



REGREEN
NATURE-BASED SOLUTIONS

Fostering nature-based solutions for smart, green and healthy urban transitions in Europe and China

Deliverable **N°7.1.**

ACTIVITY PROGRAMME FOR THE ULLS

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EXECUTIVE SUMMARY

The document outlines the work with the Activity Programme for the ULLs and includes the formal activity plan developed for the project. It further shortly outlines how the activity programme will be used within the project.

The activity programme intends to clarify and attribute responsibilities for the tasks and thereby underpin the deliverables and milestones throughout REGREEN. The activity programme will be located on the internal REGREEN Sharepoint and updated throughout REGREEN.

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1. INTRODUCTION

1.1 Purpose of the document

This internal report sets out the format and role of the activity program for each ULLs, developed by SLU and ICLEI. The Activity program is one tool, in combination with the stakeholder list (M7.1) that are developed to support each ULL in their time and resource planning for the research activities within REGREEN.

The report outlines the processes of the development of the Activity program and how it will be integrated into the continuous planning of activities that are taking place within each ULL as REGREEN develops. The report does hereby act as a guidance for the consortium on how to use the Activity program as a tool to for carrying out research within each ULL.

The activity programme will clarify and attribute responsibilities for the tasks and thereby underpin the deliverables and milestones throughout REGREEN. The activity programme will be located on the internal REGREEN Sharepoint and updated throughout REGREEN.

1.2 Structure of the document

The document outlines the process of developing the activity program, the structure of the activity plans as well as how it will be used during the project.

2. ACTIVITY PROGRAM FOR THE EUROPEAN ULLs

2.1 ULLs within REGREEN

REGREEN has set up three European ULLs, Aarhus in Denmark, Paris Region in France and Velika Gorica, Croatia. In order to support and guide the local authorities in fostering stakeholder engagement with the research taking place within the ULLs, the local Activity programs are very important. These were developed based on an initial time-line exercise during the project meeting in Aarhus in October 2019 and formalised into a table.

2.1.1 ULL Aarhus (Denmark)

The city of Aarhus is the 2nd largest city in Denmark with 273,077 inhabitants. It is located at 56.09°N-10.13°E on the east coast of Jutland. The city has a typical temperate climate with an average annual precipitation of 596 mm and an annual average temperature range from -2 to 20°C. The municipality of Aarhus has the 2nd largest population in Denmark with a land area of 468 km² and a total population of 341,000. The city of Aarhus occupies 91 km². The urban population density is around 3,000 people per km² compared to an average of 272 people per km² for the whole of the municipality. Over 90% of the inhabitants have access to green space within 500 meters with an objective to sustain or **increase green area per inhabitant** through green blue structure planning in spite of densification. The city anticipates a **densification** with an additional 75,000 inhabitants by 2030. The water supply company of Aarhus Municipality will invest annually 19 MEUR over the next 65 years to **reach full separation of rainwater from wastewater** using NBS and NBS hybrids to create a flood resilient city with rainwater on the surface instead of in pipes; Aarhus Municipality has decided to **double the total nature area in the municipality** by 2030 and increase the area with forested land by 60% by 2030 to ensure drinking water provision and **improve recreation, biodiversity, social habitation and health** and it focuses on **improving accessibility to green areas** to all citizens. Agricultural land and forested land account for under 60% and 11% of the land area respectively, protected areas including water surfaces 6% and settlements about 25%.

Environmental pressures: **sea level rise**, very high **groundwater levels**, and cloudbursts leading to **pluvial flooding** events causes disruption as well as economic and social costs. Pressures from **intensive land use practices** and **urban land cover** pose a substantial challenge to meet biodiversity SDG goals. **Population growth in a densifying city** adds to soil sealing, puts additional **pressures on existing urban and peri-urban green spaces**, increases demand for recreational green space and adds to the challenge of finding space for NBS to manage pluvial flooding.

