



## **Disconnecting the autopilot in urban water projects** creating an innovation platform for sustainability

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# Disconnecting the autopilot in urban water projects: creating an innovation platform for sustainability

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## Abstract

How can we motivate urban planners, water utilities and house owners to collaborate about sustainable urban water projects and to aim for solutions that go beyond the narrow perspective of individual stakeholder interests? A concept for framing a multidisciplinary learning process is developed in the research project: Black blue green: Integrated infrastructure planning as key to sustainable urban water systems, with the acronym 2BG. The concept addresses the need for local authorities to develop competences for adopting an integrated approach including different internal departments. The concept is referred to as 'the 2BG platform concept'. The 2BG platform concept as been tested three times and proves to a step in the intended directions of developing organisational competences for an integrated approach in sustainable urban water projects. Primarily because it invites urban planners, road and park managers, and sewage managers to a dialogue about sustainable urban water projects while exploring cases of new design solutions; secondly because it facilitates an appreciative communication between "softer" and "harder" disciplines, and thirdly because it promotes multidisciplinary thinking during the early stages of an urban water project. To realise new sustainable urban water designs a project team will need to engage and get acceptance from internal and external stakeholders, and this calls for communication and social skills rather than technical skills. The paper identifies potential stakeholders that can support or potentially stop urban water projects. Competences of network governance represent a need to break out of the conventional urban water design and to develop new designs where storm water is handled visible to citizens. The platform concept is in a Danish context a milestone in capacity building for integrating urban planning with water management and management of parks and roads, and might inspire others to rethink planning processes and to build organisational competences to innovate urban water management for the benefit of present and future citizens.

## Keywords

Governance; sustainable urban water design; organisational learning, integrated water management.

## THE CALL FOR SUSTAINABLE URBAN WATER DESIGN

Flooding in urban districts has in Denmark as well as in other developed countries been an eye opener for climate change and what kind of practical impact it might have. Professional stakeholders are gathering to promote visions of future water technology, future infrastructure and point to the potential for water technologies to be a way to green growth in society (e.g. European Council (2004) and in Denmark ATV (2011)). They point to the need of innovation, and for visionary and courages politicians. This is the point of departure in this paper, which in addition includes public administrations for their ability to qualify project ideas about urban water projects and to insure that private or public investments in urban water leads to more sustainability. In some situations this approach challenges ideas of conventional thinking, and as such the project should be evaluated as a step in a transition.

Researchers like Rebekah Brown (2005) has argued that rethinking water management as a more integrated and holistic practice will need a new institutional setting. Much can be achieved if only the existing competences for urban management, water management and administrators of roads, parks and nature are united in a project team. This is why we have developed the “2BG platform concept”, to enable multidisciplinary teams to collaborate. The paper is building on action research Reason and Bradbury-Huang (2006) in Denmark, but is applicable in other countries as well, since the problem of silo-thinking versus integrated thinking is recognised in administrations worldwide.

The multidisciplinary 2BG research project explores the possibility for a paradigm shift within urban water systems, a shift that focuses on citizens’ life quality and long-term functionality of applied management concepts.

In terms of storm water the 2BG key-challenges are to analyze

- 1) potential for massive infiltration to avoid sewer overflow, and to recharge local streams and aquifers,
1. methods for water quality control to avoid pollution of receiving environments and improve re-use opportunities, and
- 2) options for inclusion of technical water systems as assets in urban life.

This paper informs about transition management and initiatives to facilitate learning and innovation within public organizations.

We first present the principles in an integrated urban water project, secondly we present the 2BG platform concept and thirdly we evaluate and discuss the value of the 2BG concept for capacity building in local authorities on enabling sustainable urban water projects.

## **METHODOLOGY**

Throughout the lifetime of the 2BG project, which was initiated in 2007, there has been an ongoing dialogue between researchers and practitioners to enable a co-creation of knowledge about integrated urban water systems, and how, if desired, the project planning process could be improved, and what competences the organisation would need to conceive, design, implement and operate urban water projects with a higher sustainability profile.

We have used qualitative research methodologies to explore the learning process. This includes:

- More than 75 hours of observations and dialogue of participants at 2BG seminars and similar professional gatherings
- Documentation of group work and informal interviews during 2BG platform course sessions
- Survey including participants evaluations of the 2BG platform course.

