



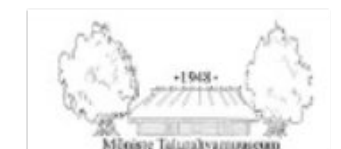
International Student Competition

Exploring Tartu Emajõgi and its watercourses

Winning teams and finalists

Working Period: October 2023 - January 2024

<https://forum.ln-institute.org/international-student-competition-2023-2024>



Weaving with Water

**Caroline de Vries, Malavika Mohan Das,
Mahan Esmaeili Zavieh, Ernesto Velasquez Gonzalez**

HfWU Nürtingen-Geislingen & HSWT Weißenstephan-Triesdorf, Germany

Drawing inspiration from Estonian folk textile traditions, we view blue-green infrastructure as the warp and weft of Tartu's urban fabric. Just as stories unfold in the regional weaving traditions in Estonia, water weaves the context for a new regenerative narrative with the landscape. A network of urban streams and bicycle and pedestrian pathways serve as a loom for abundant life, clean water, and diverse cultural and economic functions.

In our focus area, we offer a solution for how development in housing and business can integrate ecological value into the urban fabric and provide a legible transition from the city to the rural landscape, releasing pressure on valuable habitats. We support and expand Tartu's current planning and sustainability initiatives as part of an integrated blue-green system designed to maximize the benefit of Tartu's investments in the city and increase equitable distribution.

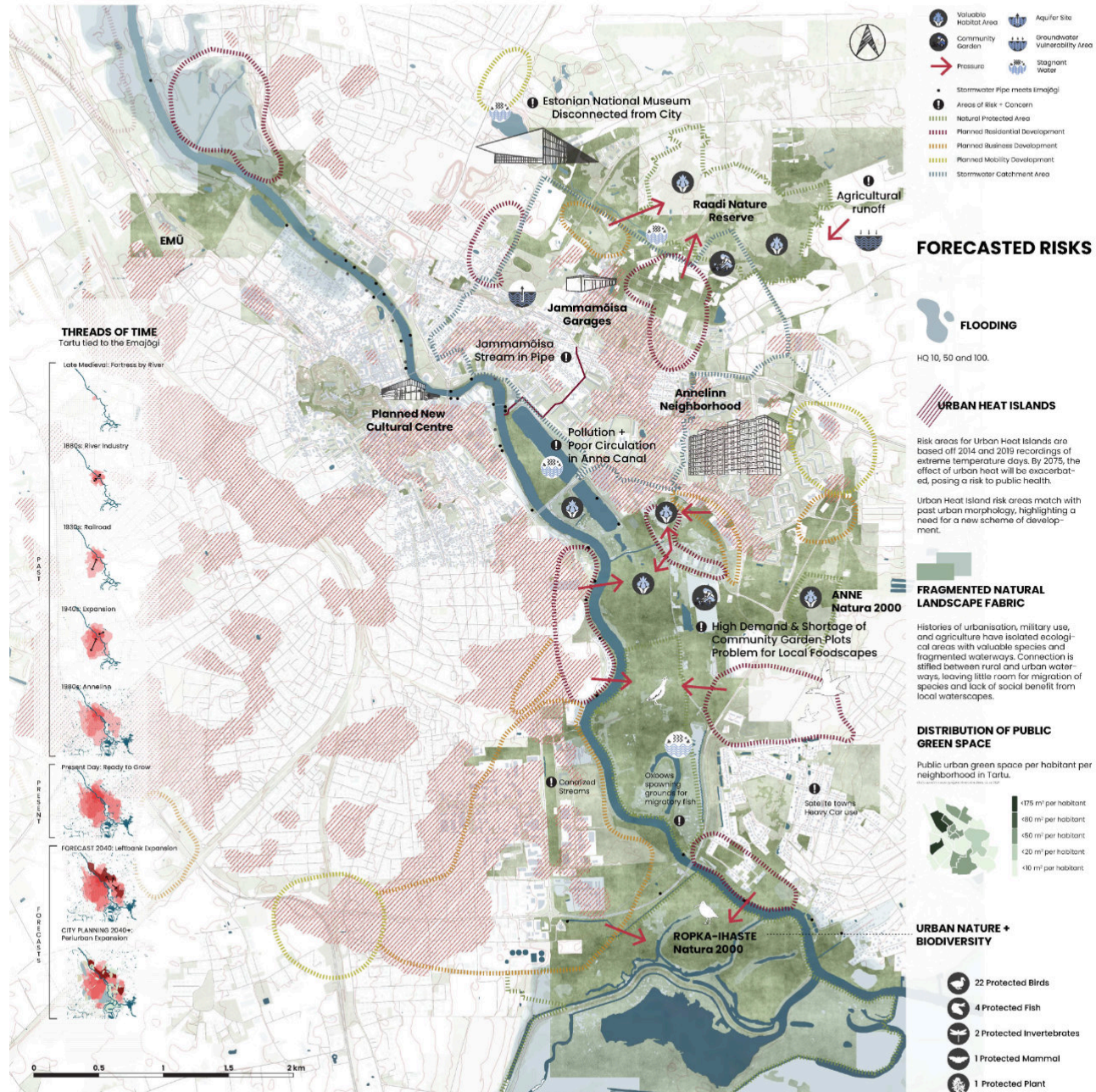
Where land meets water has a timeless attraction for social life and biodiversity. By designing a new orientation to water, Tartu provides new amenities to its people, supports social and intergenerational cohesion, and enhances urban life both now and in a climate-adaptive future. Our model exemplifies a scheme for other periurban areas in an interconnected green belt. Weaving with Water will be considered a success when an abundant context for ecological and public health and well-being is established. Within this network, each local participatory initiative will ensure that the people of Tartu can steward their landscape and waterscapes as they develop, and weave their own stories into the city.

