will be quickly swept from the table. However, if the benefits of this measure are also enumerated and the beneficiaries identified, a different picture emerges. Trees not only make the town centre look more attractive, but research has shown that they also increase consumers' propensity to spend. Moreover, trees clean the air by capturing particulates and provide shade to create a more pleasant microclimate. Retailers, local residents, people visiting the town for recreation or day trips all benefit from these improvements. Because so many parties in the town

centre benefit from the planting of trees, this seemingly expensive measure is nonetheless economically viable. (See also page 19 Almelo; Underground benefits in the town centre.)

### Better outcome

The issue in Delft is a different one. Plans have been on the table for some time for the construction of around five thousand homes in the Delft-Zuidoost district of the city. However, an Environmental Impact Assessment (EIA) compiled in 2010 showed that the extra building would create problems with surplus water. The project would also reduce the area of green space and





nature per inhabitant, thus impacting on liveability.

To avoid these negative consequences, the council appealed to the stakeholders to formulate integrated plans which drew together the construction, green and water elements.

"Developers view calls like that with distrust", says Maartje Scholten, project manager for green space and water amenities in the local authority of Delft. "Their first question is, 'How much will it cost?' A better outcome is achieved by mobilising all stakeholders. But how?" By placing the emphasis on the benefits rather than the costs," says Scholten. "What will new, better plans deliver?" In her experience, it then becomes interesting for stakeholders to continue engaging with the project, and this creates new energy. (See also page 21 Delft: Green space and water in Delft Zuidooost.)

### Meeting expectations

Area development projects are often accompanied by high expectations. But are those expectations always met? The town

of Haarlem wants to make the Kleverlaanzone site greener and more accessible. This is expected to bring a big improvement, especially for the residents of the nearby Indonesian neighbourhood, where there is very little greenery. But the local authorities asked itself whether this assumption was correct. "We want to be able to demonstrate what the benefits of our plan are", explains policy officer Diana Bakboord. Simply setting out the measures and benefits clearly can optimise the plan for the Kleverlaanzone site. Survey findings showing that residents wish to keep the area of green and open can be used by the local authorities to improve its plans for the site: the more closely the plans match people's needs, the greater the benefits. (See also page 9 Haarlem: Kleverlaanzone area development plan).

### Innovative solutions

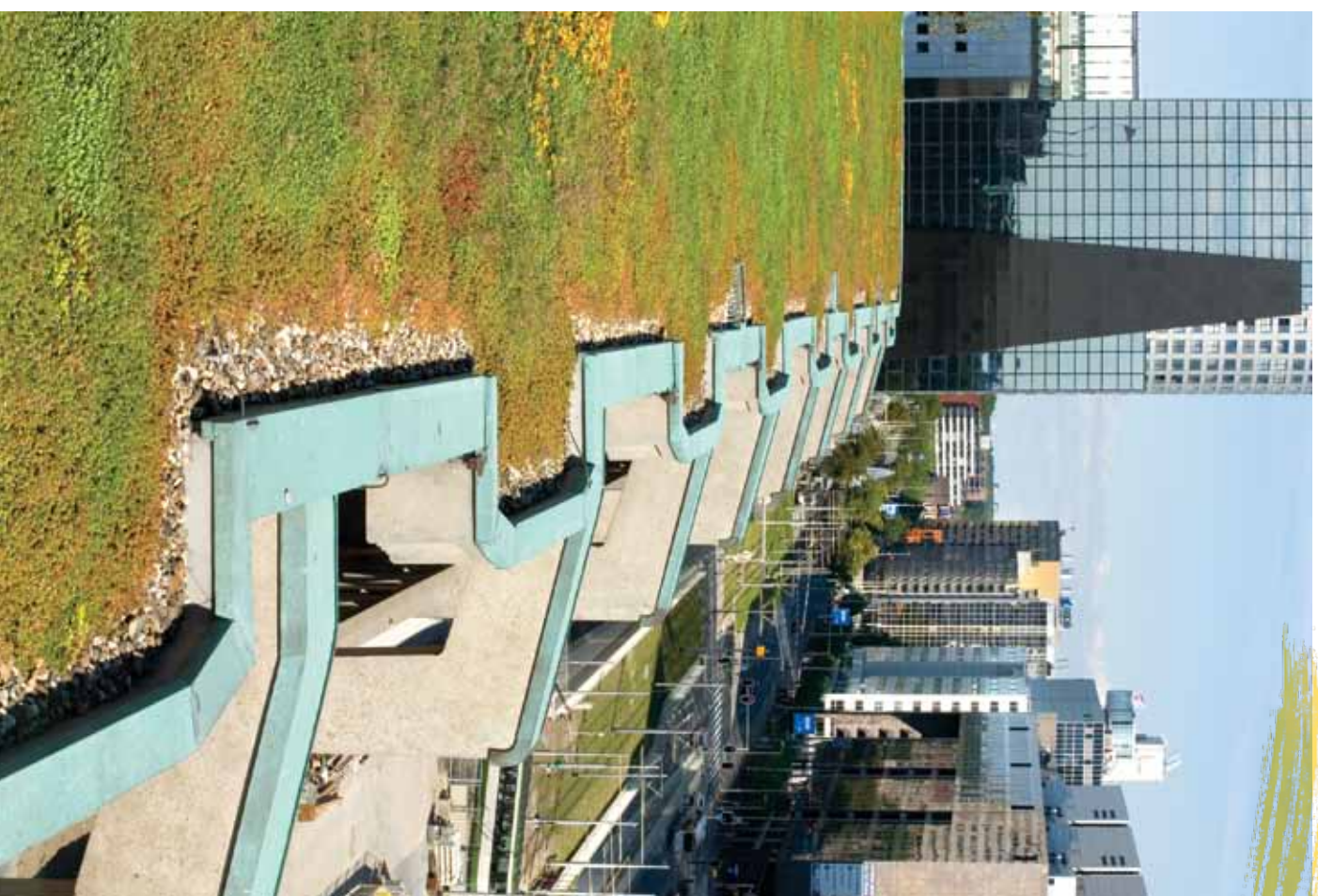
Matching people's needs more closely was also the motivation for Rotterdam to apply the TEEB method to its development plans for the Merwe/Vierhavens dockland site. The dockland sites developed to date, such as Wilhelminapier and Lloydkwartier, offer cultural facilities but are lacking in green spaces, and residents and users have expressed a desire for nature and recreational amenities. Rotterdam also needs low-level urban dwellings in an environment surrounded by nature and water. This is an indication that simply building more of the same is not a good idea. Particularly in this time of crisis, when investments are difficult to find, creating green spaces appears to be more necessary than ever. As a solution, one idea is to build floating homes on the Merwe/Vierhavens site, in a green environment, and to build two tidal parks. According to landscape designer Ronald Bakker from Rotterdam council, both solutions are innovative. "The original plan included floating homes, but without any green spaces. And the tidal parks are also genuinely different from the existing parks in the area. Thinking from the perspective of the benefits when formulating a green development plan has genuinely led to something other than standard solutions.

In taking these measures, the city is exploiting the potential of this unique bit of Rotterdam to the full", he concludes. Whether these innovative green investments will also deliver financial benefits remains to be seen, because the biggest gain is in the added value of the homes. "In the present climate, with a completely flat housing market and falling prices, it's hard to see where you can make those gains. We did anticipate this situation, though, by opting for affordable houses rather than flats, a housing category which still sells best."



