Water Resilient Cities Project

Cross- Border Seminar and Networking Event

Sustainable Drainage Systems

4th October 2017. Mechelen, Belgium

Presentation Summaries

In order of appearance

Marcia van der Vlugt, Program Manager Incentive Programme Spatial Adaptation to Climate Change at Ministry of Infrastructure and Environment, Netherlands

Water Management Policy Context: Innovative approaches towards creating Climate Adaptive Cities.

The Delta Programme brings together central government, provincial and municipal authorities, water boards, civil-society organisations, the business community and organisations with specialized water expertise.

The Delta Programme is overseen by a special government official: the Delta Programme Commissioner. The Delta Commissioner is empowered to advise ministers and other public administrators and to urge them to act if the situation requires. Every year, the Delta Commissioner proposes an update to the Delta Programme. The government then responds to the proposal.

In 2014 the Delta decision Spatial Adaptation was presented. The Delta Decisions generate new working methods in three fields: flood risk management, freshwater availability and water resistant spatial planning. The presentation focusses on the later. The delta decision on spatial adaptation includes plans for shaping the landscape, in a way that makes society more climate-resilient. Greater effort should be made at the planning stage to consider the potential impact of flooding and keeping cities cool during hot summers. As the climate changes, this is becoming more and more important.

The central government, provinces, municipalities and water boards have a shared ambition that - by 2050 - the spatial planning in the Netherlands is as climate-proof and water-robust as possible, eliminating any incidental flood-related risks of damage and victims, to the extent that this is reasonably feasible. Climate-proof or water-robust design will therefore be part of policy and practice by 2020.

In September this year the Deltaplan Spatial Adaptation was presented. What is the Delta Plan about? Waterlogging, heat floods and drought. Focus in Deltaplan on water pollution and heat stress. The aim of the Deltaplan is to expedite the spatial adaptation process and make it less noncommittal. To achieve this aim the analysis ambition action approach has been adopted. Mapping out vulnerabilities (analysis), formulating goals (ambition) and setting to work to render our living environment climate-proof and water resistant (action).

The Deltaplan has 7 ambitions: Mapping out vulnerability; Conducting a risk dialogue and drawing up a strategy; Drawing up an implementation agenda; Capitalising on linkage opportunities; Promoting and facilitating; Regulating and embedding and Responding to calamities

Mapping out vulnerabilities: Municipalities, district water boards, provinces and the central government will conduct stress tests in collaboration with stake holders in their area to map out its vulnerability. The stress test can be characterised as follows, the stress test: Covers an entire area, in both urban and rural environments; Targets an area's vulnerability to waterlogging (caused by severe downpours or prolonged rain) heat stress, drought and urban flooding; Focuses specific attention on vital and vulnerable functions; and, Takes account of other developments that raise an area's vulnerability (such as soil subsidence and changing ground water levels)
The central government is taking the lead by developing a 'standardised' stress test this year.

Capatilising on opportunities for linkage: Wherever possible we want to utilize the synergy with other tasks, by creating work with work. In many cases, particularly in highly dynamic urban areas, breaking up a street in the purview of spatial adaptation alone is neither efficient nor effective.

Promoting and facilitating: The existing spatial adaptation incentive programme supports parties in the implementation of spatial adaptation by organizing theme-based meetings and investing in living labs, pilots and experiments. This programme will be continued after 2017.

A knowledge sharing platform will be set up. This platform will gather information, expertise and experience and support the exchange of knowledge among local governments and private professionals working on spatial adaptation at the local and regional levels. The goal is for such parties to provide input, based on their practical experience in terms of process and content, and regarding the wider applications of instruments and solutions developed locally.

The spatial adaptation knowledge portal is the central portal in the Netherlands where governments, private parties and NGO's can find information relating to climate-proof and water-resilient spatial planning. This portal will be expanded further in order to cover the entire scope of climate adaptation in the future.

These instruments are based on the experience of the incentive programme that starts in 2015. The focus there was on Knowledge sharing; Learning by doing: and education.

Knowledge sharing: Local governments play a crucial role in adaptation, but climate science and data does not reach local stakeholders. Therefore there is a clear need for methods that bridge the gap between the climate science community and the spatial planning community.