**FIRST
PRIZE**

In the coming 50 years, Tartu is planning development and housing in the periurban areas of the city to meet future needs of its population, driven by rising opportunities in Tartu's academic institutions and IT innovation. However, these areas put pressure on the valuable ecological areas that neighbor and overlap with planned development sites. We offer a solution that meets the demands for development while practices water-sensitive design.

WEAVING WITH WATER

ANALYSIS



FORECASTED RISKS

FLOODING

HQ 10, 50 and 100.

URBAN HEAT ISLANDS

Risk areas for Urban Heat Islands are based off 2014 and 2019 recordings of extreme temperature days. By 2075, the effect of urban heat will be exacerbated, posing a risk to public health.

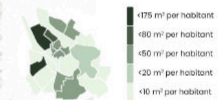
Urban Heat Island risk areas match with past urban morphology, highlighting a need for a new scheme of development.

**FRAGMENTED NATURAL
LANDSCAPE FABRIC**

Histories of urbanisation, military use, and agriculture have isolated ecological areas with valuable species and fragmented waterways. Connection is stifled between rural and urban waterways, leaving little room for migration of species and lack of social benefit from local waterscapes.

DISTRIBUTION OF PUBLIC GREEN SPACE

Public urban green space per habitant per neighborhood in Tartu.



**URBAN NATURE +
BIODIVERSITY**

- 22 Protected Birds
- 4 Protected Fish
- 2 Protected Invertebrates
- 1 Protected Mammal
- 1 Protected Plant

**STREET + AGRICULTURAL
RUNOFF IN THE EMAJÖGE**

Low permeability in the urban fabric leads to runoff of pollution and sediments in the Emajõgi, decreasing the water quality, threatening aquatic life, and limiting the benefit of the river amenity.



URBAN STREAM SYNDROME
As seen in Jammamōisa Stream

watercourses in pipes

dams blocking movement

high river banks

straightened watercourse

pollution from street runoff

lack of biodiversity

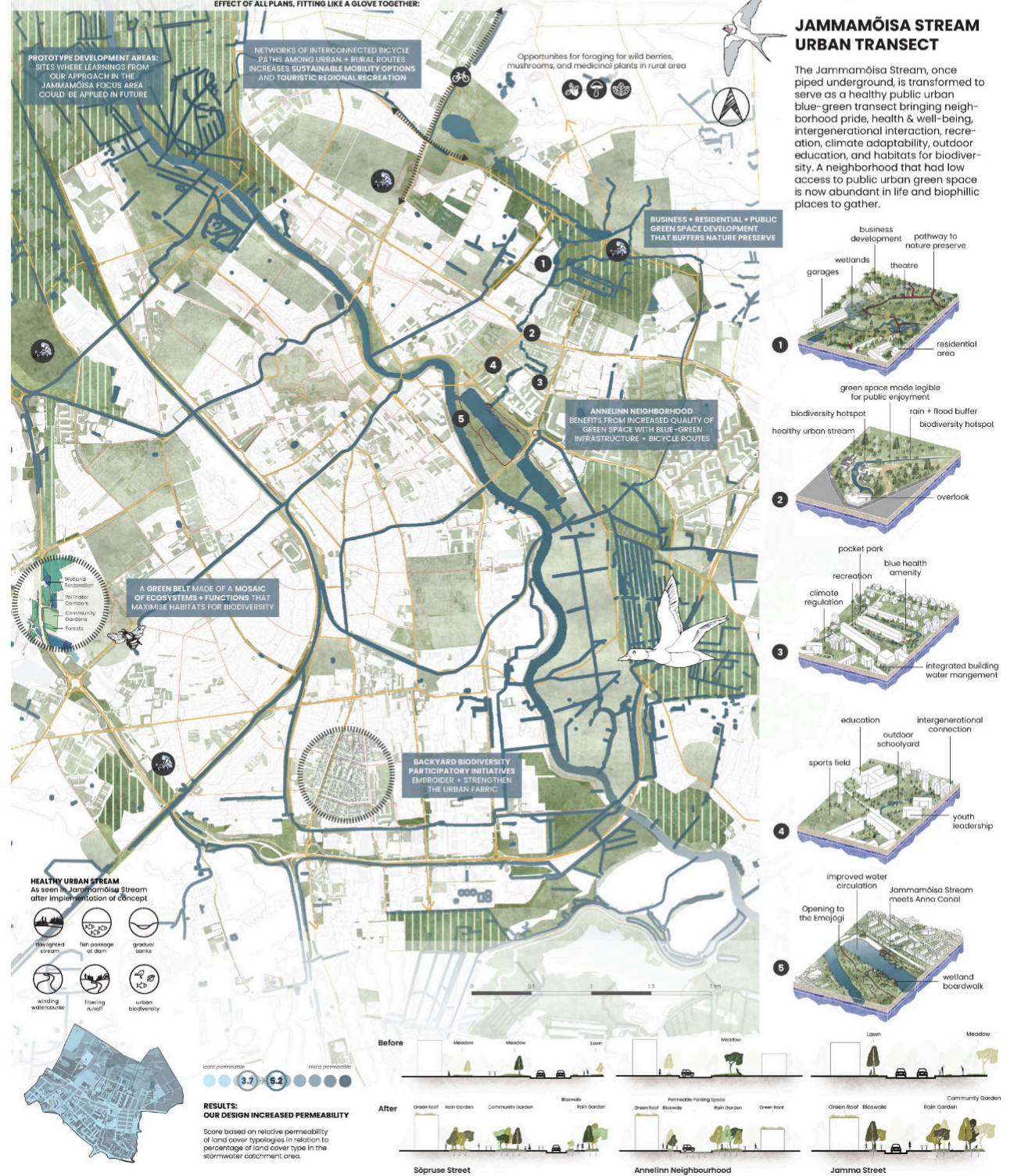
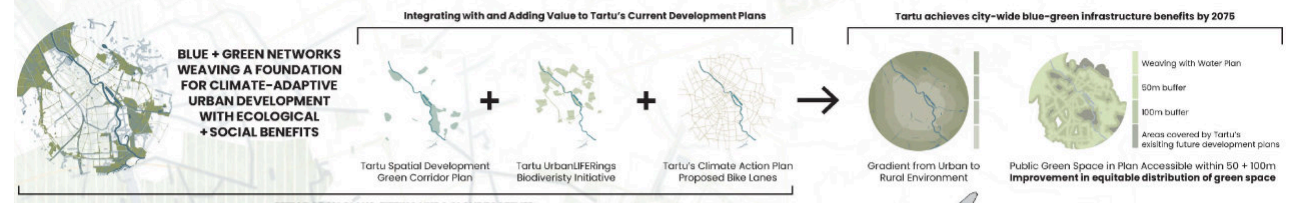