“Every investment in green amenities almost automatically has a positive effect on the climate. If we could obtain a contribution for that, more could be invested in those amenities.”

Robbert Linnekamp, president of the Dutch Climate Alliance (Klimaatverbond) and an Councillor in Zaandam





Putting TEEB into practice

The TEEB guide helps you analyse the situation and opportunities step by step. Ask the following questions and start analysing:

1. What are the biggest bottlenecks or opportunities? Compare the qualities of the site with the average qualities in the city or neigh-

bourhood and draw up a list of good and bad qualities.

2. Which qualities need to be improved? Look at which improve-ments will produce the biggest benefits for which group. TEEB provides useful tables for linking qualities to benefits. Fill in those tables. This will generate priorities in the list of envisaged benefits.

Measures: creating green amenities and water elements (more and better)			
Quality changes		Benefits	
Air quality			
<ul style="list-style-type: none"><li>• better air quality through capture of particulates by trees, reeds, sedum roofs, (PM10, NO<sub>x</sub>, SO<sub>2</sub>);</li><li>• better air quality through storage of CO<sub>2</sub> in trees, reeds, sedum.</li></ul>		<ol style="list-style-type: none"><li>1. better health due to better air quality;</li><li>2. reduced CO<sub>2</sub> emissions</li></ol>	
Energy			
<ul style="list-style-type: none"><li>• better outdoor microclimate (wind) thanks to shelter by trees;</li><li>• better insulation capacity through sedum roofs;</li><li>• better outdoor microclimate (temperature) thanks to shelter/insulation by trees/sedum roofs.</li></ul>		<ol style="list-style-type: none"><li>1. avoided energy costs due to better shelter;</li><li>2. avoided energy costs due to better insulation;</li><li>3. better climate safety due to energy savings resulting from more shelter and insulation;</li><li>4. better health due to reduced heat stress.</li></ol>	
Economy			
<ul style="list-style-type: none"><li>• more attractive outlook from homes and offices thanks to green amenities and water.</li></ul>		<ol style="list-style-type: none"><li>1. higher value homes.</li></ol>	
Recreation			
<ul style="list-style-type: none"><li>• more recreational capacity thanks to green amenities and water.</li></ul>		<ol style="list-style-type: none"><li>1. more recreational value for residents through more recreational capacity.</li></ol>	
Community			
<ul style="list-style-type: none"><li>• more social cohesion between residents due to more green amenities (planting) and water (pond) through more meeting opportunities;</li><li>• more social cohesion between campus employees via meeting opportunities in the green space.</li></ul>		<ol style="list-style-type: none"><li>1. avoided costs of moving home due to more social cohesion;</li><li>2. more labour productivity due to more innovations through more cohesion (meeting).</li></ol>	
Nature			
<ul style="list-style-type: none"><li>• more biodiversity;</li><li>• reduced risk of flooding due to greater storage capacity.</li></ul>		<ol style="list-style-type: none"><li>1. more genetic value due to biodiversity;</li><li>2. avoided flood damage through more surface water storage;</li><li>3. avoided costs of sewer expansion due to reduction in water discharge to sewer;</li><li>4. avoided water treatment costs due to absorption of nutrients (P, N) by reeds.</li></ol>	



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Reckoning



# Almelo

## Underground benefits in the town centre

**Goal:** Understanding the added value of a more attractive town centre.

### Study

The local authority of Almelo has a development plan for the town centre which it hopes will lay the basis for a new, sustainable urban structure. The plan makes Almelo town centre more versatile, more compact and readily accessible. The restoration of the historic canal route will bring the harbour back into the town centre. A logically laid out and compact shopping circuit will offer opportunities for new retail outlets. New residential developments will make the town an attractive place for many people to live.

### TEEB approach

The TEEB tool makes clear what the main action perspectives are for the underground infrastructure and how these can be anchored in the planning process.

### Outcomes (40 years)

*Calculated benefits: € 3.8 million*

*Estimated costs: € 0.8 million*

### Benefits

- Relocation of cables and pipelines to facilitate tree planting
- Installation of soil energy systems

### Beneficiaries

- Retailers (+ € 2.7 million)
- Local residents (energy-saving + € 0.7 million, increased housing satisfaction + € 0.3 million)

### Results

Reckoning in terms of benefits has great added value for the thought process and for involving colleagues.

### Follow-up

Almelo wishes to incorporate the theme 'underground' as an intrinsic part of the spatial planning process. The project offers tools for doing this in a practical and relevant way. Stakeholders will be speaking the same language and the project results will raise awareness about the costs and benefits of the underground works for both internal and external parties. The positive outcome will inspire what follows.

## Factsheet Delft



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## Reckoning





# Delft Green space and water in Delft Zuidoost

**Goal:** Chart the benefits of creating green amenities and water elements in parallel with the construction of new homes.

## Project

The building of 5,000 homes in Delft Zuidoost is being combined with water storage and the creation of green space.

## TEEB approach

The TEEB model was used to calculate the benefits of 180 measures, ranging from water storage in crates beneath the road to the installation of green roofs and living walls.

## Results

Reckoning in terms of benefits adds a new dimension to the design process. Placing the central focus on benefits and gains instead of costs and constraints generates new spatial solutions which are supported by the beneficiaries. There is now a realisation that the stakeholders are jointly responsible for the sound development of the area.

## Outcomes

*Calculated benefits: € 27 million  
Estimated costs: € 17 million*

## Benefits

- Greater housing satisfaction
- Reduction in flooding
- Improvement in health (related to air quality)
- Increased recreational opportunities
- Avoided costs of moving home (due to increased social safety)
- Energy saving

## Beneficiaries

- Local residents
- Local businesses
- Delft University of Technology
- Delfland Water Board
- The local authority
- Project developers
- Housing associations

## Follow-up

The beneficiaries began by securing a number of 'quick wins'. For example, work on culverts and ditches was carried out at the same time as drainage and roadworks. Also, a biodiversity garden was created in collaboration with the residents of two apartment complexes. The beneficiaries negotiate about who will bear the investment costs for which measures. The starting point is linking measures to activities or development projects already planned and to align as far as possible with the core activities of each stakeholder.

“Calculating benefits and identifying beneficiaries doesn't mean that a local authority can withdraw its investments. It's about cooperation. Seek out those parties which benefit most from an investment.”

Bert Gijlsberts, president of horticultural sector organisation VHG





# Reckoning with benefits

A measure to improve quality generates a certain benefit.

For example, planting trees (measure) leads to a nicer outlook (quality improvement) and this increases the value of the homes which look out onto the green area (benefit).

Three types of information are needed for calculating a benefit:

- data relating to the measure, e.g. the number of trees to be planted;
- site data, e.g. the number of homes in an area;
- generic key figures, e.g. the rise in the value of homes with a view of trees

To calculate the size of the benefit, it is necessary to know how many people will benefit from the measure. The zone of influence of the quality change determines the **number of beneficiaries**. If the outlook of homes in a street is improved by planting a row of trees, those households which look out directly onto the trees enjoy more housing satisfaction. If a park is constructed, households in a radius of 400 m have more housing satisfaction.

Key figures for benefits are experiential figures which predict the benefit and the price of that benefit. These figures can be applied generically, but of course, the more specifically they fit a given situation, the more accurate the prediction of the benefit will be. For the benefit 'recreational value', for example, a distinction is therefore made between different types of nature: a wood can facilitate more recreation than a grass field or a lake, for example.