NBS in focus: Addressing the pluvial flooding problem through **strategic planning for depaving** of sealed surfaces, **regreening** wide roads and **separating rainwater** from wastewater at neighbourhood scale using NBS surface solutions across the whole of the municipality. Enhance **urban biodiversity** through comprehensive analyses of impacts of existing and potential green roofs, vertical greens, street trees, and improved management of urban green areas and green infrastructures for biodiversity. Addressing **urban liveability** through developing and enhancing cultural ecosystem services from NBS flood interventions in co-creation with local inhabitants.

Deployment, awareness raising and educational outreach: Preparing for **innovation and business incubation of startups and SMEs** in Aarhus's new business incubator. Establishment of an **ULL**

advisory board for local politicians from across the political spectrum, civil servants from different administrative sectors and researchers (e.g. the local museum of natural history) at the beginning of REGREEN. **Citizen's project** established to involve, educate and raise awareness on biodiversity and ecosystem services of natural surroundings and NBS interventions among citizens of different ages, especially school children and youth. **Establishment of a climate school involving tests of NBS solutions provided by local businesses.**

Main outputs: **Guidelines and methodologies on engaging** local inhabitants and stakeholders in regreening and depaving neighbourhoods. Improved **evidence from inhabitant groups' experience and interaction** with natural environment using social media and big data. **Technical catalogue of locally adapted NBS solutions and cost-effectiveness.** In-depth evidence of citizen preferences and values towards NBS benefits. **New methods in governance** to incorporate the intentions of evolving a green, liveable city and solutions to enhance the quality of and awareness of the benefits of biodiversity.

2.1.2 ULL Paris region (France)

The capital region of France, consisting of 8 départements. It is located at 48.3°N-2.3°E, with a land area of 12,012 km². The region has a mild and temperate weather, with an average annual precipitation of 642 mm and an annual average temperature range from 3 to 25°C. It has 12 million inhabitants, or 18.2% of the population of France. 21% of the territory is urbanised (16% totally impermeable), 23% covered by forests and 47% of the territory is composed of cultivated, mainly intensive open field crops. Île-de-France has 35 Natura 2000 sites and 11 Regional Nature Reserves and hosts many endangered species or taxa. **Biodiversity has greatly depleted** over the last decade, especially visible in agricultural areas and in urban parks and gardens. On the other hand, plants observed in urban informal spaces have increased by more than 90% in just 7 years. **Green space per inhabitant is very scarce** within the inner ring of Ile de France consisting of 4 départements, varying between 2-10 m² by administrative unit. The region experiences **substantial land take** with more than 900 hectares of rural areas consumed each year by urbanisation. The municipality of Paris has an ambitious plan underway to **expand green space** through 100 ha green roofs and squares as well as an additional 30 ha of urban agriculture.

Environmental pressures: **Urban heat islands** represent a substantial risk in the region, exacerbated by heat waves and generally rising temperatures. In the 2003 and 2018 heatwave events, the Paris region was particularly vulnerable due to a very dense urban fabric, heavy traffic and lack of vegetation. Nocturnal temperatures differ in the range of 2.5°C or up to 10°C in special cases compared to rural areas. Ile-de-France also faces severe **riverine and pluvial flooding** events, which become more frequent and can be associated with intensive farming on the Seine basin, the lack of trees and hedges in agricultural areas, but also the lack of green infrastructure in peri-urban and urban areas to absorb excess of rainwater and slow water flow. Heavy traffic causes severe **air pollution** peaks every summer.

NBS in focus: water cycle management and temperature regulation through **improved soil services and vegetation** to reduce urban heat islands and reduce riverine flooding. Impermeable surfaces made **permeable** again (streets, parking lots, squares etc.); obstacles and coverages of rivers removed and **"re-naturalised"**, offering an additional opportunity for **urban regeneration**; increased vegetation cover in streets and squares; and roofs and building walls vegetated to increase evapotranspiration and slow down rain-water flow. Added benefits can, if properly designed, include habitats for

biodiversity, increase **water storage capacity**, or the prospects for **social inclusion** through accessibility to new green spaces locally.

Deployment, awareness raising and educational outreach: The ULL will work specifically with awareness raising and education with children and adults including both the public, professionals and elected representatives. With children, REGREEN will test different interventions aimed at developing children's knowledge and awareness of nature as a vital resource for urban living. With adults, REGREEN will raise awareness, educate and train them to NBS design and management, including helping technicians from cities to design NBS based on solid biodiversity and ecosystem knowledge in order to switch **from landscape-based design to nature-based design**.