JAMMAMŌISA STREAM:
AT THE CENTER OF DEVELOPMENT
HIGH POPULATION DENSITY
NATURAL AREAS AT RISK

**BLUE + GREEN NETWORKS
WEAVING A FOUNDATION
FOR CLIMATE-ADAPTIVE
URBAN DEVELOPMENT**

WEAVING WITH WATER

CONCEPT



WEAVING WITH WATER

FOCUS AREA



WEAVING WITH WATER

SYSTEM MODEL



PermaTartu

**Yanis Becquart, Steffen Both,
Ryutaro Hanzawa**

Sapienza University in Rome

The Emajogi river is the main feature of the urban landscape and life in Tartu, both today and in the past. In order to secure the future of Tartu as a climate-resilient city, it was first important to understand the main threats and potentials of Tartu's urban history and development

With increasing precipitation events during ongoing urbanization, it is vital to ensure a permeable urban landscape and society.

Our project therefore investigates the watercourse of the Emajogi river and the city as a whole with a particular focus on the aspects of permeability and accessibility. Focusing on the area around the Anne Canal, we as a group have identified three areas that offer particular challenges and opportunities.

The unused green space by the Emajogi river is to be renatured to serve as a wetland and attract a greater diversity of species. Nevertheless, the population of Tartu should be encouraged to visit the area for recreational purposes by means of a sensitively designed route. Clear rules are intended to make coexistence work and demonstrate the great value of nature in the city.

Since there are hardly any places to stop and linger in the chosen area, the usability of the green space between the river and the canal is to be increased by means of low-key offerings, pathways, footbridges and benches, without increasing the amount of sealed surfaces.

The unused industrial site on the Emajogi river is to undergo the greatest transformation. Due to the location of the site directly on the

SECOND PRIZE

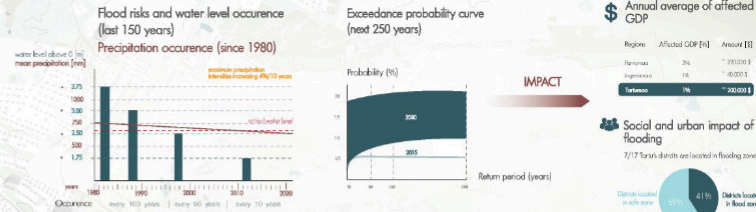
riverbank, this area offers enormous potential. The building is to be repurposed as a community lab for permaculture with a participatory educational approach. In addition, the aspect of meeting and sharing is a priority, in a urban area where the possibility of cultivating regional plants together is given.

In addition, space for various cultural events will be offered in the heart of the capital of culture.

This concept is intended to function in cooperation with the university of Tartu, schools, the city and its population and to be coordinated in a participatory process.

PermaTARTU 214

An analysis of the city development, the economical factors and the Emajõgi river as driving force of Tartu led us to the question of the permeability in Tartu. The project focuses on the effects of future flooding on the emajõgi river and surface permeability in the urban area of Tartu. This site analysis aims to identify the strengths and weaknesses, as well as the opportunities and threats of the emajõgi river and the city land use. The aim is thereby to develop concrete proposals for land conversion and the integration of urban wetlands in particularly endangered areas.



PermaTARTU 214

Embracing state-of-the-art ecological design, we propose an urban landscape that seamlessly coexists with nature, prioritizing green infrastructure, biodiversity, and climate resilience. With a focus on achieving high permeability and accessibility, our aim is to create an environment characterized by permeability, superior urban quality, and a resilient economy. Ecologically, we recognize the importance of wetlands and green spaces, emphasizing the natural integration of blue infrastructure as a vital element for a diverse and resilient ecosystem. By enhancing the accessibility and use-friendliness of blue-green infrastructure, Tartu has the potential to provide an urban setting conducive to interaction and well-being. From an economic standpoint, our vision nurtures local entrepreneurship and resource efficiency, fostering a thriving urban economy while remaining adaptable to future challenges posed by the impacts of climate change.

