

Stormwater management in Sogn Allotment Gardens, Oslo, Norway

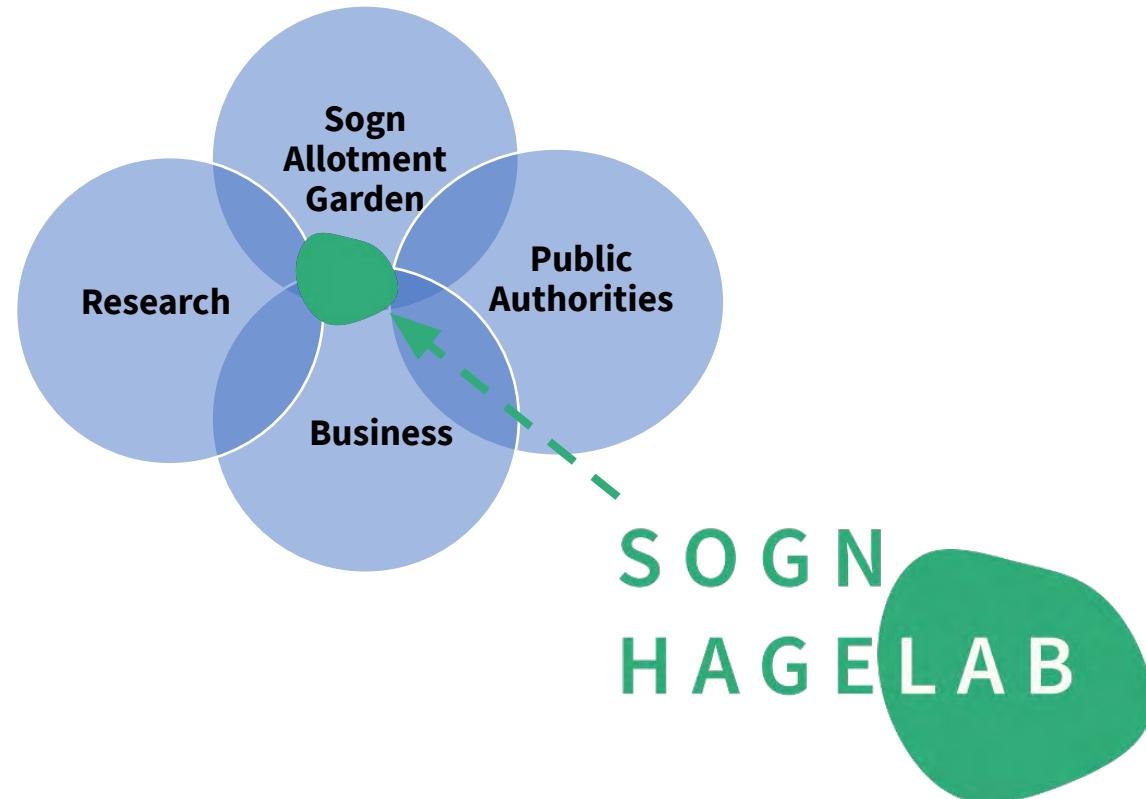


How to handle extreme rains in a sustainable manner by applying nature based, blue-green solutions.

- A living, learning lab co-developed by allotment gardeners, research institutions and the City of Oslo

Presentation by: Bente Mogård, Sogn Hagekoloni (Sogn Allotment Gardens)
Line J. Barkved, NIVA (Norwegian Institute for Water Research)
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Sogn allotment gardens as an on-site live demonstration and learning arena for blue-green stormwater solutions



Sogn allotment garden: Contributes with volunteers, gardening and local knowledge, plant donations, testing and demonstration areas

Research: **NIVA** carries out research and knowledge transfer (self-financing) and project coordination

NMBU contributes with master student projects and knowledge transfer (self-financing)

Public sector: **The City of Oslo** provides financing, knowledge transfer through the New Water Ways project, and dissemination opportunities

Commercial sector: Some interest from suppliers to contribute with hardware and materials (on varying commercial terms)

Financial actors/supporters: Other finance partners have contributed to various research and test projects