Main outputs: At the scale of the region: concrete **planning tools, guidance and governance approaches** that i) enable a better integration of the hydrological cycle in rural and urban areas; and ii) help an ecological transition by systematically integrating NBS in newly developed urban areas/areas at the planning and projects scales. At the neighbourhood, street and building level: **methodologies, technical guidelines and planning tools** on concrete NBS and biodiversity solutions to meet multiple urban challenges (urban heating, flooding, depletion of biodiversity, social exclusion, lack of education & awareness of nature, lack of well-being and health) through the increase of NBS in *quantity* and *quality*. **Methodology** for identifying the "re-greening" potential in cities (mostly "depaving" potential) in Paris region (mainly Seine-Saint Denis département), which will also be tested in Aarhus and Velika Gorica at the city or district level.

2.1.3 ULL Velika Gorica (Croatia)

[City of Velika Gorica](#) is the 6th largest city in Croatia with 63,517 inhabitants. It is located at 45.42°N-16.04°E close to the capital City of Zagreb in the central part of the Republic of Croatia. The city has an average annual precipitation of 495 mm and an annual average temperature range from -4 to 27°C. The municipality is the largest in the County of Zagreb, covering 328 km². The urban area covers only around 13 km² (ca. 4%) and was intensively constructed during the 1970s and 1980s. With 32.000 inhabitants, the urban population density is around 2.500 people per km² compared to 193 people per km² on average for the whole of the municipality. Urban green space accounts for about 1 km², with a target to reach 1.6 km² corresponding to 40 m² per inhabitant. Free urban public gardens have been introduced to interested citizens, covering close to 12,000 m². In the near vicinity, lowland, humid wooded areas host the highest woodland biodiversity nationally. Separation of rainwater from the sewage system, accomplished in the 1970s, is based on grey infrastructure solutions, which partly causes flooding in downstream rural settlements. Agricultural land and forested land account for 37 and 38% of the land area respectively, water surfaces 4% and settlements 20%.

Environmental pressures: high traffic, heating with wood and oil combined with vast agricultural areas around the city and close vicinity to the main state airport contribute to **excessive pollution**, particularly of airborne particles during winter months. **Land take** for increasing urbanisation due to the proximity to the capital, Zagreb, add pressures on existing ecosystems. During recent years the city experienced an increased frequency and scale of **flooding events and heat waves**.

NBS in focus: Adaptation to **flooding** in peri-urban areas through retention of urban surface rainwater (e.g. green roofs) and re-naturalisation of existing rainwater channels combined with the development of a new recreational area and new cycling/hiking/horseback riding lanes; addressing **pollution of airborne particles** through planting of street trees to disperse and catch pollutants and rinse it to the rainwater drainage system; addressing **urban heat island** effects through analysis of impacts of

existing urban trees and suggestion for afforestation using native species for biodiversity, depaving and installing green roofs (combined with solar power); enhancing **liveability, social inclusion and biodiversity** through mapping of urban biodiversity, improving management, expanding existing urban green areas and maintenance of existing areas of high biodiversity.

Deployment, awareness raising and educational outreach: preparing for incubation of “green” startups in Velika Gorica’s new business incubator; participation of citizens in **participatory boards** comprising of citizens, institutions, university, schools, utility companies, private sector and representatives of other local stakeholders, who will devise a catalogue of all possible NBS sites on the territory of Velika Gorica, which could solve particular climate change mitigation and adaptation problems; **raising awareness** of the importance of biodiversity of natural surroundings for sustainable urban living among **citizens, and particularly children and youth**, as those who will carry this awareness forward.

Main outputs: **technical documentation** for reconstruction of public building roofs to “green roofs”, including monitoring of local microclimate before and after the reconstruction; installation of solar panels on the green roofs, for the same buildings through crowd funding initiated through REGREEN; **preliminary design and study documentation** for renaturalisation of rainwater canal; **survey on public park areas and green public spaces management needs** among citizens; 6 local **biodiversity and nature events** (2 per year during the project implementation period) to include fairs, exhibitions, conferences, and workshops; 3 **conferences on green job** opportunities held during the project implementation period; **communication/education and information plan** developed for transfer of knowledge and information to the general public, school and pre-school children.