GOALS

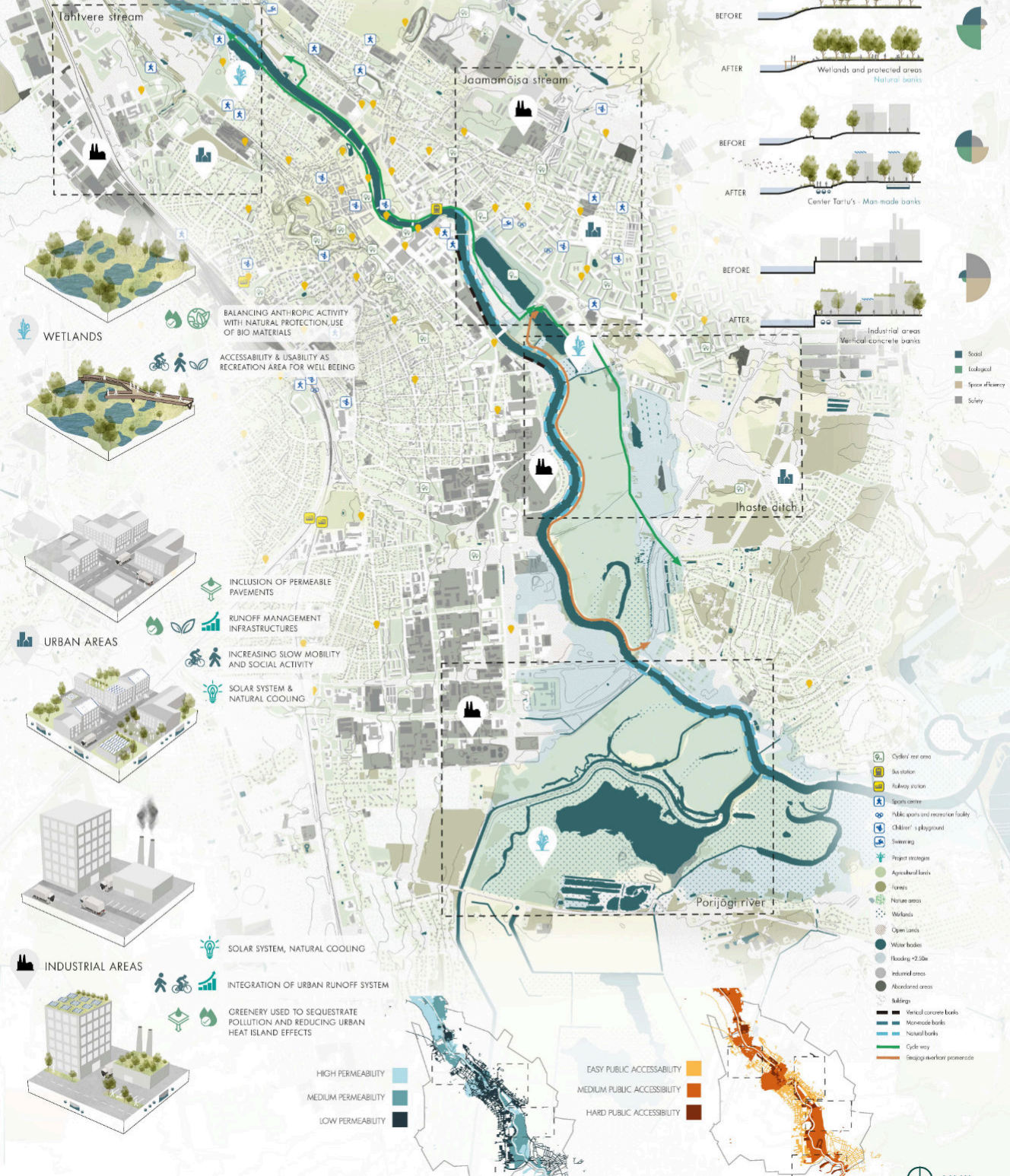
- MITIGATE CLIMATE CHANGE IMPACTS
- URBAN LIVABILITY AND ECONOMIC RESILIENCE

