REFLECTION IN ACTION
The WAVE Learning Model

WAVE - Water Areas Vision for Europe

Integrated knowledge and visions for sustainable water landscapes in Europe

Publication title

Reflection in Action: The WAVE Learning Model

About

This output will document the partnerships' learning experience from the Wave Living Labs in order to share relevant knowledge about how universities can partner and collaborate fruitfully with their community environment. There is limited documentation available on this topic and this output will fill a knowledge gap and provide ideas transferable to other universities and communities.

During the WAVE project the universities will partner with local NGOs, schools, stakeholders, beneficiary groups and other society representatives to initiate the resolution of water-related landscape challenges specific to their local contexts. The actual challenges can be very different as they are site specific and vary from location to location. This process embraces a research approach called Participatory Action Research (PAR). This approach engages academics and students in deep and extended partnerships with civil society as equal partners in a research process aimed at uncovering landscape-based, action-oriented strategies for the resolution of some of their pressing sustainability challenges. The PAR approach is grounded in rigorous investigations and reflection, involving a cyclical loop of analysis, action, reflection and adaptation, to occur in the context of participatory workshops and other forms of creative citizens' engagement. The goal is to document the processes with each community in depth. We envision the documentation to result in a report we have tentatively named 'Reflection in Action: The WAVE Learning Model' will take the shape of rich case-studies of integrated approaches to water areas to be disseminated through an open access learning resource to inspire other communities and academics to take on this kind of work.

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Introduction

This report is meant for students, teachers, researchers, community workers and other parties who want to work on sustainable development of water areas and floodplains in an urban or peri-urban context.

We want to share with you our transdisciplinary approach for developing an online seminar in combination with a number of local living labs. The ERASMUS plus WAVE project built upon the principles developed during the Erasmus+ project COLAND.

For the online seminar WAVE developed a template and learning resources for carrying out case studies on water landscapes. In the WAVE living labs our partner universities worked together with local communities on addressing environmental, social and economic challenges related to water.

The report includes a reflection of the lessons we learned by delivering an online seminar and organising intensive community participation-inspired workshops within the Belgian, Estonian, German, Italian, and Romanian Living Labs. These Living Labs offered participants in our educational programme the chance to test theories and methods for working with communities, and to do so by establishing partnerships with non-profit organisations and community groups that would ensure the integration of the perspective of all possible users of water landscapes.

In the section 'The WAVE Online Course' we present the structure, goals, content of the seminar, with the case study templates. These are illustrated by a selection of cases that highlight the dimensions of water landscapes, such as water as a natural system, as a living, cultural and sacred space. They show the role of waters as blue and green infrastructure and a place for people to access and use. The planning aspects for water landscapes include community mapping, forecasting possible futures, collaborative goal setting, developing strategies, and implementation.

If you are interested in how the seven labs developed, you can consult the section "The WAVE Living Labs: Seven Landscape Stories'. Each lab presents its local water landscape, the way the lab was developed and how it built

the community, and what the results were. Here you also can learn from our reflection on the process, and learn from our failures and successes. For each lab we present an outlook on the expected impact and development beyond the life time of the project. The water landscapes range from rivers, ponds, lakes, lagunas, and canals.

The section 'Learning in and with WAVE Living Labs' presents the competences for students, teachers, researchers, and community members. It provides an assessment strategy with forms and rubrics that help students and assessor alike to carry out a transparent assessment. The competences of academic staff focus on those which are relevant for organising a living lab and collaborating with communities. In the labs and seminar WAVE made use of various digital methods for learning and collaboration. In the section 'Digital Living Labs' shows the potential of Web-GIS, using story maps for storytelling. The methods WAVE applied in the living labs are presented in the WAVE wiki page.

If you are an academic, learner or community member seeking to develop Living Labs, or you are already working within that framework, we share our water landscape story in the hope that you will benefit from our experience and our evaluation of the Living Lab processes we carried out. In the section 'Lessons learned from the WAVE Living Labs', we reflect on the work we have done, and draw a few conclusions on how academics and communities can address the current challenges for water landscapes by activating the agency of design education in change-oriented, socially-just participatory research processes.

WAVE
Project Process and
Online Course
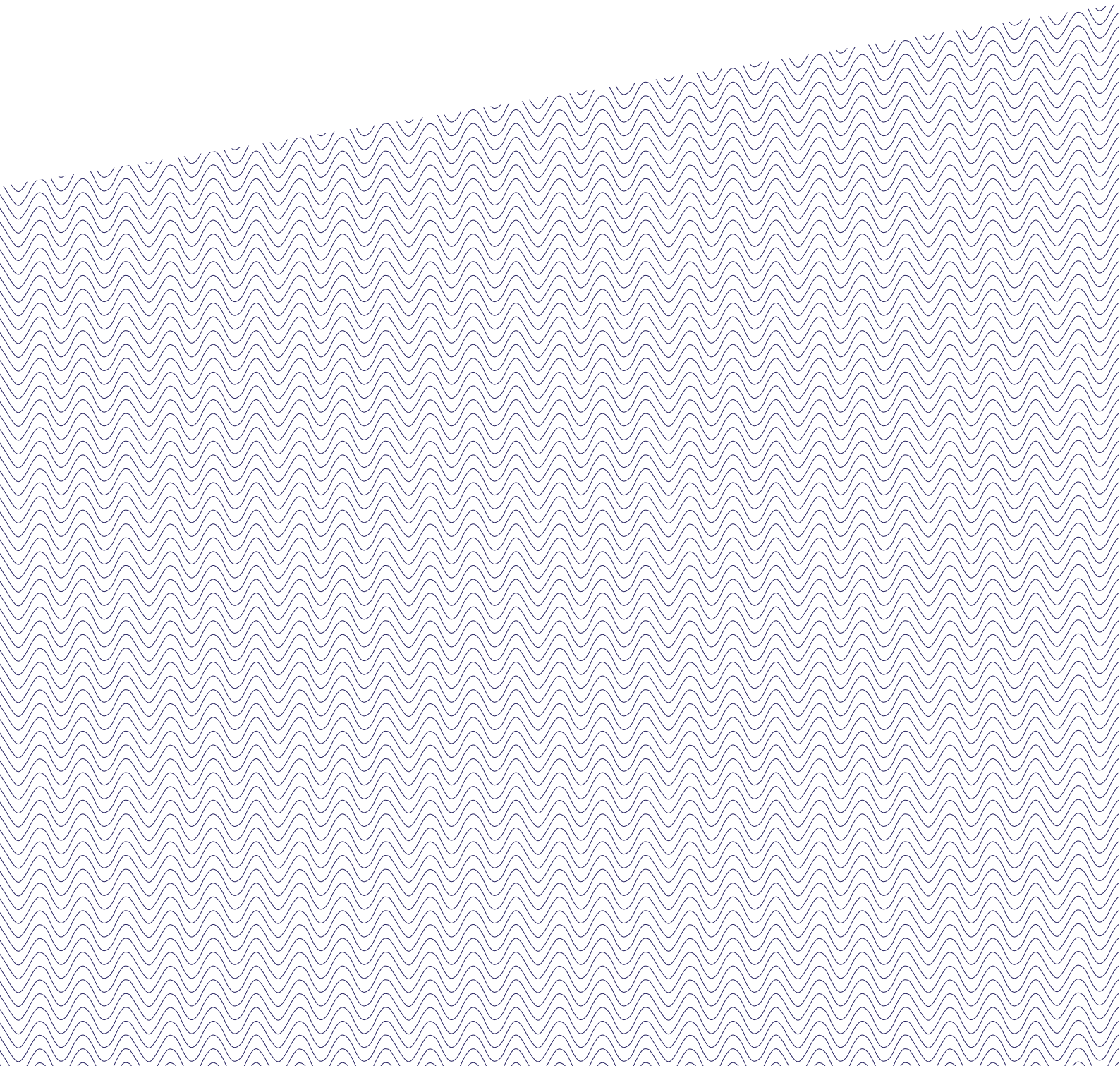
The WAVE Project Process

One main objective of the WAVE project was to develop a new course for students of different backgrounds focusing on the sustainable development of water areas and floodplains in urban and peri-urban contexts in Europe. Our learning format was an innovative combination of Living Labs in combination with an international Online Seminar.

The project addressed the pressing issue of sustainable development of water areas and floodplains in the urban and peri- urban environment. Sustainable development of water areas and floodplains is still not achieving its full potential, although relevant policy is already in place. In order to address these profound sustainability challenges, our plan was to set up a transformative educational programme with the following innovative elements:

Synthesising interdisciplinary knowledge about water areas and floodplains: Our team brought geographers, architects, urban planners and landscape architects together.

Active community involvement with a living lab approach: Each university partner has set up a local living lab around a place-specific challenge of the water landscape. This way we could link the universities with their local communities in joint learning environments. In that setting, all partners have explored and tested innovative methods for cross-sectoral assessment, strategy building and visioning in the context of water areas, floodplains and their sustainable development.

In addition, we started to innovatively connect analysis, strategy building and design by ICT approaches using GeoDesign methods and online GIS.

The overall goal was to foster the generation of innovative solutions by bridging disciplinary, sectoral and institutional boundaries under the common framework of water areas and floodplains.

By implementing all these activities, the WAVE project evolved around the following four dimensions of innovation:

• The water area as a joint reference (Landscape Approach)

• Sharing different knowledge dimensions for a holistic understanding of water landscape dynamics (Interdisciplinary Approach)

Process model of the WAVE ERASMUS project 2021-2023

WAVE ~ Reflection in Action: the WAVE learning model ~
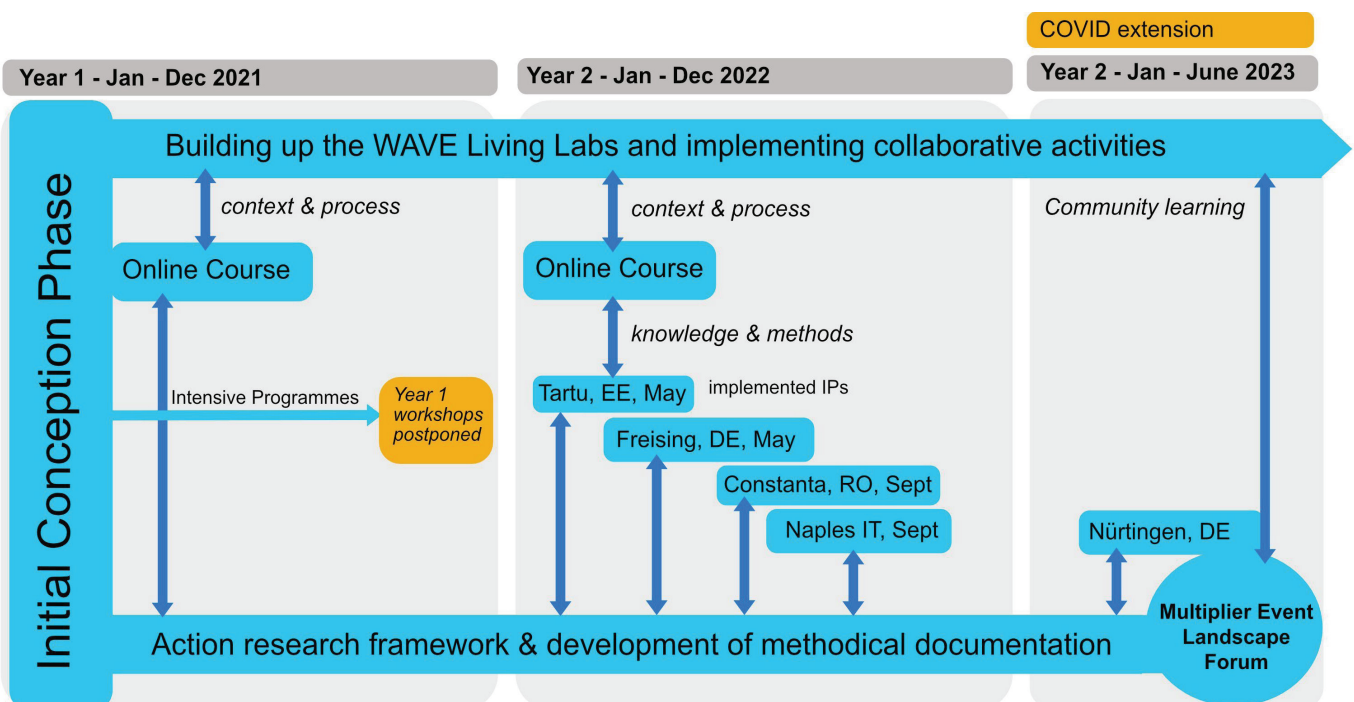
• Involving the public and local stakeholders in the knowledge creation and visioning process in Living Labs (Transformative Approach)

• Bridging local and international learning processes by a combination of local field work, online education and platform development (Digital Approach)

The process model below shows how our project evolved over time. It has been significantly challenged by the pandemic situation that was determining our cooperation for almost half of the project lifetime. However, the transnational digital approach which has been essential as well, helped a lot in overcoming these challenging circumstances.

The WAVE Online Course

Link to WAVE Online Course recordings

The WAVE programme has been conceived as a combination of the following elements: a transnational online course with synchronous weekly sessions, on-site intensive study programmes and the living lab process itself. While the online course and the intensive programmes had a regular schedule, the living lab process was a constant evolution and process since the project started.

The online seminar was implemented twice, from March - May both in 2021 and 2022. Due to the pandemic situation, it was not possible to combine the online course with an intensive programme in 2021. Therefore, all international workshops from 2021 were moved to 2022.

In the following, we will describe how the transnational online course comprised and how learning in this digital environment was organised. In the first part, we describe the contents of the seminar sessions. Each section gives a brief overview of session goals and contents. For more detailed information, you can follow the weblinks to the learning resources. The second part describes the WAVE case study template in detail. This template was given to each student group as a framework for structuring their learning process in and with the WAVE living labs. Online sessions and case study development processes are conceived as an integrated learning process that includes various moments of sharing and feedback.

The WAVE Seminar structure and sequence:

Session 1: Seminar Introduction

Lead: HfWU Nürtingen-Geislingen with the involvement of all living lab partners

Goals: Informing about the seminar goals and objectives, in particular why water areas matter and why water is relevant as a planning and design framework. The session also informed all participants about the requirements expected by them to complete the course.

Contents: An introduction to water and water systems as a framework for planning and design. Introduction to the WAVE case study template, the seminar process and requirements.

Session 2: Water as a dynamic phenomenon

Lead: Ovidius University

Goals: Inform how water is shaping and defining our natural environment and how this influences human settlement development.

Contents: Why is water important, the natural water cycle, different types of water bodies, river basins, floods, man made changes to water bodies, water pollution, water quality indicators

Session 3: Water as a natural living space

Lead: Ovidius University

Goals: To inform why water areas are important for biodiversity

Content: Freshwater habitats, rivers and river meadows, the biodiversity of rivers and lakes, the biodiversity of wetlands and lagoons, Ramsar Convention

Session 4: Water as a cultural space

Lead: Estonian University of Life Sciences

Goals: To better understand why water areas are a relevant element of our cultural landscape

Content: Discussing a variety of examples of how water appears in our cultural landscapes, discussing the role of water in arts and culture with examples from painting and film, cultural meanings and interpretations of water, the iconography of water in human landscape identities. The role of water in engineered landscapes. Forms of designed waterscapes.

Session 5: Water and people

Lead: HSWT Weihenstephan-Triesdorf

Goals: Share knowledge about how people can be involved in the planning and design of their water areas.

Contents: Clarification of what we understand by living labs and participatory design. Good practice example from Husum in Germany with the example of a public planning workshop. Discussion on how students can transfer approaches to their own living labs.

Session 6: Alternative Futures

Lead: HfWU Nürtingen-Geislingen
oals: Introduce approaches to integrated systems thinking and scenario building

Content: Introduction to evaluation and assessment, Karl Steinitz' framework for landscape architecture, the concept of eco-system services, DPSIR Analysis, forecasting, scenario building, briefing for the interim presentation.

Session 7: Possible futures: Interim presentation

Lead: Entire WAVE team giving feedback to the working groups

Requirements of the presentation: Participants were asked to present the dimension of the water landscape they were observing including its location, context and main characteristics. They had to focus on 2-3 evaluation goals and present evaluation findings, for example as a potentials and risks map. They synthesised findings with the DPSIR framework. For the forecasting they applied the scenario approach and showed a spectrum of four possible development directions in a creative form.

Session 8: Goal setting and strategy building

Lead: Ion Mincu University for Architecture and Urbanism

Goals: Create knowledge about what strategy building in spatial planning comprises

Content: How to move from goal setting to strategy building in a community-based way, how to transform problems into objectives, how to plan the city-water relationship in a strategic way, reflection on what are the challenges and obstacles to strategy building, steps in public planning, comprehensive approaches to spatial planning, integration of sectoral plans, the difference between planned, emergent and realised strategies, the role of scenarios in participatory strategic planning.

Session 9: Nature-based solutions

Lead: ULB Brussels

Goals: Introduce the concept of nature-based solutions as a strategic approach to water-
sensitive planning and design in the context of climate change.

Content: Discussion of the implications of climate change on the urban environment and the relevance of green and blue infrastructure to increase urban resilience and reduce risks, drivers of greenhouse gas emissions in cities, city climate action planning, mitigation of and adaptation to climate change, elements of urban resilience, definition of nature-based solutions, case studies, focus case study Brusseau (Water Sensitive Brussels) as a case for co-production of NBS.

Session 10: Water and Design

Lead: HSWT Weihenstephan-Triesdorf (add readings to wave reading list)

Goals: Introducing approaches of how to design with water at multiple scales

Content: How to rethink classical design approaches towards structure and process-oriented design with water, principles of evolutionary design (inclusion, sustainability, aesthetics, process-orientation), the concept of place-making, principles and methods

of waterscape-related design, transects as a design approach to waterscapes, criteria for defining transects, examples.

Session 11: Water and Action

Lead: EMU Tartu and LE:NOTRE Institute
Goals: To create an understanding of how to design, visualise and prototype interventions as a participatory design approach, to learn how to envision new partnerships and value streams

Content: Presentation of the BlueHealth Project results as good practice project review, the power of landscape design and community, examples for collaboration: Room for the River in the Netherlands, case study: transformation of a quarry to a nature reserve in France, interactive session: testing a prototype of a design intervention on the water's edge.

Link to recording and slides: https://ilias.hfwu.de/goto.php?target=cat_34861&client_id=hfwu
Session 12: Final Presentation

Lead: Entire WAVE team giving feedback to the working groups
Requirements of the presentation: Participants were asked to present the following:

(1) their goals and vision for the water landscape they had explored, based on a further development of the scenarios presented in the interim presentation,

 (2) an overall visualisation of how this vision may translate into the spatial context of the water landscape,

(3) The specification of a transect along the water body/water system with strategic points that would need intervention,

(4) Exemplification how these interventions might look like (sketches, collages, prototypes or similar),

(5) Reflections: Which process would you need for advancing your vision? Who needs to be involved and how? Which collaboration model would you suggest? and

(6) a final reflection of the process so far with an outlook of how they may continue involving the local community.

The WAVE Case Study Template

In the following, we present the case study template we have applied in detail. Each section is exemplified by materials generated by the student teams during the 2021 and 2022 WAVE online courses.

The case studies can still be accessed on our seminar wiki:

All case studies from the WAVE 2021 course

All case studies from the WAVE 2022 course

Chapter 1: Water as a natural system
Analysis of the geomorphology, typologies and dynamics of the living labs' water areas. Students were asked to describe the water areas in the context of the wider water system and catchment area. For achieving this, it was important to identify the water bodies' catchment areas, tributaries and floodplains.
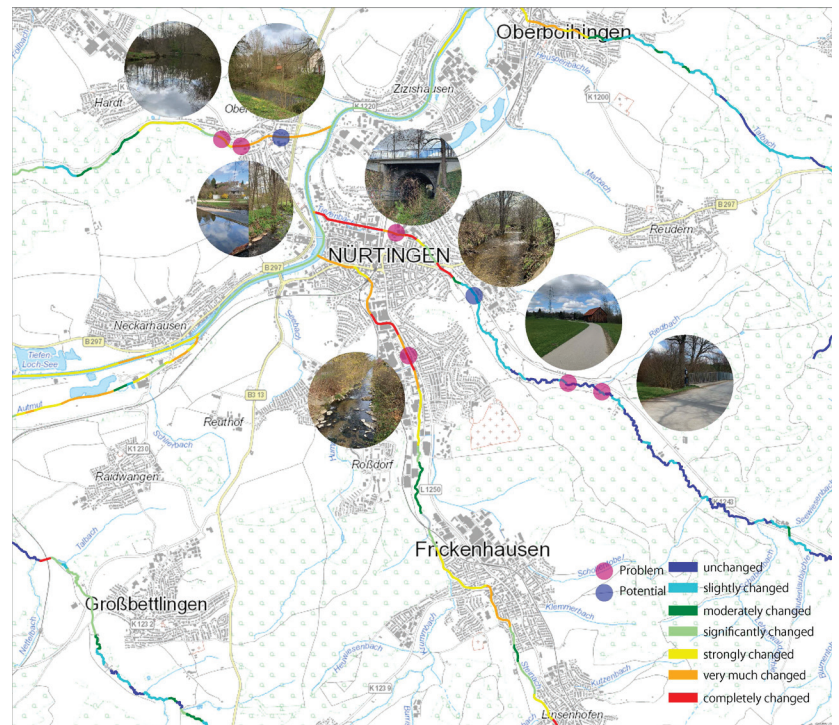
Guiding questions are:

How does water appear in the landscape of your living lab?
What types of water areas are common?
Which dynamics do these water areas have?
Have there been any flood events in the past?

Students were encouraged to use innovative graphics for visualising landscape system dynamics.

Exaple from Chapter 2: Natural and Artificial river structures of Tiefenbach in Nürtingen, a tributary of the river Neckar. Team Arash Najafi, Md Ekbal Hossaini, Mohadese Bagheri,Samira Shirzad, Yuga Tanaka from Nürtingen-Geislingen University in Germany. Original Map Source: UDO BW
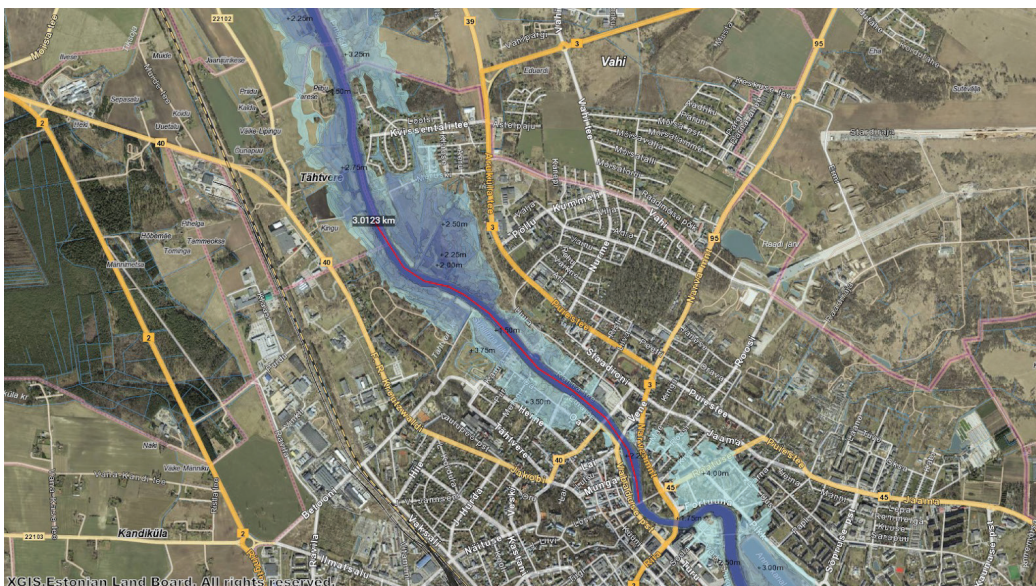
Flood zones of river Emajogi in Tartu, Team from EMU Tartu, Estonia (Natalia Pawłowska, Khaled Mohamed Abdelmonem Sayed, Razeen Malik), working on the Emajogi River Upstream, source: XGIS Estonian Land Board

Blue and Green infrastructure

Chapter 2: Water as a living space
In this section, we asked for the habitats that could be found in and along the water areas that were analysed. This includes not only the existing habitats but also the potential ones, and those that have been lost during the transformation process of the water areas. Further aspects were the water quality and the structural quality of the water bodies (i.e. if river banks are more natural or urbanised and artificial). On that basis, it was possible to identify the dimension of the green and blue infrastructure.

Chapter 3: Blue and Green Infrastructure
Green and blue infrastructure is a concept that helps managing especially urban territories in

an integrated way. The goal is to consider any unbuilt land, no matter which function it has at the moment, as a green infrastructure potential. Urban and peri-urban waterscapes are often fragmented because of competing uses and functions along riverbanks or lakeshores. In this section we asked the participants to identify the major potential elements of a green and blue infrastructure network? They were further asked to evaluate the current state in this regard. Extensive background material on green infrastructure was provided in the reading list.

Chapter 4: Water as a cultural space - Land use and water
Water areas are typically modified by human settlement and engineering activities that have evolved over centuries. This often creates many difficulties in making waterscapes accessible and hampers their ecological restoration. On the other hand, these modified spaces are part of our cultural landscape and constitute the cityscape as we know it. In this section the participants had to map the land uses along their water areas. These are primarily classified as settlements, infrastructure, agriculture, resource extraction, natural areas and energy production. The teams were further asked to describe the historical evolution of these land use patterns, ideally by making use of historical maps. An important goal of this section is to understand what has been driving landscape change in the past and thus constituted the present state.

Chapter 5: Cultural and spatial typologies of water areas
In this section, we aimed at exploring which spatial patterns have evolved in relation to the water areas under consideration. What is the role of water areas within the overall urban morphology? This includes a deeper evaluation of the spatial qualities that have emerged over time along the water areas, in the process of their co-evolution with the urban environment.

Chapter 6: Sacred spaces and heritage
Waterscapes and riverfronts are very often also the place where heritage and sacred spaces are concentrated, since humans settled near to water areas and shores over millennia. Tgether, they form very relevant elements of place iden-

❶	❷	❸	❹	❺	
Role in the supply of water and energy for agriculture	Trees, birds, and other flora and fauna are painted	Farmland was spread out along the natural river.	River as a place of relaxation	River as a place of relaxation and industrial	

❶ 1683
Bestand LMZ-BW

❷ 1701
Württembergische
Landesbibliothek Stuttgart

❸ 1850
Württembergische
Landesbibliothek Stuttgart

❹ 1907

❺ 1935

Historical map :1980s
S=1:10000

Past river water1940s
Hidden in the process
urban morphology.