Other forms of knowledge sharing: the *City Deal Climate Adaptation* aims to achieve a breakthrough in climate change adaptation in Dutch cities. City Deal is a

cooperation agreement between fourteen public partners and twelve (semi) private partnership partners. The City Deal partners intensify their mutual cooperation in an open culture of learning, experimentation and innovation. It is an organically driven organization, in which they work regionally on activities that help them achieve their goal.

Regulating and embedding: Working on climate proofing is no longer a noncommittal challenge. The Parties will embed their contributions in policy and regulations. In the next five years the municipalities and provinces will explore whether local regulations need to be amended.

Responding to calamities: The municipalities and district waterboards will explore by no later than 2020 how they themselves can contribute to damage reduction immediately before, during and after a disaster through communication, management and maintenance. Comprehensive dialogue with society addresses the additional relief that the various other parties could provide during disasters.

A different perspective: Flood risk management in the Netherlands will be substantiated in a robust manner by focusing on three layers: Layer 1: preventing Floods wherever possible with solid dykes, sand replenishment, and more room for rivers; Layer 2: containing the impact of a flood by water resilient spatial planning, and; Layer 3: Good disaster control, in the event that a flood should occur nonetheless.

Different perspective same outcome, sharing solutions, knowledge and opportunities and working across themes.

Dries Debruyne - An introduction to the Adaptation to Climate Change Priority: 2Seas Programme speaker.
Increasing the ecosystem-based adaptation capacity to climate change and associated effects (Specific Objective 3.1)

The presentation began by giving the context of Interreg in the wider European Regional Policy, following an overview of the priorities in the Interreg 2 Seas programme. Hereby, a link was made not only with the adaptation to climate change-priority, but also with the priorities technological innovation, resource-efficient economy and circular economy.

A particular focus was giving to the priority 3.1 of the Interreg 2 seas programme called: Increasing the ecosystem-based adaptation capacity to climate change and associated water-related effects.

After a short reminder of the 2-Seasprogramme and project intervention logic, a summary was given about the needs and challenges, the expected results and the type of actions and outputs the Member state what to achieve in the Interreg 2 Seas programme.

So far 6 project is this priority have been approved, which leave about 49 % or almost 19 million EURO ERDF left to invest in new projects. In order to fill the programme gaps before the Brexit, an overview was given of the actions, outputs and challenges which are currently insufficiently addressed by the approved projects. This relates to a particular initiative of the programme to boost new project around these gaps. However it needs to be reminded that new projects can also address actions, results or themes for which project have already been approved, as long as the complementary is clear.

Finally an overview of the coming call was giving, together with the application procedure and the assistance the Interreg Secretariat and facilitators can give in the process.

Projects overview

Water Resilient Cities -Alex Midlen, Low Carbon City Officer, Plymouth City Council

Water Resilient Cities – increasing urban resilience to climate change through improved storm-water management

Climate change will increase risks of urban flooding due to increasingly heavy rainfall, which overwhelms outdated drainage. Retrofitting sustainable urban drainage (SUDS) to existing urban areas, making use of the public realm to overcome a shortage of space on individual sites offers a solution. However, there is little experience of this approach, which requires new types of cooperation between municipalities and owners to overcome physical, regulatory and cultural barriers. The project will demonstrate reduced flooding while protecting or improving amenities, biodiversity, health and wellbeing, local economies and saving public money. The adoption of these approaches will increase adaptation capacity to the effects of heavy rainfall and deliver added benefits for society.

Investments in Plymouth, Boulogne-sur-Mer, Bruges, Mechelen and Middelburg will be used to test and demonstrate different approaches to retrofitting SUDS in public areas. Lessons learned will be incorporated into a guide that will provide various tools to support retrofitting of SUDS in cities across the 2Seas region. These tools will include:

- Design Principles for retrofitting SUDS
- Guide to preparing SUDS implementation strategies
- Tools to help value the added benefits from SUDs

The project will establish a lasting network to allow professionals to meet and share knowledge and experience and as a platform to widely promote SUDS retrofitting.

Sponge 2020 – Lynsey Adams, Project Officer, Major Projects & Strategic Transport Policy, Southend on Sea Borough Council

Co-creation and implementation of innovative, participative climate adaptation solutions in densely built areas.