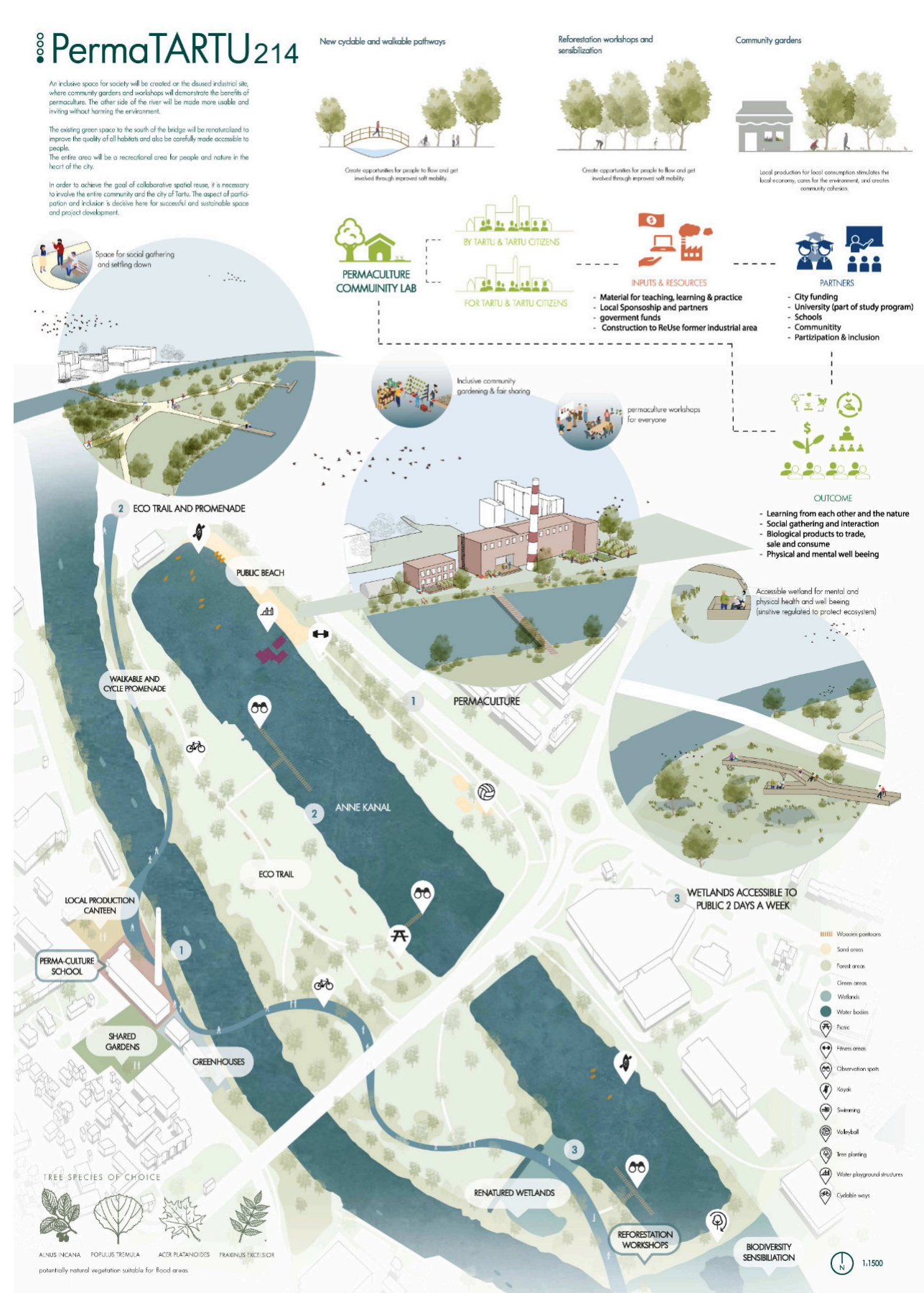
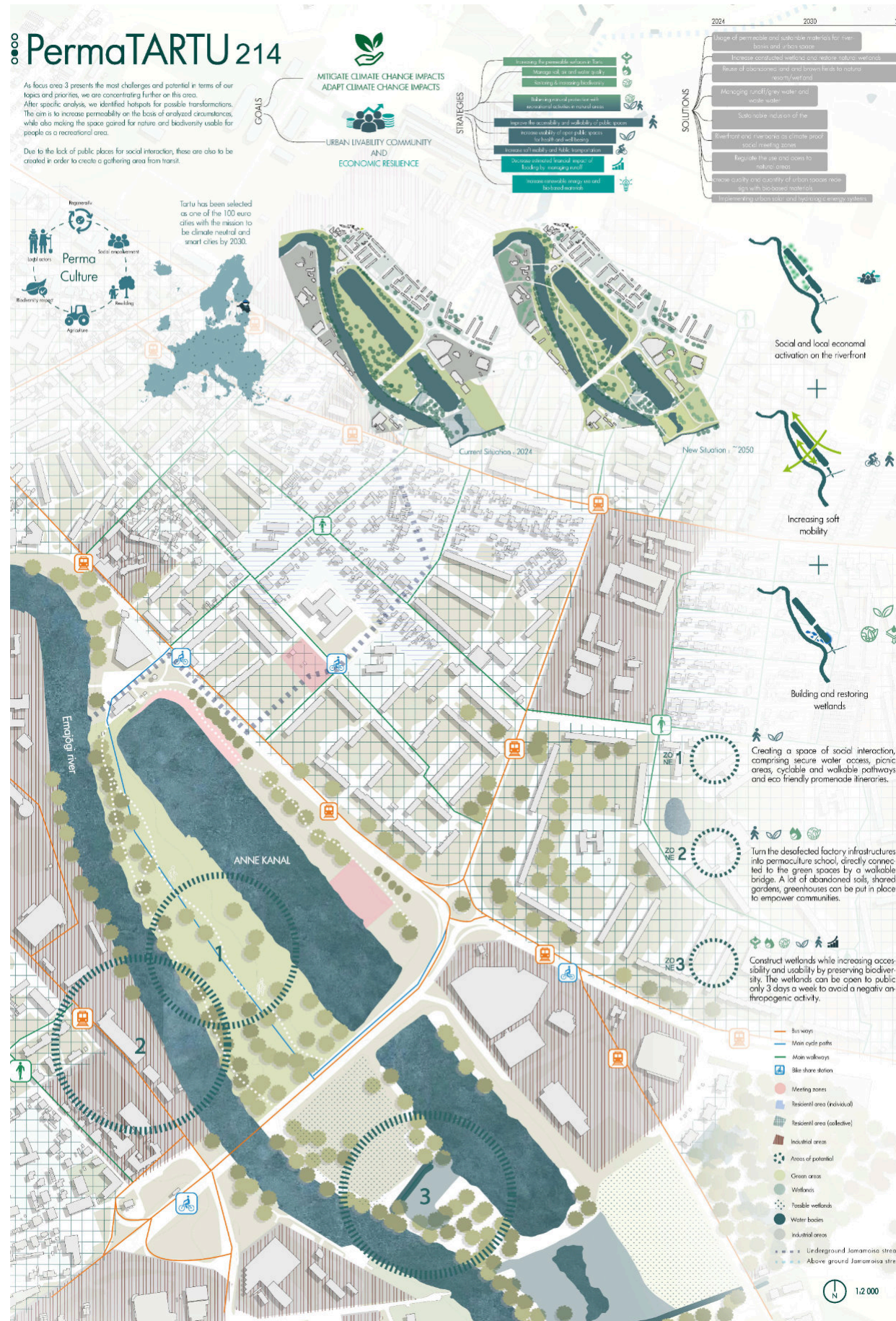
STRATEGIES