In the research project we have worked with more than 10 local authorities in Denmark, which all came in groups of 3-5 people. On this back ground we assume that we have gained a detailed insight into the possibilities and barriers for sustainable urban water design in local authorities. However there is better insight into the situation in the larger organizations, since most of the participating municipalities represent large to middle size municipalities (from 50.000 to 540.000 inhabitants). Many of the smaller municipalities were not able to meet the organizers’ demand of registering representatives from 3 different departments to be admitted on the course.

## **THE PRINCIPLES OF SUSTAINABLE URBAN WATER SYSTEMS**

Sustainable urban water systems refer both to a sound management of freshwater as an essential resource, i.e. the restoration of the natural water balance around the city and the improvement of the water quality, as well as to the beneficial use of the water for strengthening the sustainability of the city in additional aspects, for instance related to social, educational or recreational values. In the 2BG research project the potential of the urban landscape to contribute to storm water management by means of storage, infiltration, and evaporation is sized based on natural science discipline, while the specific design aims at adding extra value by supporting overall urban development goals, be it related to urban biodiversity, accessibility, safety, economic growth, etc. (Jensen, 2008).

### **From bureaucratic to network governance**

Creating a storm water basin to retain storm water, while also improving biological diversity and citizens' access to diverse nature is relatively strait forward for projects when:

- At a strategic level: A local authority owns the location and is willing to invest in local management of storm water and sustainable urban quality
- At a tactical level: Sustainable storm water design is required in the local plan for the location
- At an operational level: The physical and geological conditions make it possible to construct a facility large enough to handle all storm water on site. That it is relatively few people which have access to the water, and those that have access will be familiar with this water.

Even then there may be disputes about the risks of drowning, risks of damages due to overflow in extreme situations, the allocation of costs and benefits, the ascetic experiences and on top of that competitions with other political goals and priorities.

We argue that a public servant has to be able to handle this potentially critical negotiation. While it is important to be aware of the many different interests, a broader group of stakeholders might have an impact on the urban water design and on the realization process. We argue that they need competences to be emphatic towards other personal or professional values, in order to facilitate and contribute to constructive dialogues and processes.

In our research we have identified this broader group of stakeholders which is experienced to have a role in the development and implementation of a sustainable urban water project. This includes stakeholders being influential on: the idea, the design, the authorization, the construction process, the use, operation and maintenance. The broader group of stakeholders is illustrated as a network of actors in figure 1.

Society needs professionals that can promote integrated design of space, buildings and infrastructure. We argue that there is a need for:

- Introduction of a new concept for integrating urban design, space and storm water management
- Developing professional competences to perform water management according to values of integration, transition and sustainability

On a personal level it is a challenge to try new approaches, move into unknown land and to break out of conventional procedures. Some people likes it, others find it difficult and feel vulnerable. Our idea was to facilitate a learning process in a neutral learning environment, where key stakeholders

could test and develop ideas of how to manage innovation in sustainable urban water projects.