2.2 Time line exercises

During the kick-off meeting in Aarhus on the 23rd of October there was a time allocated for the ULLs to meet with the workpackages in order to discuss the activities that are to be taking place within each ULLs. In preparation for the exercise timelines with months and rows for the WPs were printed out on large A2 sheets for each of the three ULLs. Each WP group was provided with a set of coloured post-it notes that were allocated on the time line based on discussions, noting down questions, tasks and resources needed. This resulted in three time-lines for each ULL, see Figure 1 for an example. Each time line was photographed and later digitalised in Excel and stored within the WP7 folder on REGREENs Sharepoint directory.

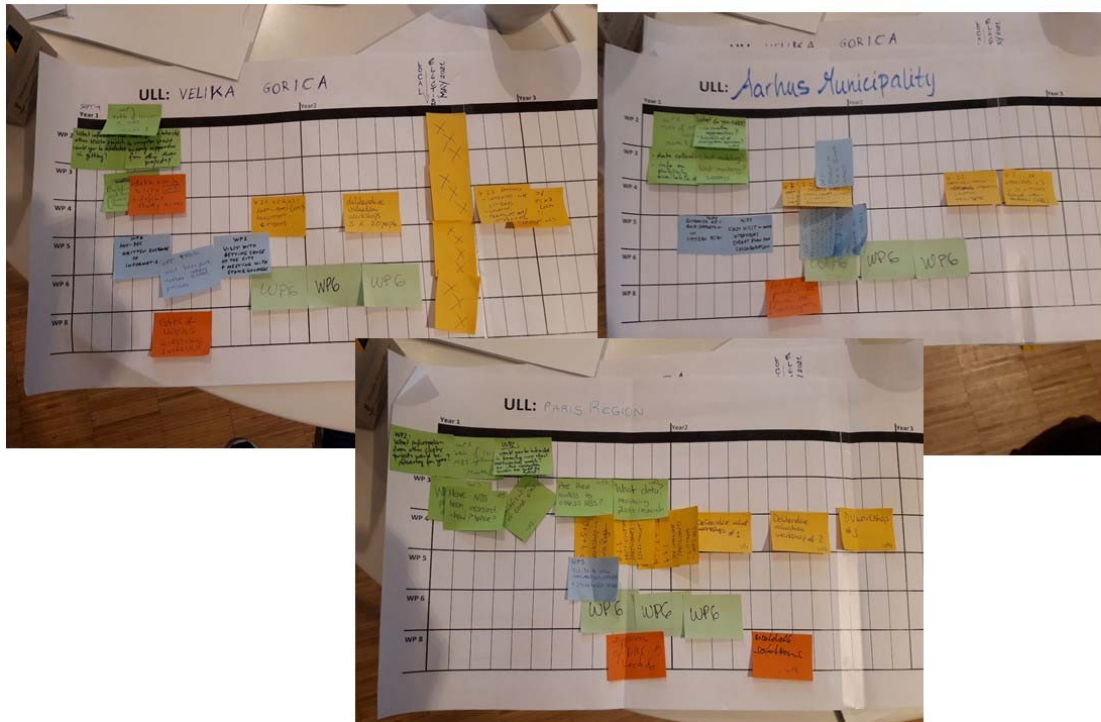


Figure 1: Time-lines developed for each of the ULLs

2.3 Formal Activity program

In order to develop a REGREEN ULL specific Activity program we identified key headings (based on Durham et al. 2014) that are useful and relevant for the ULLs. We focused on headings that would aid the ULLs to plan their activities within their organisations and overlaid this with the tasks as identified during the meeting in Aarhus and described in the work programme for REGREEN. The Activity Programme was circulated to all ULLs for review and an agreement was reached that the proposed format would be suitable for REGREEN.