Wasserkraftwerk
since 1927
Role of power supply

NÜRTI

Stadtkirche St. Laurentius
since 1506
Landmark historical and
natural water scape.
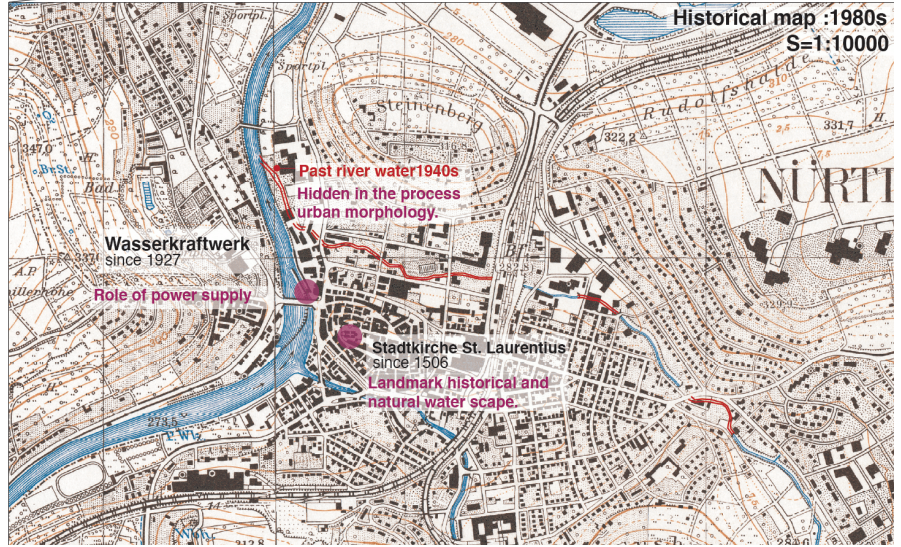
Exaple from Chapter 5:
Evolution of the Tiefenbach tributary to the river Neckar in
relation to the townscape of Nürtingen in Germany, team:
Arash Najafi, Md Ekbal Hossaini, Mohadese
Bagheri,Samira Shirzad,Yuga Tanaka, HfWU
Nürtingen-Geislingen.

Exaple from Chapter 6:
Countless heritage elements from Greek and especially Roman
times in the Bacoli case study site in Baia. Team members: M.
Errico, F. De Falco, G. Gagliardi and L. Ossuto
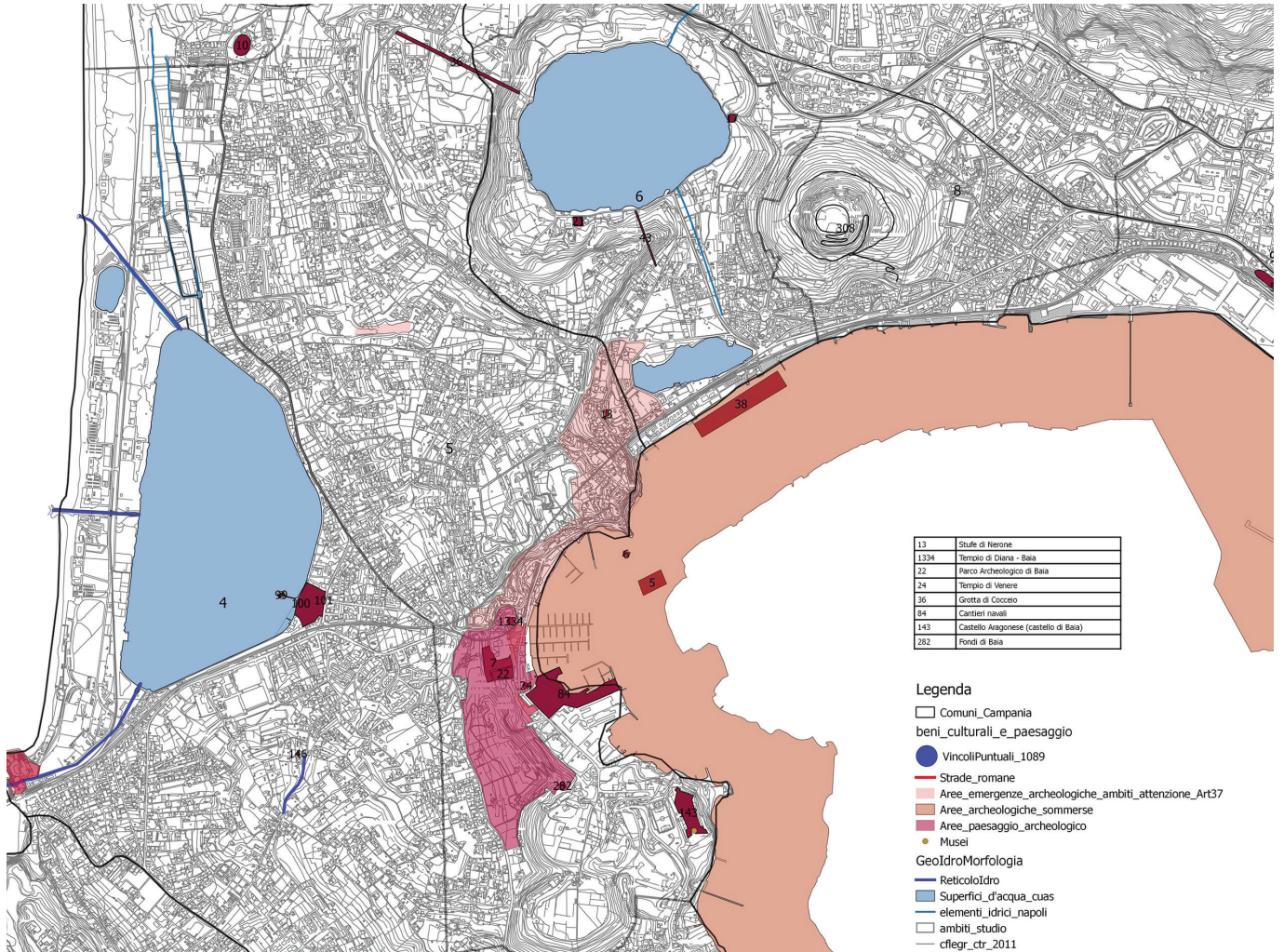
13	Stufe di Nerone
1334	Tempio di Diana - Baia
22	Parco Archeologico di Baia
24	Tempio di Venere
36	Grotta di Cocceio
84	Cantieri navali
143	Castello Aragonese (castello di Baia)
282	Fondi di Baia

Legenda

Comuni_Campania

beni_culturali_e_paesaggio

● VincoliPuntuali_1089
— Strade_romane
Aree_emergenze_archeologiche_ambiti_attenzione_Art37
Aree_archeologiche_sommerse
Aree_paesaggio_archeologico
• Musei

GeoIdroMorfologia

— ReticoloIdro
Superfici_d'acqua_cuas
— elementi_idrici_napoli
ambiti_studio
cflegr_ctr_2011
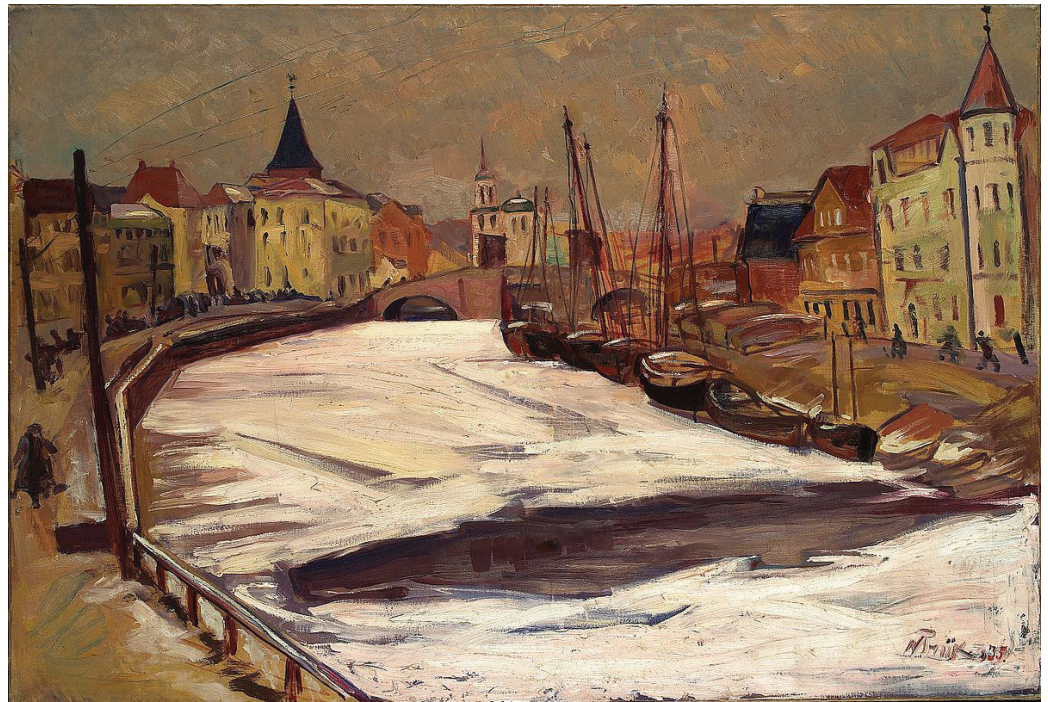
tity and landscape character. In this section, the teams were asked to identify the cultural heritage elements along their water areas and to evaluate their role in the local context.

depicted, when and whom?
Which elements are essential?
Which narratives exist?
Who has written about this landscape or depicted it in some way?

Chapter 7: Visual appearance and landscape narrative

In this section, we asked the participants to explore which elements are essential for the landscape character. The template includes the following guiding questions:
Has the landscape been painted or otherwise

Chapter 8: Water and People - Accessibility and usability

Urban developments of the past have often ignored the potential of water areas as an open space for people. Instead, the suitability for roads, infrastructure and production sites has

been determining land use and consequently, also determined the public accessibility. Today, this prevents communities from developing attachment and stewardship for their local waterscapes. In this section, we asked the teams to map the public, semi-public and private accessibility of the water areas.

How strong are spatial obstacles preventing access? And who is actually using the spaces and how?
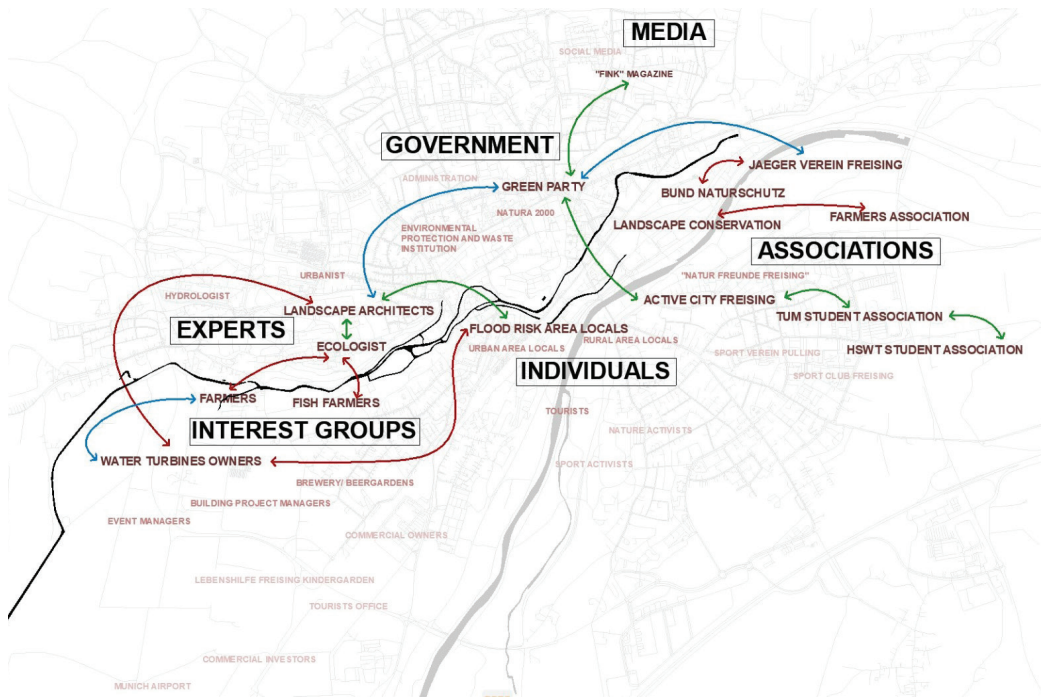
Chapter 9: Community Mapping
In this section, we asked the participants to synthesise the knowledge they have gained so far into a community map that would show the relationships between people, place, natural resources and the power structures present in the territory. This includes an identification of the social groups that are present and affected, for example the youth, kids, students, parents, the retired etc. Typically, these groups have specific needs, which the groups had to make explicit on the map. Social groups might not be organised in any way, but they are usually present in the water areas under consideration.

Next to the social groups, there are also local stakeholder groups. These groups are organised in one or the other way. They only exist within the community context under obser-

vation. For example: the local community centre, local churches, local interest groups, the landowners, small businesses and retailers.

In addition, there are external stakeholder groups-. These are not necessarily present in the environment under observation, but they may have strong stakes and interests. These can be local authorities, politicians, associations, care services etc.

For each group, it is important to identify their needs, objectives, power and capacities. Mapping these structures helps identifying gaps and power conflicts.

We asked the groups to depict these elements in an integrated way and in relation to the concrete water landscape under observation. Some guiding questions:

What is the relationship between these groups?
Are they close or distanced from each other?
Who is more powerful?
Which voices are hardly heard?
Do they have any shared concerns?

Chapter 10: Forecasting possible futures
Based on the various landscape dimensions that have been studied and evaluated so far, the teams were now invited to summarise their findings with a SWOT diagram and

2050 - Ecosystems Reconnection

Exaple from Chapter 10 Possible future of the Nürtingen waterscape: Scenario C: 2050 - Ecosystem Reconnections, working group: Gabriel, Yana, Digjam, Titiksha, Manasviben, HfWU Nürtingen-Geislingen and HSWT Weihenstephan-Triesdorf

cities temperature warming
increase of population
water flow

more public spaces
reforestation
floodable parks

green infrastructure health problem
decrease of forest areas
rewilding

sponge city
nature quarantine
beach

a DPSI(R) Model. It was further important to Link back to the Sustainable Development Goals and to be explicit about which goals are at risk in the local waterscape. On that basis, the teams had to forecast possible developments and to depict which futures might be possible.

What would be the worst case scenario for this landscape? And what is your best case scenario for this landscape? It was suggested to present the scenarios in the form of a collage or sketch.

Chapter 11: Collaborative Goal Setting
The scenario process was the final analysis step, in fact an analysis of the future, or the possible future. On that basis, the teams had to define strategic planning objectives which together would constitute their vision of the future. Within the academic setting, it was not really possible to involve the local community in this process. However, the teams learned how to negotiate competing goals and how to integrate them into an overall vision as the basis for strategy building.

Goals Setting
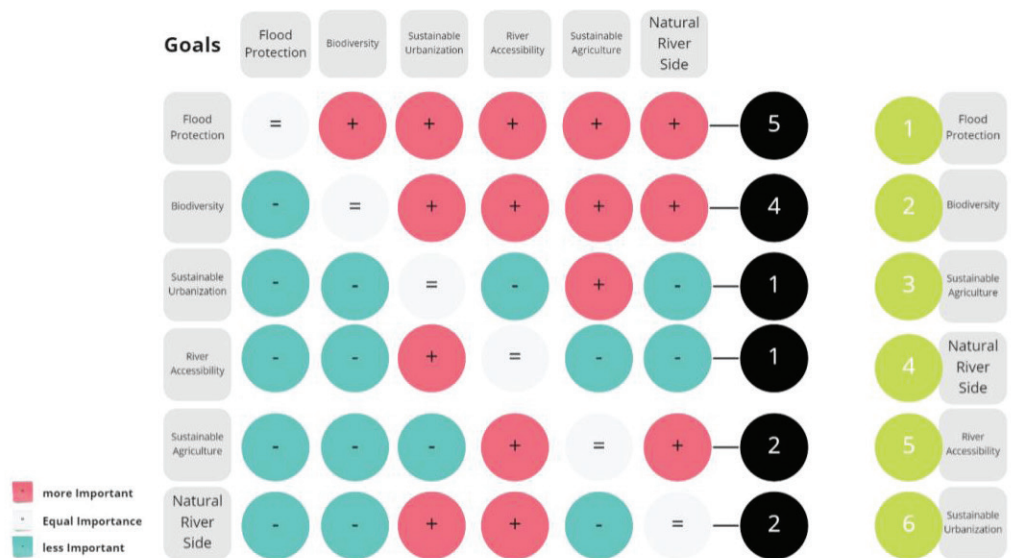
Exaple from Chapter 11 Matrix for comparing, evaluating and synthesising development goals in relation to the Nürtingen waterscape along the Tiefenbach Valley. Team members: Arash Najafi, Md Ekbal Hossaini,Mohadese Bagheri, Samira Shirzad, Yuga Tanaka, HfWU Nürtingen-Geislingen and HSWT Weihenstephan-Triesdorf

Functioning shore path

In case of inevitable new development, it has to be sustainable

Provide access to nature

The riverside in city center is actively used

Encouraging building more compact city center to avoid suburbanization

Tartu city center densely populated area: residential and commercial

Residential areas with gardens with high biodiversity + beach

Disperse settlement with agricultural land and nature

Newly developed residential areas with pressure on the nature

Involve main Stakeholder	Finding suitable areas	Getting access to areas	Planning & Starting measures	Manage areas
→ help in further steps → funding → management	→ testing areas for suitability	→ buy areas → rent areas → other ideas	→ renaturating → construction → rewetting → baseline data for future comparisons	→ granting permanence → maintenance → monitoring → success control & evaluation

Preparation	Measures	Fulfilled Vision

Chapter 12: Spatial Strategy and Transect
Once the strategic goals are synthesised in an integrated vision, the teams were asked to develop a spatial translation of their vision in order to prove if the territory has the capacity for it. We suggested exemplifying the vision in the form of a transect with concrete interventions.

Chapter 13: From Theory of Change to Implementation
In this final chapter, we asked the teams to think further. If we are to change the spatial situation in order to implement your vision: Which innovative partnerships would be needed? And which governance model would be required for this? Who needs to act and how? Teams were asked to represent this in the form of an actor and process timeline.
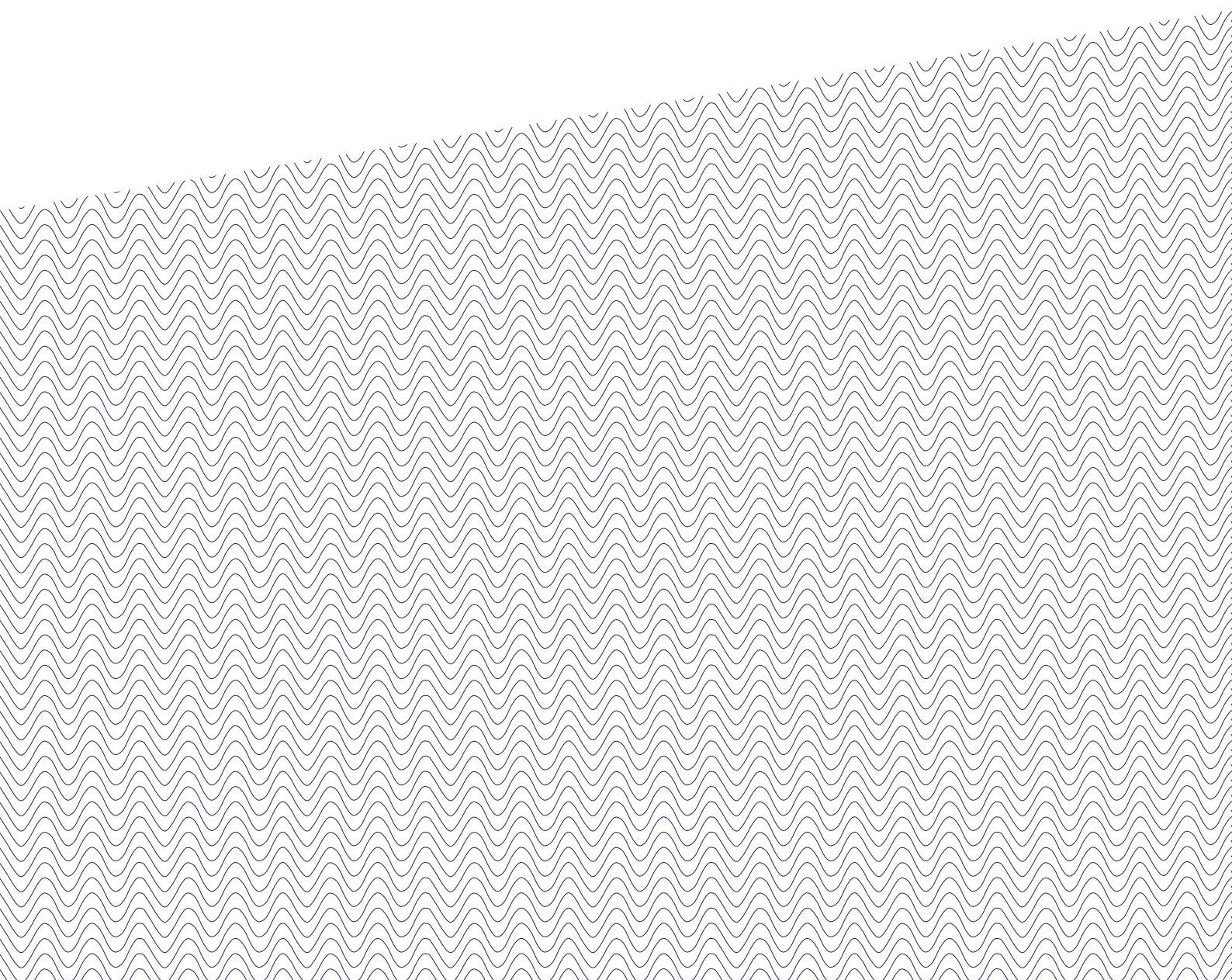
WAVE LIVING LABS
Seven Landscape Stories

A WAVE Story from Tartu, Estonia

The Water Landscape of Tartu

The Tartu WAVE Living Lab was dedicated to analysis, development, and management of public open spaces along the Emajõgi river in Tartu. The river stretches from a protected woodland area in the north-west to a protected Natura 2000 wet meadow area in the South-west of the city.

Emajõgi is a river of particular significance in Estonia. Its length is 101 km with an average depth of 1,5 m measured in the city of Tartu. The river has a large watershed of 9740 km2 and is the only fully navigable river in Estonia. Trade navigation on Emajõgi made Tartu part of the old Hansa trade route connecting Europe to Novgorod in Russia in mediaeval times. In the centre of the city the river is urbanised, with concrete embankments and surrounded by urban open spaces, commercial areas, new residential buildings, hotels and the historical city centre, being attractive for tourists and spaces of cultural importance. On both sides of the embankment in the central part of the city, the river is surrounded by parks, which are confined by streets with intensive motorised traffic.

The Tartu WAVE Living Lab aims to manage and develop this complex urban river system in Tartu, considering its historical and ecological importance.

Emajõgi river and its adjacent areas face various pressures from increasing motorised traffic numbers, increased construction and urban development, which could result in degradation of the natural landscapes, a partial loss of biodiversity and natural habitats, land use conflicts and quality of life decrease. The official strategy of the Tartu City Government is to enhance the usage of the riverbank front and to maintain the existing green buffer. To achieve this, efforts are being made to design for biodiversity, improve access across the river and its natural slopes, and qualify green areas. Despite the efforts made by the city authorities, the river still does not hold the attention it deserves as one of the substantial elements of Tartu urban environment and its cultural and historical significance (Emajõgi means "Mother-river" in Estonian).

During summer Emajõgi river is actively used for various activities such as water sports, swimming, private watercraft, and barge trips. Also during summer, on the Northern shore, the street is closed for traffic as part of the summer festival "Autovabaduse puiestee" ("car-free avenue", a pun, because the "Vabaduse puiestee" means "freedom avenue"). This festival has catalysed various public discussions and conflicts between the "car-oriented" inhabitants of Tartu, city authorities and those communities of interest, who support the development of the light traffic and pedestrian infrastructure.

Emajõgi views in the northern part of Tartu

Towards a WAVE Living Lab in Tartu

The Tartu LivingLab team has tested the concept of living labs for landscape architecture. Considering the territorial context of urban pressure connected to protected Natura 2000 water landscape together with a lack of integrated and sustainable spatial planning, the Living Lab focused on raising awareness towards these problems among the inhabitants and different professional communities. Furthermore, one of the Living Lab aims in Tartu was to understand the characteristics, issues and challenges of the central area to increase the biodiversity of the blue urban open spaces, while fostering local community participation. The Living Lab team intended to improve the decision making process through enhancing links between the different types of stakeholders (residents, academia, professionals) and city authorities.

The Estonian University of Life sciences (EMU) aims to support the green economy and development with academic competences. Therefore the WAVE Living Lab, initiated by

EMU is an example of cooperation between the educational institution, existing initiatives on sustainable urban development and local stakeholders, together supporting the aims of the Tartu City Government.

Building the WAVE Living Lab Community in Tartu

EMU team has established connections with an existing local initiative called "curated biodiversity", initiated by three landscape architects, working in Tartu with an aim to demonstrate the practice of green area management, while enhancing urban biodiversity. The community manager from the "Curated biodiversity project" was hired by EMU during the period of funding.

The activities of the Tartu Living Lab started by organising three focus group interviews with experts in the fields of urban greening, urban nature, and cultural heritage. The participants were selected based on their expertise and knowledge of the study area and its relevant topics. The data, collected during the focus group discussions was also

Students and public at the open-air interactive poster exhibition near the river during the WAVE intensive programme

Public planting workshop at the study area organised by the Curated biodiversity team. WAVE students are also participating

Outcomes of the Tartu Living Lab

used to develop several bachelor and master theses at the Chair of Landscape Architecture of EMU. Based on the topics, identified in focus groups, the task for the Tartu WAVE Intensive Programme (IP) was developed by the EMU team. The Intensive Programme took place in May 2022, followed by several local events (planting trees with local communities in the central parks), organised by the curated biodiversity project. The students, who participated in the WAVE Intensive programme, defined a further list of the relevant stakeholders on substantial topics concerning the green-blue open space development in Tartu. Participants of the IP experienced the Living Lab case study areas via different methods (described further in this publication) and prepared an outdoor exhibition of the IP results.

Approx. 200 people were involved in the LivingLab. The stakeholders contained the European Culture Capital Tartu 2024 team, Tartu City Government, ecologists and historians, landscape architects and city planners, but also architecture classes for pupils, local companies, surrounding the project area, such as: IT business, Ministry of Education or the Tartu food market. We managed to bring these different stakeholders together, organised workshops, initiated physical actions in the river parks and held focus group interviews. We were successful in fulfilling some tasks and hopes for the LivingLab, but in reality, many people just came together for the actions we planned, and the Living Lab as a forum for discussion is not working without a curator, who assembles people and helps to lead the discussion.

The outcomes of the Tartu Living Lab (TTL) organised events were thoroughly integrated into the curriculum activities of the Chair of Landscape Architecture, the LivingLab experiences were developed more profoundly in different study projects at EMU. In 2021, the LivingLab started by building local academia teams analysing the river through fieldwork and literature review. 5th semester Bachelor students worked along Emajõgi river in an urban landscape project with the municipality of Tartu as a project partner. Their tasks included analysis, concept and designs for the project area. In this initial phase the WAVE online course also happened the first time, being repeated in 2022.

The main development of the TTL activities took place in 2022, with continuing the student participation in design projects and the IP taking place in Tartu. This added insights to the initial academic consultation of the previous year and the LivingLab focused more on engaging with the local community, both professionals and inhabitants, through direct participatory and interactive meetings. Students participating in the Tartu WAVE IP were involved in the events within Tartu Living Lab, organised by Curated biodiversity project and thus, the outcomes of these events were integrated in the IP outcomes.