In order to assign a particular value to the benefit, a range of **pricing techniques** are used. One of these is the consequential loss method, which calculates the costs that people incur after loss or damage has occurred. For example, if the capacity of the drains is insufficient following heavy rainfall and homes and businesses are flooded, this leads to flood damage; businesses lose sales due to temporary closure and home occupants and businesses incur repair

and rebuilding costs. The cost avoidance method is another pricing technique. With this method, the costs that people incur in order to avoid a situation are quantified. An example are the costs of moving home that people are prepared to incur in order to escape the decaying neighbourhood in which they live.

Yet another pricing technique is the travel costs method, in which the travel costs that people are willing to pay in order to seek out a specific situation are quantified. An example of this would be where the attractiveness of a park increases and people are consequently willing to travel further and incur higher travel costs in order to visit it.

Extensive measurements are carried out in order to improve existing key figures and derive new ones. Key figures for predicting green benefits have now been brought together in a number of reference works (Ruijgrok at al., 2011, 2006; Bruyn at al., 2010). These reference works are used in the TEEB method.

In most green projects, land is an important cost factor. But what land value should be taken as a starting point when performing a social cost-benefit analysis? The value of land is difficult to pin down; it is a matter of speculation, sentiment and strategic positioning. In a social cost-benefit analysis in which the prosperity effects of an existing and a changed situation are compared, the most objective possible land value is taken as a basis. That is the social utility value of the land before any changes take place. For example, if the land was formerly used for agriculture, the market value of agricultural land is taken as a basis. If this land is used for green space in the changed situation, this takes place at the expense of future agricultural production from that land. This loss of agricultural production is counted as a cost item. It is important to remember that this is the value of the agricultural land without speculation (for example based on a change of use to business or residential use), and the bare land value is also stated.



A social cost-benefit analysis ignores the costs of acquiring the land. Land does of course have to be purchased in order to realise a green project. For the initiator (e.g. local authorities) these are costs, but for the landowner (e.g. a farmer or developer) they are benefits. Since both parties form part of the same community, in a broader social perspective the land acquisition costs are in reality a shift in prosperity. They therefore play no role in the social cost-benefit analysis.

The later costs and benefits occur in the process, the lower the value that is assigned to them. When using the TEEB method,

therefore, it is important to indicate the phase in which the costs and benefits arise. It is also essential to state whether a benefit is a one-off or annually recurring one. By applying a discount factor (based on the official discount rate of 5.5% for social cost-benefit analyses), it is then possible to convert the value of a future cost or benefit to its present value. A **net calculation** can then be made that provides an insight into the costs and benefits over a specified number of years.

Source: TEEB in de Stad, handleiding bij het rekeninstrument voor de baten van natuur en watermaatregelen, Witteveen+Bos, April 2012.



## Investing profitably in green amenities requires calculation of the benefits

Calculating the financial value of benefits makes clear whether a project is socially profitable. And local authorities think that is interesting to know. “You don’t want to go down as a council which throws away money”. The greatest green benefits arise when green amenities form an integral part of a plan.

Keep a tight hold of the purse strings or continue to invest? Local authorities are wrestling with this question now that the economy is not going so well. The local authority of Apeldoorn, too, is in a difficult position, facing large financial deficits. Despite this, the construction of Zuidbroek Park is still going ahead, albeit at a slower pace. Is that wise? Apeldoorn thinks so. “The park could serve as a driver to boost home sales”, explains Jolanda van Sikkelerus, programme manager for the council. She justifies her expectation by citing the outcomes of the calculations made for Zuidbroek Park in the TEEB project by the engineering consultancy Witteveen+Bos.

### Interesting results

“It’s quite a task gathering all the information, but the calculations have produced interesting results”, says Van Sikkelerus. It transpires that the greatest benefit of the park is an increase in housing satisfaction. In addition, the presence of the green space increases the assessed value of existing homes and the sale price of new homes. Armed with this understanding of the benefits created by the park, the council wants to look at whether it can persuade stakeholders to sharing in the investment. “There’s a mutual interest here”, argues Van Sikkelerus.

Both the local authority and the developers want the planned Zuidbroek residential development, on which work has stopped due to the crisis, to be built. The construction of the park will boost this ambition and is moreover justified by the quantifica-

tion of the benefits: at the moment, only residents of the existing Zevenhuizen neighbourhood will benefit from the new park; however, if the Zuidbroek development goes ahead, the benefits from the park will be much greater. (See also Page 29 Apeldoorn: Zuidbroek Park.)

### Risky question

A similar picture emerges from the calculations by the local authority of Deventer. As part of the redevelopment of the Zandwetering suburb on the northern periphery of the city, the local authority is constructing a park. Next to the park, a new residential development, Steenbrugge, is also planned. However, the economic crisis has pushed the new-build plans onto the back burner. “We wanted to know whether building only the park was a worthwhile investment”, says landscape architect Marlies Spreen from the local authority of Deventer. It is a good question, but not without risk when the first spade went into the ground at the start of this year for the construction of the park. Spreen: “We were on a travelling train. There was no way of stopping it. And of course, you don’t want to go down as a council that throws away money. That thought made us nervous about subjecting this project to the TEEB method”.

Despite these fears, Deventer decided to have the costs and benefits of two alternatives for the redevelopment of Zandwetering calculated: constructing Zandwetering Park with and without the adjacent Steenbrugge residential development. The outcomes of the calculations showed that constructing the park would not be money thrown away. Both alternatives generated a net positive outcome, though the alternative in which both the park and the housing development were built scored better because the number of beneficiaries increased: more people would be able

“TEEB makes clear that green amenities are important. As well as an earnings model, it also offers substantive arguments for engaging in dialogue with the market.”

Margriet de Jager, Portfolio Holder for green amenities, local authority of Deventer

to enjoy the park. (See also Page 31 Deventer: Construction of Zandwetering Park and Steenbrugge residential development).