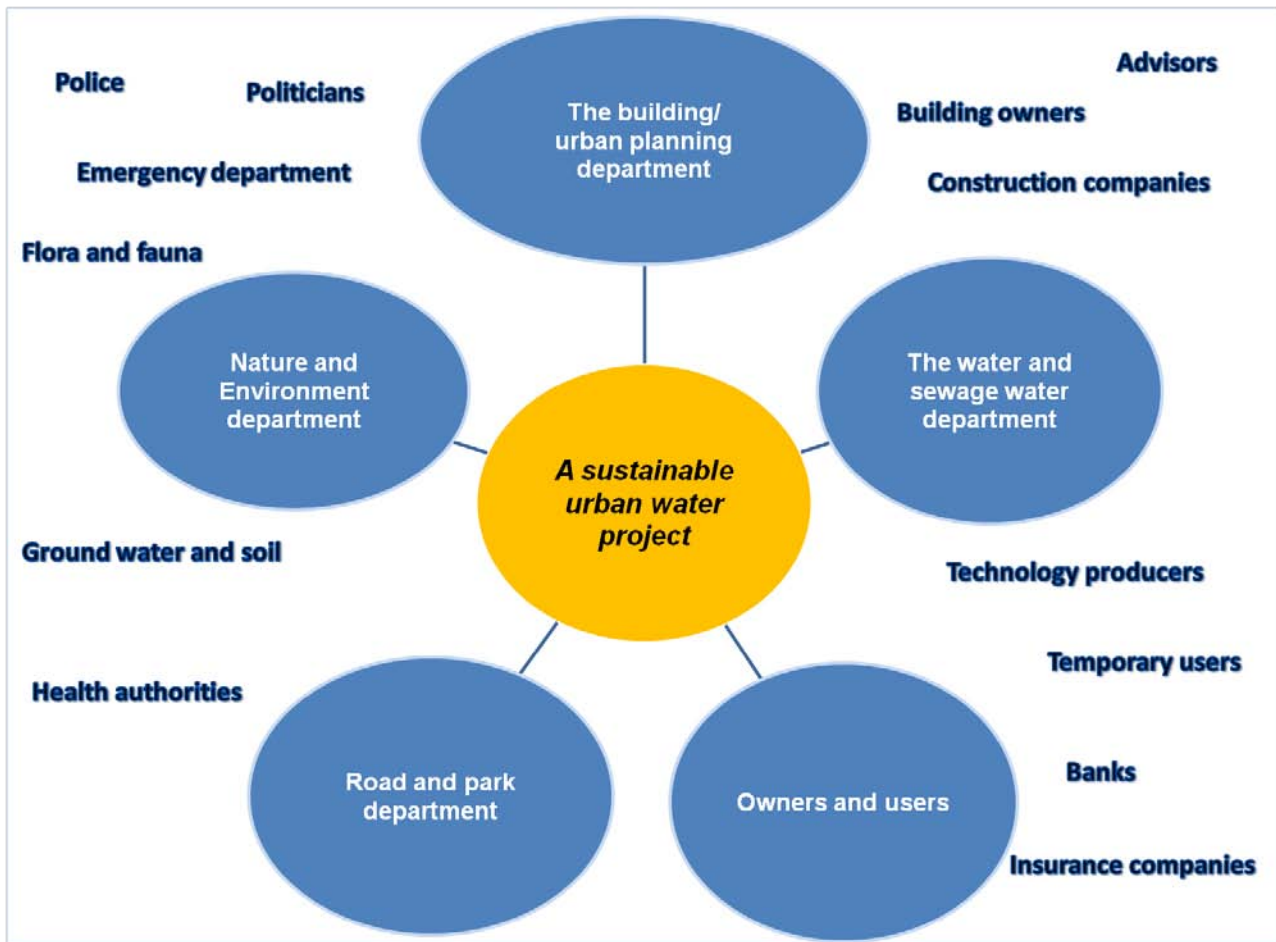


Figure 1: Stakeholders in the 2BG project, which by experience have a role in the realization of sustainable urban water projects. Human and non-human actors are included.

### Improving the local phases of the local planning process

Urban planning and storm water management is currently happening in separate stages which leave the co design of physical systems with few chances of success. Our idea is to create an innovation platform, a concept borrowed from innovation system theory (e.g. Tukker et al. 2008), by forming a team of people with supplementary competences, who know each other and who are capable of communicating and considering a multitude of interests of the broader stakeholder group. We suggest improvements in the early phases of a project design, and figure 2 illustrates the case of improving the local planning process.