Several students have chosen the LivingLab as a research topic for the bachelor and master thesis and used the results for the focus group

Use the boat as a way to transport and explore. Visit some of the interesting places that are along the river. As final destination - the Natura 2000 site. Also, another idea is to implement kayak excursions during the summer season.
Destinations:
• Emajõe rand
• Tartu Botanical Garden
• Delta stairs
• Atlantis
• Tartu Turg
• Anne Canal Beach
• MTÜ Tartu Maheaed
• Ropka-Ihaste Nature Reserve
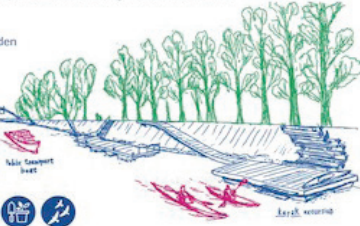
Learn

Interventions in Natura 2000 site - implementing information panels to inform the people about the flora and fauna, the ecosystem and its value. Also, put QR codes on the panels so people can access and explore the area on phones.
Interventions:
• Wooden paths and decks
• Birdwatching areas
• Signage
• Guided tours
• Fire-free picnic areas
• Fishing areas

Share

At the weekend, close the Vabaduse Puiestee for traffic for 4-5 hours and organize educational activities for the people.
Activities:
• Interactive panels about biodiversity and the river value
• Paint the banks or the alleys
• Competitions
• Urban foraging

INTERVENTIONS

BETTER ACCESS AND SHELTER
ACCESS FOR ALL
add more vegetation
MIX PRIVATE AND PUBLIC
CONNECT TO WATER UNEXPECTEDLY
staircase to the water
SHELTER TO REFLECT AND PROTECT
adding lighting
USE THE POTENTIAL OF UNUSED SPACES
TREE FOR SHADE AND SHELTER

WHY?
• During the interviews, people in Tartu mention a lack of places to spend time by the river
• In Tartu, however, there are plenty of decks in different forms that serve this purpose

An example of one design idea development through the Living Lab process
1) Left: Design ideas of the WAVE IP students after on-site interviews with visitors. Authors: Elif Naz Duman, Iuliana-Vasilica Bulmagă, Stefano Cesaro, Rehan Wasi
2) Right: Poster presented during the co-creation workshop, based on some ideas, developed during the IP. Author Elif Naz Duman.
3) Below: Master thesis design proposal after all step of Living Lab activities. Author Elif Naz Duman.
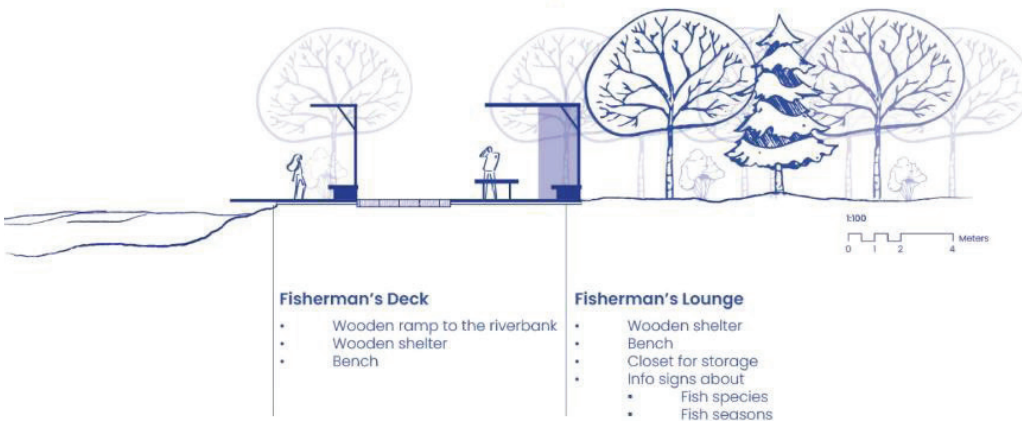
Fisherman's Deck
• Wooden ramp to the riverbank
• Wooden shelter
• Bench

Fisherman's Lounge
• Wooden shelter
• Bench
• Closet for storage
• Info signs about
  • Fish species
  • Fish seasons

interviews, on-site interviews as well as their own methods, thus contributing to the Tartu Living Lab outcomes.

Also, the Living Lab resulted in a consolidated relationship between the University and the Tartu City Government as well as an increased local community engagement in city planning issues and sustainability aspects.

The actions, organised by the curated biodiversity project involved collective planting of shrubs, the planting and picking of potatoes and a traditional mowing techniques workshop in the parks adjacent to the river.

Consultations with urban residents included online questionnaires and fieldwork discussions, such as ice fishermen, business owners, but also winter swimmers, to name a few. These interactions were realised both by the local students and by the WAVE international students participating in the Tartu IP in May 2022. We engaged school teachers and pupils in the LivingLab and the IP, by organising meetings with a gymnasium class and high school groups in Tartu, located in the project area, who had been identified as an important stakeholder group. A direct consultation and exchange of knowledge and ideas on the Emajõgi was also realised through fieldwork and urban ecology workshops. In 2022, also an Erasmus design course as well as the Big design project for the final master year was completely dedicated to the WAVE LivingLab, with the students using its steps, such as the

co-creation workshop in November 2022, for boosting their outcomes. The Living Lab offered both involved students and teachers the opportunity to learn and apply new analysis methods as shared within the international and interdisciplinary context of the WAVE project.

Co-creation workshop im November 2022. Left: workshop participants develop the design proposals based on the ideas, suggested by the students. Right: the progress of the design ideas by the end of the workshop.

Communicating the Living Lab

The Tartu Living Lab activities were communicated mainly through University press releases disseminated and through the continuous participation of WAVE teachers and students at local conferences. We have also organised two public debates – one public event as a result of the Tartu IP, and the World Town Planning Day Conference focused on Tartu and its river, but many TTL activities and events were not always promoted through social media platforms.

We also presented the Wave research in a paper at the AESOP Conference in July 2022 and we received valuable information about what people of Tartu would like to do and see in the central part of the town and how they see the river as a part of the cityscape, which helped to build the design input for

the ongoing curated biodiversity project, also tightening the network around Tartu central parks and cityscape. Because of the LivingLab actions, we were able to raise awareness on the potentials of the central parks and riverscape, as well as casting light on the pressures to the natural environment of parks and the river, while taking more people to the river and enabling new access points to the water.

WAVE Living Labs in practice: A critical reflection

One of the key problems, vocalised during the Living Lab events, was the absence of strong stakeholders and communities, which could be formed around Tartu green spaces at the river. Another issue, mentioned by people in interviews and focus group meetings, was the missing action in Tartu public space. Many people described the urban environment as dull, although they appreciated the peace and serenity. From focus group discussions with experts, the TTL received a lot of valuable advice on upgrading the centre and riverside as a more natural environment, bringing water to the parks, and building access to rivers. Another problem, mentioned during TTL events: the absence of the direct connection to water in the central areas, such as sunbathing near the river, dipping toes into the river or walking along the natural riverbed with benches and study trails to teach about the nature near the river.

The TLL organising team experimented with different methods, encouraging the people to participate in the events. For example, in spring 2022, a co-design workshop was organised and advertised through social media, the city information lists, local community organisations, web magazines and announced the registration in a conference. Nevertheless, the organising team failed to receive enough registrations to the workshop. Another method was applied to organise a second co-creation workshop in autumn, where people were invited individually through the existing network of the Curated biodiversity project using snowball method. The lessons learned were that open calls were not effective in the case of Tartu Living Lab. Assumably because they seemed too anonymous for the participants, not directly interested in this topic.

The initial expectation was that reaching out to local communities was going to be difficult because there were only international students in our courses at EMU, but surprisingly it led to the positive effect, enhancing the use of more drawings and simple language. The other problematic aspect was the pandemic restrictions and risks to facilitate LivingLab activities and meetings in its first stages, but a surprise within the Tartu LivingLab was the enthusiasm and high involvement of students, together with the successful engagement of high school pupils. Success can be measured by the events that have taken place, the workshops and companies and schools that were involved. Before the actions in the parks some of the participants probably walked through the area without perceiving the environment. After talking about it or planting shrubs participants took a closer look at the place and started to think about it more intimately. We can conclude that it was a success and we were able to involve a lot of people from different organisations.

Future of the Tartu WAVE Living Lab

In 2024, the Le.Notre summer school will take place in Tartu. The LivingLab Tartu will probably not continue without somebody curating it, but since the curated biodiversity project has joined forces with the Tartu LivingLab, it will continue and some actions will also take place in the future.

Why would the LivingLab as a method not continue without a curator? As mentioned earlier, there are very few people living in the city centre there and there is no community or interested party near the centre parks and riverside. The Living Lab is not very viable without a curator, so what could be done to make it work? Bring in some interested parties with an individual goal to provoke? Give the space to people and let them make it their own space? Flowerbeds or planting areas could be established and be taken care of by the companies around the area, but also redesigning riverside parks for urban gardens may bring in people who would stand for this place if needed. The future of our profession is not solely connected to the material output, such as flashy design and constructions, but furthermore to guide the awareness of people towards problems and challenges of a given and familiar place.

A WAVE Story from the Phlegrean Fields, Italy

The Water Landscape of the Phlegrean Fields

The Phlegraean Fields represent one of the most complex areas of the Region Campania in terms of layering of historical and geological events. Linked to the unique identity, the environmental delimitation includes a wide depression among Posillipo hills to the east and the Licola plain to the north-west. Such an area almost matches with the administrative surface of the municipalities of Pozzuoli, Bacoli, Monte di Procida, Quarto, and part of Naples, corresponding to some 200 000 inhabitants. It consists of a volcanic land with twenty extinct craters defining the Phlegraean caldera, whose morphology has been shaped by four lakes (Fusaro, Averno, Lucrino, Miseno) and a weak hydrographic network. The volcanic activity has also enhanced the landscape with thermal spas well-known since antiquity for recreational and healing purposes, especially during the Roman Empire. The Phlegaean territory hosted luxurious patrician villas and military garrisons for the imperial fleet, firstly in the lakes Lucrino and Averno, then in the lake Miseno. Currently, the area shows one of the highest concentrations of archaeological ruins of the world, which in the 18th century has attracted plenty of central-northern European travellers as the last stage of the Grand Tour.

As imaginable, the Phlegraean landscape results from an inseparable fusion of cultural heritage and volcanic environment where the archaeological sites constitute a nodal relationship of the infrastructural and settlement frame built over the time.

The choice of such a variegated waterscape has derived from the awareness of the territorial distinctiveness that integrates archaeology, crater morphology, and volcanism expressed from the widespread spas. Taking inspiration from these peculiarities, the concept of the living lab is a "constellation of ancient and modern thermal waters", which relates Roman cisterns and spas, minor archaeological heritage, and contemporary spas. The proposed idea will be pivotal for policies of requalification, conservation and improvement of the landscape.

The main challenges of the study area are:

• poor accessibility, due to the orography and the spread of settlements;

• conservation of the widespread archaeological heritage, subject to increasing degradation;

- regeneration of urban and periurban tissues, dense and resource consuming;

- claim for socio-economic development.

The living lab is a useful tool to attract the stakeholders and to make them involved in consultation tables for the redevelopment of areas closer to the lake and to foreshadow waterscape thematic itineraries.

Towards a WAVE Living Lab on the Phlegrean Fields

The Living Lab of Bacoli was launched on the basis of an agreement between the Department of Architecture of the University of Naples "Federico II" and the municipal administration. The latter body has been very active in its territory, thanks to the support of various NGOs aiming to improve the liveability by enhancing the outstanding landscape and environmental resources. In doing so, the joint efforts made by the Town Council and the NGOs would contribute to deal with the conflicts between the dense urbanisation and its impact on the environment.

The municipal administration of Bacoli had already developed some projects with the University of Naples. Therefore, the WAVE Living Lab resulted as a logical continuation of such a synergy. The Municipality of Bacoli applied for various projects on the restoration and enhancement of archaeological sites and the development of slow mobility. Two examples of those projects are, respectively, the restoration

of the Water Grottoes (Grotte dell'Acqua) and the construction of a green parking area close to the Casina Vanvitelliana by Lake Fusaro. Through the Living Lab, the municipal administration can be supported by the university to implement the project already financed. Concurrently, the university has promoted the Living Lab to make the community involved to listen to its claims and to co-plan interventions to emphasise waterscapes of the municipal territory – i.e. the lakes Miseno and Fusaro, the ancient and contemporary spas.

Building the WAVE Living Lab Community on the Phlegrean Fields

The Living Lab of the Municipality of Bacoli, called "BacoLIving L@b", was developed from the existing network of NGOs. They were invited together with entrepreneurs in the thermal sector and in the tourism one, schools, and residents. As the Living Lab started in early 2021, due to the Covid-19 pandemic it was necessary to rely on digital devices and online events to present its goals and agenda. In this phase, the students interviewed residents and designed public grounds with facilities and cycle routes along the lakes Miseno and Fusaro, published in a booklet. In the second phase, it was possible to continue the activities of co-mapping and survey through digital media e.g. Google-my-maps and Google forms.

The expectations of the communities mainly regarded the availability of public spaces such as squares, playgrounds and meeting areas for seniors, sport facilities, and the mitigation of

COMMUNITY | **STAKEHOLDERS INVOLVED**

NGOs
FreeBacoli
Diamo a Bacoli
Percorsi Cumani

LOCAL AUTHORITY
Mayor
Municipal councilors
Assessors

SUPERINTENDENCE AND MUSEUMS
MANN - Archaeological Museum
Flegrean Archaeological Museum

ECONOMIC OPERATORS
Nostro Sud S.R.L.
Mussel cultivators
Local businessmen

UNIVERISTY AND RESEARCH CENTRES
Teachers - researchers
Students

SCHOOL
High school students
Teachers
Student council

The stakeholders involved in the Living Lab.

the side effects of mass tourism on the entire Phlegraean area. In spring 2022 a group of students attending a post-lauream professional Master were involved in the programme. They organised three meetings with local stakeholders, divided in thematic areas, and an international workshop in which Prof. Carl Steinitz was invited.

In September 2022, the university staff organised the Intensive Study Programme (ISP) by Lake Fusaro. Such workshops involved several institutional stakeholders and entrepreneurs working by or close to the lake, NGOs, and residents. In the workshop, the students applied the co-mapping methods already experimented in the living lab. The projects of the workshop were displayed to the residents and the tourists on the permanent interactive panels, with short videos explaining

the most remarkable features of the place and allowing to delineate future improvements. The workshop helped to launch a permanent digital living lab, which will help to collect data, to study and monitor the social needs and the preferences for the various design options

Outcomes of the Living Lab

In 2021 and 2022, during the phases of the Living Lab, various publishing and digital products were issued. They described the characteristics of the territory, its resources, and the design solutions conceived by the students. The main outcomes are listed below:

• Website storymap "Waterscape" (https://arcg.is/1DuGy1), which describes the main territorial resources and the products of

the Intensive Study Programme held in September 2022. It includes the charts illustrating the design proposals aiming to improve the accessibility to the Lake Fusaro and to the Roman Beach (Spiaggia Romana) and to enhance the environmental potential of the woodland surrounding the lake.

• Website story map "One day Trip" (http://bit.ly/40XgTOR), output of a MSc thesis, which proposes the interactive fruition and the planning of customised tours to visit the entire territory of the Phlegraean Fields.

• The design proposal, output of a MSc thesis, of the so-called "Phlegraean constellation",

Stage n. 1 _ The lake
Stage n. 2 _ The cultural heritage
Stage n. 3 _ The Roman beach
Stage n.4 _ The "Quarantena" park
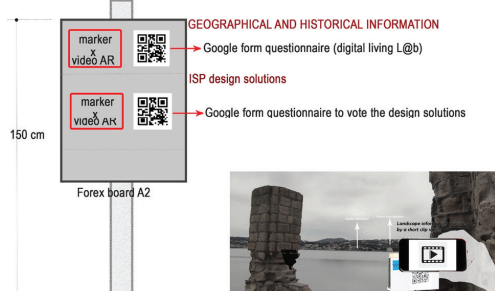
namely a network of pedestrian and cycle paths to connect the main archaeological sites and the contemporary spas. The bike route has been co-developed with the local bikers' association "Percorsi Cumani".

• The set of interventions designed to redevelop the Miseno lakeside area, output of the educational activities of the post-lauream Master, specifically of a workshop coordinated by Carl Steinitz with the participation of the stakeholders from the Living Lab.

• The permanent digital Living Lab, built during the Intensive Study Programme Bacoli 2022, which enables to collect information and hints, and to select a design solution among the alternatives elaborated by citizens and visitors.

The interactive panels provide access to short videos illustrating the cultural and landscape heritage of the focus area, and collecting opinions and evaluations from the citizens. The data of the surveys (Google forms) have been processed by the university researchers to extract needs and expectations of the population,
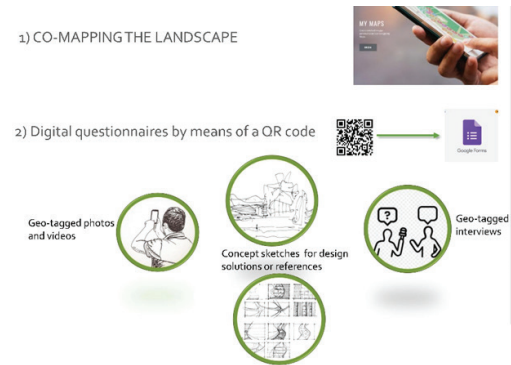
The interactive panels for the permanent digital living lab by Lake Fusaro.

As a whole, the activities of the Living Lab have built the network of actors and progressively increased the number of participants. The data processing, the meetings, the discussions among the participants and the workshops have strengthened the relationships between the municipal administration and the university. It will lead to further collaborations on future scenarios for the territory of Bacoli

as to orient the meetings of the Living Lab. The questionnaires were also distributed by the municipal administration among the local schools to widen the participatory process in Bacoli.

Communicating the Living Lab

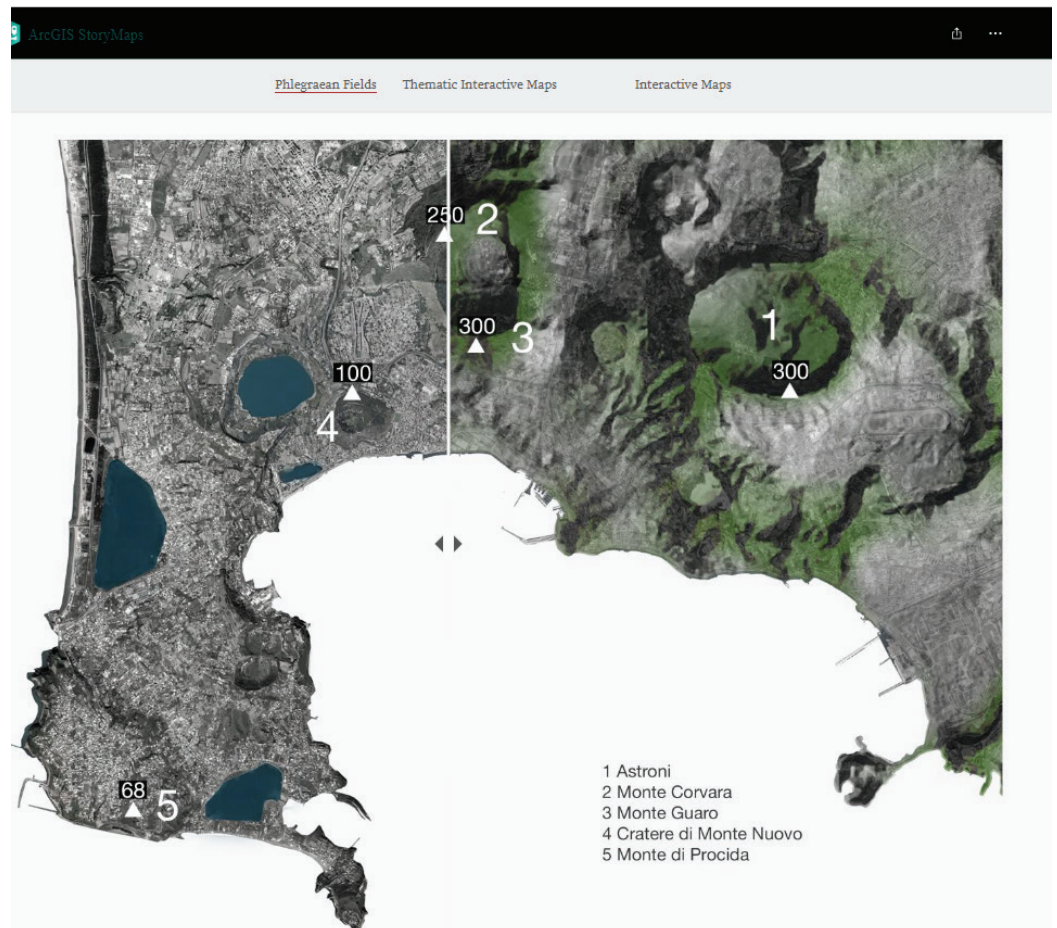In the first phase, the activities of the Living Lab were spread through releases of the municipality and posters and flyers of the university, to encourage stakeholders and citizens to join it. Subsequently, the advances and outcomes of the Living Lab have been conveyed academically, on papers presented in national and international conferences and on scientific journals.

Communication benefited from digital technologies. Interactive panels were located in public spaces close to Lake Fusaro. Moreover, two story maps websites were launched to collect information from the whole territory of the Phlegraean Fields and to show itineraries to visit the main archaeological and landscape resources. The websites have gathered histo-

rical and current images, short descriptions of local resources and hints for future actions. The activities and especially those involving the stakeholders – i.e. workshops – were priorly announced and then reported on social media set up by the university (Facebook, Instagram). Finally, it is worth mentioning that reports and interviews to the university staff were broadcasted on local television channels during the ISP.

WAVE Living Labs in practice: A critical reflection

The experience of the Living Lab has undoubtedly resulted in synergy between the University of Naples (facilitator of the participation process) and the Municipality of Bacoli. Thanks to the availability of the local stakeholders – mainly NGOs – detailed information was collected on socio-economic dynamics and community needs.

The complexity of the lake areas is evident in both the Miseno and Fusaro lakes, because of conflictual anthropic activities:

WAVE ~ Reflection in Action: the WAVE learning model ~

- mussel farming has been damaged by sewer systems;

- hores are not well-equipped or overused in relation to the fragile ecosystems;

- bike and pedestrian accessibility is poor and limited;

- public open spaces are insufficient by considering the population (inhabitants and tourists).

It must be said that no clear awareness of the current weaknesses has emerged from the meetings with the population. Some members of NGOs acknowledged the main critical issues, whereas several entrepreneurs substantially promoted their interests. However, the meetings with the stakeholders and the design workshops enhanced the local community's awareness.

As known, the involvement of the citizens generates cohesion and fosters new skills applicable in different areas. Usually, the participation is open to anyone who is interested in the activity of the living lab, but some selection of the participants may be profitable, according to the topics and the previous knowledge of the team members. On one hand, free participation can be progressively implemented and benefit from feedback also from far disciplines. On the other hand, complex problem solving requires participants with a wider cultural background and/or higher specific skills.

The living lab offers a common physical or virtual space to deal with community problems and to deliver shared solutions. The outcomes reflect the inclusion of the main actors who relate proposals based on the users' direct observation and follow-ups on the advances in building a local understanding.

Future of the WAVE Living Lab on the Phlegrean Fields

The Bacoli Living Lab was structured in the Phlegraean territory largely due to the wide and dynamic action of the NGOs. Nevertheless, the constant work of the facilitator/coordinator of the living lab is essential to monitor the outcomes of the various initiatives and

identify further ones, either in continuity or change. Currently, the university is keeping the responsibility of the living lab looking for opportunities of specific funds. Notably, the University of Naples "Federico II" is carrying out a PNRR (National Plan for Recovery and Resilience) programme on the enhancement of the cultural heritage in risk zones, particularly in the Phlegraean Fields. This programme ensures the possibility to keep the activities of the living lab alive at least by December 2024. It's difficult to keep the Municipality of Bacoli involved as coordinator responsible for the project, due to its commitments and limited expertise in leadership. Similarly, the NGOs cannot ensure continuity as principal coordinator.

An advisable scenario might be the institution of a permanent space/bureau for living labs in the town hall. The new space would be open to associations, stakeholders, and the university, with a calendar of scheduled events on various themes, including a focus on the Phlegraean landscape.

Links and References

https://wave.hfwu.de/index.php?title=WAVE_Living_Lab_in_Phlegraean_Fields,_Italy

A WAVE Story from Constanta, Romania

Landscape of Siutghiol lake

Constanta's Water Landscape

The Constanța WAVE Living Lab is focused on the analysis of the coastal NATURA 2000 site ROSPA0057. As a NATURA 2000 site, this area is recognized for its importance in terms of biodiversity and the preservation of natural habitats and species. This site comprises two lakes, Siutghiol and Tăbăcăriei, which are situated near the shores of the Black Sea. Both lakes are located within the jurisdiction of Constanța Municipality, with Tăbăcăriei entirely falling within its boundaries, and Siutghiol partially extending into the territories of two other towns, namely Năvodari and Ovidiu.

Tăbăcăriei lake covers a surface of 99 hectares, with an average depth of 1.5 m, being connected to the Black Sea and Siutghiol lake (1900 hectares in surface, and 17 metres maximum depth) through two artificial channels. Tăbăcăriei lake is completely urbanised while its shores are cement consolidated and its surrounding adjacent area comprises multiple functionalities: an urban park, several commercial areas, a water treatment plant, new residential buildings, hotels, tourist areas, cultural spaces. Siutghiol lake has a tourist functionality on its eastern shore due to the

development of Mamaia resort, while its western shore is mainly residential, comprising both old and new housing areas. The northern part of Siutghiol lake is in the vicinity of several industrial activities and of arable land.

The two lakes and their surrounding adjacent areas are under high tourism and chaotic urbanisation pressure while lacking a management plan and a specific administration of their status of NATURA 2000 protected area for birds. Under the current development trends and local governance deficiencies, the two lakes suffer from pollution and degradation of urban and natural landscapes, loss of biodiversity and natural habitats, land use conflicts, quality of life decrease, and inadequate tourism infrastructures and services.

Towards a WAVE Living Lab in Constanța

Given the territorial context of high urban and tourism pressure on a Natura 2000 water landscape as a lack of integrated and sustainable spatial planning, the Constanța Living Lab focused, first, on raising awareness at local and national level on the characteristics, issues and dysfunctionalities of the Siutghiol and Tăbăcăriei lakes while, secondly,

increasing the local community participation in the planning approach and decision making through improving especially the link between the different types of stakeholders (residents, academia, professionals) and the public urban administration.

The vision, mission and strategic goals of Ovidius University of Constanța are closely accomplished through the WAVE Living Lab as it supports the institutional aims of social engagement within the local and regional sustainable development process. By such, the University develops its leadership pillar, as being an active territorial actor contributing with knowledge and innovation to a better participatory urban governance and planning process.

Building the WAVE Living Lab Community in Constanța

In 2021, the Living Lab started by building the local academia teams analysing both Tăbăcăriei and Siutghiol lakes through fieldwork and literature review. The first research results were presented by the Ovidius University students at one local and other national geography scientific conferences.

