REGREEN
NATURE-BASED SOLUTIONS

GREEN ROOF STRATEGY OF HAMBURG

Adressed SDGs:

Image: Gruendach / Unilever

> OBJECTIVES

The Green Roof Strategy Hamburg (Germany) was initiated in 2014 with the first green roof symposium, making Hamburg the first major German city to launch such a comprehensive green roof strategy. Its goal is to green at least 70 per cent of both new buildings and suitable flat or gently pitched roofs undergoing renovation. The Ministry for Environment, Climate, Energy, and Agriculture supports the project with three million euros in total until the end of 2024. The strategy is based on four pillars: promotion, dialogue, policy and research. Green roofs and facades have different positive ecosystem services and support several SDG's. They improve environmental conditions by reducing noise, reducing fine dust particle concentration, lowering surface temperatures, offering retention and evaporation, reducing drainage system congestion and reducing risk of flooding. They can, in general, be seen as actions for climate adaptation.

> DESCRIPTION

Integration of the green roof strategy into overarching strategies (e.g. Hamburg's climate plan) gave the strategy a wide and stable foundation. While pushed forward by the environmental ministry, the Green Roof strategy was developed in close cooperation with different special authorities. In implementing the strategy, the ministry needs the support of the district authorities – to apply the developed instructions for green roofs and facades.

Hamburg has incorporated a binding green roof regulation in many land-use plans for 20 years. In accordance with the Nature Conservation Act, green roofs and facades are considered possible measures for compensating the impact of building on nature. The city of Hamburg regularly reviews its green roof legislation, in particular the ecological quality standards for the roofs. The following elements were crucial in the early stages of the green roof strategy: 1) developing an urban land-use planning guide w.r.t uniform installations for extensive roof greening throughout the city and making them mandatory in the long term; 2) introducing a split wastewater fee; 3) launching a 3.5 million euro support program for green roofs and facades; 4) organising a publicity campaign with international outreach; 5) promoting roof greening as an eligible flagship for sustainable companies in the city; and finally 6) launching a green roof and facade competition to generate best practice examples and promote the funding program.

Within large parts of the city, the green roof area increased from 124 ha to 168 ha over the last six years. Within projects, such as CLEVER Cities Horizon 2020, there is a chance to test ways of improving the implementation of green roofs and facades to raise the positive benefits derived from the NBS. For example, experimenting is done to design roofs in ways that create biodiverse hotspots for different insects, for example by bringing nesting aids and other materials for bees on the rooftop. Another project will implement smart flow control by creating retention basins on roofs to retain water during heavy rains and release it upon need during dry periods. There is also a plan to combine green roofs with solar panels for energy production. These solar panels will work more efficiently over green roofs, as evaporation cooling lowers the microscale air temperature and increases energy production in the solar cell. Other than this, the HafenCity University Hamburg will monitor the retention capacity of green roofs. This long-term observation is important to determine the retention capacity of green roofs and prove the effectiveness of green roofs, especially during heavy rain events.[1] There are about 16.000 housing units in planning to adopt green roofs and/or facades in the coming years.

> CHALLENGES

Low technical knowledge and trust: The lack of knowledge in regard to fire safety but also maintenance have been barriers in the continuous progress of the strategy. It has also been questioned whether green roofs indeed provide the needed water retention capacities especially with a heavy storm water event. Since the evidence stems from small scale experimental settings, there is a concern that real and large roofs would not provide adequate retention service. To understand this better HafenCity University is currently researching this question. Further, when initiating the Green Roof Strategy, it was challenged whether Hamburg has sufficient flat roofs to be able to succeed with the strategy. GIS-based research answered this question, showing that over 40% of the city's roofs are flat and suitable for greening.

1 Richter, M.; Dickhaut, W. (2016): Evaluation of green roof hydrologic performance for rainwater run-off management in Hamburg. Conference Proceedings of the International Conference on Sustainable Built Environment, Hamburg 07th-11th March, pp. 536-545.

Lack of scientific evidence: In a few cases, the scientific support is missing as little on-site real scale measurements have been made. For example, it is still difficult within the land-use planning sector to implement greenery on buildings for noise mitigation and air quality improvement owing to lack of research on the correlations. In order to make initiatives like green facades mandatory, there is a need for good scientific evidence.

> OPPORTUNITIES

Political will and common goals: The initial binding political decision was very effective giving the strategy the needed political force in discussion with other governing bodies of the city. Another very critical factor is the link to other overarching strategies of Hamburg, the Hamburg Climate Plan, RainwaterInfraStructureAdaptation (RISA) Strategy, and the Qualitäts Offensive Freiraum (quality offensive for open space). Incorporating common goals from these strategies into the green roof strategy and vice versa increased the strategy's legitimacy.

Financial incentives and knowledge exchange: As most of the roofs are privately owned, the ministry's influence remains limited to future planning. In that regard, financial incentives are relevant to realise NBS and bring on board the general public, experts and get media attention. With the incentives, the motivation for private partners increased leading to implementation activities. In the end, the support by national funding programs from the federal ministry of environment is helpful as those programs foster the exchange also beyond the city scope.

> LESSONS LEARNED

Whenever trying to implement a NBS strategy, all bodies of the city should be included in the process and regularly updated about the progress to raise the awareness of the topic and show the successful implementation. Taking into account a wide range of planning tools, it was possible to identify a number of factors that could positively influence one another and thus contribute to the success of the strategy. The advantage in Hamburg was that the challenges (reduced green space within a growing city, climate change, biodiversity loss) were omnipresent.

One success factor for this strategy is also the participation of different stakeholders in the strategy creation and aim definition. This increased both awareness and acceptance of the project. The public relations work included the creation of a "brand", a website, brochures and flyers, posters in the urban area, film contributions, and publications in daily newspapers and trade magazines as well as on social media. In order to address the target groups in an adequate manner, there are regular meetings with multipliers from professional associations and contributions to trade fairs, lectures and events for different stakeholders. Hence, communication and dialogue/involvement is key to changing practices and creating a demand for green roofs among residents and companies. This requires a dedicated full-time communication officer and structured co-creation processes.

Nevertheless, disservices of green roofs – e.g. the case of many seagull pairs breeding on a large green roof during spring– necessitates a lot of dialogue and awareness raising as well as management needs.

> INSPIRATION FOR OTHERS

The Green Roof strategy Hamburg is a successful story of how a citywide agreement fostered an NBS implementation. The fundamental pillars of this strategy can be repeated elsewhere, as they allow for adjustment in focus to accommodate distinct local context and conditions.

Here are some tips for cities wanting to develop a similar strategy:

- Integrate into overarching strategies (e.g. climate plan, etc).
- Work together with all stakeholders to take into account their concerns.
- Combine support and promotion programs with accessibility of practical examples for the public and experts.
- Produce content and images for the public, experts and media.
- Distribute advice and training content for different target groups.
- Provide regular feedback and update meetings with partners.

Thus, a combination of regulation, promotion and dialogue, financial incentives, science advice and evaluation are key for successful implementation. Nevertheless, application to an entire country might be difficult due to a risk of oversimplification and lack of knowledge or consideration of local contexts.

FURTHER INFORMATION

All fact sheets were produced from questionnaires and interviews conducted by the ICLEI team. Contact ICLEI Europe for more information or access Oppla: https://oppla.eu/casestudy/21219

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