Lead partner

Hoogheemraadschap van Schieland en de Krimpenerwaard (NL)

10 partners: Regional Water authority of Schieland and Krimpenerwaard, Municipality of Rotterdam, City of Antwerpen, Somerset County Council, Westcountry Rivers Trust, Essex County Council, Municipality of Westland, Regional Water Authority of Delfland, Southend-on-Sea Borough Council, Municipality of Leiden

Specific objective: Improve the eco system based capacity of 2 Seas stakeholders to climate change and its associated water related effects

Why? Common challenge

Cities and densely built areas in the 2 Seas must adapt to more frequent intense rainfall and increased risks of urban flooding. Traditional public investments in drainage and sewage infrastructure cannot solve this challenge due to financial and spatial constraints.

Local (water) authorities must resort to alternative, innovative solutions that integrate smart adaptation features in public and private spaces and buildings across their territory. Local stakeholders must become prominently involved in the implementation of those adaptation measures in/on their own properties.

“Pave, Pipe, Pump” mentality has dominated urban development for over a century.

Instead of water being absorbed by plants, evaporating, or filtering through the ground back to rivers and lakes – is forced to slide over pavements and roads into drains, pipes and sewers.

Once maximum capacity is reached the water has nowhere else to go.

Sources: https://www.theguardian.com/cities/2017/sep/25/what-flood-proof-city-china-dhaka-houston

Overall objective

Objective: improve the adaptation capacity of cities and densely built areas in the 2 Seas region by co-creating and implementing innovative climate change adaptation solutions with local stakeholders.

This results in: increased adaptation capacity of densely built area’s in 2 Seas by at least 25.000m3 lower costs: saving 10-50% compared to the use of traditional adaptation investments

SPONGE paves the way for a wide rollout of these innovative participatory adaptation solutions to reduce the risks of and damages from urban flooding across the 2 Seas at considerably lower costs.

Main outputs

7 complementary pilot actions to co-create and implement innovative, place based climate adaptation solutions with local stakeholders. The partners jointly plan, design, implement & evaluate the pilots

1 toolbox for stakeholder engagement in climate adaptation

1 guidance pack for participative climate adaptation in densely built areas

1 Cross border action plan to introduce participative local climate strategies

Main target groups: local (water) authorities, businesses, housing corporations, city facilities (hospitals, museums, etc.), community groups, citizens

Cross-border approach – Responsibility is shared

Involving local stakeholders in co-creation and implementation of innovative climate adaptation measures brings local (water) authorities on new terrain. In our consortium we have partners with experience in alternative adaptation techniques, stakeholder mobilisation and co-creation of public interventions.

By putting these capacities together in a cross-border cooperation we create the opportunity to develop, pilot and demonstrate participative climate adaptation actions to increase the adaptation capacity of our partner cities and other densely built territories in the 2 Seas area.

What is new?

SPONGE presents a new participative approach to climate adaptation, based on 2 pillars:

1) innovative place based measures, integrating adaptive features in design and function of existing/new spaces and buildings and stacking multiple smaller scale interventions (e.g. at individual buildings)

2) active participation of a range of local stakeholders – who are currently not involved in climate adaptation – in co-design and co-delivery of adaptation measures

This approach allows local authorities to considerably enlarge the adaptation capacity of their territories at substantially lower costs.

Creative approaches to stakeholder engagement

Using Wageningen University & Research

Discovering incentives to contribute to climate change adaption

Stakeholder mapping: to analyse stakeholders by interest and influence to identify key stakeholder groups

Stakeholder analysis: Identification of stakeholders; contribution & barriers

Approach: Transition theory

Core recommendations

Future research

Considerations

Investment, Time, Politics, Money, Awareness Challenges

Social Proofing – Social proof being the concept that people will conform to the actions of others under the assumption that those actions are reflective of the correct behaviour.

For example – Landfill to Recycling culture, Smoking to Non-smoking culture

Consider how climate change adaption will follow in those footsteps and how we can capitalise on this.

SCAPE - Arne Debruyne, Strategic Coordiantion, Oostende

SCAPE – Shaping Climate Change Adaptive PlacEs

Based on a landscape led approach, SCAPE will develop (innovative) solutions for water management to enhance the resilience of coastal landscapes and tackle/adapt them to the effects of climate change.

The SCAPE consortium consists of 8 partners in Flanders, the Netherlands and the UK: 4 Municipalities (Ostend, Kent, Brighton & Hove, Middelburg) Farys (Utility Company for water supply, gas, sewage, waste collection,…), Regional council (Province of West-Flanders), Environmental Agency, Waterboard.