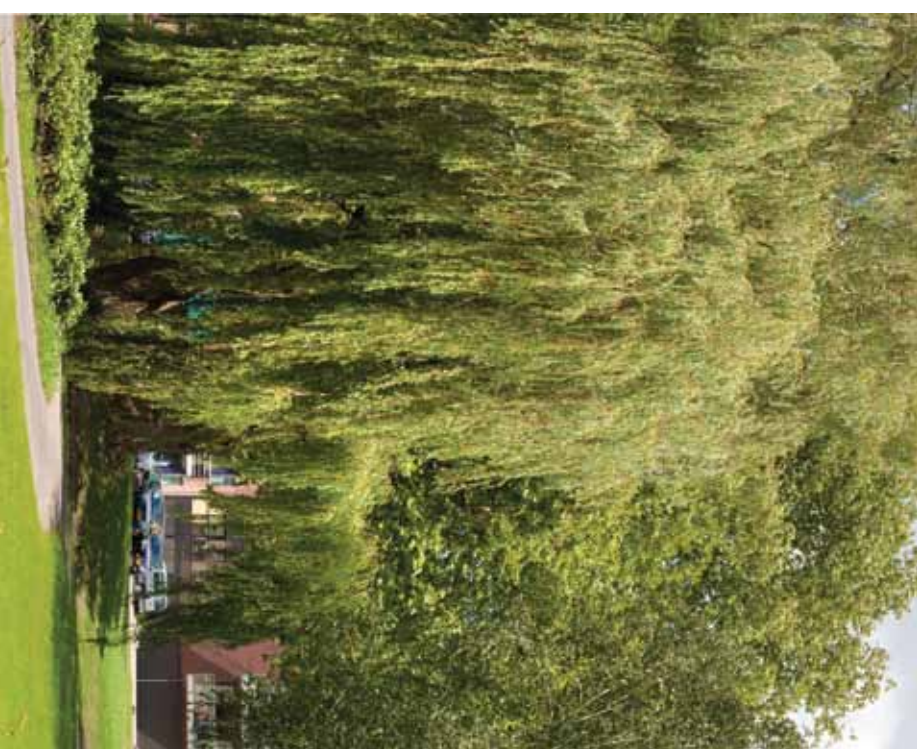
#### Match

Spreen says the model was complicated, and the local authority relied heavily on support from Witteveen+Bos to perform the calculations. Yet she is positive about the method. “There were more green benefits than I had initially thought”. She does wonder whether some of the key figures used reflect the specific situations in practice accurately enough. As an example, she cites the benefit ‘recreational value’. The key figure for this benefit incorporates the assumption that the highest benefits of a new green recreational amenity are likely to occur in areas with a great shortage of such amenities. “There are already lots of green spaces in the east of the country, where Deventer is situated, so the model predicts that constructing a park will generate fewer benefits. I don’t agree with that. Even in Deventer there are large brick and concrete neighbourhoods with little green, where building a park would contribute a great deal to improving the recreational amenity value for residents, and where benefits would therefore be high.”

She also thinks it is a pity that some benefits cannot be quantified because of a lack of suitable key figures. “As a local council, benefits such as health improvements and a better business settlement climate are just the kind of things where you would like to score highly, but we had to leave them out of our calculation.”

#### Potential

Landscape architect Ronald Bakker from the local authority of Rotterdam would also like to see figures for a number of benefits. The decision to build fewer homes on unembanked alluvial land in the Merwe/Vierhavens development and to build floating



homes instead generates a potentially large benefit in the form of avoided flood damage. “In our calculations we concentrated on the green elements, and the flood benefit is therefore missing from the final conclusion”, says Bakker

On the other hand, the benefit ‘avoided dredging costs’ does come out clearly in the calculations. The creation of a tidal park means that the Merwehaven and Keilehaven harbours do not need to be so deep, enabling the local authority to save a considerable sum in dredging costs. Moreover, extra dredge spoil from the city’s canals can be dumped in the harbours instead of having to be taken to the more distant depot at Heenvliet. This means a saving in transport and processing costs. “The understanding





### Putting TEEB into practice

The TEEB guide helps you analyse the situation and opportunities step by step.

Ask the following questions and begin calculating:

1. Which measures lead to the envisaged quality improvements? Convert the qualities into measures. TEEB provides tools for this, too, resulting in a list of measures.
2. Do the measures generate social benefits? The greater the improvement and the more people who benefit, the lower the costs and the higher the social profit. Tools for calculating these benefits have also been developed in TEEB. What comes out is a list of net costs and benefits, beneficiaries and opportunities for improvement.

#### Greenhouse gas reductions through energy saving thanks to shelter and insulation

Climate safety (€ per year) = Y cubic metres reduction in gas consumption per year (X kg CO<sub>2</sub>) (X euros in emissions trading price per kg)

Cubic metres per year	17,600
kg CO <sub>2</sub> per cubic metre of gas	1,79
€ per kg CO <sub>2</sub>	0,015
benefit in € per year	473
benefit in € (long term)	7,608

Source: TEEB in de Stad, handleiding bij het rekeninstrument voor de baten van natuur en watermaatregelen. Witteveen+Bos, April 2012.

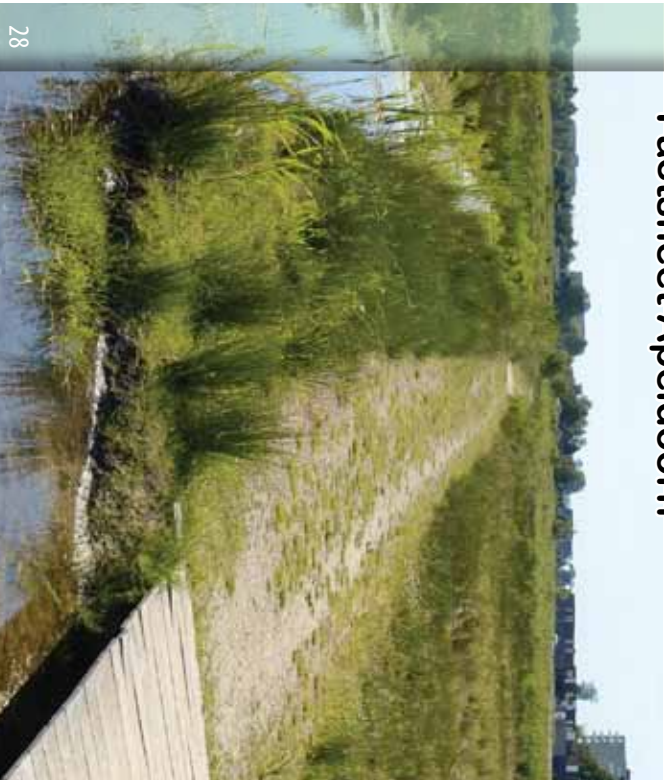
that green space in this specific form of a tidal park generates benefits that wouldn't arise with other types of green amenity is very inspiring," says Bakker. It makes clear that it is not a question of simply adding green elements to a design, but that the type of green amenity is important and that green amenities must moreover be an integral part of the plan. Only then are the greatest benefits achieved.

Bakker stresses again that the decision to construct a tidal park in the Rotterdam situation is unusual. "A park like that has special qualities. There's nowhere else in Rotterdam with one like it. So it has extra added value for animal life and residents alike. The improvement in biodiversity created by the freshwater tidal

environment was included in the benefit calculations, but I would like to see those benefits substantiated more specifically and robustly. It's a pity the extra added value is still difficult to quantify."



## Factsheet Apeldoorn



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Reckoning



**Goal:** To determine the benefits of a new park adjacent to the Zuidbroek residential development.

### Project

A park of approximately 28 ha is being constructed in a new neighbourhood that is being developed. The park forms part of the Groene Mal, an interconnected green infrastructure network in and around the town. The park will not only serve the immediate neighbourhood, but will also provide a link between town and country. Water, nature, cultural history and recreation will go hand in hand.

### TEEB approach

The benefits for the new neighbourhood and for the existing local neighbourhoods were calculated for five aspects, namely increased housing satisfaction; increased recreation; reduced flooding and improved water quality; improved health due to air quality and climate; and reduced energy consumption.

### Results

Investing in Zuidbroek Park pays. This can now be actively communicated (at official and administrative level). Thinking in terms of benefits also provides a means for looking at issues differently and designing in a genuinely different way.

### Outcomes

**Calculated benefits : € 19.4 million**  
**Estimated costs: € 10.2 million**

### Benefits

- Greater housing satisfaction (+ 84 %)
- Rise in property values (+ 14 %)
- Improved water storage
- Increased recreational value

### Beneficiaries

- Project developers
- Local residents

### Special features

Zuidbroek Park is part of a residential (2,300 new homes) and commercial development (35 ha business park). Due to the economic crisis, development is going less quickly than desired, and the construction of the park is also under pressure. TEEB can shed a different light on the need to construct the Park. In a stagnating market, it is more important than ever to devote attention to green space. Future residents find a green neighbourhood more attractive and will therefore more often choose to live there.