The year of 2022 involved the main development of the Constanța Living Lab activities. Continuing the student participation to several local and national scientific events

(taking place in Constanța, Bucharest and Cluj-Napoca) and adding insights to the initial academia consultation in the previous year, the Living Lab focused more on engaging the local community, both professionals and inhabitants, through direct (physical) inter-active meetings. Thereby, the WAVE students and teachers consulted the Constanța urban planners activating within the Association of Romanian Urban Planners and other local professionals and public administration representatives by organising a debate followed by a workshop and a World Town Planning conference.

The consultations with the urban residents included online questionnaires and fieldwork discussions with different types of population, such as the fishermen on the lakes, and the nearby inhabitants, but also with tourists. These interactions were realised both by the local students and by the WAVE international students and teachers participating in the September Constanța IP. Also, we engaged with school teachers and students in the Living Lab and we organised three meetings with one gymnasium class and two high school students groups in Constanța and their geography teachers.

A direct consultation and exchange of knowledge and ideas on both Tăbăcăriei and Siutghiol lakes was realised through a fieldwork urban ecology workshop in Constanța with the participation of geography students and

WAVE Living lab event at Siutghiol lake

Fig. num 1. Transect 1. N-S

● = where we plan to intervene

Area	Pavilion	Treatment Plant	Commercial and Residential	Microrezervation	Church
Soil's type	Oolitic limestone	Clay and Sand	Leossoid Deposits	Leossoid Deposits	Leossoid Deposits
Land use	Administrative	Industrial	Residential and Commercial	Green Area	Cultural
Interventions	Clif , Tăbăcărie-black sea canal,Parking lot and Buildings	Clif ,Tăbăcărie- black sea canal, water treatment plant	Clif and Buildings	Clif	Clif and the Church
Problems	Emission's from cars	Attractiveness	Soil Compaction		Soil Compaction

Fig. num 2. Transect 2. S-N

● = where we plan to intervene

Area	Lesiure Zone	Park Area	Comercial Zone	Comerical and Park
Soil's type	Oolitic limestone	Leossoid Deposits	Oolitic limestone	Leossoid Deposits
Land use	Commercial	Green Area	Commercial	Commercial and Green Area
Interventions	Clif ,Buildings and dock	Clif , Benches and swings	Clif and Buildings	Clif ,Buildings and Tabacarie-Siutghiol canal
Problems	Urban Pressure	Cliff is degraded	Soil Compaction	Soil Compaction

researchers from the University of Bucharest, under the coordination of a SURE (Society for Urban Ecology).

Outcomes of the ConstanțaLiving Lab

The main outcomes of the Constanța Living Lab include: the realisation of a master dissertation on the sustainable territorial development of Tăbăcăriei area; a multi-stakeholder World Town Planning Day Conference focused on the sustainable development and better governance of Siutghiol and Tăbăcăriei lakes; the start of a new research project Competence Center for Climate Change Digital Twin for Earth forecasts and societal redressement: DTEClimate with European funding aiming to further develop the Living Lab on Siutghiol Lake, within a new national research and business cooperation and network focused on improved knowledge and solution innova-

tion on the impact of climate change. Also, the Living Lab resulted in: a consolidated relationship between the University and the local professionals of the Association of Romanian Urban Planners; increased local community engagement in city planning issues; increased awareness on sustainability objectives; increased level of environmental and urban ecology education among both university and highschool students.

Communicating the Living Lab

The Constanța Living Lab activities were communicated mainly through University press releases disseminated at local and regional level, and through the constant participation of WAVE students to local and national conferences. We have also organised two public debates – one public event as a result of the Constanța IP, and the World Town Planning

Day Conference focused on Constanța and the two lake areas. Additionally, all Living Lab activities and events were promoted online through social media platforms (Facebook and Instagram pages).

WAVE Living Labs in practice: A critical reflection

Currently, we have already made an important step forward while recently starting a new research project with European funding which aims to develop the Siutghiol Living Lab as an essential component in the process of managing the local impacts of climate change on water areas - Competence Center for Climate Change Digital Twin for Earth forecasts and societal redressement: DTEClimate.

Links and References

https://www.univ-ovidius.ro/
https://www.instagram.com/geografieunivovidius/
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A WAVE Story from Bucharest, Romania

Bucharest's Water Landscape

The focus of the Bucharest Living Lab was the Colentina lakes which form a blue-green necklace in the northern part of the Romanian capital city. The river is a rather small one of about 100 km length, which springs from the hilly areas in the north-western part of South-Muntenia Development Region and flows into the river Dâmbovița – a much longer river crossing through the centre of the city - a few kilometres east to Bucharest. More than 35% of the river length is crossing the capital. A large hydrotechnical and urban project was set up in the 4th decade of the last century leading to the creation of 15 artificial lakes, most of them being entirely or partially within the administrative limits of Bucharest. The blue-green necklace of lakes was achieved along almost 5 decades and has a double role:

to protect the city from floods and to provide a large recreational area for its inhabitants. It is also a valuable ecosystem for biodiversity and for preserving a healthy microclimate.
The Colentina lake necklace in the Northern part of Bucharest (General Urban Plan, 1999)

The blue-green Colentina corridor was the subject of the 4th Landscape Forum LE:NOTRE in 2015 (LE:NOTRE Landscape Forum 2015 Bucharest | LE:NOTRE Landscape Forum (ln-institute.org), that brought to Bucharest over 110 participants from 21 countries, for an interactive and interdisciplinary event. Banner of the 4th Landscape Forum LE:NOTRE, Bucharest, April 2015.

The importance of the Colentina lakes chain war emphasised by the final Outcome Statement of the Forum, stating that it brings "ecological, social and economic benefit to the entire city and environs" and that it represents " a public benefit, a cultural monument and a fundamental element of Bucharest that links the city to its metropolitan region" (Outcome statement of the 4th LE:NOTRE Landscape Forum Bucharest, Romania - A Future for the Colentina Lakes Chain).

Baneasa Lake is one of the 9 Colentina lakes, entirely within the administrative territory of Bucharest It is in District 1 of the city, at the edge of the modern city developed by the mid 20th century and the further developments, close to the main access route to the city (National Road 1) and to a major railway line going east to the Black Sea.

Băneasa lake has 40ha and stands between two other lakes: Grivița lake at the west and Herăstrău lake at the east. The lake is surrounded by residential areas, green and sport areas, a mix of various institutions and offices and is closed to some new and modern development areas including higher density residencies, offices and commercial areas.

Towards a WAVE Living Lab in Bucharest Briefly explain: Why are you building a living lab and which specific goals does it have? How does the Living Lab support the vision, mission and strategic goals of your institution? Baneasa Lake is especially a good pilot project, as there is a lot of interest manifested in the area by the local community that acts as an

important force in starting an initiative and could also potentially outbalance the lack of action and interest from the public sector. In the context of recent development trends, increased interest in green-blue corridor and participatory cooperation projects, as well as the substantial funding they can benefit from, we believe that the student project we want to bring to your attention is of great interest. The project aims to support sustainable development of aquatic spaces and floodplains in urban and peri-urban contexts in Europe through knowledge and integrated approaches. This is especially relevant now, as a solutions competition is being launched for the chain of lakes in Bucharest, an area limited to the Sector 2 administrative-territorial unit, with the potential to create connections and result in an integrated vision for the entire lake ecosystem.

Băneasa Living Lab aims to address the challenges of a water landscape, part of a large complex system of lakes in Bucharest, in a highly urbanised context, that lacks any initiatives benefiting the community. It also seeks to make the community participation in the planning and decision-making processes more visible to the public sector and improve linkages between various stakeholders, such as residents, academia, professionals, and the public administration. According to the law, the administrators of the lakes and roads are responsible for their maintenance, rehabilitation, and potential exploitation. The construction of the road around the Colentina lakes chain began immediately after the lakes were dredged, between the years 1930-1940,

Băneasa Lake area (Google Maps, 2022, processed image)

and was continued during the communist period. At present, 25% of the road around the lakes is blocked by various properties, 56.5% is only pedestrian access - sometimes a footpath - and 18.5% allows both pedestrian and vehicle access. The local administration did not continue this project after 1989. It did not even maintain what had been built, except for the Sector 1 City Hall, which recently modernised a large part of these roads in the area where luxury residences are located.

Because of an institutional inconsistency (that refers to both the quality of the administrator and multitude of actors involved that don't always have common interest and communicate efficiently) and the quality of the legislation, very little has been done to improve both accessibility and the quality of these important natural resources of Bucharest.

By supporting the institutional goals of social engagement within the local and regional sustainable development process, the WAVE Living Lab contributes to the vision, mission, and strategic objectives of the Ion Mincu University of Bucharest. The University plays an active role in the development of participatory urban governance and planning and a better collaboration among multidisciplinary teams, thus strengthening its leadership in the field and promoting knowledge and innovation in the region.

Building the WAVE Living Lab Community in Bucharest

A recent activity within the project is related to the initiation, by the University of Architecture and Urbanism "Ion Mincu" (UAUIM), in collaboration with the Professional Association of Urban Planners in Romania (APUR), of a "living lab" in the Baneasa Lake area (LLLB) in the northern part of the capital. Since July 2022, field visits, meetings, and discussions have been conducted with representatives of public or public interest institutions, as well as with members of NGOs/community or professional associations. In the last fall-winter, students from the Faculty of Urbanism at UAUIM conducted a series of analyses and field research in the Baneasa Lake area and developed proposals for intervention and development/redevelopment of the waterfront areas on the lake's shores and nearby.

Invitations to participate were issued to a group of interested stakeholders. The Bucharest Metropolitan Association, Local Action Groups Baneasa Lake and Bucurestii Noi, representatives of Bucharest City Hall, The Romanian American University responded and contributed with opinions, discussions, information about the area and about related projects. Stakeholders were solicited to partake in a survey that was subsequently disseminated by them, culminating in a corpus of 50 responses. This process also facilitated an enhanced comprehension of the area and its needs.

Outcomes of the Bucharest Living Lab

Opinions and suggestions offered by partners and the public resulting from dissemination were collected and provided a basis for project improvements and will be part of the participatory process and future collaborations between the public administration and the community. Hopefully, these actions will result in future new partnerships.
The students benefited from input provided by the partners and received a better understanding of the realities of a project's development, implementation methods, and how an urban initiative can be applied in real life.
The final results of LLLB are published on a dedicated webpage in StoryMaps and will be transmitted to the local public administration and will be.

WAVE Living Labs in practice: A critical reflection

Throughout the project, the community, as represented by local action groups, emerged as the most engaged and dynamic stakeholder. The community's enthusiastic reception of the initiative reflects their aspiration for renewed discourse and decisive interventions in the area. Notably, the project shed light on pre-existing challenges and tensions, facilitated by the convergence of stakeholders who have historically eschewed collaboration: the local authority and the community.

Surprisingly, the Living Lab started out as a pilot project. Representatives from different local action groups, not directly related to the Băneasa Lake area, took part in discussions and presentations. They aimed to gain expe-

rience to conduct similar projects within their neighbourhoods. Nevertheless, their contribution was essential to LLLB students, who could also validate their ideas against a more neutral stakeholder.

For the students, working in a real-life environment and dealing with a large array of stakeholders was a strong incentive to be both responsible and creative. The most challenging problem they had to tackle was to negotiate the public and the private interest and to transpose it into an ingenious, yet plausible scenario. The Living Lab helped the students to understand the waterscape and the property laws and to adapt different design models to serve the local community needs. The LLLB came out as a great opportunity to put into practice the theoretical knowledge gained during the online course and during the IPs. Finding the right time for the activities was another problem that had to be overcome. At first, because of the COVID pandemics, the Living Lab debut had to be delayed. Then, because of the busy schedule of the partners, planning the activities required skillful coordination, collaboration and negotiation. The partners approached this situation with flexibility, early-booking the meetings and using extended project teams. Usually, throughout all the activities, at least one representative of each partner was involved, even though it was not always the same person. Thus, the LLLB benefited from the opinions of numerous experts, at the expense that, at times, it was difficult to keep everyone up to date.

Future of the Bucharest WAVE Living Lab

Explain how you will continue from here Public authorities can have access, through this project, to a series of well-founded ideas that are easy to implement and significant resources resulting from the project. Hopefully, the project's initiative will spark new initiatives concerning this area of study, with great potential, which require particular attention. There is a lot of interest and involvement form the local community, owing to a peculiar social paradox that it confronts: residing in one of the most affluent and costly areas of Bucharest, yet experiencing a substandard quality of life due to the paucity of essential public amenities and green spaces, despite their close proximity to large and beautiful natural areas such as Baneasa lake and its adjoining verdant expanse.

We hope that results of this Living Lab will be replicated in future projects in Bucharest and that future important complex projects of Bucharest (for example Dâmbovița River Development Plan, Colentina Lake System revitalization project) will include living lab methods and components.

A WAVE Story from Brussels, Belgium

The WAVE Brussels Living Lab is focussing on the area in the **South of Brussels region**, specifically on the territory of the Municipality of Anderlecht, where the **valley of the river Pede, the valley of the river Senne and the Brussels Canal** come together. It is an area with a lot of conflicts and challenges, related to food production, flood zones, ecology, use of land, water management, speculation on soil and land, urban activities with industry, but also the place of living for a large part of the population – including one of the most famous garden-cities of the last century – the Garden-City of La Roue (Architects / Landscape Architects Van der Swaelmen – Eggerickx). The different types of water (river water, canal water, aquifer water) make this part of Brussels unique. It is also a territory with a lot of different actors and stakeholders - e.g. water protection (Bruxelles-Environnement), water development (Port de Bruxelles / Brussels Harbour, owner of the Canal), municipality

of Anderlecht, Brussels Regional development Agency, Brussels Mobility, but also other NGOs (stakeholders description below), such as a recent citizens initiative called "Sauvegardons Neerpede". The South of Brussels Region is characterised by an almost flat plain, and includes a fragmented territory with different functions such as industry, mixed and commercial uses, mobility infrastructure, powerplant, agriculture, recreation area, and water. To be able to understand the relation between water and the periphery of Brussels, it is needed to start from a broader context analysing how Brussels was inserted into the Senne System, together with its historical and economical importance regarding the canal "Brussels-Charleroi", as transportation means between industrial areas. There is a clear understanding that the water elements are facing a situation of abandonment and negligence. The Neerpedebeek and the Volgelzangbeek are the principal tributaries of the Senne River,

Territory of South of Brussels (Municipality of Anderlecht), with: Canal, Motorways, the rivers Senne, Neerpedebeek, and more. (Google Earth 2020)

WAVE ~ Reflection in Action: the WAVE learning model ~

crossing the area of study. The Senne itself is
a tributary of the Escaut River, which dis-
embogues to the North Sea. Agricultural use
and some riparian areas surround these two
tributaries. Most of the streams and tributaries
are carrying polluted water since some houses
in the neighbouring communities of Brus-
sels are still not correctly connected to water
treatment plants and the sewage goes directly
into the subsoil and the phreatic levels. This
lack of quality in water and the absence of an
integrated development that features water
into the urban growth as a key source of life
and aesthetics has caused people to ignore the
streams, rivers and the canal. Most of the wa-
ter in Brussels was directed underground be-
cause of the housing pressure on the land use,
making the water elements almost invisible.

This territory is therefore full of challenges
and opportunities, which can lead to strong
transformative figures of water landscapes.

Towards a WAVE Living Lab in Brussels

The current situation of lack of water and
flood management, polluted water bodies
and unsustainable ecological situation along
the rivers calls for an urgent change in the
understanding of the situation in Anderlecht.
A Living Lab is the perfect tool to make the
decision-makers and inhabitants aware about
the situation (awareness-rising), engage with
different stakeholders and students, bring
fresh ideas and dialog between the different
actors and communities, and increase the
visibility of the challenges.

As the Faculty of Architecture with its Lab
LOUISE (research lab) is involved

currently in research projects and implem-
entation measures on several rivers in the
Brussels region - PhDs were also developed
connected to water - such as the BRUSSEAU
research project focussing on "BRUSS-EAU"
(Brussels-water) challenges and funded by
the EU, it appeared essential to connect and
capitalise the research outputs with the stu-
dents work and focus on water management,
flood anticipation, nature-based solutions and
participation methods. Additionally, students'
ideas are always welcome to start a debate with
the different actors, as their ideas are always
fresh and neutral, encouraging a new dimen-
sion of debate. A specific contribution was
made to the citizens initiative "Sauvegardons
Neerpede" opposing the creation of a swim-
ming lake in the Neerpede landscape.

The Living Lab at the University is contribut-
ing and will in future contribute to the essen-
tial dialogue with the actors in an integrative
way; one of the main objectives is that people
living in impacted areas are informed about
the risks of water flooding and water mis0
management, and how problems can be solved
in a sustainable way.

**Building the WAVE Living Lab Community
in Brussels**

The start of the Living Lab was connected to
the start of the activities of students at univer-
sity and the choice of their study topic - the
selected areas were chosen together with the
Anderlecht municipality and the Brussels
Environmental Regional Agency (Bruxelles
Environnement).

Together with the members of the LOUISE
Lab at the Faculty of Architecture and the
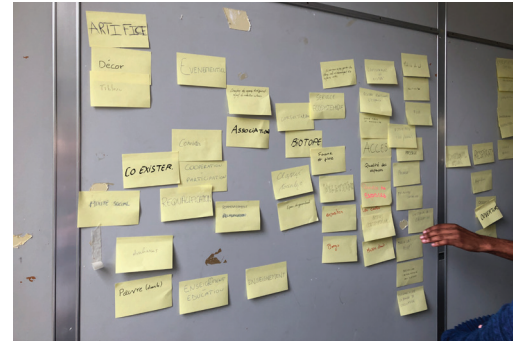
municipality of Anderlecht, we discussed how and which stakeholders could be involved in the process. Several kinds of stakeholders are now involved in the process: a people's initiative discussing the water challenges, the water association, the How to Swim association dealing with creation of open air swimming pools, the research lab, the students community, the teachers, the municipality and more.

In that sense we have a collection of all levels of decision-making in the stakeholders community.

As for the engagement, we used several communication means, formal and informal. Newsletters of the Faculty, facebook community, personal invitations of selected representative stakeholders and invited speakers in conferences delivered a multifaceted description of the current challenges and developments. Expectations were very high, and the results of the interaction of the

students with the locals are quite controversial and interesting. The outputs of the students' ideas were very well received by the authorities and the local stakeholders were happy to talk and exchange on the different concepts. The municipality was especially happy about the different approach of students' work and the scenarios developed. Through different means of communication, the Faculty is now well known about the outputs and the community is referring to the students' work in the current debate, especially around the development of the swimming pond.

Outcomes, outputs and impacts of the Brussels Living Lab

The outcomes of the Brussels Living Lab are several. With the Brussels Living Lab, we focussed on students' work and different areas within the territory of Anderlecht (Brussels South). During the first year, we elaborated

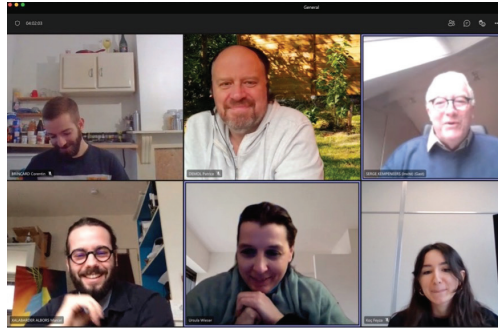*Conference by Henri Bava, President FFP*

Facebook page "Sauvegardons Neerpede" - Guided tour by Mr Jef De Gryse, honorary member of the Municipality of Anderlecht, landscape architect

concepts related to the water management of the rivers and the green infrastructure (River Senne, Canal Brussels Charleroi), and during the second year (2022-2023), we elaborated reflections to the discussion on the redesign of the Neerpede Park, where currently a big discussion (and conflict) between the Regional Authority, the local administration (Anderlecht) and the citizens (local initiatives) is taking place. The students elaborated a catalogue of solutions and reflections which contributed to the debate. The discussion was supported by regular conferences done by high level speakers (Henri Bava, Stefan Werner Copenhagen), but also Catalina Dobre (Brusseau Project), and others. Experts from the Anderlecht municipality and Brussels Environment were closely involved in the process. Students' projects were published in the Yearbook of the Faculty of Architecture 2022 https://archiexpo.ulb.be/wordpress/category/_edition-actuelle/yearbooks/

The broad involvement of local partners (Louise Lab ULB Faculty Architecture / Brusseau project ULB and Brusseau Bis project, Pede initiative Anderlecht, Municipality of Anderlecht, Artists Group Canal Ander-

lecht, Brussels by Water organisation, How to Swim Association (Paul Steinbrück), Brussels Environment, Inter-Environnement Brussels, IFLA Europe, and CIVA (Centre international pour la Ville, l'Architecture et le Paysage), demonstrates the interest and the burning issue of water management in the Brussels region. Indeed, the water quality and ecological situation in this territory is not satisfactory at all, still too much pollution and not solved cleaning infrastructure, bad ecology situation, and more. Several meetings with the actors were organised, including lectures; students engaged in studio work, aiming to develop for this area different landscape scenarios – based on a DPSIR analysis. The results were presented to the stakeholders of the municipality of Anderlecht, Brussels Environment and the CIVA. Unfortunately, during the first year of the Living Lab, we had to organise our meetings online, due to the pandemic situation. During the second year of the project, onsite activities could be organised and diverse activities took place.

The developed student's ideas were based on a deep DPSIR analysis of the territory, followed by the development of scenarios with a time horizon of 2100. It means that the students need to understand and apprehend the current challenges of the territory, analyse the future development, think about thematic aspects related to water, economy, ecology, and stakeholder roles. While the students identified the

drivers of change, they developed for each topic at least three different scenarios; one scenario was developed in a more detailed way. The creativity of the students was not restricted, they were able to imagine realistic or futuristic ideas.

This open approach was well received, even by the local authorities. The idea of creating a swimming pond in the big Neerpede area was born some years ago by a private initiative, where the Faculty of Architecture was also involved; last year this idea was supported by the politicians, and a landscape planning office was mandated to elaborate a new landscape design. Students were involved in the discussion, which is today dominating the debate. Several student's groups were developing scenarios where concrete solutions were proposed. Lately, a citizens initiative ("Sauvegardons Neerpede") has been created and is now opposing the proposed new swimming pond, supporting a more natural and integrated redesign of the territory. Students were directly involved in the intense discussion.

Communicating the Living Lab

The communication outside the living lab was done in coordination with the municipality of Anderlecht: invitations to events were sent by the municipality to selected stakeholders and inhabitants initiatives. As the topics of the river Senne and the Neerpede park were becoming very visible in the press and public discussions in the last years, it was easy to inform and mobilise the inhabitants. Information about project development was shared in the news, in the press (photos), and the Brussels Regional authority organised in parallel several events.

We used digital media, such as the newsletter of the Faculty, websites of the projects, infor-

mation channels of the municipality and the regional authority (Bruxelles Environnement). The Brussels living Lab has also a specific website where the student's work is displayed.

WAVE Living Labs in practice: A critical reflection

The first year of the living lab activities was difficult due to the pandemic situation - we could have activities online only. Activities with the students were restricted, workshops in presence with externals not possible due to the university restrictions. Nevertheless, we started our activities with brainstorming sessions, identifying the adequate topics, organised site visits (possible during the pandemic time), and completed the process with online sessions. The situation changed consistently by the end of 2021. The DPSIR and scenarios methods were successfully used for the territory and the outputs were impressive: students were able to identify drivers and develop scenarios towards 2100 - especially municipal actors were impressed by the student's creativity. The diversity of presented solutions and opportunities was convincing the experts, which could lead to discussions at the upper level.

A Living Lab can live and function only by delivering constant output and keeping a discussion ongoing: in times of pandemic, the social dimension is totally absent. By bringing scenarios and ideas on the table within the local community -as we did- and discussing "live" the solutions, an amazing spirit between the participants around the table became a clear driver of change. This was experienced as the swimming pond idea was discussed in the local community, which led the local municipality of Anderlecht to take a political decision against the swimming pond and accept only a redesigned Neerpede Park area. This is
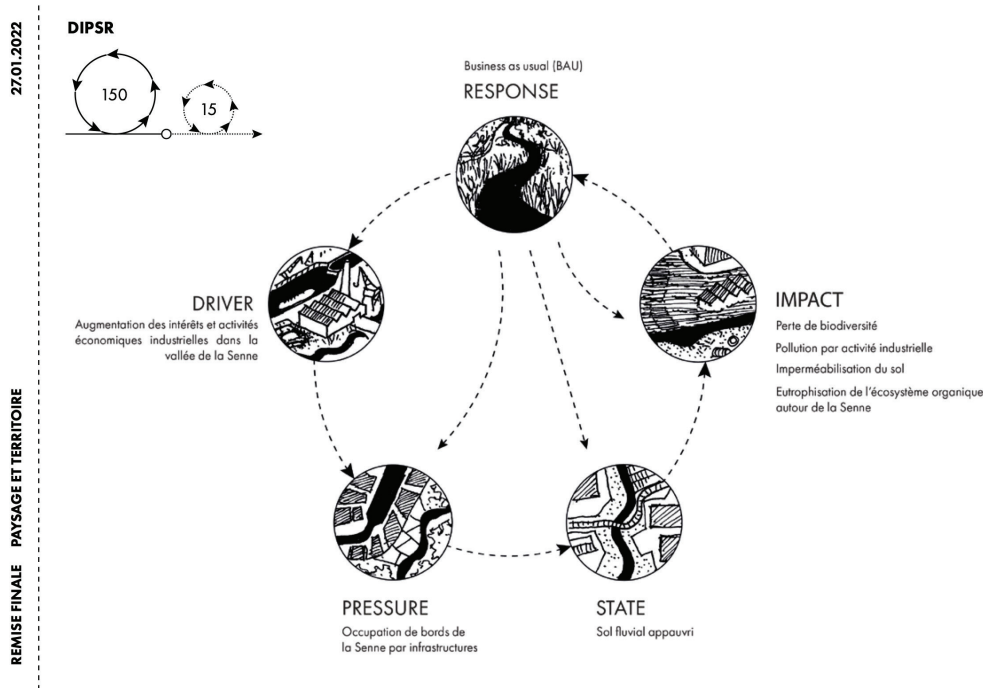
DIPSR

RESPONSE
Business as usual (BAU)

DRIVER
Augmentation des intérêts et activités économiques industrielles dans la vallée de la Senne

IMPACT
Perte de biodiversité
Pollution par activité industrielle
Imperméabilisation du sol
Eutrophisation de l'écosystème organique autour de la Senne

PRESSURE
Occupation de bords de la Senne par infrastructures

STATE
Sol fluvial appauvri

Figure top: DPSIR Analysis of the Senne Valley Brussels - scenario building on short (15 years) and long term (150 years). Students Work 2022

Figure bottom: Scenario Horizon 2050 on the transformation of the Senne Valley, Brussels South Anderlecht, existing office and production park to a "Parc Fluvial" with large retention landscape areas. Students Work 2022 (Aya Fares, Feyza Koç, Marcel Xalabarder Albors, Georgios Garcia Koutsoukos)

an impressive milestone in an open Living Lab process, and demonstrates how bottom-up initiatives can influence politics and future management of territories. This process just started, and we are expecting more interaction and discussions in the next months. A Living Lab can also become an interesting tool in helping the decision-making, or searching for a good decision.