Pilots:

- Urban:
  - East Bank Ostend – Victorialaan
  - Brighton & Hove – Patcham and Norton Road
- Fringe:
  - Middelburg – Essenvelt
  - Ostend – Gardens of Stene
- Rural
  - Knokke – Zwin
  - Kent – Darent Valley

Coastal landscapes in this 2 Seas area are particularly sensitive to the water-related effects of climate change, specifically flooding, rainfall and drought.

Heavy rainfall, extreme weather, water flows from the hinterland can cause flooding. Moreover, big concrete and the many paved spaces don't let any space for the infiltration of water. This results in an area where the surface can't store any water anymore and the sewage system needs to drain all the water.

To become more resilient to climate change, a better understanding of water management solutions that can improve the ability of these landscapes, to cope with intense rainfall and rising sea levels is needed.

SCAPE will address this challenge by developing and testing innovative water management solutions for coastal sites in urban, rural and fringe area that experience flooding problems.

In the conventional, mono-disciplinary, water management approach measures do not take these landscape specific characteristics into account. SCAPE however, wants to build upon the principles of Landscape Led Design (LLD), which is fundamentally different from today's civil technical solutions.

The LLD principles is derived from the European Landscape Convention (ELC). It states 'landscape' as a holistic approach and an equal integrative concept, where *landscape is centered upon people and all of the thing they experience and value about a place, from tranquility to wildlife.*

Besides the use of LLD, a Climate Test was developed for all pilots. Based on the characteristics of the landscape, this test will provide insights in the effects of climate change within several geographical settings that are of relevance to the urban, fringe and rural dimension of the pilot sites. The climate test focuses on the core themes, water safety, flooding, extreme rainfall and drought. All climate test are already executed for all pilots, they will be executed again at the end of the project to compare the pre-and post-implementation and construction phase.

Based on the results of the Climate Test and the characteristics of the landscape, innovative tools and solutions to enhance the resilience of the site will be implemented. In this way, SCAPE wants to increase the climate resilience of the different coastal landscapes in the 2 seas Area.

Isabelle Terri, City of Mechelen and Sander Belmans, Waterwegen en Zeekanaal- De Vlaamse Waterweg
Introduction to WRC project from Mechelen representatives.

The first part of this presentation gives an overview of the complex water network in and around the town of Mechelen. It is complex because part of it works according to tidal mechanisms and part of it does not. The next part of the presentation shows how the Flemish Waterways and the Mechelen town authorities, as WRC project partners, will carry out a pilot investment project in three locations in order to better climate-proof the town's drainage systems.
These three pilot location projects will be:

- Altering the river Dyle (Dijle) to make it usable as a buffer
- Exposing an underground watercourse in Zakstraat (street)
- Exposing the underground section of the river Dyle where it is crossed by Zandpoortvest (road)

There are a lot of implications for different stakeholders (citizens, project developers, etc.) in all three of these locations. The added value of this project lies not only in improvements to drainage, but also in the creation of a greener and more attractive town, with a lot of opportunities to enjoy the town's waterways.

Panel 1: Innovation and Research – What are the newest innovations and research in relation to retrofitting SUDs (10 minutes each)

1. Speaker from UK – Dr Katherine Hyde, University of Reading

Recycled water and sustainable green urban drainage systems

Greywater originates ubiquitously wherever there is human activity. This widespread generation of greywater arises in close proximity to urban green infrastructure.

The proximity factor is important for both sustaining irrigation for green infrastructure, as well as the sustainable reuse of locally generated greywater.

Research conducted at the University of Reading applied both treated and untreated greywater to planted green wall boxes. Tests were conducted on soil quality before and after the trials, as well as on the quality of greywaters before and after irrigation.

The research showed no inhibition of growth in boxes watered with either treated or untreated domestic greywater over the medium-term duration of the tests, in comparison with boxes watered using drinking water.

Urban green infrastructure benefits from the planting of hardy species, watered using locally generated greywater. Since greywater is a relatively constantly arising water resource, it is less subject to fluctuation than watering using rainwater.

This pattern of greywater reuse for watering and irrigation leads to more water resilience in urban areas. This is partly due to the assistance of retention in maintaining appropriate Soil Moisture Levels (SMLs). These in turn enhance the wetting properties before the start of rainfall events, reducing the propensity to flash flooding.

Innovation in irrigation equipment can support greywater delivery designs that are suitable for green infrastructure developments in urban areas.