### Follow-up

Based on the TEEB results, Apeldoorn is looking at how the tool can be incorporated in the municipal system. The tool could also be useful in calculating the costs in the case of private development. The administrative process is also being set in motion to build support for constructing the Park based on the outcomes of the study.

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## A wide-angle photograph of a golf course green. In the foreground, a large, well-maintained green lawn stretches across the frame. A line of diverse trees, including pines and deciduous varieties, stands in the middle ground. The sky is a clear, bright blue. The image is oriented horizontally but appears to be a vertical shot rotated 90 degrees clockwise.





# Deventer

## Construction of Zandwetering Park and Steenbrugge residential development

**Goal:** Constructing Zandwetering Park will link the Keizerslanden redevelopment district to the rural surroundings.

### Project

A housing development (1,100 homes) is planned in the northern periphery of the city, and a 45 ha park is also being constructed as part of the redevelopment of the Zandwetering site. The park design brings together water, nature and recreation. It will be completed in 2012. In view of the economic climate, the plans to build the residential development are being reassessed and it is unclear when construction will start. New cycle tracks, footpaths and rambling routes invite mobility. The amphitheatre in the centre of the park is a place for people to meet. The Zandwetering water-course has been rerouted and there is a fish ladder and flood meadows. The pools and flower-filled meadows allow space for plants and animals. The KEI 13 children's centre in the park can make direct use of the opportunities for nature education that the park offers.

### TEEB approach

The costs and benefits of two alternatives were compared with the reference scenario.

The alternatives were (1) development of Zandwetering Park plus the Steenbrugge residential neighbourhood; and (2) development only of the park.

The benefits of the alternatives were measured in terms of housing satisfaction, increased property values, improved health

### Outcomes

Development of Zandwetering Park plus Steenbrugge residential project:

**Calculated benefits: € 37 million**

**Estimated costs: € 7.5 million**

Development of Zandwetering Park only:

**Calculated benefits: € 21 million**

**Estimated costs: € 1.4 million**

### Benefits

- Housing satisfaction
- Recreational value

### Beneficiaries

- Residents of Steenbrugge housing development
- Residents of adjacent neighbourhoods, including Keizerslanden

thanks to better air quality, increased recreation and avoided costs of moving home.

### Results

The construction of Zandwetering Park makes a positive contribution to housing satisfaction and the property values of the existing dwellings. The benefits relative to the costs become even greater if the Steenbrugge residential development is built. Development of the park also contributes to the environmental quality of Deventer as a whole. The value of different types of dwelling in the construction plan is determined using a range of factors, including distance to the park, sports facilities, the rural area and other recreational amenities.

### Follow-up

Construction of the park is nearly complete. The local authority intends to take a decision towards the end of 2012 on when construction of the Steenbrugge housing development will begin, bearing in mind the present situation on the housing market.

“The public space represents important collective work and residential capital. Economic functioning benefits from good development and management. CROW therefore constantly develops new support instruments.”

Ton Hesselmanns, Head of Residential development & Environment at CROW

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Earning





# Earning with benefits

Many green projects are socially profitable, but not financially. This is because the parties which finance the project do not enjoy the benefits. An earnings model is designed to make the project financially feasible. There are two ways of doing this: structures that raise more funding or approaches that save more money.

## Raising more money

Additional funding can be raised from the direct beneficiaries (e.g. a homeowner who sees the value of their home increase because of the creation of green amenities near their home) through lease and sale, tax and PPP constructions (Public-Private Partnership). Extra money can also be raised from indirect beneficiaries (Civil-society

parties which do not benefit directly but which make money available if it fits within their object) via subsidies, donations, etc.

## Saving more money

Extra money can be saved by building in cost-saving structures in the implementation, for example by switching to a party that provides their services more cheaply or free, and by linking the measure to other measures by keying into the interests of other parties. Extra money can also be saved by raising finance more cheaply through revolving funds (e.g. national green fund) or crowd funding (one-off cheaper loan). In all these cases, these structures may involve public or private money or a mix of the two.

## Raising money from direct and indirect beneficiaries

	lease and sale		taxation			Public Private Partnership (PPP)		subsidies, gifts
earnings model	leasehold	sale of building-ready land	licence fees	water/drainage levy	incremental taxation	benefit sharing	developer's contribution	public and private
within legislation, fund object	yes	yes	yes	yes	yes	case-specific	case-specific	case-specific
amount adequate	case-specific	case-specific	case-specific	case-specific	case-specific	case-specific	case-specific	case-specific
Location	all	all	all	all	shops, businesses	all	all	all
one-off/recurrent amount	recurrent	one-off	one-off/recurrent	recurrent	recurrent	one-off/recurrent	one-off	one-off
labelled to green measure	no	yes	yes	yes	partially	yes	yes	yes
transaction costs	limited	variable	limited	limited	limited	variable	variable	variable
condition	local authority is landowner	local authority is landowner, new-build	new-build	project contributes to management objective	public support; project contributes to management objective	interest of private financier, sufficient profit	interest of private financier	fund covers financial shortfall

## Earning: first overcome resistance and build commitment

When it comes to aspects such as liveability, housing, green amenities, nature and water, developers, businesses, citizens and health organisations are expected to make a bigger contribution. Achieving this requires a great deal of creativity and commitment. Simply presenting these parties with a bill is something you can't do as a local authority.

Once the benefits have been calculated, the beneficiaries can be contacted with a view to sharing the costs equitably. That sounds clear enough, but is difficult in practice. "It is sometimes hard to say precisely who benefits from a particular intervention, and to what extent. This has already led to a great deal of debate in Delft", explains project leader Maartje Scholten.

If you build a park, do only the occupants of the homes that overlook it benefit, or do homes in the wider area around the park also share in the benefits, and if so how do you quantify that? And who benefits from planting trees or shrubs to improve the air quality? Clean air doesn't stop at a particular boundary; everyone benefits from it. Scholten: "The first reaction is then: using plants to provide clean air is all well and good, but I'm not about to start paying for the rest of the city. And if we're not talking about air but about water storage, people are likely to think: why does that have to be done near me? Everyone has the feeling that they are being put at the biggest disadvantage".

### Overcoming the resistance

Yet initial resistance can be overcome, in Scholten's experience. The fact that the TEEB calculations allow everyone to see the social benefits is a help, but simply presenting those concerned with a bill doesn't get you very far. It's about finding solutions together and building commitment. "And then it's a bonus if parties have worked together for a while and know each other well", stresses Scholten.

In Delft, after a great deal of dialogue, a sense of shared responsibility has emerged among stakeholders. People look beyond their own interests, and parties are then found to be willing to trade off investments. A negotiation situation arises. "A developer

is perfectly prepared to install planted roofs and therefore to partially meet the need for water storage, if the local authority and water board are willing to do something in return", says Scholten by way of example. Or, to cite another example, Delft University of Technology, which owns the Botanical Garden and the Science Centre, stops seeing the water storage facility planned for its site as a constraint and starts seeing it as an opportunity: a water storage facility that is designed as a water park also offers scope for education and research.