- Increase the permeability of surfaces in Tartu
- Improve the accessibility and usability of public spaces
- Increase the sustainability of natural spaces
- Increase the sustainability of urban infrastructure
- Increase the sustainability of urban infrastructure
- Increase the sustainability of urban infrastructure

SOLUTIONS

- Integrate permeable and sustainable materials for river banks and urban
- Increase areas of constructed wetlands
- Base of abandoned land to natural marsh/wetland
- Flooded adaptation with water runoff and storage systems
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- Increase areas of constructed wetlands
- Base of abandoned land to natural marsh/wetland
- Flooded adaptation with water runoff and storage systems





Live in Harmony

Eren Caba, Alina Chomaeva, Rojan Kamyab, Ghazaleh Monshizadeh

Sapienza University in Rome

The vibrant student city of Tartu is facing challenges as the Emajõgi river, spanning 10 km through Estonia, has transformed into a hazardous area in Tartu. In response, our project initiative seeks to convert this adversity into an opportunity by implementing environmentally friendly and sustainable strategies. The project envisions diverse businesses synergizing to create livable, entertaining, and safe spaces along the river, with circular economy principles.

The most important risk that Tartu is facing is flood near wetlands, therefore We came into the idea that using Tartu's timber resources to construct new residential areas with timber and high-rise buildings, significantly reducing the carbon footprint. Flood risks are addressed with adaptable stairs and structures, also adding a fun element along the river bank. A botanical garden and education center on the left side contribute to wetland preservation and biodiversity education which all connected through new bicycle lane to give residence unique experience.

Zone 1 includes new local industry, while downstream offers a recreational area for tourists with sports and cultural activities. The project aims to create a nature-oriented environment by strategically implementing green spaces, residential developments, and eco-friendly industries, fostering synergy between residential, recreational, and industrial functions.

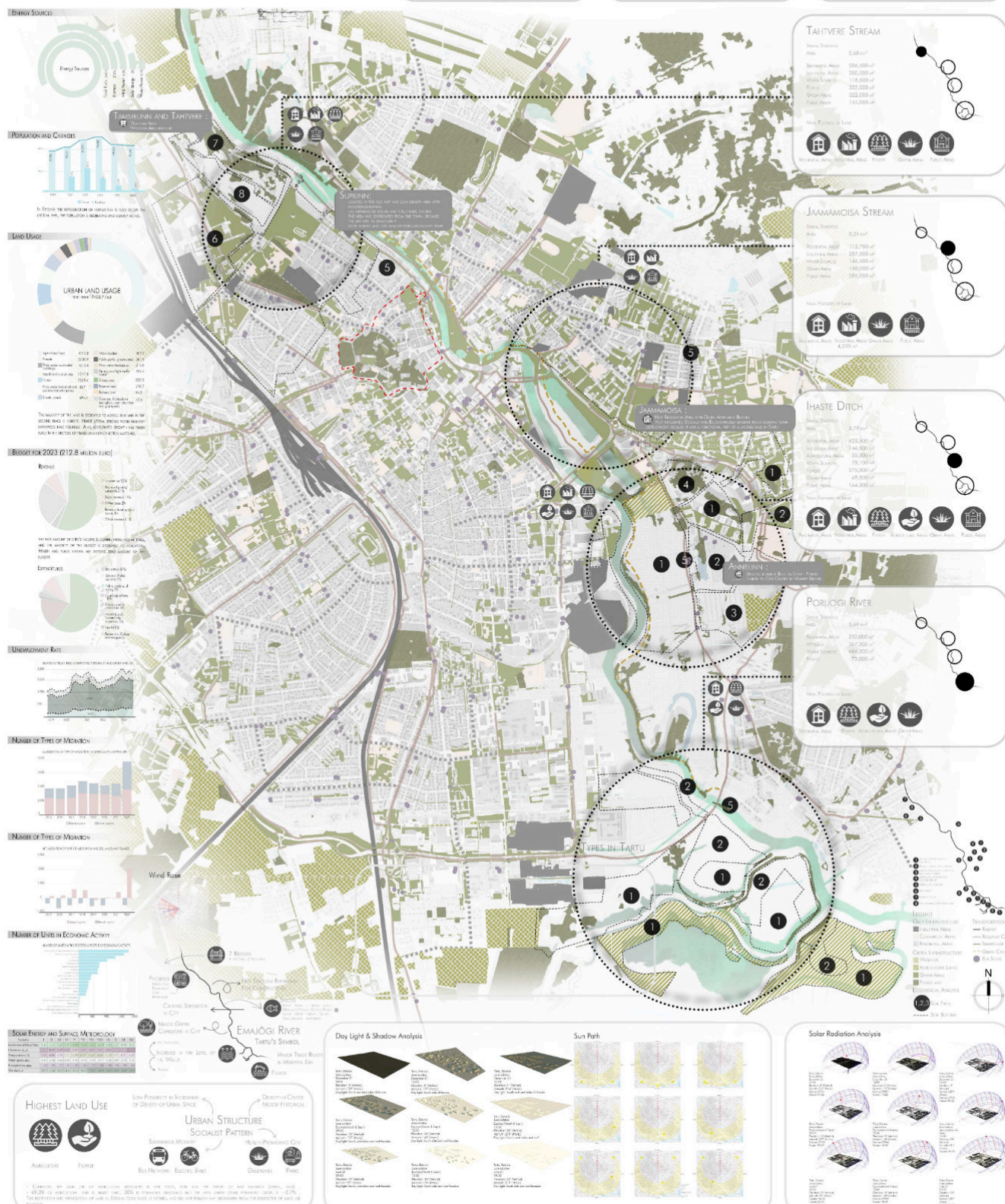
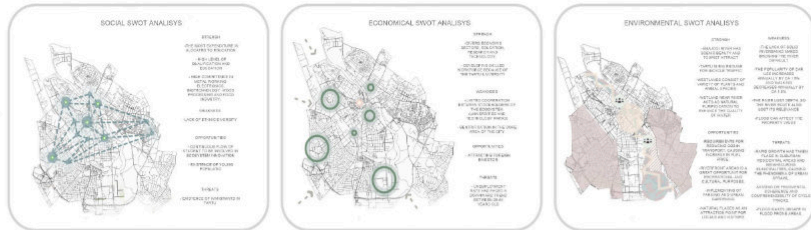
THIRD PRIZE