2. Speaker from Belgium – Vincent Wolfs, KU Leuven, Faculty Civil Technique, Department Hydraulics

Simulating the impact of climate change and SUDS on urban floods

A historical trend analysis on the Uccle rainfall time series (1898 – present, 10 minute rainfall observations) revealed changes in rainfall extremes. First, a clear multi-decadal oscillation pattern in anomalies in rainfall extremes can be noticed: some decades are characterized by higher rainfall extremes than average, and vice versa. Secondly, the time series analysis showed a clear rising trend. The past decades, rainfall extremes have become significantly more extreme (up to +30%). This change in rainfall extremes increases (specifically urban) flood risks, and causes longer dry periods (which further enhance city heat stress).

Action is needed to mitigate these increasing risks and create water resilient cities. Such actions are required on multiple fronts, including the creation of “adaptive”

infrastructure, multi-functional use of open spaces, a behavioural change from both citizens and decision makers, and new technology.

The presentation highlighted some relevant recent technological developments. Climate scenarios were discussed which can be used to simulate the impact of climate change on hydro-meteorological variables.

Two novel modelling platforms were shown. The first platform, “Sirio”, was developed for industries, cities and engineering firms to create optimal rainwater systems. This user-friendly tool was recently launched (www.sumaqua.be/sirio). A second platform “SCAN” is currently under development. This platform uses an integrated approach (hydrology, rivers and floodplains, urban drainage systems, etc.) and has enhanced possibilities.

Next, the presentation discussed the potential of a forecasting and real-time control application for the city of Ghent using a fast-simulating model of the “SCAN” platform.

Finally, the BRIGAID project (EU H2020) was presented. This project aims to bridge the gap for innovations in disaster resilience. Two innovations (“Hemelswater” and a smart green roof) were selected and will be tested in the near future in the city of Antwerp.

Panel 2: Challenges for Policy and Public-Sector Delivery (10 minutes each)

1. Speaker from Netherlands: Dr. Aline te Linde, Twynstra Gudde, Amersfoort
   Implementing Climate Adaptation Strategies at a Regional Level: Governance Challenges

The impact of climate change on the regional and urban water system increasingly results in flooding from extreme rainfall in the Netherlands. The estimated damage caused by extreme rainfall in June 2016 was 285 Million Euros in the provinces Limburg and North-Brabant in the Netherlands. This resulted in increased awareness and urgency at political level in this region, and the two Provinces, five Water Boards and all Municipalities in the region together, developed an ambitions climate adaptation plan, which was presented in April 2017. In this plan, the parties commit themselves to a yearly extra investment in water management measures of 50 Million Euros, on top of the current ~500 Million Euros.

The province of Norh-Brabant asked Twynstra Gudde, a Dutch management consultancy, to help them to write a strategy and implementation agenda for the plan, and to build a team that is responsible for implementation. The approach for such a task seems simple: i) assess the current situation, ii) set a goal, iii) make an action plan by back-casting, and iv) assign tasks to team members. However, in this issue of extreme weather events (rainfall, heat and drought) and climate adaptation, there are many unknowns. It is not clear how big the problem and yearly damage is in the current situation. The goal is set ‘in 2050 we are climate proof and water resilient’, however, there is no definition or norm describing a climate proof and

water resilient situation. There is more information about costs and effects of measures, such as implementing SUDs, but also many uncertainties.

Therefore, we adopted the so-called 'process management approach', which is applicable in situations with many actors and stakeholders, an uncertain or wicked problem and a dynamic context. This approach entails seven steps[1] (slide 10). Since then, we have made considerable progress with the project team at the Province of North-Brabant. We helped to set a direction, although the goal is unclear. We have planned and started activities; often no-regret measures, such as stimulating municipalities to assess climate risks, knowledge sharing and improving water retention in nature areas.

Our conclusion is that when there is no clear goal or (design or result) norm, it is not a reason to do nothing. There a many no-regret measures for climate adaptation, improving spatial quality. It is possible to define a direction, navigate step-by-step, and learning by doing. For many practitioners, it takes some time to feel comfortable in this changing and uncertain working environment, especially when they are used to policymaking and managing projects of clearly defined problems. So, get used to enjoy the bumpy ride.

However, in our opinion, we have to determine some sort of 'norm', or directional statement, describing what is climate proof and water resilient, and what is not. This is necessary to aid political decision-making and to be able to compare regions and countries. We can do this at national level, or even at European level.

2. Speaker from Belgium – Koen De Winne – Aquafin (main sewer company of Belgium) – Rain Water Management

   No summary available.