Future of the Brussel WAVE Living Lab

It has been demonstrated in the past months of activities that an active discussion between students, academics, locals and decision-makers can be very fruitful and benefit the general situation. Also the input of students in developing scenarios and innovative ideas can help the community to formulate good arguments to the benefits of all.
The plan of the Faculty is to continue the activities of the Living Lab and include more ideas and projects to the platform. We will structure and open the platform to the next generations of students. This can be done within the Faculty of Architecture, together with our Research Labs, and include the future generations of students.

Links and References

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A WAVE Story from Dachau and Freising, Germany

Living Lab with the youth in the Ignaz-Taschner-Gymnasium: school and international university students start co-creation

The Weihenstephan Landscape Lab – Weihenstephaner Landschaftslabor is the 'Living Lab' of the Department of Landscape Architecture at the Weihenstephan Triesdorf University of Applied Sciences (HSWT). This Lab is being developed by university representatives together with the interested public as part of the WAVE project.

The wider study area roughly corresponds to the landscape context of the university between the Isar river in the east and the Amper river in the west. It is characterised by a very complex system of many diverse natural and man-made water bodies: (smaller rivers like the Moosach or the Würm, streams, canals, quarry ponds, etc.) and the peatland belt between Dachau and Freising.

The core of this water landscape is formed by the transect of the historic Dachau-Schleißheimer Kanal along today's Schleißheimer Straße. This canal was constructed at the end of the 17th century in an east-west direction at right angles to the rivers (Amper, Würm) and numerous streams that run from south to north according to the natural gradient. It is part of the complex Baroque canal system between the rivers Isar and Amper in the north of Munich. The canals are regarded as a technical as well as landscape work of art of European rank and their total length of 50 kilometres is under monument protection.

The transect connects the cultural landscape of the Dachauer Moos (Moos = peatland) around the Obergrashof with the old town and city centre of Dachau, situated on the characteristic Schlossberg. The scenographic vista of Dachau Castle characterised the baroque landscape. Today, this view can practically only be experienced from the car on Schleißheimer Straße.

The Dachauer Moos is part of the large moor belt that extends to the north of the Munich gravel plain. Around 1900, the aesthetics of this moor landscape were a core topic of the Dachau art scene and open-air painting school. There are numerous paintings by famous artists from this period –such as Franz Marc. They document for us today the state of the landscape at that time. Due to human uses such as peat extraction, drainage and agricultural use, this landscape is now almost completely degraded. Due to the outstanding importance of peatlands for climate protection as CO_2 storage, there are more and more plans to re-naturalise and re-wet moor areas. In order to take appropriate account of this importance in research and development in the future, the Peatland Science Center (PSC) was founded at HSWT in 2022 and inaugurated in

spring 2023.

A further water element of this rural part in the project area is the 'Obergrashofseen' (Obergrashof lakes, Fig. 03) in the south of the organic farm 'Obergrashof'. This type of former gravel excavation ponds is very characteristic for the region in the north of Munich. A typical after-use of the gravel industry is the renaturation of groundwater ponds and local recreation. However, bathing and swimming in the Obergrashof lakes is still not allowed because they have not been officially cleared for this purpose. Accordingly, their importance for nature protection is high. Nevertheless, there are plans for a new commercial area in the immediate neighbourhood of the lakes, which were presented and critically discussed in the Living Lab.

Towards a WAVE Living Lab in Weihenstephan

The Weihenstephan Landscape Lab attempts to test the concept of 'living labs' for landscape architecture and to gain experience in the process. It is open to all conceivable research and study projects together with the public. In the Weihenstephan Living Lab, various projects can be developed at different locations or across locations.

Weihenstephan.Triesdorf is the university that specialises in green engineering. The starting points for all fields of study are the sustainable use and protection of our natural resources. As a partner of practice, Weihenstephan. Triesdorf University of Applied Sciences stands for applied research. Through practice-relevant results, we make our contribu-

tion to solving local and global challenges. We and our students create networks with people, companies and institutions throughout Germany, Europe and the world (source: Website of the university www.hswt.de). Against the background of this statement, the Weihenstephan Landscape Lab is the interface between education, research and dialogue with society.

Building the WAVE Living Lab Community in Dachau

In terms of space and content, reference is made to the LE:NOTRE Landscape Forum 2017 'Inclusive Landscapes'. This event organised by the HSWT together with the Technical University of Munich can be seen as the starting point of the WAVE living lab story as well as the beginning of co-creative international collaborations dealing with the landscape in the North of Munich. The living lab appeared to be a suitable instrument to implement some of the ten key messages from the outcome statement of the forum with different partners. The story of the Weihenstephan Living Lab - Weihenstephaner Landschaftslabor started in autumn 2021. First Living Lab experiences were gained in 4 different study projects:

• Winter term 2021/22 study project 'Schleißheimer Straße Dachau' in the 3rd year of the Bachelor programme, implementation of the idea of the 'Weihenstephaner Landschaftslabor'

• WAVE Intensive study programme 'Dachau Waterscapes' in May 202

• Summer term 2022 study project 'Moosach

Left:
Experiencing the blue water of the Obergrashof gravel ponds, which is currently not legal

Right:
Guided transect walks along the historic Dachau-Schleißheimer canal, partly without water

river Freising' in the 1st semester of the international master programme IMLA

• Summer school 'Dachau Waterscapes' in September 2022

In a first project, 7th semester Bachelor students worked on a transect along the historic Dachau-Schleißheim Canal. Project partners were the city of Dachau and the Dachauer Moos e.V. association. This association was founded in 1995 to protect the landscape of the Dachauer Moos (peatland); its members are 11 municipalities, cities and counties. Representing so many stakeholders, it is ideally suited as a Living Lab partner. Furthermore, the association has a wide range of experience with implementation projects with citizens, including children, in the field of nature conservation. The students' tasks included analysis, concept and test designs for the project area as well as the development of a one-week co-creation phase in May 2022. During the follow-up project, the WAVE

Intensive Study Programme (ISP), 15 international students, 3 student tutors and 10 professors and lecturers worked on the study area along the Dachau-Schleißheim Canal onsite in Dachau and in Freising at the HSWT. One focus of this WAVE ISP was a co-creative workshop with 15 students from the Ignaz-Taschner-Gymnasium in Dachau, located in the project area, who had been identified as one of the most important stakeholder groups.

Also involved were:

• The mayor and representatives of the urban and green planning of the city of Dachau and the neighbouring municipality of Karlsfeld

• The Dachauer Moos association, its managing director and members involved in environmental education.

• Teachers from the high school involvedDachau citizens
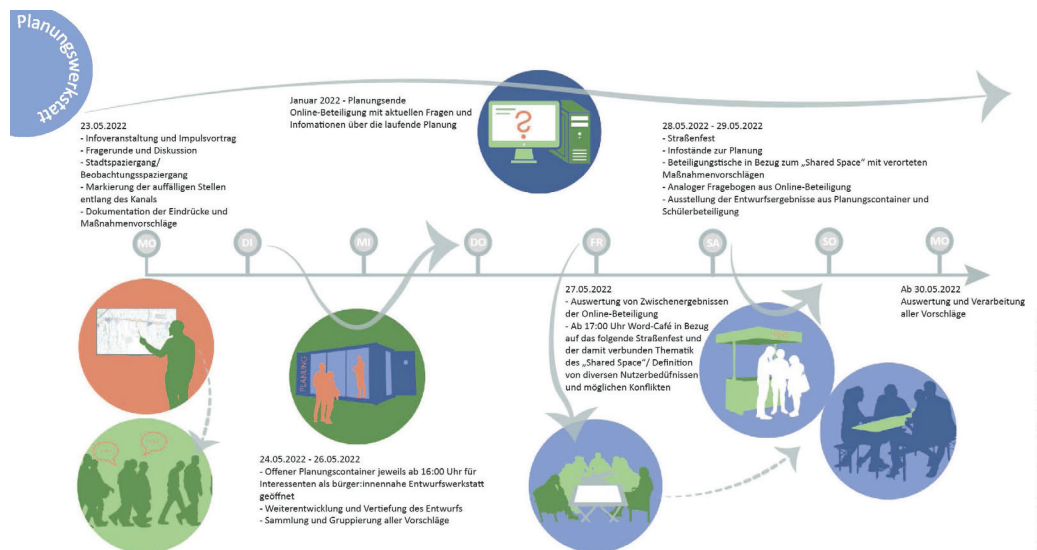
The concept for one week Living Lab workshop in May (students' work; authors: Simona Schramm, Jessica Simon, Nicola Sturm, Sarah Weber)

Living Lab activities of international students at the construction site to uncover the Moosach river in Freising's city centre (Photo source: Frieder Luz)

• Students, staff and professors of the HSWT as well as international students and lecturers

During the whole summer term 2022 the international students of the International Master's Programme in Landscape Architecture (IMLA) studied and tested the living lab approach in their Main Project I. The main issue of this project was the Moosach River and the waterscapes of Freising.

Finally, the living lab experiences were implemented in a summer-school with landscape architecture students of the University of Sheffield in September 2022.

Outcomes of the Dachau Living Lab

• The multi-phase development of the Living Lab through various study projects and the ongoing communication with the municipalities of Dachau and Freising, the association "Dachauer Moos" and other stakeholders has also led to greater awareness and knowledge about the landscape and its transformation among all those involved.

• On the part of the teachers, new competences have developed in dealing with co-creative methods such as transect walks, mapping, urban gaming etc.

• The presence of international students in the cities and the communication with them raised the awareness and interest of the local people for their water landscapes and their history. Even more, they were able to address problems and tell stories. On site, in the middle of things, language barriers could be overcome more easily.

• On the basis of this co-creative learning process in the field, the students developed sketches and visions, which were presented to the stakeholders.

Communicating the Living Lab

A key role in the communication of the living lab is the Story Maps collection at https://arcg.is/mvXb4. The Dachau Water Landscapes Story Map informs potential participants about the project area, the context of the peatlands around Dachau, its historic canal system, how the landscape has changed over time, and the historic artists depicting this landscape. Particularly strong interactive elements of the
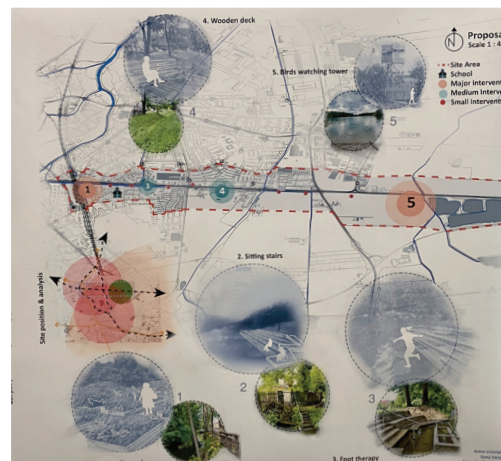
Work in progress: First sketches showing the spatial problems and the final proposal for interventions during the Intensive Study Programme in May 2022
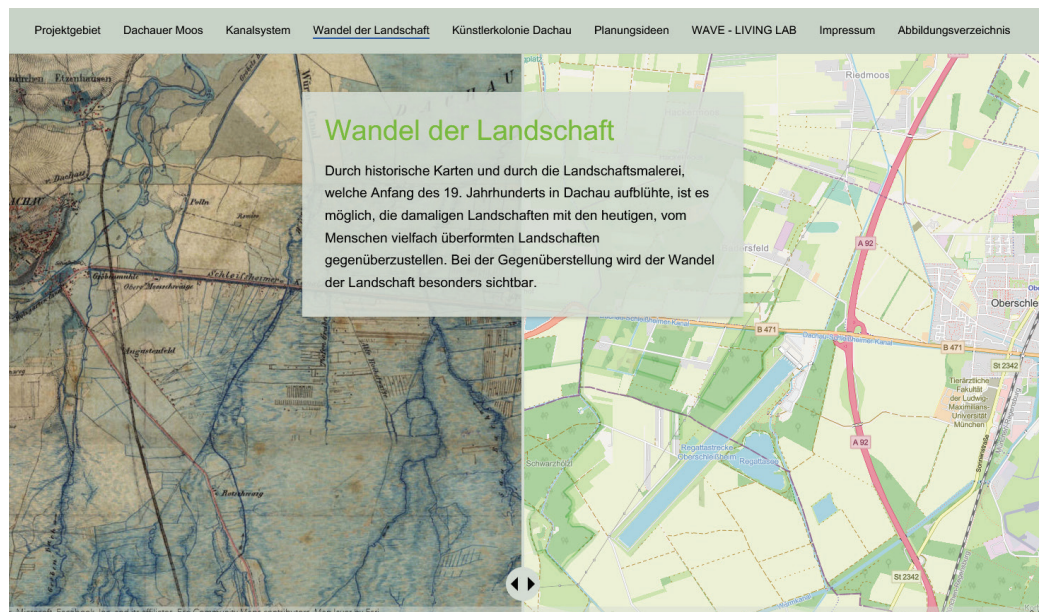
website are a birds-eye-view video of the site taken with a drone and an interactive map allowing to merge the historic into today's map in the style of Repton´s before- and after images (see figure 9). After the first workshops, results and design proposals are documented and presented through the Story Map.

WAVE Living Labs in practice: A critical reflection

The experiences with the Living Lab approach in different study projects can be summarised as follows: There are big differences between the theory in publications and articles and the practice on the street with the people on site. This makes it all the more important to actually go out and try co-creation with people.

Our Living Lab activities have shown that there is usually a great openness towards students on the part of stakeholders and citizens, despite certain language barriers in the case of international students. Moreover, the school students involved have proven to be engaged and enthusiastic actors who have enjoyed exploring their city's water landscapes and learning together.

Nevertheless, there is still much to learn and investigate. It seems particularly important for the future to bring as diverse a range of actors as possible, including those from hard-to-reach groups in society, into the living labs at the same time as decision-makers. Without a good collaboration of all people we will proba-

bly not manage the multiple challenges of the future.

Future of the Weihenstephan WAVE Living Lab

Resources, personal networks and the
• Weihenstephan WAVE Living Lab website as

digital platforms are all tools to facilitate further workshops on the Dachau water landscapes to sustainably continue the living lab. A second workshop, funded by the Bavarian government, was held from September 17th -25th 2022 together with the landscape department of the University of Sheffield. 19 students and the landscape historian Prof. Dr. Jan Woudstra came to Dachau and Freising to continue working on the work of the WAVE living lab.

 The results were presented at the Umwelthaus to representatives of the Dachauer Moos NGO and the City of Dachau: https://www.sheffield.ac.uk/landscape/news/third-years-delve-water-bavarian-summer-school
Similar workshops are planned for the future with another Bavarian-British workshop scheduled for September 2023.

The experiences made in the WAVE Living Lab and the tested co-creative methods will also be integrated into a research project in the coming years. Under the title 'Strengthen-

ing the power of municipalities to act - transfer through co-creation' (German title translated), the WAVE project team will investigate the potential of real laboratories in eastern German cities together with social and cultural scientists at the University of Leipzig. The declared aims of this project are to achieve a high level of diversity among those involved in the Living Lab, to include migrants into the cocreative activities and to bridge potential language and cultural barriers. The project will be funded by the German Federal Ministry for Research and Education.

Links and References

https://arcg.is/mvXb4

Association Dachauer Moos: https://www.verein-dachauer-moos.de/

Peatland Science Center (PSC): https://www.hswt.de/forschung/forschungseinrichtungen/institut-fuer-oekologie-und-landschaft/peatland-science-center

A WAVE Story from Nürtingen, Germany

Nürtingen is a medium-sized town on the river Neckar and one of the 179 municipalities that constitute Stuttgart Greater Region. This region is one of the economically most productive areas of Germany and also ranks high at the European scale. 2,7 million people live here of which around 42.000 belong to the municipality of Nürtingen. The regional plan of Stuttgart Greater Region has a strong policy towards reducing further land consumption which is why at present, 75% of the territory is protected open space. This includes agricultural land, forests, flood and groundwater protection zones, biotopes and landscape protection areas.

In order to better enhance the quality and identity of the regional open space network, the regional planning department introduced the concept of the 'Stuttgart Landscape Park'. This approach started 15 years ago. The informal planning instrument of the regional landscape park is a great way of stimulating inter-communal planning and development processes, which eventually lead to the development of master plans for the different subsections of the landscape park. The subsections are usually following larger landscape units, such as the rivers crossing the region. Consequently, the Neckar Landscape Park is at the heart of this regional green and blue infrastructure network. In theory, Nürtingen lies within the territorial scope of the Neckar Landscape Park and the master plan developed some time ago also included the waterscape of this town.

However, neither the citizens nor the local administration are fully aware of the potential of this landscape park for sustainable local development. On the other hand, the need for better water-based open scapes both for humans and biodiversity is not the only water-related issue for the municipality. Following the requirements of the European Union's Flood Directive, which include national, regional and local flood risk management, also the municipality of Nürtingen needs to reinforce its flood protection infrastructure. This process started already before the WAVE living lab process and is still ongoing. After all, the town is forced to implement technical flood protection measures on its territory as part of the district's planning schemes. There is only little flexibility here and attention needs to be taken to avoid mistakes, for example by increasing the physical distance of people to the river. This process is very much driven by water engineers and top-down planning. The WAVE living lab was not in the position to get involved in these processes which is why we took a different strategy. Our WAVE living lab aimed in particular at raising awareness for the potential of an integrated open space network along the river Neckar and its tributaries. Our focus was not so much on the river Neckar, where most top-down planning was going on in that period. Instead, we put much more attention on the tributaries Steinach and Tiefenbach, two small rivers that are running through the town towards the river Neckar.

Towards a WAVE Living Lab in Nürtingen

Nürtingen-Geislingen University aims to become a model university for sustainable development, in particular by creative synergy of its economic and environmental competences. More recently, the guiding principle of the entire institution has been reformulated under the headline Education for Responsibility. Therefore, the entire institution has

an increased interest in further developing its capacity in the field of education for sustainable development. A local community lab fits perfectly into this perspective since it provides a shared context for teachers, students and local community. All groups involved are part of a development process. Not only in the sense of developing innovative ideas. In addition, everyone develops his/her competences for sustainable development. The WAVE Living Lab is part of a small ecosystem of Living Labs which we call Hölderlin-Lab. Hölderlin Lab is an open local innovation platform. Its name giver is the famous German poet Friedrich Hölderlin, who spent his youth in Nürtingen. This connects the lab with our city in a symbolic way. And even more to the river Neckar that has often been depicted in Hölderlin's poems.

For the students and teachers of the university, Hölderlin Lab is a living learning space, a Living Lab. Here, young people learn to design living environments in a participatory and interdisciplinary way. The teachers at HfWU are responsible for bringing local actors and students together in a process that is meaningful for all. This way, Nürtingen as a community can better benefit from the methodological expertise of its local university, the research activities of the students and the many ideas that keep emerging from the process.

Building the WAVE Living Lab Community in Nürtingen

As the starting point of our living lab on the waterscapes of Nürtingen was influenced by the pandemic situation, it was challenging at the beginning to activate the local community. It also needs to be mentioned that the local authorities were in the process of managing

the reinforcement of the local flood protection infrastructure. This process is very much determined by the state and the district, leaving only limited decision-making opportunities at the local level. We quickly realised that intervening at that level would have limited support as the local authorities were already reaching their capacity limits in the light of addressing this urgent need for reinforcing the local flood protection infrastructure.

We therefore focussed on two themes which we considered complementary to the process of the local authorities:

• Raise awareness for the diverse elements of the Nürtingen waterscapes, including the tributaries of the main river Neckar that are passing through the urban landscape

• Create visions for an integrated development of the water areas

We addressed this during the summer term 2021 by a study project of our international master programme in landscape architecture. The project had a workload of 10 credits and thus gave sufficient room for working on the various dimensions of the WAVE approach. During the summer term 2022, we repeated the approach in the master programme 'City, Landscape, Transformation'. The project area was moved downstream to Plochingen where the navigability of the river Neckar starts. In the summer term 2023, we brought the master students back to continue working on the Nürtingen waterscapes and with a focus of all teams on the Tiefenbach valley. Tiefenbach as a main tributary to the river Neckar is a very interesting transect from the Swabian Alb all through the townscape of Nürtingen into

Vision for a river park combining the flood plains of Aich and Neckar in the northern periphery of Nürtingen. Design concept developed by Sara dos Santos, Rabija Hadzimehmedovic, Mahasta Mahfouzi and Israt Jahan.

the river Neckar. The Tiefenbach transect was then selected to become the focus area of the additional WAVE summer school implemented in Nürtingen in June 2023 together with the multiplier event as part of a transnational landscape forum. In total, we had 50 students working actively in the context of the WAVE living lab.

The focus on the Tiefenbach valley allowed us to build closer ties to the local community. This includes to present: the cross-sectoral neighbourhood initiatives of Braike and Kirchheimer Vorstadt, two schools along the Tiefenbach valley (Max-Planck-Gymnasium and Peter-Härtling-Gymnasium), the horticultural club, the youth club, the cultural centre 'Seegrassspinnerei', the university community, the local art academy and some experts of the local planning administration. As the neighbourhood initiatives have emerged on their own it was important to constantly link to them and participate in their meetings, to support the awareness of water-related issues in the discourses and activities. Most of the other groups were approached within the framework of the upcoming landscape forums, its focus on the Tiefenbach valley and the invitation to participate in this process and the stimulating outcome of a 'local travel guide to the Tiefenbach valley'.

During the pandemic, our outreach to the

community included small playful interventions along the Neckar tributaries, to which passers by could react and give feedback. The most important event was a one day public workshop at a central location on the river Neckar, during which the students gained a lot of valuable feedback. This was complemented by a public exhibition in fall 2021, where the community could see and discuss the visions and ideas. In 2023, a lot of interventions with the local community are already underway and they will be implemented at the end of June.

Outcomes, Outputs and Impact of the Nürtingen Living Lab

We implemented two cycles of student projects with visions for the Nürtingen Waterscape 2050 plus another project on the waterscapes of Plochingen, located further downstream. All projects generated a lot of knowledge and awareness for the situation and the potential of the local waterscape. We would in particular like to highlight here the vision of a regional park between Nürtingen and Zizishausen to then north of the town which would give a new strategy to the floodplain Aich and Neckar and give shape to the regional landscape park, that is on its way for more than a decade now:

All ideas for the Nürtingen waterscapes are

currently coming together as a public story map that will be further extended with the outcomes of the 2023 project cycle:

Water landscapes in Nürtingen (arcgis.com)

We further used the opportunity of the upcoming landscape forum to initiate an international student competition on the river Neckar focusing on a transect between Nürtingen and Altbach. This is exactly the area where the natural structure of the river Neckar transforms into an industrial infrastructure. Plochingen is the starting point for the navigability of the river. From here, the Neckar valley is highly industrialised and sealed. This competition was launched in cooperation with Verband Region Stuttgart, the regional planning authority, and the International Building Exhibition IBA'27 Stadtregion Stuttgart. The competition had a great response with over 50 student projects submitted. The exhibition of the competition results and the price-winning teams will be launched at the WAVE multiplier event during the landscape forum in Nürtingen.

We are still in the process of our community outreach. The next step is to document the upcoming landscape forum process in the form of an innovative 'Travel Guide to the Tiefenbach Valley'.
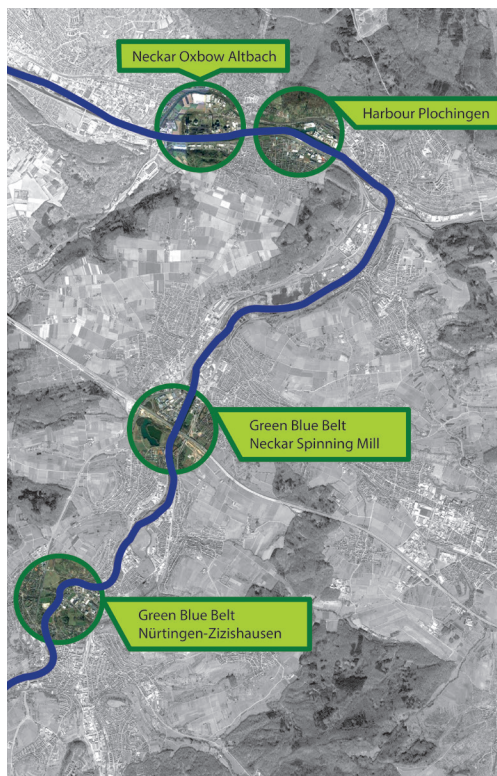
From October 2022-January 2023 an international student competition was launched focussing on the integrated landscape development of a Neckar transect between Nürtingen and Altbach. Around 50 teams submitted ideas. All results are exhibited during the WAVE multiplier event in June 2023 and also online. The site suggestion for Nürtingen, the green blue belt Nürtingen-Zizishausen, was derived from the first student project presented in the previous section.

Communicating the Living Lab

Our living lab communication strategy involved the following elements: living lab workshops in public spaces, open space exhibitions of ideas and interventions, indoor exhibitions in a community-owned exhibition spaces in the city centre, launching an international student competition, development of an 'alternative travel guide to the Tiefenbach Valley' as well as artistic interventions.

Students present their visions for Nürtingens' waterscapes during a public exhibition in the town centre in October 2021.

Vision for a river park combining the flood plains of Aich and Neckar in the northern periphery of Nürtingen. Design concept developed by Sara dos Santos, Rabija Hadzimehmedovic, Mahasta Mahfouzi and Israt Jahan.

WAVE Living Labs in practice: A critical reflection

In the first place, we have learned a lot about the current situation, the problems and the potentials of Nürtingens' waterscapes. So far, we have focussed on the river Neckar and its tributaries Aich, Tiefenbach and Steinach. It became clear that there is no integrated approach or strategy in place that would enhance the role of the blue infrastructure of Nürtingen. During the project lifetime, we had to observe that a new residential area was developed on a former hospital territory directly on the river shore and in the floodplain. On the other hand, good developments happened as well, for example the closing down of a central road on the river. This area is now closed permanently and undergoes a transformation process. It was an ideal space for running our living lab workshops, as seen on the picture here. But despite these small changes, there is still a lot to be done. In particular, we need to focus not only on the visible water bodies, but on water as a whole. It appears also in the form of rain, stormwater and greywa-

ter. Given the perspective of climate change, which leads increasingly to drought situations in Germany, there is need for further community-based research on how the current urban landscape can transform and adapt.

Future of the Nürtingen WAVE Living Lab

We will definitely keep going. The most important aspect is to build on the knowledge we have gained so far and to make sure that not every student group starts from scratch every year. In that sense, internal communication and constant transfer of knowledge, results and ideas to the public are crucial. At this very moment, Nürtingen is facing the challenge of losing its last opportunity for creating a central river park because the town council is giving priority to housing. The author of this case study has therefore raised a petition for a central river park. It has reached almost 1000 supporters by the time of this writing. This is possibly the most effective outreach measure for the local waterscapes we could have done.

Links

[Water landscapes in Nürtingen (arcgis.com)](arcgis.com)

[Nürtingen Living Lab on the WAVE seminar Wiki](#)

[International Student Competition](#) Neckar Landscape Park: Re-imagining the Productive City Region

[Petition for a River Park](#)

Für einen Stadtpark am Fluss auf dem Wörth-Areal in Nürtingen

Petition for a community park on the river shore in Nürtingen. Status: 07.05.2023. This is the last plot on which this would be possible. The petition urges the decision-makers to support this vision and to avoid even any partial privatisation through housing developments.

| Startdatum | 1. Mai 2023 |
| Petition an | Raimund Braun (Stadtrat Nürtingen) und **an 28 mehr** |

Warum ist diese Petition wichtig?