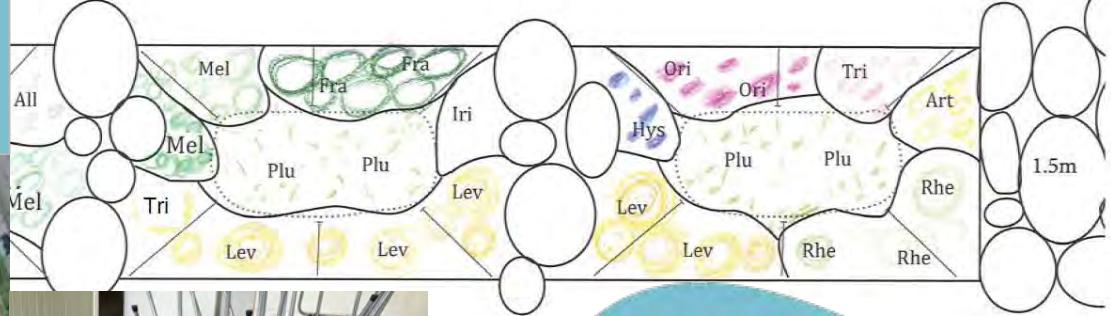
Sogn Hagelab (Sogn garden lab): Demonstration and learning arena (physical and digital) open to the public and research

#sognhagelab



- Established in 1923
- Centrally located in Oslo, the capital
- 204 allotments (the largest in Norway)
- Covering 20 acres, average plot ~270 sqm
- Maximum cottage size 32 sqm
- 5.5 kilometres of white picket fences
- More than 1000 fruit trees and 1500 berry shrubs, innumerable flowers, vegetables and herbs
- Bees, cats and dogs, birds, deer (not our favourite visitors), turtles (always escaping, but won't get very far), slugs (not welcome either)
- Some hundred eager gardeners and happy kids, lots of visitors

Mapping of flood areas with input from the allotment owners



Mapping trouble spots, selecting test areas and planning plant donations

Initial considerations and building phase

- Soil at Sogn is mainly clay-based, hence requires substantial preparation to act as filter medium in blue-green structures. Some masses needed to be changed. Drainage below structures were needed.
- Ground water level at Sogn is in many places only a few decimetres below surface, which makes water absorption in the ground difficult.
- For building the larger structures, hiring outside contractors and machinery was costly, but necessary! Multidisciplinary knowledge was essential. Construction of blue-green structures new to many construction workers.
- Plant selection a mix of purchase and donations (cuttings and mother plants) from allotment plots. Positive: Plants are expected to be suitable for the rain beds because they thrive locally. Less positive: Many plants and cuttings were weed infested, requiring extra weed cleaning of roots.



“The best learning
comes from working
together and taking
part in the actual
planting” (allotment gardener)



Photo: Leidolv Magelssen



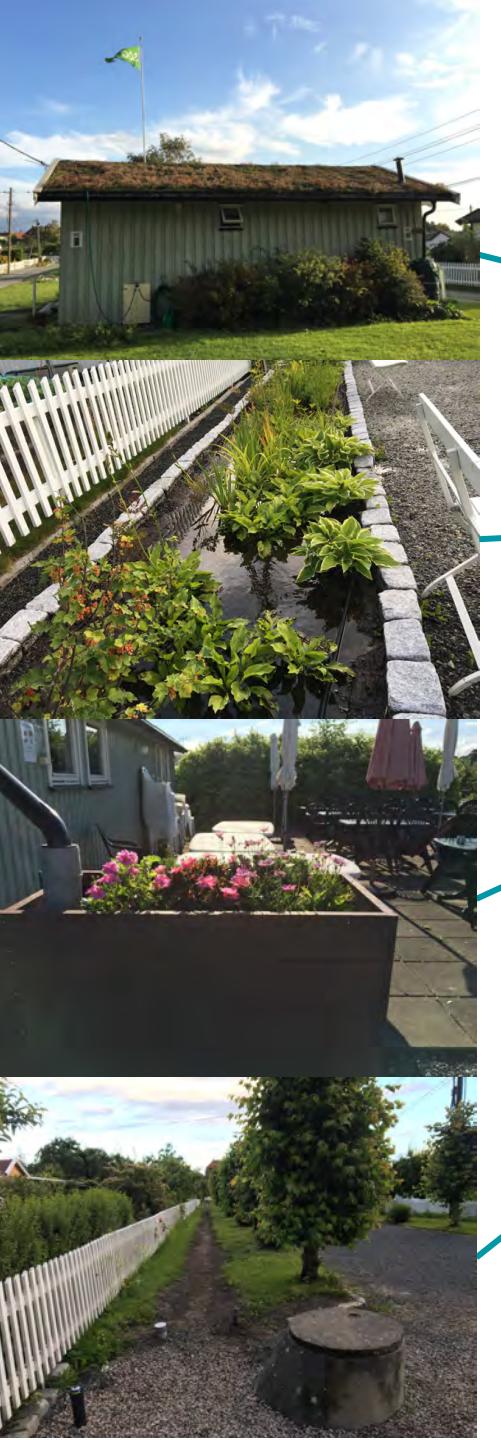
Sharing and learning,
dissemination
and information