3. Speaker from UK – Chryse Tinsley, Landscape Architect at Leicester City Council
   Making changes in Leicester; a city perspective

The talk was about practical changes that are being made to lessen vulnerability to flooding.

Leicester's principal urban area is one of the 10 most at risk from surface water flooding; which is due to topography, fluvial and pluvial flooding and also to the patterns of development. Some examples of the historic solutions used were shown; concrete channels and walls; which were designed to manage water volumes. Recent studies have shown that despite these works there are still substantial numbers of homes and properties at risk. The surface water management plan has shown that critical drainage areas extend across a large part of the city making it a priority to encourage suds on every site that comes into planning.

[1] Eric Spaans, et al., 2016. Hoe richt ik een zwerm? Eenvoudige aanpak voor complexe vraagstukken. November 2016, van Duuren Management.

Examples were shown of the sorts of projects that we are doing within the city. These included city centre highway projects, natural flood management along the river, opening up a flood channel within a park etc. A key point was that the changes were improving safety and areas for children as well as water quality, amenity and biodiversity. We will keep trying to make changes wherever possible from the smallest house development through to major development schemes.

Currently we are trying to get a technical guide for developers adopted. The aim is that developers who follow the guidance will be more likely to get schemes adopted; thus saving them time and costly delays whilst achieving the sorts of sustainable drainage that we want to see in the city.

Finally we are wrapping education around the schemes to enthuse young people.

Panel 3: Design and Best Practice (10 minutes each)

1. Speaker from Belgium – Bram Volgels – Hydrologist at VMM (Flanders Environment Agency)
   Rainwater management in Flanders – preparing for the future

Storm water management in Belgium – Future-proofing

There has already been a strong commitment to effective storm water management in Belgium for decades. The first regulatory initiatives relating to the public sphere were introduced in the nineties. This commitment really quickened apace in early 2000, when implementing source-based measures also became compulsory for private individuals. These regulations were further amended over the years and safety measures were stepped up, design storms were adapted to climate change and, as well as compulsory reuse, compulsory infiltration was enforced in the public and private sphere. Every project that starts up must now include a commitment to the reuse of rainwater very early on; overflowing rainwater tanks must from now on be connected to an infiltration facility and only from there can an emergency spillway drain further into a downstream system. Retarded rainwater drainage is no longer permitted in Flanders, unless it can be demonstrated that infiltration is not possible. Whenever a licence is granted, adherence to these conditions is verified by carrying out a water assessment, which allows absolute grounds for refusal by the Flemish licensing scheme.

In order to judge whether the existing regulations are having the desired effect and to check at what point infiltration must or must not take place, an extensive modelling process, using a matching watercourse/sewage model was carried out. This proves that when the prescribed source-based policy is correctly implemented, the impact of climate change can be amply withstood. The situation as regards the impact on water quantity (overflowing sewers…) and water quality (overflow, wastewater treatment system (RWZI) dilution) is significantly improving, even given the increased precipitation and ever-greater presence of paved surfaces. The regulations are thus thoroughly climate proof.

The modelling also proves that the threshold for practical infiltration is much lower than was initially assumed, when this is calculated over a whole drainage basin, for watercourses as well as sewerage. The threshold calculations can be further refined using a multi-criteria analysis where both water quantity and quality are taken into account. As a result, the Flemish Environment Agency has significantly lowered the practical lower limit where it is compulsory to encourage infiltration: Constant > 1x10-7m/s or > 5x10-7 m/s, depending on the downstream receiving water system.

Using this framework, Flanders is readying itself to solve existing problems but also to ensure that the effects of climate change can be withstood. The source-based policy in place in Flanders therefore also constitutes an important priority in the implementation of a complete water policy.

2. Speaker from UK – Sue Illman, Landscape Architect, Illman Young
   SuDS retrofitting – from challenges to best practice

Managing surface water in towns and cities requires a wide range of approaches that exploit every opportunity to deal with it better. Whilst new development can be addressed as part of the planning and design process, retro-fitting is a more opportunistic approach. This needs us to consider the opportunities for managing water whenever changes are made to the urban fabric. However, delivering effective solutions also requires engagement with those who live and work there, both to explain the changes and engage their support. Combining local knowledge with a creative design approach can help ensure that the outcomes are more robust, appropriate and deliverable.