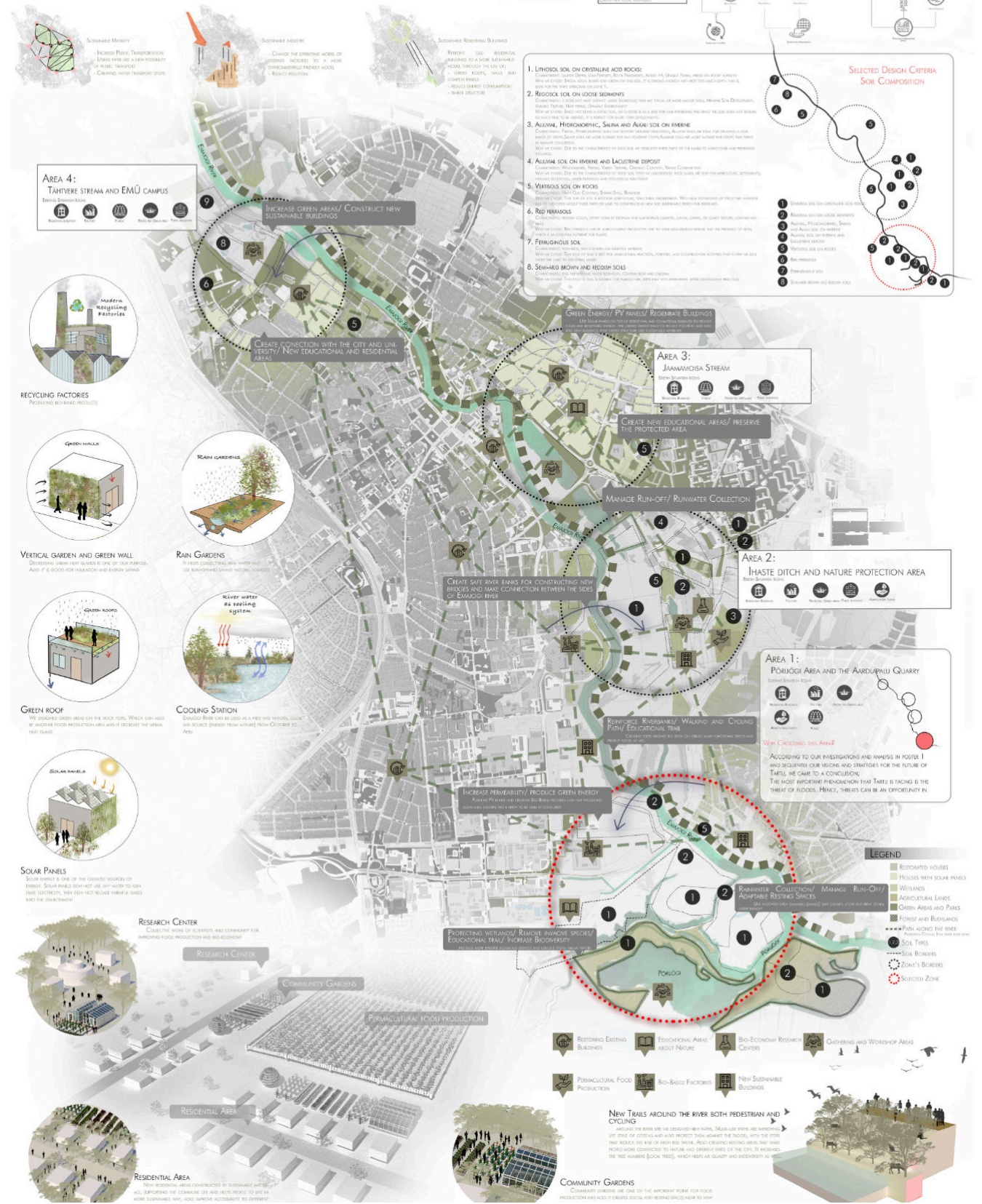
The transformation of the Emajogi river into a secure and enjoyable destination is envisioned to attract diverse individuals, providing memorable experiences and educational opportunities about the local environment.