Delft has not yet reached the point of actually conducting the negotiations, however. "We are pioneers here. Because as far as I know, not many local authorities have experience in trading off investments between parties in an integrated area development project, so we have to find all the answers ourselves. And that's sometimes quite tricky".

### Trade-offs

In some situations, it is clear in advance that it will be difficult to trade off investments. For example, the Delft student accommodation organisation DUWO would like to improve housing satisfaction in its TU Midden-West complex by increasing the amount of green landscaping, but cannot cash in on these benefits because the quality of the residential environment is not included in the national points system for letting student accommodation.

Parties which are focused mainly on short-term benefits will also not be open to contributing to investments in green measures. For example, it is difficult to persuade shops and businesses that they will benefit from increasing the amount of green in the street if that benefit will only be realised in 40 years' time. Moreover, it is sometimes difficult to persuade stakeholders that they will benefit from green landscaping, as the local authority of Eindhoven, for example, has found.

Eindhoven has held talks several times with the department store Vroom & Dreesmann (V&D) about planting cover plants on the external walls of the store. And although calculations have shown that this investment would be earned back within four



months due to increased profits, V&D is not persuaded. "During a recession, retailers have other priorities for investments which they believe can increase sales", says Roel den Dikken, Green programme leader for the local authority. "A green facade is a low priority for the store chain at this point in time". He understands that, of course, but it is a shame for Eindhoven. The main shopping street in Eindhoven, where V&D is situated, has little in the way of green planting. And because the inner city is the most important public face of the city, the council would like to change that.

Although the meetings with V&D have so far not produced any results, Den Dikken believes that the TEEB method is a useful way of engaging in dialogue with local businesses. He sees that the often theoretical key figures pose a barrier for parties in acknowledging that they will actually be beneficiaries. "The method is still somewhat experimental". The TEEB method will be more accepted when these theoretical figures are supplemented by actual figures from practical experience which show clearly that investing in green amenities boosts sales, he believes. It will also help if the TEEB method starts to be more widely used, not just by local authorities, but also by other organisations which serve the public interest. (See also Page 39 Eindhoven: A greener heart)

### Savings

Earning from green investments does not always mean asking external beneficiaries to contribute. Linking green measures to the activities of other public or private parties or municipal departments can also open the way to cost savings.

In Almelo, for example, there are clear savings opportunities. Planting trees in the town centre is expensive because underground cables and pipelines have to be moved. But if the trees are planted at the moment when the cables and pipelines are due for replacement anyway, this reduces the costs considerably.

Lydia Plant, an environmental policy officer in Almelo, agrees that plans have to be coordinated. "At the moment, five planning processes are being carried out in parallel for smartening up the town centre. Civil servants do contact each other on an ad hoc basis during the implementation of the plans, but in some cases key decisions have already been taken. A more integrated approach would be better here".

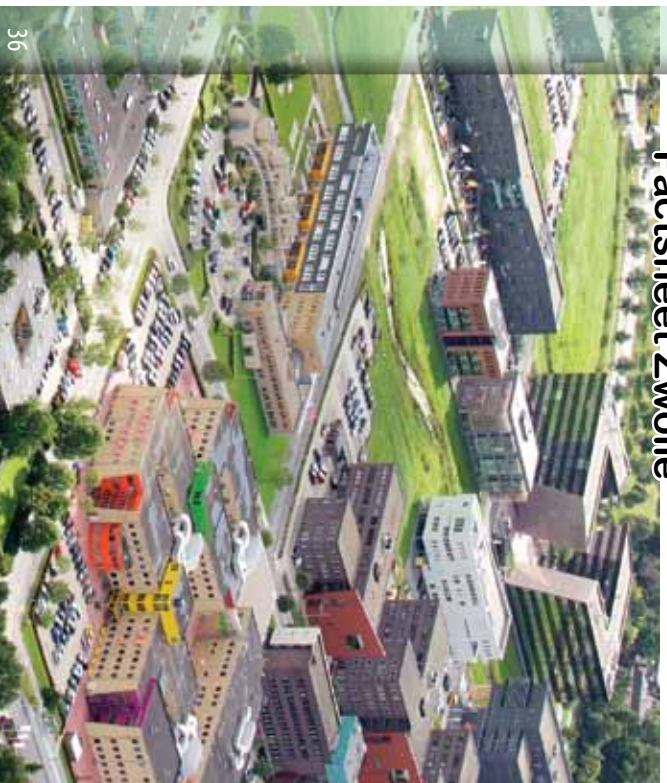
In the town of Zwolle, too, use of the TEEB method produced unexpected opportunities to make savings. Benefit calculations showed that the creation of a 14 ha flood washland combined

with water storage and ditch repair is very important for the recreational value for approximately 10,000 people who work in the offices, care centres and education establishments in the adjacent Oostereijk location. "The washland is already there, so that doesn't require any discussion. But it would have been more logical if it had been developed as an integral part of the Oostereijk development plan, rather than being carried out by the local authority under its own steam", concluded Zwolle council afterwards. If the local authority had coordinated its plans with the objectives of the water board and the provincial authority earlier, Zwolle could have saved costs. (See also Page 37 Zwolle; Nature and water on the city's edge).





# Factsheet Zwolle



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# Earning





# Zwolle Nature and water on the city's edge

**Goal:** Justification of the creation of a washland not included in the land management plan.

## Project

Oosterenk is a transformation zone: from offices to a mix of offices and the care economy (approx. 65 ha), housing commercial offices as well as semi-government, government, care and education establishments. A multifunctional washland of more than 14 ha has been created adjacent to the site, combined with stream restoration work on the Westerveldse Aa river and the creation of water storage capacity. The project has been completed.

## TEEB approach

The TEEB method was used for the evaluation. Several benefits were evaluated: reduced flood risk, reduced water treatment costs, non-utility value of nature, more climate safety, improved health, greater recreational value, more travel time gains for low-speed traffic, improved business settlement climate.

## Outcomes

*Calculated benefits: € 2.86 million  
Estimated costs: € 1.86 million*

### Benefits

- Recreational accessibility (bridges)
- Accessibility (path network)
- Nature development combined with water storage

### Beneficiaries

- Staff at the business park
- Local residents
- School pupils

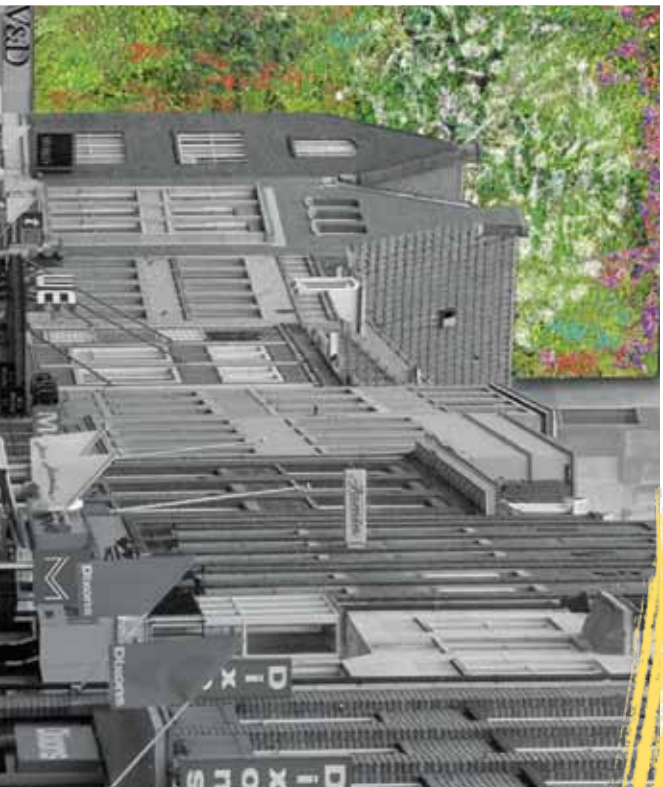
## Results

Some benefits were real eye-openers. Given the great significance of the washland for the recreational value for employees working at the Oosterenk site (a benefit of € 2 million), it would have been more logical if the development of this area had been integrated in the overall Oosterenk land management plan, with supplementary contributions from the water board and the provincial authority to enable their respective objectives to be achieved. In practice, it was done the other way round, with contributions from the land management organisation.