Adriana Bertet og Anita Glittum har hatt en bratt læringskurve, men sier det er både spennende og lærerikt. Foto: Amalie Sofie Aune Bjerkem

Etter styrstregn og flom kan resten av Oslo lære vannhåndtering av Sogn hagekoloni







Different types of rain gardens and infiltration structures



Rain gardens

A rain garden is a planted depression built with a filtermedium and dedicated plants, where rain- and stormwater can be infiltrated and delayed. Such structures come in different sizes and shapes. Plants need to endure both much water and dry periods. At Sogn due to the clay ground, there is a drainage pipe below the rain gardens. We also have a **mini rain garden** capturing roofwater.

In a sloped area, the rain garden is constructed as **a terraced rain garden** to prevent erosion. We are also experimenting with edible herbs and plants in some of the rain gardens.

We have also constructed a **pocket wetland**, a structure where there will always be some standing water. The combination of a rain garden and wetland is unique. In the constructed wetland special wetland plants are needed.

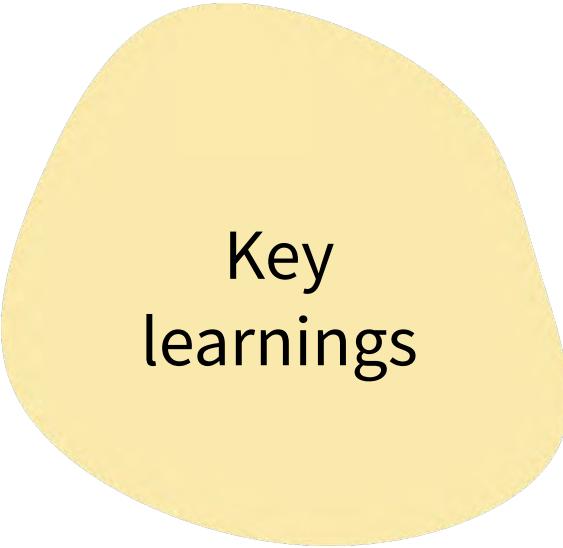


Green roofs

Green roofs slow down rain water and is positive for biodiversity. Data from our roofs show how they can help regulate indoor-temperature.

Water barrels is a small-scale measure to delay and use rainwater for plants, rather than using scarce drinking water. It usually also holds a better temperature for plants.





Key learnings

- Stormwater management and nature-based solutions requires interdisciplinary and multi-actor collaboration. At the same time, collaboration between different parties adds to the management and coordination complexity
- The core team (consisting of the key partners) must have sufficient authority and a flexible attitude
- Selection of plants - what seems suitable on paper needs to be tested locally over several years
- Engagement and ownership - and influence by allotment owners is essential for project success
- Communication and information requires dedicated resources
- Financial resources are needed for such a collaborative project, it cannot be based on solely voluntary efforts
- Experimenting and demonstrating effects at the same time can be challenging.
- Meeting the objectives of all parties involved is not always possible



Further reading

Sogn Allotment gardens:

<https://www.sognhagekoloni.no/>

Sogn Hagelab, publications and presentations:

<https://www.sognhagelab.no/>

Glimpses of Sogn Hagelab in Media:

Oslo can learn about Water Management from Sogn Allotment garden. Vårt Oslo, 11.09.19

<https://vartoslo.no/adriana-bertet-amalie-sofie-aune-bjerkem-anita-glittum/etter-styrtregn-og-flom-kan-resten-av-oslo-laere-vannhandtering-av-sogn-hagekoloni/212123>

Heavy Rains and Floods in Cities: We can learn from Nature. Research Days 2019, 13.09.19

<https://www.forskningsdagene.no/artikler/styrtregn-og-flom-i-byer-vi-kan-lre-av-naturen!t-7374>

An Interesting Rain garden in Oslo (Norway). Video from the Documentary Desafio 2030, aired on Chilean TV 13.01.20. <https://www.youtube.com/watch?v=QyyfLCaNwJE>

City Of Oslo's Stormwater Management plans and strategies:

<https://www.oslo.kommune.no/overvann>

<https://www.oslo.kommune.no/politics-and-administration/green-oslo/plans-and-programmes/>



Come visit Sogn
allotment
garden &
Sogn Hagelab!