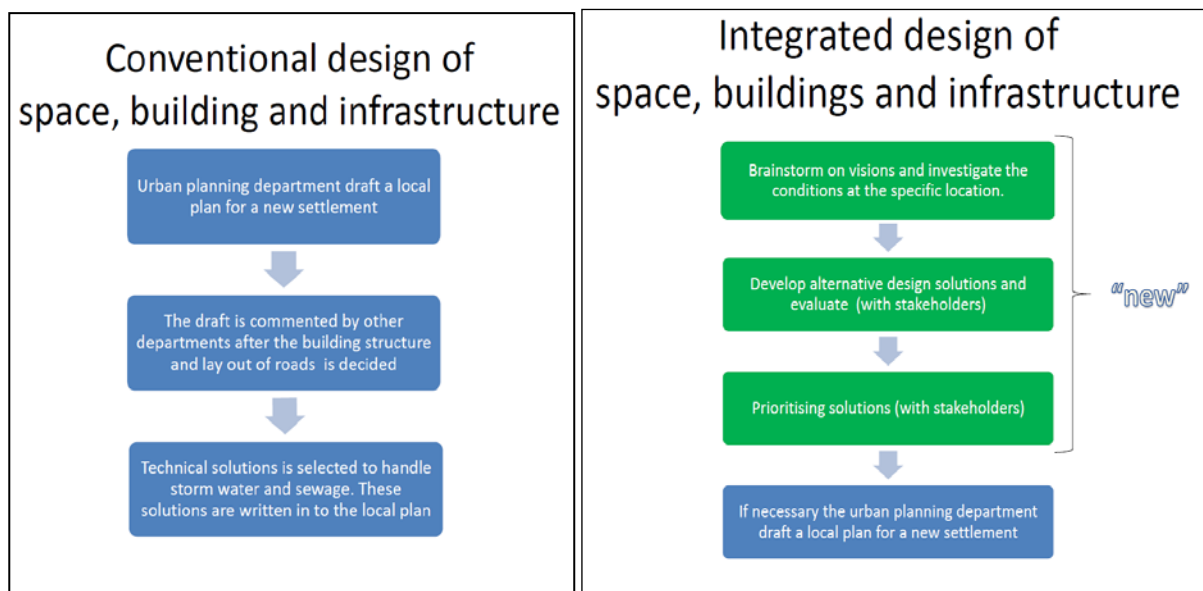


Figure 2: In a conventional design process of space, buildings and infrastructure the urban planning department are in charge of designing the building structure without technical consideration of water management. Where as an integrated design process calls for integrating water handling in the building structure, the roof design, the design of surfaces etc. In case of existing areas the conventional response to stormwater management problems is sewer system enlargement, while in an integrated approach based on the urban landscape the city is re-designed by introducing elements for water storage, infiltration, evaporation and cleansing, the form of which is linked to overall urban development goals.

As private persons we know that it takes a special effort to change habits and to start to do things differently. Likewise in water management, as one of our informants said *“sometimes I think – this is the opportunity to do things differently and more integrated, but then I get overwhelmed and do not know where to start, and then I end up doing things the way I know that is the easiest”*. This tells us that it is not only the “production process” that needs to be improved, especially in the early phases. It is also a question of learning how to do water management, and specifically urban water projects differently.

Three types of learning processes (inspired by Sabatier 1993) is useful to structure the type of learning that needs to take place in order to disconnect the autopilot in water management

- **Instrumental learning:** which is learning about how different political instruments can be improved according to given goals.
- **Conceptual learning or problem oriented learning:** which refers to a changed understanding or approach to a problem and its character. This is normally associated with adaptation of new concepts, principles and visions.
- **Social learning:** is the learning associated with changed common values, norms, goals and perspectives.

Theories of lean management and construction (e.g. Jørgensen 2006) provide useful tools to address instrumental learning and issues of improving “production processes”. To some extent it is also useful in relation to water management where the organization must ask the question “are we acting from the right concept and in alignment with values of sustainability?”. In Denmark there is however a need of “conceptual learning” on integrated water management as the 2BG-platform concept, and also social learning to promote the values of local handling of storm water and new urban designs.

## **THE 2BG PLATFORM CONCEPT**

The 2BG platform concept aim at developing networks of people representing key stakeholders for sustainable urban water projects. The aim is to enable a network to emerge among local authorities, representing the disciplines relevant for a multi-disciplinary integrated approach:

- The road and park department
- The water and the sewage water department
- The urban planning department, and
- The political and administrative “hinterland”

The aim is also to create a national network for knowledge sharing, which is why the course concept stimulates both multidisciplinary team working in local, municipal teams and disciplinary team working with participants from across the country.

The activities aim at strengthening the participant’s competences for dealing with issues that are primarily of a technical character and within a natural science discipline. Further, the aim is to strengthening their competences for dealing with issues of communication, which is more into a management and social science discipline.

The learning process is structured of four workshops with home work in between, offering the possibility to gain deeper insight into the participants own professional discipline

- urban planners: especially local planning and urban design;
- water- and sewage planners: especially sewage planning, new technologies and storm water design
- road managers: especially surface design and capacity for storing water
- nature and park managers: especially the potentials and reasons for precautions from a water quality and biological perspective

The program has been adjusted over the three times it has been tested. The following gives an impression of the program in the latest version.