## Follow-up

The beneficiaries have worked together throughout the entire project and know each other well. They were also willing to embrace this new method. The plan has been implemented, and the participating parties are generally very enthusiastic. Ambassadors are needed for the further implementation of the TEEB method in the organisation.

## Factsheet Eindhoven



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## Earning





# Eindhoven A greener heart

**Goal:** Gain an insight into the costs and benefits of creating a greener city centre.

## Project

Eindhoven, despite being one of the greenest cities in the Netherlands (100 m<sup>2</sup> of green space per dwelling) is not perceived as green, partly because there is a relatively little green in the city centre. Eindhoven wants to change this. Three projects have been defined within the master plan: Catharina-plein (tree planting) the Fens site (transformation of a car park into a park) and the Groene gevel ('Green gable') (initiative phase). The Catharina-plein project has now been carried out. The most detailed calculations using the TEEB tool have been carried out for the Fens site. This site forms a link between the central shopping zone and the attractive 'De Bergen' retail area. The plan is to make this link more interesting by turning it into a park. At present, the site is mainly used as a car park.

## TEEB approach

To aid the decision-making process, both the costs and benefits of the redevelopment were calculated. The project will create an attractive setting for

bars and restaurants, partly thanks to the ability to increase the area of pavement cafes. The improved link between the city centre and the De Bergen retail area could increase the number of potential customers. For local residents and offices, the project will deliver an attractive residential and working environment with recreational amenities.

## Results

Eindhoven had already made a business case for turning this site into a green amenity. The TEEB method shows that the benefits are higher than those identified in the earlier business case. The more complete approach adopted

in the TEEB method and the inclusion of smaller benefits which when taken together are still relevant, also played a role. The decision to apply constant value calculation accentuates the difference between costs and benefits and strengthens the impression that green infrastructure delivers benefits.

## Follow-up

The results of using the method provide an excellent basis for engaging in dialogue with businesses located around the site about forms of co-financing. The TEEB method has proved to be valuable, and Eindhoven city council intends to use the method at an early stage in future green projects in order to secure commitment from beneficiaries and to encourage them to share joint responsibility. The actual benefits for the city are likely to be better than calculated thus far. The contribution of the redevelopment project to the green image of the city as a whole has not been calculated, but is regarded as a significant aspect of this project.

## Outcomes

**Calculated benefits: € 2.5 million**  
**Estimated costs: € 1.5 million**

## Benefits

- Increased sales for hospitality outlets (pavement cafes)
- Rise in property values

## Beneficiaries

- Local businesses
- Local residents and offices

"Royal Dutch Touring Club ANWB continues to remind the government of its responsibility. But the days of resting on our laurels are gone. Government, businesses and civil-society organisations must now each take their share of responsibility."

Guido van Woerkom, Director Royal Dutch Touring Club ANWB





# Follow-up of TEEB City:

## New funding models for urban green projects

As government resources shrink, the budgets for green amenities are also under pressure. However, spending cuts on green landscaping can lead to higher costs elsewhere in the budget, and to a reduction in the value of investments in property, for example. It is therefore important to seek additional funding models for green projects. Johan van Zoest and André Everts suggest a number of strategies.

Urban green spaces are a child of the Industrial Revolution.

In the rapidly growing, overpopulated industrial cities, ravaged by epidemics and civil disorder, the importance of being able to walk in the fresh air was quickly recognised. The 19th-century parks were created and maintained mainly by private financiers – the upper classes. It was only with the arrival of the modern city in the 20th century that the state assumed responsibility for urban green spaces. Since the 1970s, local authorities have been pairing away at budgets, and the management of green spaces has been feeling the pain of spending cuts.

Johan van Zoest does not believe the situation in the 19th century will return, with green amenities being largely privately funded – although he does note that social democracy is making way for a more liberal democracy. “The state is moving towards providing basic provisions of basic quality, with citizens, businesses and civil-society organisations having to pay for the extras. A more Anglo-Saxon model is emerging. And the big question then is: how do you persuade those citizens, businesses and civil-society organisations to invest time and money in their green amenities?”

Financial alchemists have dreamt up an almost infinite number of mechanisms for financing businesses, all with very impressive-sounding names, according to André Everts. He distils from this plethora four strategies for local authorities for generating extra

money and resources for green amenities: commercialisation, PPP (Public Private Partnership), co-creation and ploughing back social benefits.

### Strategy 1 Commercialisation

Provided there are paying customers, local authorities can generate income from green amenities in several ways, for example by providing facilities for small-scale bars/restaurants, meetings and parties, selling biomass or food, or making a charge to cover its costs (e.g. the additional management costs for events). According to Van Zoest, “A local authority can exploit these money-makers itself, but can also lease them out and collect the rent. In the latter case, it is up to the lessee to utilise the green amenity creatively and generate a cash flow”. Examples in which this strategy is used include Bryant Park in New York, the goat farm in Amsterdamse Bos and the Philips Fruittuin orchard in Eindhoven.

### Strategy 2 PPP (Public Private Partnership)

Another widely used strategy is to create urban green spaces as part of a housing development project in which the local authority enters into a PPP (Public Private Partnership) with the private sector. “The local authority invests in preparing the land for building”, says Everts, “while the private sector takes care of the property development. The construction sector is only too aware of the importance of public green spaces in the residential setting and appears to be increasingly willing to create and manage these amenities. Ultimately, the costs are paid by the buyers or tenants of the homes, for example in the form of a mandatory contribution to a residents’ association”. This is the method that was used to finance projects such as the Bo0 residential development in Malmö and Canary Wharf in London.

Everts points out that this strategy can also be used in another way. “With Value Capturing Finance, the local authority invests in new

infrastructure (for example a tram line) or an improvement in the public space, in the expectation that this will cause the value of adjacent property to rise. The investment is then earned back via the additional property tax revenue this generates.”

### Strategy 3 Co-creation: intelligent ‘nudging’

In Van Zoest’s experience, surprising collective campaigns can be expected when civil-society organisations are given more of a free rein. Traditionally, organisations such as museums, housing associations, non-governmental organisations (NGOs, operating on the basis of subsidies, members and donations) and volunteer organisations are regarded as making up civil society. A growing number of social enterprises, ventures and businesses are now being added to this. These are enterprises which focus on social objectives, but which operate along commercial lines and use the power of the market to carry out their social and green agenda. “Now that the government is withdrawing, civil-society organisations appear to be developing into a sort of social economy, which can also focus on green amenities. Think of volunteer organisations which are financed by philanthropists, sponsors or idealistic investors based on their achievement of measurable results. And there are also companies and neighbourhoods which manage green spaces themselves or which raise money to improve green amenities.”