1.657 Unterschriften   **2.500** Nächstes Ziel

vor 6 Stunden hat **Hannes Schulz** unterschrieben

vor 8 Stunden hat **Gerhard Schulz** unterschrieben

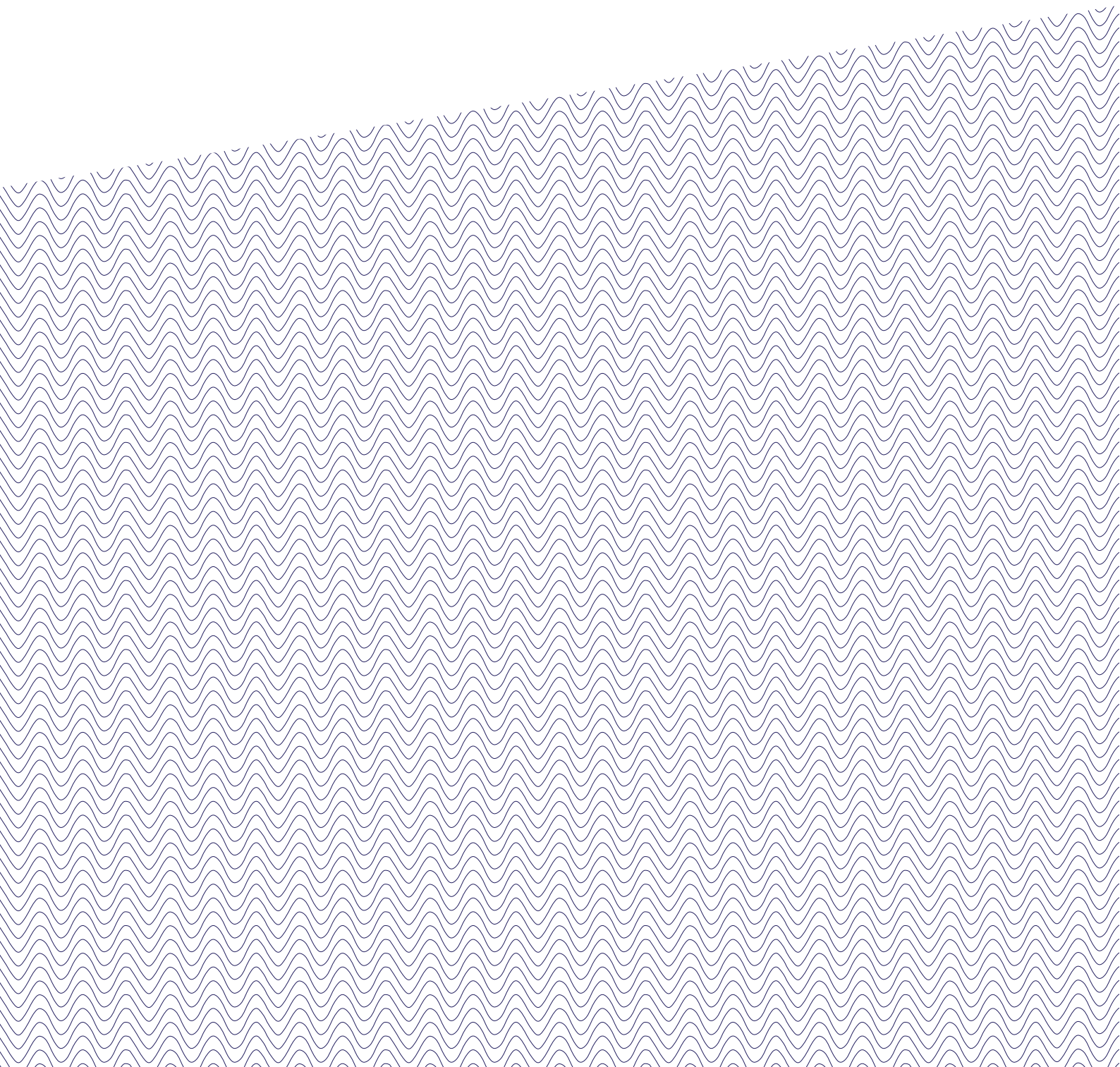Für einen Stadtpark auf dem Wörth-Areal am Neckar in Nürtingen

Auf Facebook teilen

E-Mail an Freunde senden

WhatsApp-Nachricht senden

An Follower twittern

LEARNING IN AND WITH WAVE LIVING LABS

Assessment and a reflection oncompetences and teaching skills

Learning in and with WAVE Living Labs:
Assessment and a reflection on competences and teaching skills

The WAVE course has defined learning aims and learning outcomes for the course and the project. Since the project embraces the concepts of participatory action research and learning, knowledge development is both for students, teachers, researchers and community members.

Learning outcomes for students

In the light of the sensitive nature of water areas and their relevance to society, economy and the environment it is vital that planners and designers learn how to manage these territories in a sustainable way. WAVE Course participants will develop a profound understanding of the specific character of water areas. They will learn which driving forces are influencing the water landscape system and which impact types are most relevant for planning and design responses. This includes the global and European dimension since water areas are receiving increased attention worldwide.

Learning in the WAVE programme is both theoretical and practical. The WAVE online course presents the theoretical and methodical foundations for sustainable planning and design of water areas. In parallel, participants engage in the WAVE Living Labs and learn how to involve the local community into this learning process.

The WAVE programme bridges analysis, strategy building and design by innovative ICT approaches, also known as Geodesign.

Different approaches to strategy building, planning and design in the context of water landscapes will be introduced in the last phase of the course. On this basis, the course participants will be able to draft a strategy and a master plan for a water area taking economic, ecological and social aspects and current policies into account.

In addition to the subject specific knowledge and methods the WAVE course further aims to foster transversal skills at various levels. This includes above all the following: virtual team work and creative application of ICT tools for international cooperation, team building and democratic leadership, analytical thinking, intercultural communication and creativity.

The WAVE course wants to equip a future generation of planners and designers with relevant

Group-Number + Place				Students							
Name assessors		1.				4.					
Assessment date		2.				5.					
(E-)Signature assessors		3.				6.					
Grades (text)	Very good	Very good-	Good+	Good	Good-	Satisfactory+	Satisfactory	Satisfactory-	Sufficient+	Sufficient	Insufficient
Grade	1,0	1,3	1,7	2,0	2,3	2,7	3,0	3,3	3,7	4,0	5,0

Assessment criteria	Grade (number)	Weight	Comments
Dimension of the water landscape (comprehensiveness, water system analysis, quality of visualisation, clarity)		25%	
Evaluation and assessment (specification of relevant assessment goals, comprehensiveness, logical synthesis of risks and potentials, DPSIR model)		30%	
Forecast: application of the scenario approach, show a spectrum of four development directions in creative form: level of diversity and agility in developing the scenarios as potential landscape system forcasts (NOT		25%	
Presentation and discussion (quality of the slides > expressiveness, design, readability, red thread, team work, quality of argumentation and answers, …)		20%	

knowledge, methods and skills in order to transform our societies for sustainability.

Assessment strategy

The criteria whereby each individual assessment is to be judged are clear to assessors and students alike. These criteria are appropriate to the learning outcomes to be assessed and to the range of attainments expected for the level of work.

Where outside professional assessors are involved (for example, with regard to project simulations and presentations of the results of the projects), the assessment procedures are discussed with these assessors, to ensure that they fulfil the criteria and satisfy general academic standards. The final responsibility however for the assessment lies with the examiners of the universities.

The assessment methods and criteria enable each student to fully recognise the levels of knowledge and skills they must attain in order to meet the requirements of the programme. The description of the course should contain the assessment forms (including the assessment criteria and if applicable their relative weight).

Assessing the progress of students and students' work is both formative and summative. The progress of learners is also monitored during tutoring. While the form of assessment may vary, it is linked to the WAVE learning aims and objectives.

The WAVE assessment strategy for the seminar and the workshops is characterised by the following principles and guidelines:

The assessments of the project work in the context of living labs also involve input and feedback from the professional practice, representatives of interest groups or commissioners. Not only are these particularly valuable, they are also fully compatible with the assurance of academic standards.

Each learner should beforehand be informed of the criteria that are used during the assessment. For this a rubric assessment scheme provides a transparent and easy to understand set of criteria.

Students are invited to assess themselves and colleague teams to provide a basis for self reflection and peer review. It is preferred that at least two assessors fill out an assessment form, to provide a balanced judgement. The tutor can have a role in providing insight in

WAVE-Spring Term 2021- Assignment 2: Final Presentation											
Group-Number + Place			Students								
Name assessors			1.				4.				
Assessment date			2.				5.				
(E-)Signature assessors			3.				6.				
Grades (text)	Very good	Very good-	Good+	Good	Good-	Satisfactory+	Satisfactory	Satisfactory-	Sufficient+	Sufficient	Insufficient
Grade	1,0	1,3	1,7	2,0	2,3	2,7	3,0	3,3	3,7	4,0	5,0
Assessment criteria	Grade (number)	Weight	Comments								
Strategy development: The team was able to identify and prioritize strategic goals, to translate the strategy to the local landscape context and to derive consistent measures		30%									
Transect and intervention points: selection of the transect and intervention points are consistent with the strategy, team was able to visualise the local transformation		40%									
Process and collaboration: The team has developed a process model of how the strategy could be implemented. They reflected on how to involve stakeholders and citizens and envisioned new forms of collaboration		10%									
Presentation and discussion: quality of the slides > expressiveness, design, readability, red thread, team work, quality of argumentation and answers, ...		20%									
	grade	0,0	100%								

WAVE: Form with assessment rubric for the IP in Dachau / Freising, May 2022

Name of the student / student group to be assessed:...Aaaa Bbbb.....................   Name of the assessor (can be yourself): ......Xxxx Yyyy..............

Goal of Living Lab / IP	Just mark the level of performance by a cross or colour and make a final assessment at the bottom					
	Insufficient	Sufficient	Satisfactory	Good	Excellent	Notes
1. Get in touch with waterscapes and people (first part on-site)						
Generate knowledge about the study area and waterscapes in Dachau, their system context, challenges and opportunities.	It is not yet clearly presented what the main challenges and opportunities are.	One or some main challenges and opportunities are presented, but these are defined in a general way.	There is a clear definition of the main challenges and opportunities, and it is understandable where these originate from.	Analysis is concluded with a well-argued, integrated, definition of the main challenges and opportunities	The conclusion on the main challenges and opportunities is well argued, showing new perspectives on transforming the waterscapes.	
Learn, develop, apply and test methods of living labs and design-oriented participation	Does not attempt or is unable to make use of correct and consistent methods	Uses some methods with some faults in the application of the right method.	Selects and uses the right methods, but with minor gaps in the consistency of method	Applies methods in a well-chosen and methodically consistent way.	Applies the right methods in a methodically consistent and innovative way	
Get the perspective of local stakeholders and citizens	A clear overview of the stakeholders and their perspective is missing.	Overview of a part of the stakeholders and their perspective is presented, but stakeholder categories are too general and not fully adapted to the situation.	The overview of the stakeholders and their perspective is relevant, with the right level of abstraction in relation to the challenges.	The overview of the stakeholders and their perspective is relevant and complete.	There is a clear and convincing presentation of the stakeholders involved. Their perspective shows new insights, new approaches.	
2. Reflecting and creating (second part in studio)						
Reflect the experiences on-site and identify relevant themes, topics and problems	Does not show a structured reflection on and identification of the subject.	Shows some reflection on the experience and identification on the subject but lacks some consistency.	Makes a balanced reflection on the experience and clear identification of the subject.	Clear, well structured reflection of the experience and overview of themes, topics and problems.	Excellent level of reflection experiences and highlighting new perspectives on the themes, topic and problems.	
Apply and test co-creation approaches and participative design-methods	Does not show clearly if, or how, the approaches and methods are applied and tested.	Applies approaches and methods in an ad hoc way. There is no indication of testing.	Clearly applies and test the methods, but does not clarify how these were functioning	Applies and tests methods in a transparent and consistent way.	Applies and test the methods, providing new insights for future innovation.	
Create and communicate alternative futures for the Dachau waterscapes	Only communicates one or two examples that are not coherent	Communicates part of an alternative future that is not well explained and consistent with the challenges	Communicates a well argued and coherent set of alternative futures	Presents a convincing set of alternative futures that are clearly related to the analysis and challenges.	Excellent and convincing explanation of alternative futures well grounded in the perception of stakeholders and citizens and defined challenges.	This was a bit challenging in such a short period
Final assessment	Insufficient / Sufficient / Satisfactory / Good / Excellent *) circle what is your integrated evaluation.					

the learning process and development of the learner during the course or workshop.

Where the teams are composed of learners of various levels (bachelor, master, PhD students, NGO staff) the scale of judgement should be adapted to that level. So two students within the same team can be assessed with different scales for performance.

For the seminar WAVE used assessment forms and for the IP rubrics were developed. Here are the forms shown for Assignment 1 and 2 in the seminar of 2021 and the rubrics for the IPs in Freising and Napoli in 2022.

Competences and teaching skills of teachers and researchers

Competences for teachers within the framework of WAVE are related to two aspects: the subject of water in all its dimensions and the organisation of collaborative development of knowledge making use of the concepts of living labs.

Water in all its dimensions

Academics in the field of landscape architecture and landscape planning already master a set of competences related to the planning, design and management of water landscapes and current challenges related to water landscapes. During the WAVE project we developed a deeper understanding on the various types of water landscapes ranging from seas, lagoons, lakes, big rivers to canals, and systems of brook and ponds. In addition we experienced that community members, local authorities and other stakeholders often are hardly aware of the water elements and its functions. For teaching and research on water landscapes the following types of knowledge, skills and understanding are essential:

• The great variety of water landscapes and its connection to urban, peri-urban and rural areas.

• The functioning of water systems, with its driving forces, processes, and a great variety of economic, ecological and social values and functions, such as irrigation, transport, cooling, energy production, fishing and fish nurseries, plant production, supply of drinking water and industrial water, biodiversity, and recreation.

• The challenges for water landscapes, most of these related to climate change and urban and agricultural development, such as sea-level rise, flooding, drought, salinization,

WAVE: Form with assessment rubric for the IP Fusaro lake in Bacoli / Pozzuoli / Napoli , September 2022

Name of the student / student group to be assessed:……………………………………   Name of the assessor (can be yourself): ……………………………………

Goal of Living Lab / IP	Just mark the level of performance by a cross or colour and make a final assessment at the bottom					
	Insufficient	Sufficient	Satisfactory	Good	Excellent	Notes
1. Get in touch with waterscapes and people						
Generate knowledge about the study area and waterscapes of Fusaro Lake, its system context, challenges& opportunities.	It is not yet clearly presented what the main challenges and opportunities are.	One or some main challenges and opportunities are presented, but these are defined in a general way.	Clear definition of the main challenges and opportunities, and it is understandable where these originate from.	Analysis is concluded with a well-argued, integrated, definition of main challenges and opportunities	The conclusion on the main challenges and opportunities is well argued, showing new perspectives on transforming the waterscapes.	
Get the perspective of local stakeholders and citizens	A clear overview of the stakeholders and their perspective is missing.	Part of the stakeholders and their perspective are presented, but too general and not fully adapted to the situation.	Stakeholder overview & their perspective is relevant, with right level of abstraction in relation to challenges.	The overview of the stakeholders and their perspective is relevant and complete.	There is a clear and convincing presentation of the stakeholders involved. Their perspective shows new insights, new approaches.	
2. Reflecting and creating						
Reflect the experiences on-site and identify relevant themes, topics and problems	Does not show a structured reflection on and identification of the subject.	Shows some reflection on the experience and identification on the subject but lacks some consistency.	Makes a balanced reflection on the experience and clear identification of the subject.	Clear, well structured reflection of the experience and overview of themes, topics and problems.	Excellent level of reflection experiences and highlighting new perspectives on the themes, topic and problems.	
Formulate goals and a vision for the area on various scales	Does not show clearly if, or how, the goals are formulated and integrated in a vision.	Presents goals and vision in an ad hoc way.	Clearly presents goals and vision, but some clarifications are missing.	Clearly presents goals and vision,	Clearly presents goals and vision in a convincing way providing inspiring and innovative perspective.	
Formulate design solutions which are explained by examples of interventions by way of transects / exemplary sites/or other..	Does not show clearly if, or how, the design solutions can work and how can be implemented.	Presents design solutions in an incoherent way while the interventions are not well connected to it.	Clearly presents the design solutions and shows how it could work and be implemented.	Clearly presents the design solutions in a convincing way, well illustrated by proposed interventions.	Clearly presents a strategy with innovative ideas and inspiring interventions.	
Visualisation ideas in a people oriented communication methods	Visualisation is hard to understand and not targeted at the audience.	Visualisation is partly clear but not fully targeted at the audience.	Clear visualisation with a understandable story line for the audience.	Clear visualisation with a good and convincing story line for the audience.	A visualisation that fully engaging the audience with new perspectives, innovative ideas that inspire a lot	
Create and communicate alternative futures for the Fusaro lake waterscapes	Only communicates one or two examples that are not coherent	Communicates part of an alternative future that is not well explained and consistent with the challenges	Communicates a well argued and coherent set of alternative futures	Presents a convincing set of alternative futures that are clearly related to the analysis and challenges.	Excellent and convincing explanation of alternative futures well grounded in the perception of stakeholders and citizens and defined challenges.	

pollution, and limited access for recreation (bathing, swimming, fishing) , leisure, nature experience.

• Addressing the various challenges by an integrated landscape approach, linking the urban system (with run-off and sewage water) to the natural systems, including the non visible elements and processes.

• The perception of people of water landscapes, what they value, what they overlook and what motivates them to be part of transformative actions for sustainable development.

The collaboration in living labs

The WAVE Living labs are partnerships between academics, civil society, local authorities and relevant stakeholders for sustainable change. Here we organise transformative processes of change that build on the ambitions and values of experts and communities alike. While academics in the field of landscape architecture and landscape planning already have experience with working on real-life projects within the framework of integrated studios, the living lab experience requires additional competences.

An important difference is taking the position of an engaged academic. The role changes from an observer of the development, into a co-worker and facilitator who engages with the community and intends to bring about a beneficiary change. for this one needs to develop a sustainable and trustful relationship with stakeholders. Working from the perspective of the needs of communities, implies that the challenges and aims are not predefined by the academic, but are mapped and formulated in a collaborative process. This educational part is guided by a constructivist approach where learning is defined as a communal effort, a 'community of learners' where the transfer or knowledge and refinement of professional skills result out of the students' direct engagement with reality.

Competences for starting and organising a collaborative inclusive process include the ability to:

• Define the different phases of the living lab process and link these to educational activities focusing on those that support the user participation during projects of experimentation.

• Organise workshops bringing together stakeholders to get involved in the adventure and which clarify the intent and the motivations behind the choice of a Living Lab.

- Facilitate the discussion between participants based on a common language.

- Align the operation with the expectations of the parties

- Solving problem and intermediate between parties

- Facilitating mapping stakeholders, interests, challenges, and formulating goals, visions.

- Co-designing and evaluating prototypes of possible interventions

Quotes

Ellen Fetzer:

"I learned more about the relevance of water and water areas as a natural resource, how scarce fresh water is and is threatened, and how much we have altered our water environments. Taking water catchment areas as the basis for understanding, evaluating and envisioning landscapes is a very good transdisciplinary approach which I will continue to apply"

Ingrid Schegk:

"It was surprising for me that the water is not in the mind of the people who live along the water, especially in our case in Dachau where you have this historic canal, where it comes from and where it goes to"

Friedrich Kuhlman:

"Although Europe has manifold water landscapes, built up on different spatial, climatic and cultural backgrounds, it seems that in our times the problems, challenges and threats are more and more comparable in different counties. This calls for international cooperation"

Irina Saghin:

"Also, the economic aspect of developers is important, for this you learn to negotiate with them to see their perspective and to show them the scientific perspective. By agreeing to work together also the builders can find more feasible, environmentally sustainable solutions"

Stefanie Schur:

"In Constanta we had this unique opportunity to really soften the border of the lake and make it more natural. The Edge between the lake and and the urban environment"

Alessandra Pagliano:

"We need to give students more tools to do real co-creative activities with people. For this I changed my teaching on visualisations, more showing images on eye level, story maps and less birds view perspectives"

Learning impact for community members and local stakeholders

In the reports of the living labs the WAVE partners presented the impact they had on the local community. The main impacts are a growing awareness of the value, importance and challenges of water landscapes; a clearer understanding of their needs and wishes for water landscapes that contribute to their well-being and environmental quality. Local authorities appreciate the way that collaboration between the stakeholders and development of proposals by students benefit different parties and help to overcome differences of interests.

DIGITAL LIVING LABS
The potential of Web-GIS
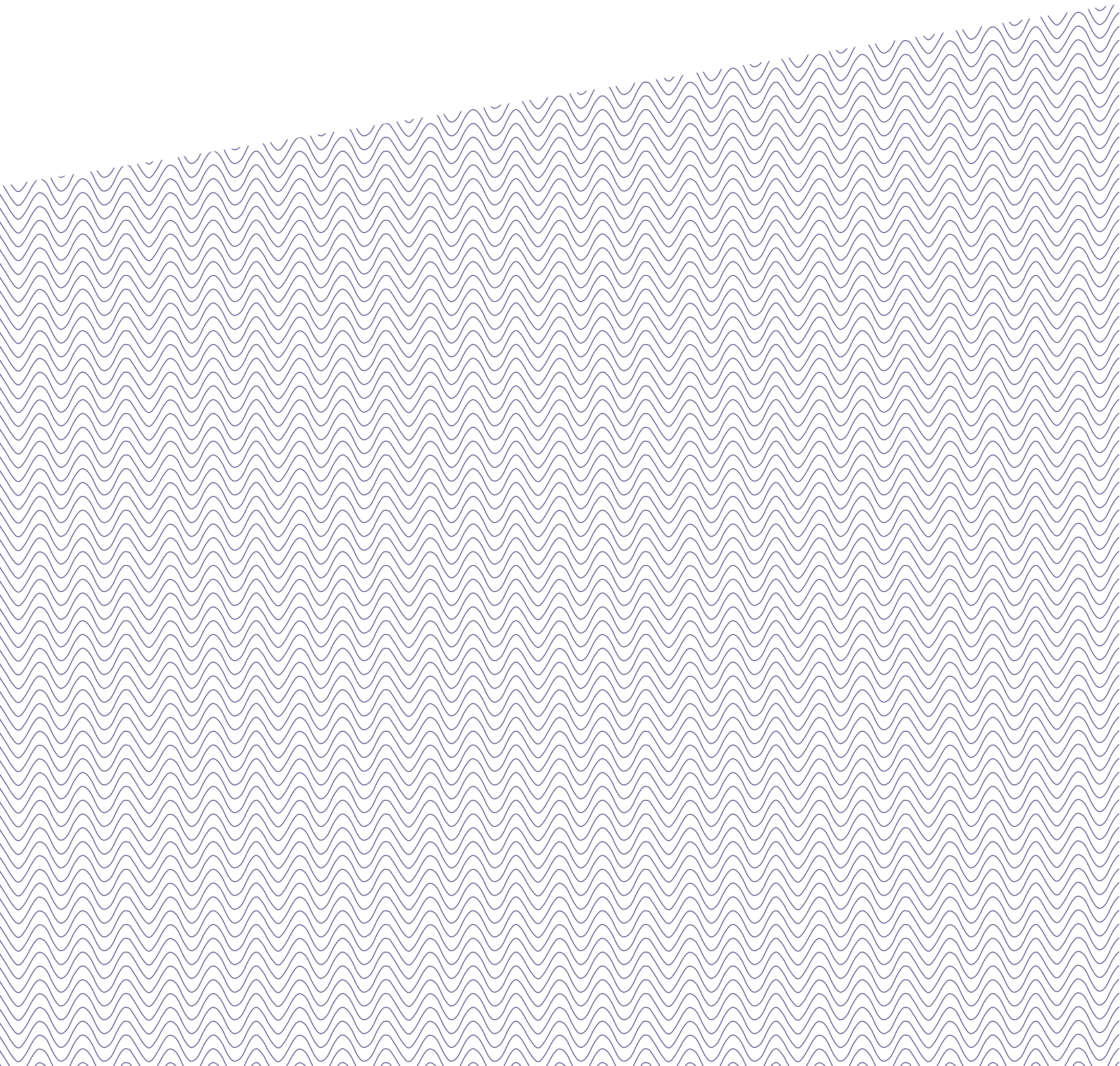
Digital Living Labs:
The potential of Web-GIS

The WAVE Living Labs applied primarily two models of Web-GIS: ArcGIS Storymaps (Freising, Nürtingen, Bucharest) and GoogleMyMaps. This article will elaborate on the potential of combining spatial information, local knowledge and design ideas as 'WAVE landscape stories', and a form of knowledge transfer from academia to WAVE communities. We will reflect on the limitations of the tools, and also reflect on current development trends.

ESRI has developed a free-to-use tool for interactive online maps called Story Maps. Story Maps have been tested in various contexts and for multiple purposes, e.g. in geography projects with high-school students (Brigham 2016), environmental education through storytelling (Gutting et al. 2019), or in soil science education (Cope et al., 2018). In the context of geodesign, Orland (2016) highlights the potential of story maps to address so-called "wicked problems" such as climate change and compare different geodesign scenarios. The strength of Story Maps is that it allows presenting geospatial map tools as stories embedding still images, video and various interactive features. Although Story Maps are built around a visual narrative, it is still possible to query underlying geospatial data.

The Nick J. Rahall, II Appalachian Transportation Institute (RTI) at Marshall University and Institute for Public Administration (IPA) at the University of Delaware research teams created a Story Map to facilitate a public participation process and evaluated its use to engage and empower stakeholders in the case study process. Scott et al. (2016: 8) concluded, "online, interactive techniques and mapping applications are ideal for fostering citizen engagement, providing meaningful context to complex topics and concepts, and empowering informed decision making. In other words, there is strong evidence that GIS Story Maps can be effectively used to empower and engage stakeholders in participatory planning processes. They combine dynamic maps with images, narrative, and other media to visualise a theme or sequential events and can be easily shared via social media or embedded

within a website." Because of the success of the case study participation process, the authors recommend broader GIS education in general and the use of Story Maps in particular.