Note – Illman Young continue to promote the concept of how to prevent flooding by Nibbling! Please watch their video from the link below or on YouTube – search for: Let's get Nibbling! – and then share with others.

Watch our latest SuDS Video 'Lets Get Nibbling' by clicking here

3. Speaker from France - Elia Desmot, Project Manager on the Territory Picard for ADOPTA, Sustainable Stormwater Management **Sustainable and integrated rainwater management: a philosophy and a toolbox of alternative techniques**

For many years city development has led to the waterproofing of soils and has prevented rain infiltration. The sewage devices are usually unable to cope with the additional quantities of water brought by the connection to new hard surfaces (roads, buildings, activity parks…). The consequences are numerous: flooding,

sewage network overflow, impact on natural environment, reduced ground water recharge…

Nowadays, various technical, legal and financial tools are available to local authorities to use innovative solutions in newly built areas as well as in a constraint built environment. They can manage rainwater as close as where the drop falls down. They can prevent surface runoff, improve people and building security (during storms for instance), change the city aspect (more green spaces) and improve the public space quality. These innovating solutions are both cheaper and sustainable.

The French organization ADOPTA, funded by two French Public Water Agencies, Hauts-de-France Region, and the European fund ERDF, has been promoting these solutions and supporting political transitions in this area for 20 years. Drawing on its long experience on a local French territory "Le Douaisis" (Douai area - South of Lille), ADOPTA's main task is to share its knowledge and to raise awareness on sustainable stormwater management. This task is achieved through multiple ways: the development of technical datasheets and case studies, a showroom dedicated to rainwater management alternative techniques, field visits, the organisation of lectures and conferences on technical as well as political themes.

4. Speaker from Netherlands - Steven Slabbers, Bosch and Slabbers, Landscape Architects, Middleburg
   Adaptive & Attractive

Main message in Steven Slabbers' presentation is that people shouldn't accept solutions that only work, but claim solutions that both work and add value. Solutions that turns the site in a place much more interesting to live, to work, to stay and that strengthen its ecological resilience.

Our cities have to deal with the negative effects of climate change. Extreme heavy rains will occur more regular. During those periods it is a challenge to store all water. At the other hand there will be longer periods with hardly any rain, periods with far too much water will be alternated with periods of extreme draught.

Average temperature increase, it is getting warmer, especially in the petrified cities that can't repel their warmth during night-time. Temperature differences within the city go up till 8 degrees Celsius. That makes the difference between a nice 23 degrees or a more scary 31 degree Celsius.

Heat stress has negative effects on wellbeing, concentration ability and production capacity. We have to re-arrange our urban areas in such a way that they supply more room for water storage and offer more places where citizens can find coolness.

Fresh water is too valuable to throw away. Cities must do everything possible to store and retain water, and only drain when no other options are left.

In our master plan for Water-city Westergouwe, a new urban development for the city of Gouda, we introduced the principle of urban floodplains -areas that

temporary can double their storage capacity without causing any harm- combined with an ecological area that will be grateful to receive periodically the water surplus.

Existing urban areas also offer many opportunities to combine adaptive and attractive, to increase storage capacity and at the same time add attractiveness. The idea of the urban floodplain is also used in the inner-city of Rotterdam, and also there squares are designed in such a way that they periodically also function as a water basin.

In Maassluis enlargement of water storage will be combined with new ecological quality.

In Middelburg our company works on the redesign of the historic Mill-water-park, here again we search for the possibility to combine this redesign with an increase of the urban water storage capacity.

Finally, be aware that opportunities are not only in the 'big projects'. Often you can achieve the most benefit from relatively small measures that you can reply many times.

For example, take the street, the smallest grain in the urban fabric. Originally the street was a social space, the place where a broad range of people and activities could meet. Until the middle of the last century we see a relatively narrow roadway with broad sidewalks and big trees supplying shade and coolness.

During the last 60 years the street has lost its social meaning, it is degraded to a mono functional traffic area. Anno 2017 the street is an oversized roadway with narrow sidewalks, no space for trees anymore, lots of underground infrastructure, no people in the street.

When you can introduce a small change, that you can repeat a thousand times, you ensure a real evolution. No revolution, but evolution. The great benefit of evolution is that it mostly happens without any bloodshed.

In our project 'The Street' we show possible applications of relatively small measures. Each of those measures delivers a modest contribution to a more adaptive environment. But together they realize a huge change rotation.

So you need not only the courage to think big, but also the guts to act small.