SOGN
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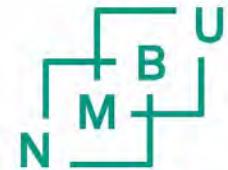


www.sognhagelab.no



Instagram: @sognhagelab

Key collaboration partners and supporters



An initiative of the European Commission

Supplementary notes to slides

1-Let us take you on a short journey through our collaboration project of research and hands-on activities at Sogn Hagekoloni (Sogn Allotment Garden) in Oslo, Norway. Here we experiment with nature based blue-green structures and a variety of plants with the purpose of learning how to prepare for a changing climate with possibly more stormwater - and fewer places for the water to escape due to more building and road construction.

2-Climate changes with more intensive rains combined with urban densification causes challenges with stormwater. This is a major challenge to all cities around the world, including Oslo, one of the largest growing cities in Europe. Our cities are becoming more and more dense, which leads water to run off more quickly and with less places to infiltrate. An important principle of the City of Oslo is that we all have a responsibility to ensure that stormwater is taken care of in a safe and good way. Furthermore, that we must withstand more and heavier rain in the future, but that we together we can take measures to reduce the damage and use the water for something positive.

3-An exciting and rewarding collaboration between several sectors has resulted in an open-air, on-site testing and learning laboratory for stormwater retention structures

4-Sogn Allotment Gardens is part of the Oslo Allotment Garden society and the Norwegian Allotment Garden Association. All grounds in Oslo are rented from the City Council of Oslo. Sogn is surrounded by a 4-lane highway, several major tube/underground lines, the national soccer stadium, and Oslo University, Norway's largest university. The small, red cottage below right is one of the original allotment cottages from 1909

5-The initial phase of the project built on a survey conducted with the involvement of all allotment gardeners, mapping problem areas (=where water stays after heavy rainfalls and in spring/autumn). The brighter the color, the more rain water creates flooding

6-An important part of the project start up was to map and consider areas where structures might be constructed. Impact, feasibility for management and day-to day maintenance as well as not creating obstructions to the daily life were among the considerations.

A key to the success was involvement from several key stakeholders. NIVA research program, potential impact and effectiveness, amount of volunteer work and commercial resources required were amongst important issues to be resolved.

The ideal (garden designer) plant map needed some adjustments in order to select plants that could be donated from the plot owners (in sufficient numbers), but also plants that would fulfill the purpose and potentially withstand the changing conditions (heavy rains, dry and sunny weather)

Supplementary notes to slides, continued

7-An important aspect of the project was to engage the plot owners and ensure their support for the activities - short and long term. In order to stretch the budget, a lot of the plants were resourced from the allotment plots, according to a “wish list”. Mother plants and cuttings were identified with their origin (who donated, from which plot, is there a story to be told). This turned out to be a huge coordination task and quite demanding - but also a lot of fun. We held several “plant feasts” with food and drink, inspiring talks and lot of people showing up, eager to contribute. The general mood was one of “I want to contribute and participate - this is fun and we can work together on something very meaningful”. Also, NMBU (the University of Life Science) contributed with expertise and plant material from their own rain beds. It was seen important to involve the public, as well as school children. Several school classes came to learn and experiment first hand structures

8-The project period coincided with a number of research conferences held in Oslo in 2019, when Oslo was named the Environmental Capital of Europe. Several conferences and meetings used Sogn Allotment Garden as part of their field trips, both researchers involved in stormwater management, city planning, architecture and others.

It has also been important to involve the public, as well as school children. Several school classes came to learn and experiment first hand structures such as green roofs. Newspaper articles, community groups, a TV-team from Chile, and a number of research articles are among the information and sharing platforms. In addition, an instagram account “sognhagelab” shows the development and details of the structures and surroundings, intended to inspire to more learning and further studies.

9- An objective of Sogn Hagelab was to establish different kinds of blue-green solutions to demonstrate a variety, as well as enabling learning and experience with the different types.

10--15 notes in slides