In summary, these case studies support the application of Story Maps for participatory and educational purposes involving geospatial data. Furthermore, Orland (2016) and Scott et al. (2016) already pointed out the potential of Story Maps to communicate a narrative or rather tell a story by enriching geospatial information through various other, mostly visual, media. Therefore, Story Maps provide the tools to communicate the cultural/social, perceptual and aesthetic dimensions of landscape linked to the physical and natural characteristics of the place through storytelling techniques, still images, panorama and 360° photos, ground-based and drone-based videos. It should be mentioned that although free-to-use, Story Maps are not open source but proprietary software. Considering that Esri is an American company, there are also potential data privacy issues. However, the underlying geodata for the Weihenstephaner Landschaftslabor are only embedded into the Esri tool but stored on our own university servers to minimise potential data privacy issues. For now, Story Maps can be recommended as a particularly powerful version of a web-GIS map due to its powerful mapping and multimedia functions combined with ease of use.
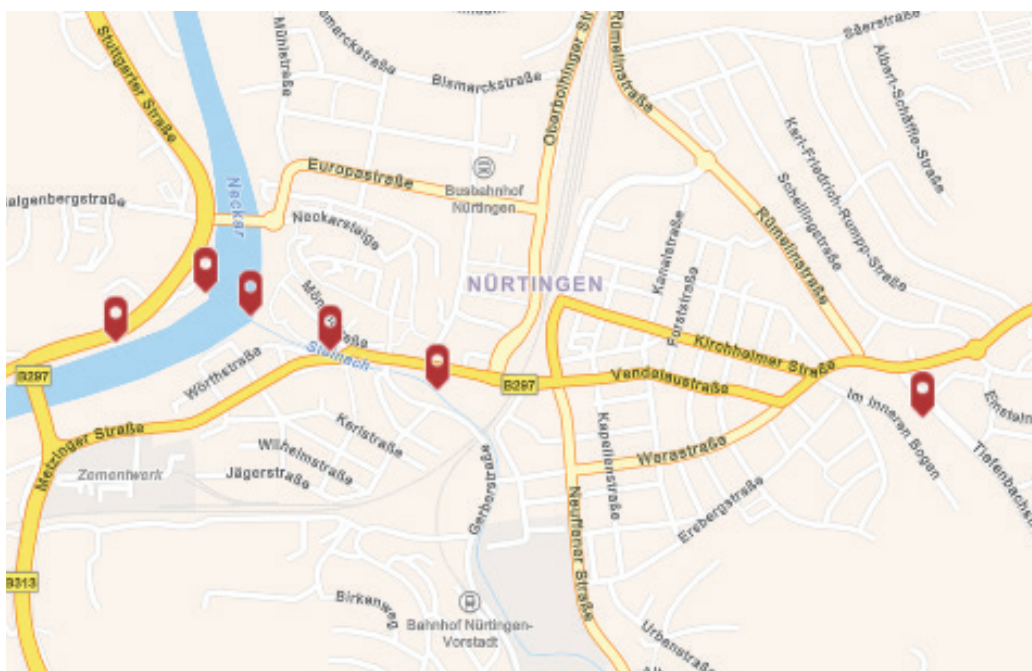
Water landscapes in Nürtingen

WAVE living lab in Nürtingen, Germany 2021

August 1, 2022

Nürtingen is part of Greater Stuttgart Region in the southwest of Germany. Greater Stuttgart Region comprises 179 municipalities in a polycentric structure around the urban centres of Stuttgart, Ludwigsburg, Esslingen and Böblingen. The regional economy is very strong and provides numerous high-skilled jobs, especially in the production of the region's emblematic cars and sophisticated machines.

Impressions from our rivers

ESRI Story Maps Example

Example from Nürtingen: Water landscapes in Nürtingen

Literature

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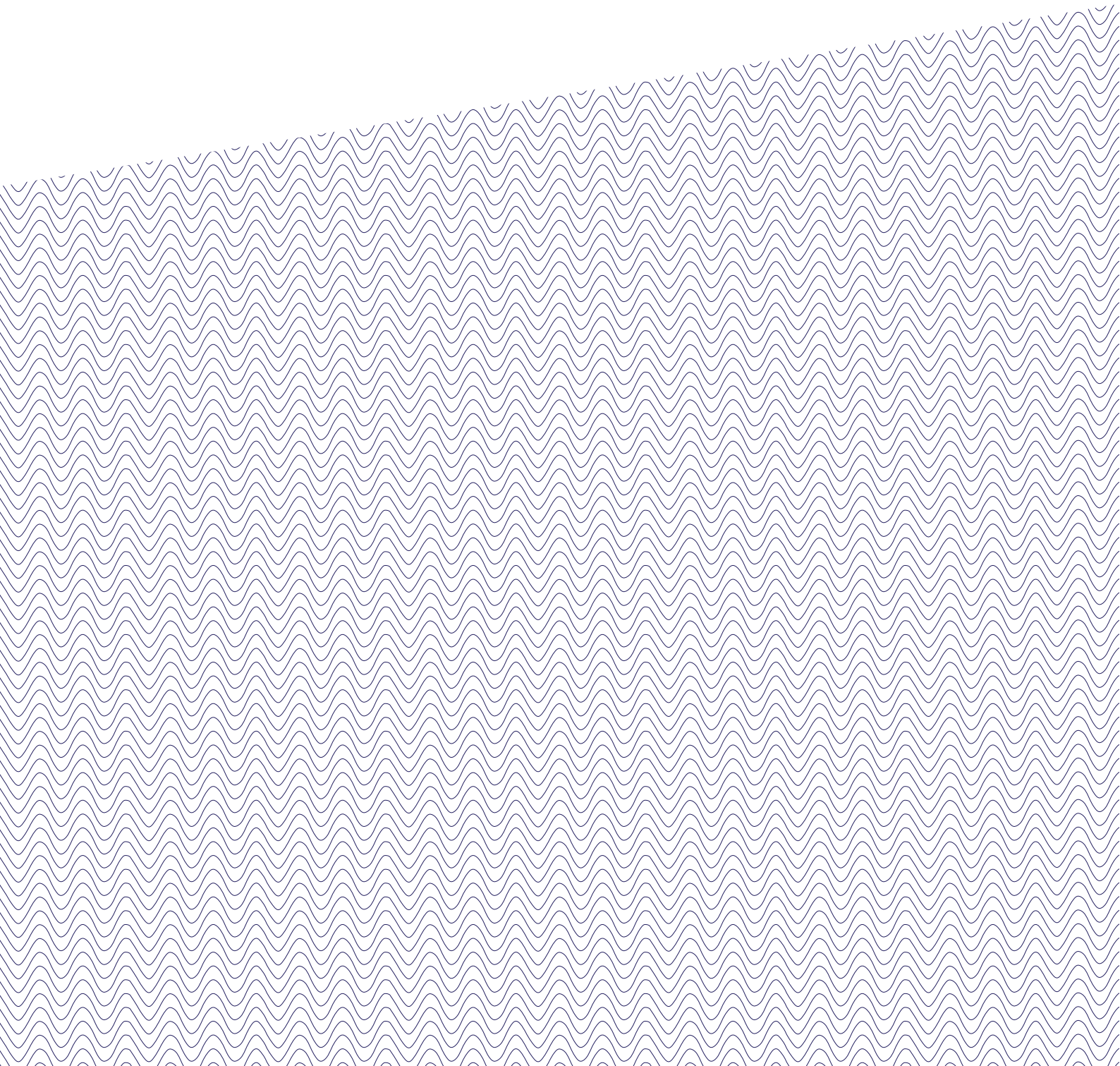
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LIVING LAB METHODS

How to make the WAVE moving

Living Lab Methods:
How to make the WAVE moving

During our Living Lab activities,we have tested various participatory methods derived from our action research approach. This chapter will consist of a matrix with short explanations, linked to the long explanations on the seminar wiki. This includes amongst others, we might rethink the structure once the methods have been documented:

1 Understanding, empathising and building trust

1.2 Go-Along Walk
1.3 Photovoice and Cellphone Diaries
1.4 Power Mapping
1.5 Mapping potentials and conflicts
1.6 Landscape Role Play

2 Framing themes and setting goals

2.1 Future Workshop
2.2 Participatory Decision Making
2.3 Scenario planning

3 Designing together

3.1 Transect
3.2 Mapping Resources through neighbour-hood Exploration
3.3 Dirty design
3.4 Urban gaming
3.5 Co-creative design sessions
3.6 Prototyping and interventions

4 Co-evaluation

Ling to the Wiki WAVE Living lab matrix

Description of selected methods

1. Understanding, empathizing and building trust

The methods presented here not only help in creating bottom-up local knowledge about landscape challenges and potentials. By implementing them, all participants enter a process of mutual understanding. Building this level of trust is crucial for the success of a Living Lab process.

Go-Along Walk

To capture the everyday life processes, people's reaction and memories of a changing space over time, we used complementary approaches to analyse movements. Within the context of the definition of landscape in the European Landscape Convention – "an area, as perceived by people, whose character is the result of natural or human processes", we look at the urban landscape through three aspects, interacting with each other and comprising its structure (area and layout patterns), its image (perception of space and sensory impact) and also its action (actions which created the urban landscape). For understanding our everyday movement, the image is surveyed with photographs, video outtakes or sound samples being perceived first-hand and with continuation of site visits these samples get more recorded comments for further adaptation. Then, actions forming the area are identified and assessed by different kinds of qualitative interviews with representative stakeholders.

To cover the main elements of the area in this linked approach is better than only looking at different aspects separately, also allowing triangulation of results and a holistic picture to be assembled. The method consists of an understanding of the given spatial grammar of the area, a first-hand perception of the area through different media and finally discovering significant spots forming a representation of the area. Moving images should be collected in several steps, taken while walking/entering/riding in or around the respective area. The videos should be accompanied by commentary of the person experiencing it and obtaining impressions. The main aspect is that only people and space together make landscape. By go-along interviews and discussions it is understood how the actions impacted and continue to impact the experiences and perceptions of the residents.

Which types of knowledge does it generate?

Residents, students or stakeholders can develop specific skills to analyse the landscape and co-design. By walking on site, filling the map pre-set by a facilitator of the living lab activities, creating a shared platform, identifying and discussing shared problems, it is possible to delineate scenarios. The participants can share their knowledge of places, highlighting key points with the support of questionnaires and interviews. The possibility to map data helps people to build a better understanding of the area, as such information is geo-localised and spatialised.

**In which situations can this method be applied and who is typically involved?**

The method is suitable when the study area is not well known, and the stakeholders are not fully aware of the main issues of the places and aims of the community. A typical case is the process of participation in a municipal masterplan which needs to address sectoral aspects related to a neighbourhood or an open space. In this method, stakeholders' participation is crucial: students, academia, municipality, civil society, NGOs, touristic industry, commerce actors, farmers, facility managers, and others - depending on the site.

Go-along workshop in Seda, Latvia, instructed by Friedrich Kuhlmann, Estonian University of Life Sciences

How does this method work in practice?
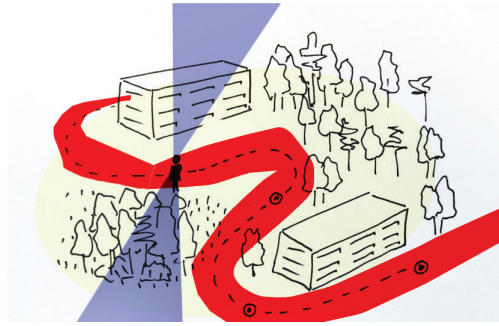
The method allows students, stakeholders, residents or municipal authorities to walk along the area with interviewees of their own kind and discuss the shared insights together. Suggested phases are:

In the **Dive-In** step researchers move around randomly in the area on foot or on a bike to perceive the area first-hand. This can be also conducted through snapshot photography or field recordings together with recorded verbal comments by researchers about route and area.

The creation of this continuous space depends on movement within a short period of time in the area, generating a first encounter which builds the basis for the following steps. Thus, applying map data connects it to other data collections. The Dive-In builds a first understanding of the spatial character of the example area as a canvas to paint on and it requires an intensive recording phase. It should be performed on foot for smaller spaces or by bike for longer distances. A researcher comment continuously on all aspects of the appearance of the area while moving through it.

The **Look-Around** step explores the spatial character of the area by 360° surround video filming at specific spots together with recorded verbal commentary about the space filmed. These spots are identified during the first step after marking them on map. To look around

*Going along and giving under-
standing*

*People talking about their
familiar place*
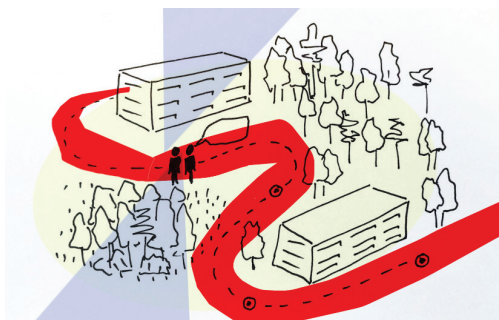
means to create a continuous space, which simulates the view of a person turning around. It should be performed with a device mounted on a tripod. After conducting the filming, the footage is used for further processing, such as assessing types of distinctive elements.

The **Look-Inside** step explores the spatial character of the area by hand-held camera filming of situations representing everyday movement cycles of residents, such as going to work or taking children to school. To look inside means to invoke an atmosphere of urban everyday life, which can also be shown to interviewees while conducting the interview step. It creates another encounter with the area, which in this way links space and people's action into the next steps, such as assessing types of public spaces or identifying neighbourhood-gathering places etc.

At the **Go-Along** interview step the interviewer moves together with one or more interviewees to collect information simultaneously about an area and its actors and to explore the relationship between both. It is dependent on movement while conducting the interview and therefore creates a continuous space over an amount of time spent with the interviewee. It also creates a social interaction, which can uncover larger spatial relationships in the area. Because Go-Along interviews look for an understanding of the spatial character of the area as part of people/actors lives, they require a careful search for interviewees.

During the interview the interviewer asks questions about the area and how the interviewee is related to it, recording their comments throughout the interview. In fact, the interviewee gives the interviewer a tour through spaces that are important to them. Going along with the interviewee in their familiar area builds up a connection by sharing a space, an experience and some time together. It is important to film
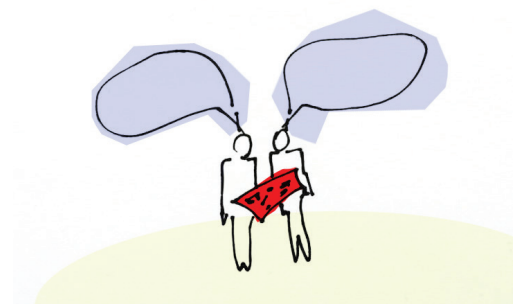
the interviewee and the traversed space while interviewing with a digital device for recording and filming while walking along, so as not to make him/her feel 'being filmed'. It is also essential to map routes and places that describe the area, as they matter to the interviewee. Maps should also be prepared which trace and join the most discussed points from the interview. These can form the basis for going along with other interviewees and building up places which strongly represent the abundance of information.

For these steps, audio files or video should be played back and listened to, to identify key aspects which emerge as the interviews proceed – these can be according to predefined themes or identified as they arise. Excel cells should be filled with text from the interpretation of the thematic content, together with interesting quotes and temporal data.

Literature, links and references

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Photovoice

Photovoice is a method that allows individuals to convey their point of view using photography as a medium. With the prevalence of mobile communication, particularly among young people, this concept can be extended to encompass digital diaries that incorporate more than just photos, such as videos, social media posts, and even text messages or emails.

It enables individuals to recognize and tackle problems that impact their community. Through photography and group discussions, members of the community can take part in the planning process and gather their thoughts on issues like safety, livability, and accessibility of their neighborhoods.

What are the goals of this method?

This qualitative methodology aims to integrate this prevalence of mobile communication into the participatory context by collecting data that help understand spatial representation. This is particularly relevant for participatory context as a viable method for capturing situated practices such as everyday patterns of social and individual on the study site. It positions the individual in a participatory approach that encourages self-expression by allowing a voice through visual and digital representation.

Typically this method provides insights into individual's spatial representation, use of space and issues of social participation and exclusion. The PhotoVoice and Cellphone diaries method collects and generates:

• individuals', notably residents and workers, thoughts and social constructs;

• collection of personal accounts that might have been difficult to gather with a more conventional method;

• affective connections between people, their environments, and life situations.

Key goals are:

• Empowerment and increased equity: give voice to people and communities who may be excluded from the decision-making process. This method gives value to participants' perspectives and offers them the chance to be active actors in shaping their neighborhoods and communities.

• Collaboration and innovation: it fosters stronger collaboration with community members and local stakeholders, and support the emergence of new ideas and solutions addressing existing issues and challenges.

• Increased trust and confidence: PhotoVoice and Cellphone diaries allow community members to feel more at ease sharing their experiences; this is particularly relevant when researching sensitive or conflictive topic.

• Inclusion of younger generations: the use of mobile phones in the data collection phase of a research enables younger generations to be more easily and fully involved

In which situations can this method be applied?

PhotoVoice initially originated in the fields of health education and disabilities before making its way to user participation. It is currently used in a wide range of geographical and social contexts.

• When assessing public health issues, the method can be applied to gather data on health behaviours and perceptions, or to develop and evaluate potential planning interventions linked with increased health benefits

• When addressing issues of social and environmental justice: the method gives voice to marginalised communities thus increasing their feeback in design and implementation relevant policies and initiatives

• When analysis areas at risk of environmental disasters: this method can be used to gather information and feedback from affected communities, looking at their perception of past disaster response and recovery processes

A mediator is typically involved to orient the method and identify patterns

How does this method work in practice?

The first step is to identity the targeted participants: they should represent a diverse range of experiences and perspectives. They are then introduced to project's goals, methods and expectations. The equipment that is used for the data collection is also introduced and explained (cameras might be distributed)

During the data collection phase participants will collect the data with cameras or cellphones: the participants take photographs according to their experiences and perspectives on the topic, or record their daily thoughts, feelings.

This is followed by a group discussion where the participants share and discuss the collected data, highlighting key patterns.

The results are analysised (this might include coding and categorizing) and inform the design of solutions

Finally, the findings should bedisseminated to the wider community, in order to ensure that the insights from the research are given back to the people, and can inform more general future policy development.

It is important to consider participants' right over their personnal data, prior consent may need to be obained for use and reuse of collected data.

Examples of typical results

The results can differ depending on the pre-defined goals and the area of study, but they usually cover:

• At an individual-level: participants feels involved as a change agent

• From a community assessment perspective: a list of key issues according to the community members is drawn, and the main root causes are identified

• From a community capacity-building perspective: new community leaders might emerge during the process

• Advocacy for change: access to the decision-making process is gained for participants

What are typical next steps after applying this method?

The raw should first lead to the identification of key themes and patterns. These findings should be discussed and lead to the formulation of key recommendations.

To maintain the engagement of participants and communities, it is important that the findings and the proposed recommendations are disseminated and discussed with them. Exchanges of feedack can ensure that future decision and planning development are supported.

The insights gained from the PhotoVoice and Cellphone diaries method may lead to further research needs, or action through participatory processes.

Any limitations and typical pitfalls?

• Power dynamics: the method can be affected by power dynamics between researchers and participants, or between different members of the community taking part of the project. It is important to consider these dynamics to ensure all the voices are heard.

• Limited representation: for this method, community members are often self-selected, which might lead to underrepresentation of certain other perspectives and groups.

• Costs: photovoice projects can be expensive. It is important to consider the costs of the cameras or training for the participants.

• Ethical considerations: the method might raise ethical issues regarding confidentiality, privacy and informed consent. It is important to set clear ethical principles and guidelines and obtain informed consent from all participants.

Further readings, links and references Research articles

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2. Participatory Decision Making

Once the landscape has been explored and explained with the above mentioned methods, many issues and topics will be on the table. We have limited time and resources, so priorities have to be set in an inclusive and participatory way. The difficult aspect here is to find the right balance between feasible short term action and over-simplification, given that landscape problems are often multidimensional and wicked. The following methods help in setting collective goals in order to build a shared vision. Such shared vision can become the basis for building a strategy leading to concrete and doable first steps

Nominal group technique

Nominal group technique (NGT) is defined as a structured method for group brainstorming that encourages contributions from everyone and facilitates quick agreement on the relative importance of issues, problems, or solutions. Team members begin by writing down their ideas, then selecting which idea they feel is best. Once team members are ready, everyone presents their favourite idea, and the suggestions are then discussed and prioritised by the entire group using a point system.

NGT combines the importance ratings of individual group members into the final weighted priorities of the group.

The NGT supports collaborative thinking for group members who are less vocal than others or there is a need that all participants actively participate. It can also highlight differences of opinion that otherwise might not become apparent.

The method can be applied on site with paper and pen collecting the contributions on a flip chart and stickers for voting. On-line, one can make use of a digital tool such as mural.co or padlet. It is important to structure the time well and to appoint a facilitator for timing, clarifying, categorising and prioritising the

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Example

Steps for a student group to explore mapping challenges

• Invite students to think of an event/situation that illustrated a meaningful challenge they had/have to face and write this on a card (possible details on the back).

• Students form groups around similar challenge cards. Those who do not know which group to join, explain what their cards are about, and can be 'adopted' by a group.

• Each group prepares a skit to represent the key challenge that matters most to them.

• Listening to the presentation, students note down what they find the most important after all: the one they first thought of or one they heard. After the presentations the facilitator invites all to join the group that addresses the challenge they consider most important.

• Newly formed groups prepare a pitch on why their challenge should matter greatly to everyone and how they could respond to it.

• After the presentation the facilitator describes recent findings from a refereed journal on the challenges faced by this type of stakeholders. Ask the group to compare and discuss.

• All ends with a brief discussion on whether the methods of action inquiry differ from the conventional approach and tools they used before.

(PAR, Theory and Methods, Chevalier and Buckles, 2020, p 119)

contributions. The group should not be too big, because otherwise the participants may lose their interest and focus. An on site session can last a bit longer than online. The maximum time also depends on the commitment and interest of the participants for the issues addressed.

How does this method work in practice?

Working a group in a collaborative way might consist of the following steps:

1. State the problem, question, or issue that is the subject of the brainstorming and ensure that everyone understands.

2. Each team member silently thinks of solutions or ideas that come to mind when considering the problem and writes down as many as possible in a set period of time (5 to 10 minutes).

3. Each member states aloud one idea. The facilitator records it on the flipchart.

4. No discussion is allowed, not even questions for clarification.

5. Ideas given do not need to be from the team members' written lists. Indeed, as time goes on, many ideas will not be found on their original lists.

6. A member may "pass" his or her turn and may then add an idea on a subsequent turn.

7. Continue around the group until all members pass or until an agreed-upon length of time.

8. Discuss each idea in turn. Wording may be changed only when the idea's originator agrees. Ideas may be stricken from the list only by unanimous agreement or when there are duplicates. Discussion may clarify meaning, explain logic or analysis, raise and answer questions, or state agreement or disagreement. With the help of the facilitator the group may also combine ideas into categories.

9. Prioritize the recorded ideas in relation to the original question using multivoting or list reduction. Typically, the solution with the highest total ranking is selected as the final decision. Other variations include estimating the amount of work required to implement each solution by assigning it a point value; the higher the point value, the more work involved

3. Designing together

Once the community has developed its goals, strategy, design themes and priorities, the actual co-design can start. However, there is often no clear linear distinction between these three phases. Design ideas might inspire new goals and lead to a change in the strategy. Or new people come on the scene as they are intrigued or inspired by the design ideas. They might bring in new knowledge and needs and the design will further evolve.

Co-mapping

The method is based on co-design of solutions as to address territorial and landscape questions in two steps:

• walking on site and mapping main criticalities and resources on a shared platform;

• discussion with the participants and elaboration of shared solutions based on the evidence of step 1

The main tool for this method is "Google my maps", an easy-to-use platform to map various types of information, both on site with mobile phones and remotely. The aim is to geolocalise information intuitively and, at the same time, to structure it according to thematic layers. The living lab participants can share the results of their exploration walk and open
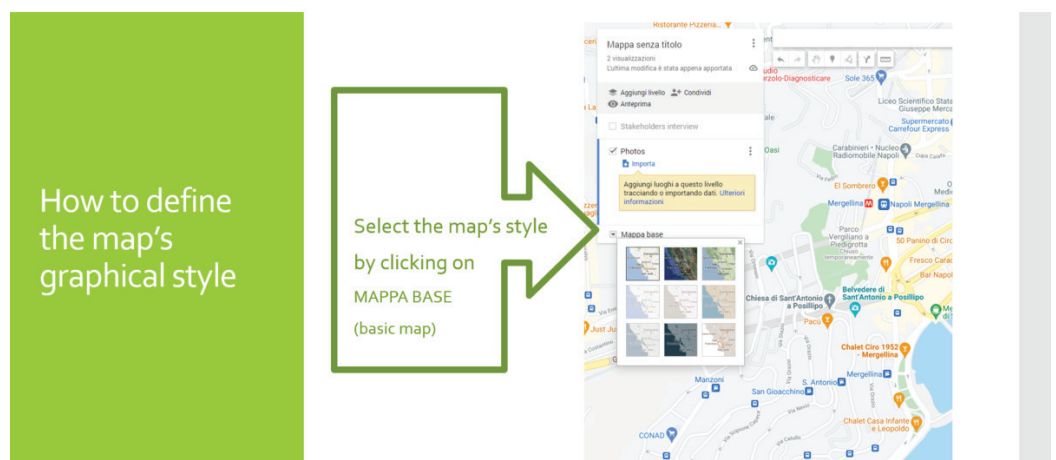
a common space to elaborate planning/design solutions.

What are the goals of this method?

The shared platform is built on the descriptions of mapped resources such as photos, sketches, texts, interviews, questionnaires, etc., collected during the "exploration walk". Therefore, it is a valuable means to discuss and elaborate solutions in a large participatory context. Moreover, the tool "Google my maps" requires only a Google account, it is free and easy to use. Non-experts can insert in map many elements, for instance photos, videos, and further sources whilst walking in the site trip, simply using their mobile phones.

Which types of knowledge does it generate?

Residents, students, and stakeholders can develop specific skills to analyse the landscape and co-design. By walking on site, filling the map pre-set by the facilitator of the living lab activities, creating a shared platform, identifying and discussing shared problems,it is possible to delineate co-designed scenarios. The participants can share their knowledge of places, highlighting key points with the support of photos, sketches, questionnaires, interviews. The possibility to map data helps people to build a better understanding of the territory,

How to define the map's graphical style

Select the map's style by clicking on MAPPA BASE (basic map)

as suchinformation is geolocalised and spatialised.

What are typical questions this method is able to answer?

• Which and where are located the main resources of the study areas?

• Which are the visible problems of the study areas, according to the involved stakeholders?

• Can you localise resources and key points along the walk?

• Can the participants analyse and discuss the observations collected by other stakeholders of the Living Lab?

In which situations can this method be applied?

This method allows students, stakeholders, residents, and municipal authorities to walk along the area and discuss the shared results together, finding co-designed solutions. The suggested phases are listed below:

1) Living Lab kick-off meeting: the stakeholders introduce themselves and illustrate their knowledge and objectives for the study area.

2) Collection of main data on the area (maps, social data, description of natural and social systems).

3) Preparation of the shared platform using "Google my maps" tool with identification of the layers of interest.

4) Setting the site walk (number and types of participants, time to be spent, devices, definition of the limits of the exploration area).

5) Site trip with exploration walk (the group and selected leaders walk and visit the study area, shooting and inserting their own photos to document their viewpoint. It represents a participatory survey of information directly linked to the places in map. Thus, it is possible to localise the viewpoint of each photo, to provide a short note to comment and express a vision, a weakness, an aim for transformation, and so on.

6) Discussion of the outcomes collected on the shared platform to highlight common problems, different viewpoints, and proposed solutions. The solutions may be further classified and categorised by defining intervention priorities.