### Course day 1: Challenges and inspiration

- Overview of the course
- Towards climate resistant cities (speech)
- Working in multidisciplinary teams (speech)
- Site visit to a role model (Augustenborg in Malmoe, Sweden)
- Group work: reflections on input, own motivation and ideas of a local case
- Group presentations

Homework: prepare own project/case: visions, location, ideas, urban design.....

### Courseday 2 and 3: Ideas, solutions and cases

- Inspiration from national and international cases (speech)
- Feedback and guidance from experts (researchers and consultants) to each group, based on homework.
- Reflections and next steps in each group
- Water quality and water quantity (speech)
- Storytelling (speech)
- Group work on storytelling to communicate the vision of the specific urban water project



Homework: production of a 'post card' communicating the values and visions of the urban water project.

#### Course day 4: Anchoring and communication

- The law of Planning and the planning hierarchy (speech)
- The sewage plan as a mean of collaboration between the municipality and the utility (speech)
- An example of the good story about integrated urban water design (storytelling)
- “storytelling” from all participating groups
- Reality check on realization of group strategy from a panel of politicians and an expert in strategy in a municipal context. This is a possibility for rehearsing before an audience before the real testing at home.

In the first version of the course we had four sessions and four municipalities and during the course we visited each municipality and learned about their special situation and political agendas. Each place we arranged an “after party” to introduce the 2BG platform concept to a larger group of the local stakeholders including politicians, participants colleagues and utility leaders. However the experience was that too few people took the time to take part in this event, to keep it in the program.

### **EVALUATION OF THE 2BG PLATFORM CONCEPT**

Participants and organizers have evaluated the course and the following presents the main points in the final evaluation.

The participants in general find the course:

- Relevant, entertaining and stimulating
- Good because of the work on own cases and feedback from experts and peer reviewers
- Good because of the site visit and the possibility to explore “a good example”
- Has lead to better relations among colleagues and mutual understandings despite of different competences.

On the personal level the course is also evaluated very positive:

- “My professional horizon is expanded”, others highlight: better cross-department collaboration, focus on own strengths, and more empathy for other disciplines.
- “Local handling of storm water has become a part of my knowledge”, other highlight new tasks, new knowledge, and “we have changed from an understanding of urban water as legally problematic to something where we have the courage to give it a try”.

Suggestions for improvements:

- The program includes a mix of technical and non-technical speeches and in the evaluation the urban planners sometimes suggest to cut down on the technical presentations and the water managers sometimes suggest to cut down on the non-technical presentations.
- Minor changes concern: time, accessibility to experts, and the food.

Other insights were formulated on the last course day. “We have underestimated the communication task that is ahead of us. Politicians and citizens need to be engaged too” and a politician in the panel gave a tip for doing so: “we politicians like to discuss, and you (the public administration) need to leave something for us to discuss and decide. We know you are cleverer, but give us something to have an impact on”. The latter is in our opinion essential when you aim at integration, networking and co-design of physical systems.

As organizers we observed that the municipal teams often did not know each other when they arrived for the first course day, but over the three sessions, they developed a language and a way of being around each other that demonstrated a mutual understanding of each other's interests and competences. Compared to other courses offered by the co-organizers Danva and the Danish Town Planning Laboratory the course evaluations are in the best end of their evaluations.

The idea of sharing knowledge about local projects is based on a problem based didactic in combination with learning from peers. From the 2BG-project we see that the participants have experiences which could be used for further innovation in public authorities, because we during the project period have heard suggestions for improving current bureaucratic processes. This insight is a potential we would like to explore more in future research projects.

## CONCLUSION

The 2BG course concept has proven to develop organizational competences for an integrated approach in sustainable urban water systems. The participants have become familiar with a new concept for sustainable urban water systems, which is related to additional urban development areas, e.g. social, educational and recreational values.

The course has provided the participants opportunities for developing ideas and on paper testing of the concept adapted to a specific location. They have done this in dialogue with peers and experts in integrated urban design and integrated water management. According to the participants, the course offers both conceptual learning as well as institutional learning, as they learn how to design and communication with different stakeholders.

Through multidisciplinary teams and a facilitated process we have succeeded in "disconnecting the autopilot" in the thinking of the participating teams, and opening of an innovation platform for sustainability.

## ACKNOWLEDGEMENTS:

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