Van Zoest is aware of the first steps currently being taken in the United Kingdom towards a Community Right to Challenge, in which an organisation that is demonstrably able to achieve social objectives more effectively than the government may take over that work and be paid for it. Something similar is already happening in the Dutch town of Dordrecht, where businesses on the Kill III business park have taken over the maintenance of the green spaces on the site from the local authority.

### Strategy 4 Ploughing back social benefits (TEEB)

The most far-reaching innovation is ploughing back the external benefits of green amenities. The TEEB City tool enables both the benefits and the beneficiaries of improvements in green amenities to be identified. It is then possible to approach any free-riders and polluters and seek compensation from them.

“A local authority can invest in green amenities based on the expectation that the investment will pay for itself in the form of savings elsewhere in the budget, for example in care costs or water management costs,” says Everts. He agrees that there are risks: the expected savings calculated using the TEEB tool have yet to materialise in practice. Guarantees can never be given.”

On the other hand, it’s an illusion to think that a political judgment can be reduced to a simple calculation. Municipal councils must be able to take decisions on measures based on feasibility.”



Van Zoest points to the possibility of taxing construction because of the loss of ecosystem services. “That is already happening with levies on property development, for example in the apportionment scheme in Rotterdam. But it is also possible to embed a ‘public space tax’ in the property tax system. A recent study by the Organisation for Economic Cooperation and Development (OECD) suggests that the land used should also be taxed, not just the buildings constructed on it.”

### **The way forward**

Looking for new funding opportunities for urban greening is a challenge, agree Everts and Van Zoest. There are ample opportunities (for example, allowing local authorities to issue bonds, direct small-scale financing by individuals, the increasingly popular crowd-funding via the Internet, etc.). Finding the right funding solution is always a matter of customisation, combi-

nation and negotiation. “We are only at the beginning of this development, and that means cautious experimentation. In this phase it’s a matter of concentrating on design experiments with low risk.” One practical start is to apply the TEEB City benefit calculation tool for a fixed trial period. “It gives local authorities a rapid insight into the differences compared with conventional calculation models”, says Van Zoest. “And that is guaranteed to lead to follow-up actions”.

*Johan van Zoest works at the Spatial Planning Department in Amsterdam and is also an urban ecologist in The Hague and a lecturer in urban development at Eindhoven University of Technology. André Everts is a planning officer and project manager in the Urban Development Department in the local authority of The Hague.*



## Postscript

The contribution made by green spaces and nature to the urban economy can be made explicit. This emerges clearly from the experiences with TEEB City. The method is basically reasonably simple, because in reality it is simply a specification of the generic social cost-benefit analysis. The biggest gains are achieved by looking right at the start, in the design phase, for the potential benefits of a green project. The outcomes show that a green living environment delivers major net social benefits, from which biodiversity also receives a boost. It therefore invites frequent use. Implementation is not automatic, however. It demands a different approach from what is usual in residential development plans, and it is therefore important not only to promote the TEEB tool, but also to make it readily accessible and to teach people in the field how to use it.

The TEEB project began as a joint initiative of central government and local authorities. Today, several organisations have indicated their willingness to play a role in its further development.

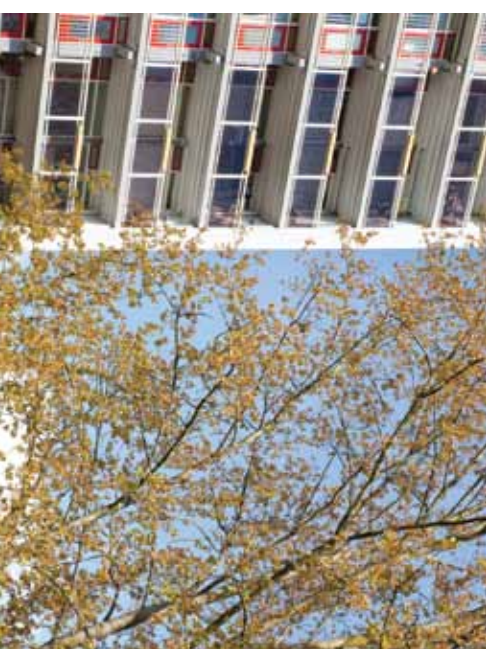
In some cases they have made a very specific commitment. De Groene Stad ('The Green City') is for example promoting the project following the successful Green Paysi campaign; CROW is acting as a knowledge platform for the public space in making the tool accessible and applicable, and Dronten University of Applied Sciences is providing knowledge transfer in the Nature, Economy and Living Environment research group. In addition, Entente Florale Nederland is giving TEEB City a key place in the national horticultural competition in 2012.

A number of local authorities which have taken part in TEEB City are looking to continue the project by investigating how the social benefits can be translated into (financial) social participation. A number of local authorities and stakeholders have also declared that they would like to take part in a TEEB joint learning group exercise.

Greening the environment in and around the city is not only a task for local authorities. Experience has shown that a broad and

early involvement of a range of stakeholders produces the best results. Those stakeholders include investors, housing associations, property developers, health care organisations, businesses, social institutions, water boards, land companies, and so on. The TEEB approach helps these parties engage in a constructive dialogue, in which the sum proves to be greater than the parts. Initiatives are also under way in which cooperation around the TEEB model can generate added value. Examples are initiatives focusing on the climate challenge, soil quality and urban development. If the project is taken to the next stage, it is recommended that alignment be sought with these initiatives.

The biggest gains are achieved  
by looking right at the start, in the  
design phase, for the potential  
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## Notes







"Building and development isn't only a matter of asphalt and brick, but also green elements. So you have to start thinking about those green elements at an early stage of the planning. It's no longer just an afterthought."

Rob van Doorn, Portfolio Holder for Sustainability, Haarlem





# Colofon

## Publication

The following local authorities, ministries and organisations were involved in TEEB City:

Almelo, Amsterdam, Apeldoorn, Delft, Deventer, Eindhoven, Haarlem, Heerlen, Rotterdam, The Hague and Zwolle; the Ministry of economic Affairs and the Ministry of Infrastructure and the Environment; Witteveen+Bos engineering consultancy and Groen Loont!.

Groen Loont! ('Green Pays!') is an initiative by parties collaborating under the banner of De Groene Stad (Plant Publicity Holland, horticultural sector organisation VHG, HIC – promotie van Groen, ANWB, Groenforum Nederland, Entente Florale Nederland and Productschap Tuinbouw/Horticulture Marketing Board.

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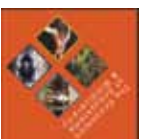
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# Green pays with TEEB City

Eleven local authorities, two ministries (the Ministry of Economic Affairs and the Ministry of Infrastructure and the Environment) and the engineering firm of Witteveen+Bos have been working on TEEB City since 2011. Together, they developed an instrument to reveal the social and economic value of ecosystems in and around the city. And, important as well, how to ensure that those who benefit from creating these natural habitats also contribute to them financially. This

publication provides answers to a number of questions. When do the benefits from the development of ecosystems become apparent? How can we recognise and ascertain these benefits? Who benefits from them, and how can they be involved as investors? As part of TEEB City, each participating city worked on its own case. The findings provided in this publication can be applied in the urban planning decision-making process in other local authorities.

The latest information on TEEB City  
can be found at [www.devitalegroenestad.nl](http://www.devitalegroenestad.nl)  
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