7) Elaboration of sketches to illustrate solutions by the living lab members.
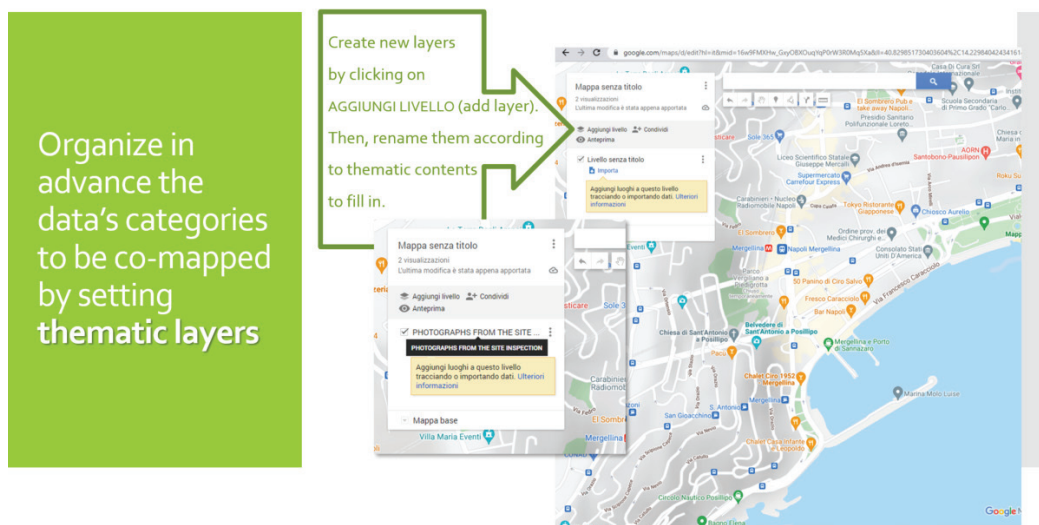
Examples of guidance steps from the method description on the Wiki page.

How much time is needed for each step?

Step1 - 1-2 hours
Step2 - 2-4 hours
Step3 - 1 hour
Step4 - 1 hour
Step5 - 3-4 hours
Step6 - 2 hours
Step7 - 2 hours

The platform does not require any previous knowledge. The first step is to be aware of the thematic requests of each layer. Subsequently, the participants can experience a "walking lab" together in the study areas and insert information in real time on the map, including thoughts, impressions, and feeling.

Which materials/rooms/technical equipment is needed?

Interviews and questionnaires are the most common methods to understand local people knowledge and collect community aims. Because the answers are strongly conditionate also by the place in which the interview is taken, the tool "Google my maps" allows to link them to the specific site where they have been taken.

What are the tasks of the facilitators? The facilitator must provide gmail account to host the map on Google Drive.

The facilitator can lead the activities by pre-setting the thematic layer as to orient people for collecting specific data related to the questions in each layer. The facilitator can share the link to the map among the participants, allowing them to edit (non only as viewers).

The facilitator can export the map and all the data collected in GIS platform or on a web site; it's possible to download all the data inserted in the map during the site inspection.

What should be avoided?

It is difficult to coordinate too many participants in the site trip-exploration walk. It should be avoided to let people map without a briefing in which the facilitator explains how to insert by thematic layer data on the map.

Literature, links and references

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Transect
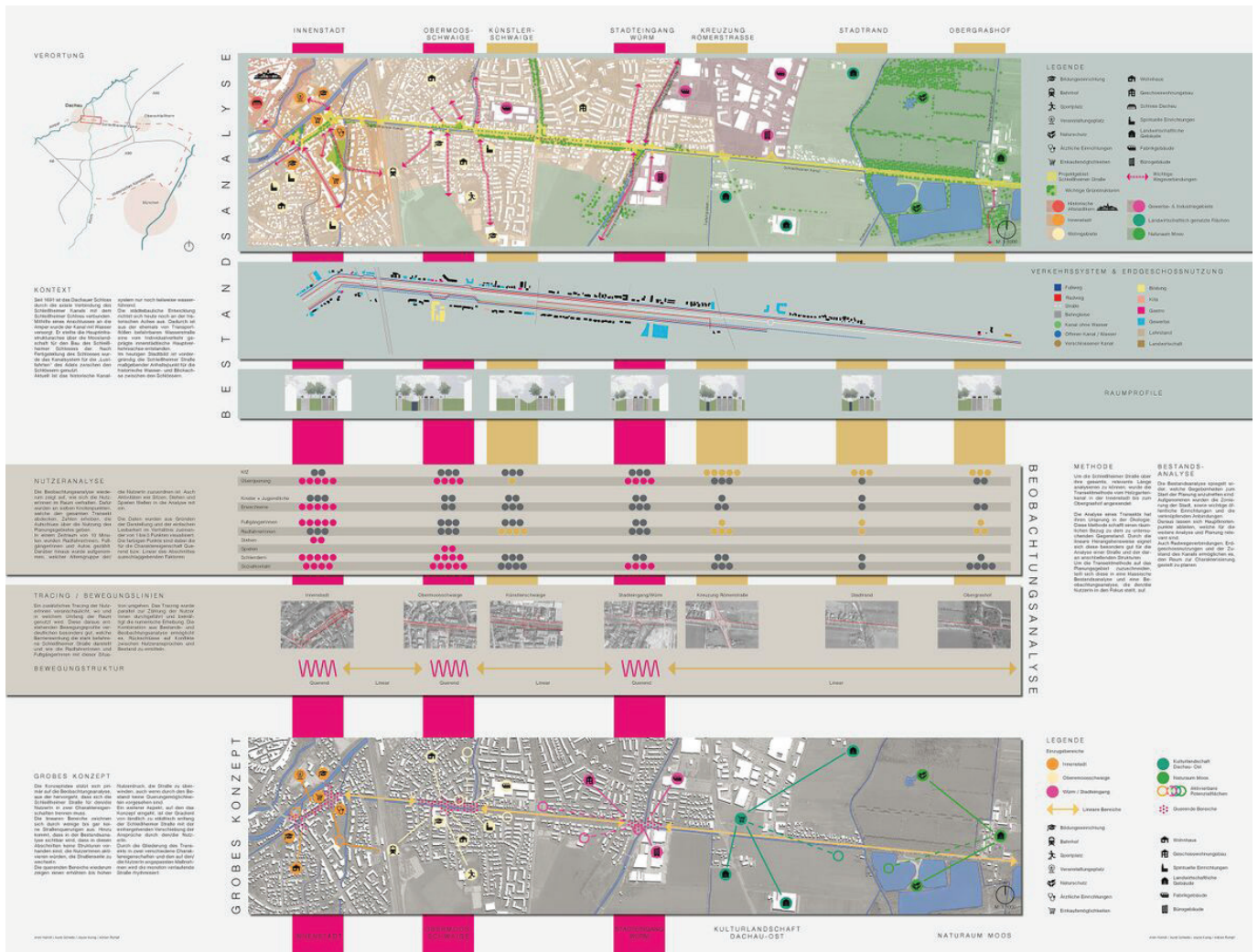
Historically, analyses along transects were applied in ecology, history and other disciplines related to urban and landscape design. Therefore, it was only logical to adopt the method to landscape design, too.

> "A transect, in its origins (Von Humboldt 1790), is a geographical cross-section of a region used to reveal a sequence of environments. Originally, it was used to analyze natural ecologies, showing varying characteristics through different zones such as shores, wetlands, plains, and uplands. For human environments, such a cross-section can be used to identify a set of habitats that vary by their level and intensity of urban character, a continuum that ranges from rural to urban. In Transect planning, this range of environments is the basis for organizing the components of urbanization: building, lot, land use, street, and all of the other physical elements of the human habitat."

Andrés Duany et al.,
SmartCode & Manual,
Miami: New Urban Publications, Inc., 2005

Based on these definition, the Transect method can be applied in the Living Lab both as a participatory analysis and/or mapping method (e.g. in the form of Transect walks) and as a co-creative design method. Focusing on a line or a path helps to capture the high areal and spatial complexity of landscape or urban contexts in a simple linear form.

What are the goals of this method?

Why transects are a relevant method for participatory design processes?

Every movement (such as walking) is linear. Therefore, the linear observation of the context

Study work in the city of Dachau using the transect method for context analysis, use and behaviour mapping and concept development (Authors: Aron Haindl, Aurel Schedo, Joyce Kunig, Adrian Rumpf)

corresponds ideally to human perception. For this reason, the exploration and design of complex spatial problems along a transect is very well suitable:

- to structure complexity,

- to explain multi-functionality,

- to clarify interdependences and interactions,

- to create spatial systems and social patterns,

- to show insights instead of top views...

...by linear walking, thinking and composing.

In which situations can this method be applied?

The Transect method is suitable for both urban and rural contexts, and especially for water landscapes along rivers or coasts. It is appropriate for scientific landscape analysis and design development, combined with other methods such as mapping, behaviour mapping or interviews respectively story-telling. It is an easy method for practical participatory approaches: Walking along the transect with stakeholders and citizens to discuss issues can generate cocreative knowledge and help to discover local problems and potentials together.

How does this method work in practice?

• Along the water (river): Following a route or path where a certain perception is possible (land – sea relation, spatial dimensions, vistas etc.)

• Across the water: Representing a gradient (from mountain to sea/river, from rural to urban, from city edge to harbour etc.)

• Crossing representative and important landscape types, types of open spaces, social hotspots, heritage places etc. with potentials for strategic developments and design interventions such as urban acupunctures

• Crossing strategic places with potentials for green and blue infrastructure solutions.

Literature, links and references

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LESSONS LEARNED
from the WAVE Living Labs
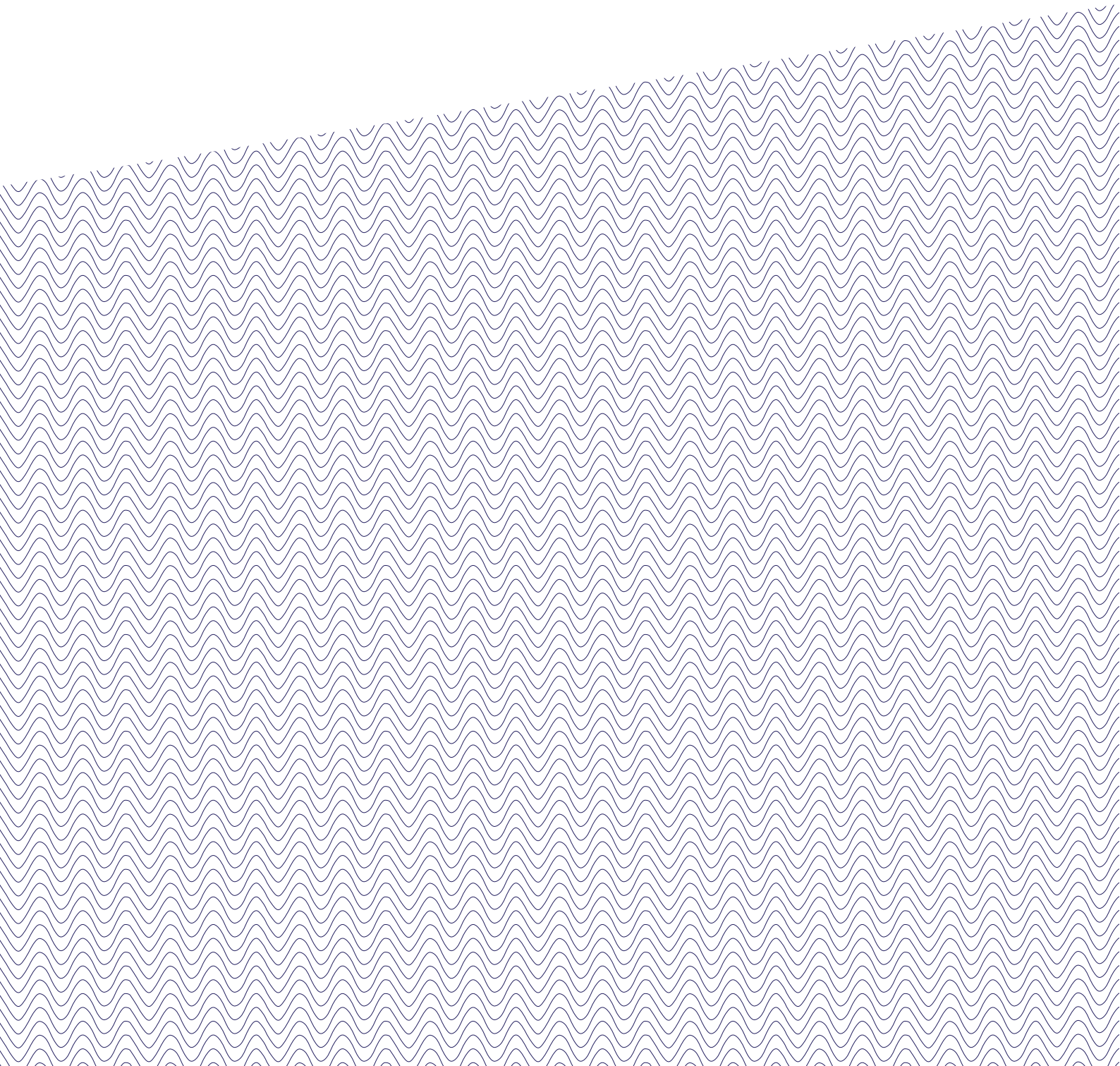
Lessons learned from the WAVE Living Labs

Teachers and students both learned by our 'reflection in action' while monitoring our experiences of studying water landscapes in the framework of blended learning in the living labs.

Water landscapes

We understood that landscape is a complex issue which is seen and understood in many different ways by people. The public at large is hardly aware of functions of water that are not directly visible, such as transport, cooling (housing, industry, energy), drinking water supply, irrigation, biodiversity, food production, etcetera. Local people are hardly aware of water landscapes in their environment. If they are, it is mainly about a nice spot for recreation, fishing, bathing, walking along the water's edge.

In metropolitan regions and within cities, the pressure on the landscape is high due to urban developments and intensive land uses. Certain landscape elements originally shaped by water, such as drained moors or piped streams, are hardly perceptible any more and are therefore not assessed as valuable.

Water only comes to the agenda to authorities, residents, and civil society when there are real challenges such as flooding, pollution or a threat to their direct living environment such as having no more access along water features, or as an obstacle for urban developments such as building residential and/or commercial areas and enlarging streets.

It is important for planners as well as for politicians and community members to understand water not only as a feature, but to grasp the functioning of a water system: the watershed, the processes, the relations between land-use, run-off water, surface water, and groundwater. The WAVE seminar helped all to gain a better understanding. So for all stakeholders it is important to explore and clarify how the system works, what the main challenges are, and how it impacts them.

Living labs

The WAVE partners experienced a big difference and gaps between theory and practice, so there is a big need for valorising the results of research and transferring these to practise. The research should include the citizens' knowledge of local people that is developed in a collaborative way. Having said this, we experienced that communities need to be informed and supported by specific knowledge on water systems and scapes, to build capacity within the living lab. In this way a living lab approach is well suited to bridge the gaps between theory and practice.

The live time of Living Labs overarches the regular time span of a course or studio work. So the living lab process needs to be organised in phases to which educational activities are linked. The lab activities should not only include planning and design activities, but also other modes such as participatory walks, hands-on work, festivals, and parties. The collaboration needs to connect to local schools, primary and secondary, to enhance awareness and future engagement. For sustainable development of WAVE living labs these should be linked to a broader context, such as in Brussels to the Louise lab: urbanism, infrastructure and urbanism as well as social issues. An institutional framework that includes local and regional authorities, decision makers, water boards, NGOs, and academies could support an integral landscape approach that is connected to the challenges of WAVE labs.

Either a university or another organisation needs to take up a long term commitment for the living lab. There should be a curator and a well organised collaboration with local authorities, communities, NGOs that represent water related themes such as biodiversity, recreation, and heritage.

Communities and communication

A living lab needs to use multiple ways of communication, both analogue and digital, oral, written and visual such as drawings, schemes, maps, photos, and videos. For this the lab can make use of existing channels such as local newspapers, social media, local television, and exhibition centres. Artistic interventions, performances, and placing spatial objects in the landscape help to raise awareness of what is going on and prototype solutions.

We experienced that only placing open invitations for activities does not work well, so one needs to directly invite people to events, workshops, etcetera. These invitations can be based on the power mapping and overview of stakeholders, in order to be inclusive and not only invite regular representatives of civil society, stakeholder groups and decision makers. To engage communities with the aspect of water it helps to provide them with a place near the water: to be there, to connect, to experience its value and the challenges.

Competences of academics

The WAVE course has defined learning aims and learning outcomes for the course and the project. Since the project embraces the concepts of participatory action research and learning, knowledge development is both for students, teachers, researchers and community members.

The teachers and tutors experienced that while they have a general competence on the various dimensions of water features and water management. They acquired in the WAVE project a better understanding of the systems

approach. To address challenges in an integrated way one needs to understand the water landscape system with its elements, processes, and driving factors. By the living lab process, academics acquired additional competences for organising collaboration, organising inclusive events on landscape perception, making use of urban gaming and other playful methods. They also learned to facilitate dynamics of a community process, where one needs to take on another role. Shifting from projects that are led by research questions and commissioner briefs to supporting the vaguely defined needs of communities. Academics need to take on the position of engaged researchers and planners.
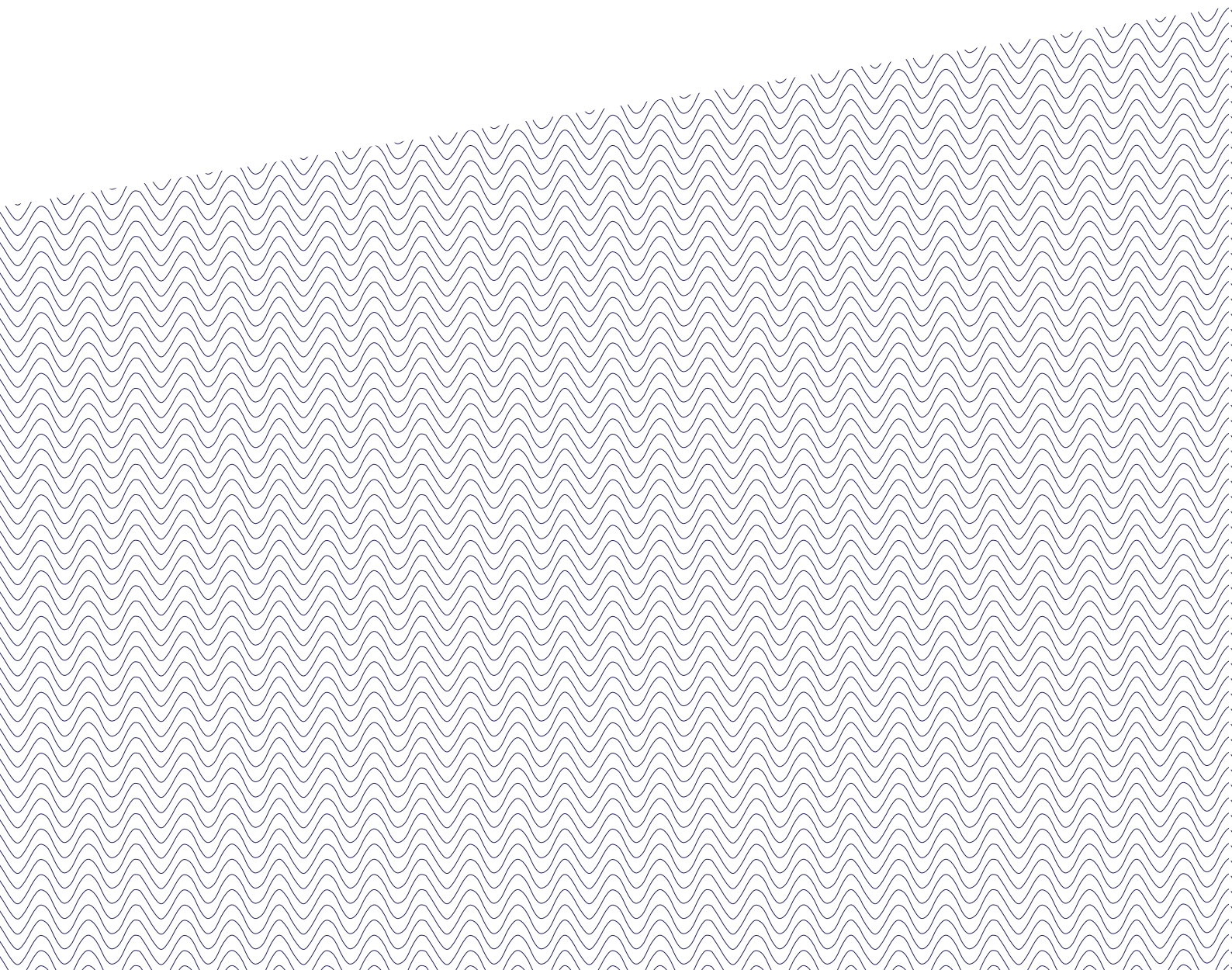
WAVE OUTLOOK
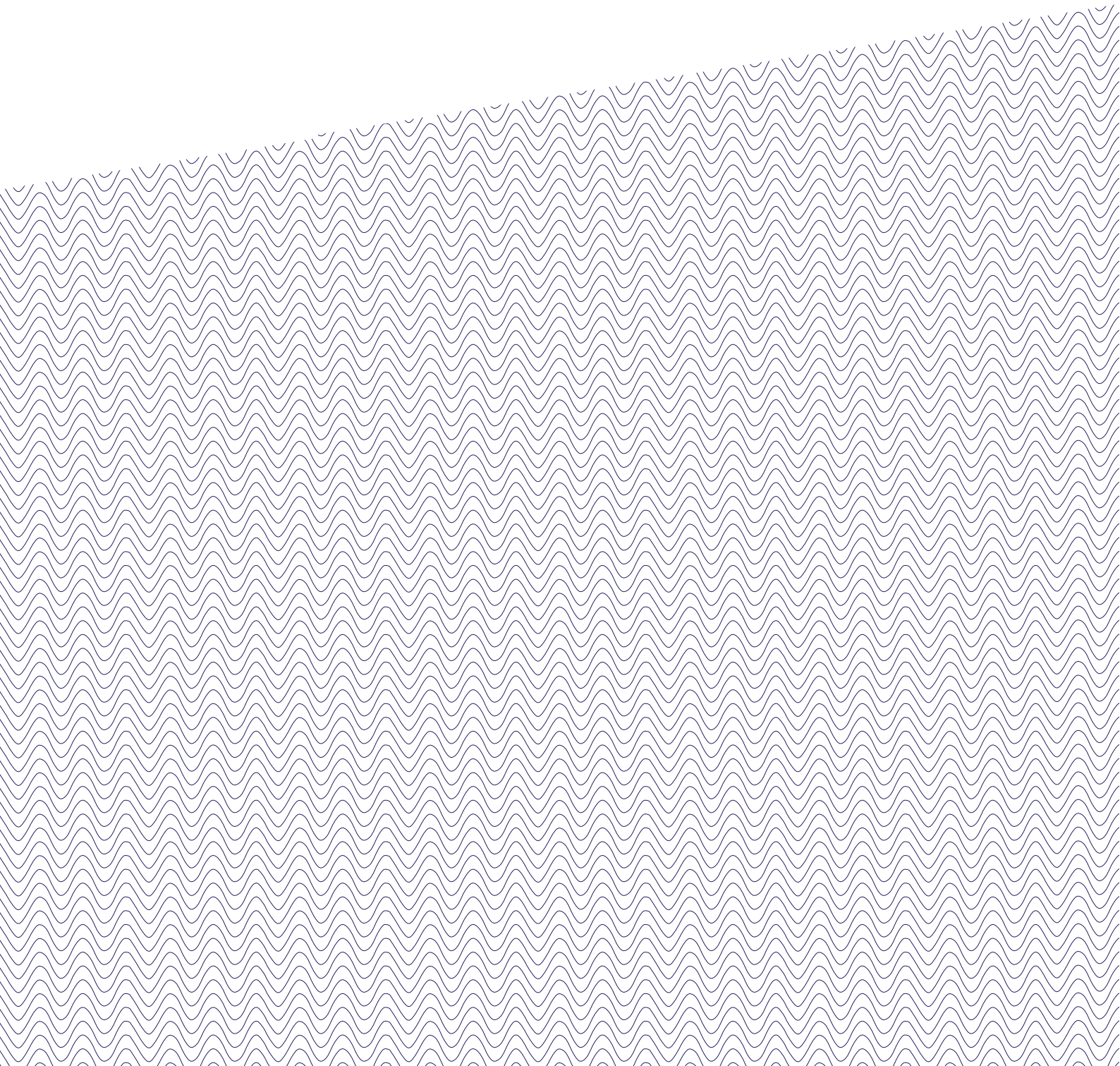
Outlook of the WAVE

The WAVE partners aim to continue with the living lab process, while the intensity and the scale varies. It is important to build on the knowledge WAVE has gained and to make sure that not every student and researcher starts from scratch. In that sense, internal communication and continuing transfer of knowledge, results and ideas to the public and the living lab community are crucial. This is done by connecting the process to new research projects, ambitions of local authorities and NGOs, or addressing challenges that are recognised by communities or the public at large.

The current and future research projects of Naples, Constanta and Tartu often have a wider scope linking waterscapes to biodiversity, sustainable development of cities. Freising sees potential for further activities in the new-founded Peatland Science Centre (PSC).

Linking to local strategies and ambitions can support the continuity of living labs. For this Tartu connects to the preparation of Tartu as a Cultural Capital. In Brussels and Constanta it has been demonstrated that an active discussion between students, academics, locals and decision-makers can be very fruitful and benefit the landscape. The input of student workshops and studios in developing scenarios and innovative ideas can help the community and local authorities to formulate good arguments to the benefits for all.

To continue the involvement of local communities, partners aim to develop common spaces that are connected to water. In 2023 Nürtingen is facing the challenge of losing its last opportunity for creating a central river park because the town council is giving priority to housing. Being an engaged researcher also implies that one takes a stand, in this case by raising a petition for a central river park. While the saying goes: "the best helmsmen are ashore" partners in a WAVE living lab can no longer stay ashore, but are called to be involved into bringing about a transformative action.

Digital Living Labs

A future development of WAVE Living Labs can be the use of Story Maps for the collaborative process. Our experience with Story Maps in Freising, Nürtingen, Bucharest and Naples showed that it is easy to use and has powerful mapping and multimedia functions. It combines dynamic maps with images, narrative, and other media to visualise a theme or sequential events and can be easily shared via social media or embedded within a website. By this, GIS Story Maps can empower and engage stakeholders in participatory planning processes.

Success factors

Future initiatives can build upon water strategies that countries and regions are developing, which also relate to flooding and the scarcity of clean water. The living labs can be more successful if there is a challenge or an issue that is recognised by the city, region, or area. Finding partners and partner organisations who have a real interest in waterscapes: swimmers, fishermen, water boards, water companies, and nature conservation organisations can contribute to success. Examples of this are the water issue in Brussels that concerns flooding and water quality, or in Tartu collaborating with an NGO for biodiversity that includes the relevance of the Emajogi river.

The WAVE will continue

Beyond the live time of the project, the WAVE will not stop. Students who completed the blending learning and academics who contributed to the living labs will further develop an integrated landscape approach. They can make use of landscape knowledge about watersheds, cycles, and processes for addressing water challenges such as drought, water provision for agriculture and households, flooding, salination and lack of opportunities for leisure and recreation.

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