3. ACTIVITY PROGRAMME FOR THE ULLS

3.1 Activity Programme format

The activity plan identified includes the following columns:

- Number of task
- Activity description for the ULLs
- Resources/form of interactions that is needed for the task to take place
- Persons that are involved from the WPs
- Stakeholders from the ULLs involved in the task based on the Stakeholder list M7.1.
- External stakeholders within the ULLs
- Timing of the task

Each task was dedicated a row each. This has been circulated to the ULLs in order to be a document that will continually be developed during the project when tasks becomes clearer and coming closer in time and hence resources and interactions with the ULLs are needed.

Table 1. The REGREEN Activity Programme

Task no	Activity description for ULL	Resources/form of interactions needed	Person(s) involved from WP	Person(s) involved from ULL	Time (months)
WP2					
T2.2	Understanding urban drivers and pressures <ul style="list-style-type: none"> • What are the issues? • What NBS? • What is the need? • What information from other H2020 projects is of interest? • What ES mapping approaches from other H2020 project is of interest? 				3-12
T2.4	Cost effectiveness of NBS				1-20
T2.5	Informing solutions				12-42
WP3					
T3.1	Evaluation of scale-dependent data and model applications <p>Scooping of</p> <ul style="list-style-type: none"> • Previous NBS assessments? • What case sites • What data is available? 				1-9

	<ul style="list-style-type: none"> • What modelling is of interest, what is currently done? • What monitoring is done and is of interest to the ULL? 		
T3.2	Modelling ES provided by multifunctional GI and NBS interventions tailored to selected ULLs	6-30	
T3.3	Integrated assessment to determine demand for future NBS interventions	3-39	
T3.4	Develop tools and guidelines for mapping and modelling ES	6-42	
WP4			
T4.2.1	Personalized sensors and social media data mining	6-39	
T4.2.2	Photo-elicitation with community groups	6-39	
T4.3.1	Deliberative valuation	6-39	
WP5			
T5.1	Children’s interaction with nature	Recruitment of participants / Seminars, network activities	1-36
T5.2	Technology for nature-based learning	Recruitment of participants / Seminars, network activities	1-36
T5.3	Citizen science, participator education and community planning	Recruitment of participants / Seminars, network activities	1-36
T5.4	Co-creation of NBS for children’s play and learning activities	Recruitment of participants / Seminars, network activities	5-36
WP6			
T6.1	Governance including planning systems		1-30
T6.2	Experimental policy learning		6-36
T6.3	Transferability of NBS based governance ideas among cities		18-42

T7.1	Establishment and coordination of ULLs	3-42
T7.2	Involvement of ULLs in research activities	3-42
T7.3	Engagement within ULLs and WPs and among ULLs	6-42
T7.4	Training of technicians in ULLs	30-34
T7.4	NBS transition handbook	34-42
WP8		
T8.1	Innovation and business incubation	
T8.2	Knowledge exchange	
T8.3	Communication and dissemination	

The Activity Programme will be located on the internal REGREEN Sharepoint and updated throughout REGREEN and will from now be developed individually for each ULL, with the contact persons being:

- For Aarhus municipality Lene Vinther Larsen and Signe Iversen
- For Paris Region Barra and Gwedonline Gardner at Institut Paris Region
- For Velika Gorica Marko Ruzic

3.2 Future use of the Activity Programme

The next step for the activity Programmes are to share them among the WP leaders and populate them in collaboration with each ULLs. There will also be a webinar run by ICLEI to identify potential relevance stakeholders to be engaged in the different research tasks taking place within the ULLs. The activity plans will be a vital document during each of the project meeting and will be formally updated on the Sharepoint directory for WP7 once every half year in connection to the meetings.

4. CONCLUSIONS AND RECOMMENDATIONS FOR OTHER CITIES

The report outlines the development of the activity Programmes for the ULLs as well as the process forward for how they will be used and up-dated during the process of REGREEN.

The activity Programme will clarify and attribute responsibilities for the tasks and thereby underpin and support deliverables and milestones.

5. REFERENCES

Durham E., Baker H., Smith M., Moore E. & Morgan V. (2014). The BiodivERSA Stakeholder Engagement Handbook. BiodivERSA, Paris (108 pp).