Ultimately, the project holds the potential to draw people from various backgrounds throughout different days and seasons, enriching their understanding of their living environment and nature.



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LIVE IN HARMONY



INDUSTRIAL
USE ABANDONED AREAS AS A PLACE TO PUT NEW PV PANELS TO PRODUCE SUSTAINABLE ENERGY FOR PRODUCING CLEAN ENERGY FOR THE ZONE. ALSO USE THE RECYCLING FACTORY TO PRODUCE WOOD AND FUEL FROM THE TREES IN TARTU OR FROM THE LEFT-OVER OF THE DESTROYED BUILDINGS. BOTANICAL GARDEN TO PLANT NEW ENDANGERED OR COMPLETELY LOCAL PLANTS AND TREES, TO PRESERVE THEM AND GIVE OPPORTUNITY TO PEOPLE TO ENJOY THE RELATIONSHIP WITH NATURE.

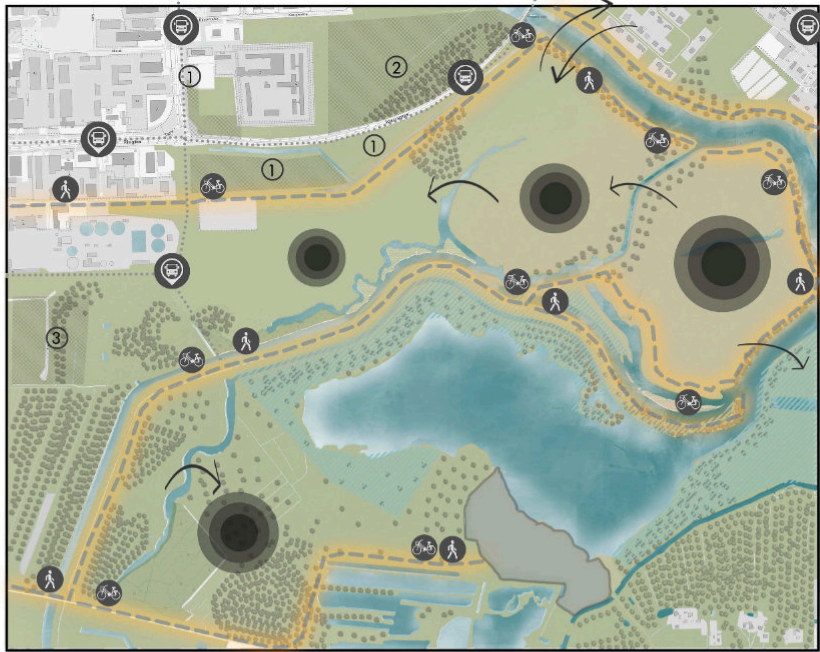
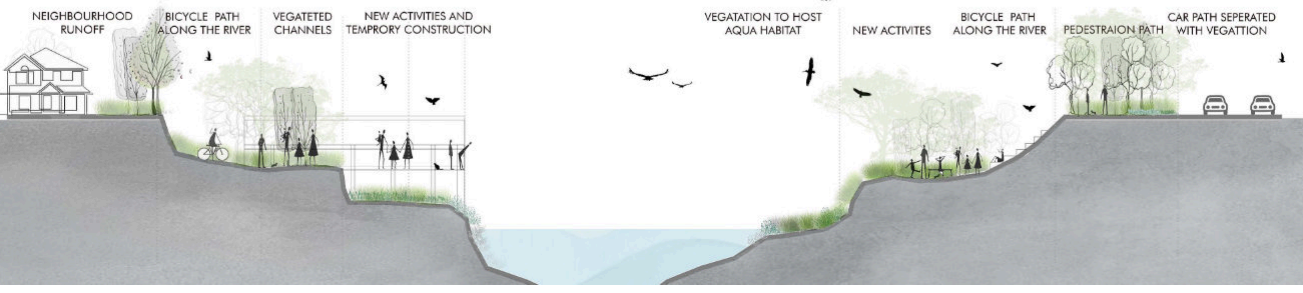
MOBILITY
CREATE NEW PATH AND BUS STATIONS TO CONNECT THE SOUTHERN PART OF TARTU TO THE CENTRAL PART AND BE MORE WELCOMING TO THE RESIDENTS WITH BEING MORE ACCESSIBLE TO ALL. NEW PEDESTRIAN AND BICYCLE FRIENDLY WOODEN BRIDGES TO CONNECT DIFFERENT SIDES OF THE RIVER TO EACH OTHER AND CREATE MORE USABLE AREAS FOR PEOPLE TO USE. EDUCATIONAL TRAIL IS A PATH, MOSTLY PEDESTRIAN AND BICYCLE FRIENDLY, WHICH GIVES THE OPPORTUNITY TO USERS AND VISITORS TO TAKE A WALK IN TO NATURE WITHOUT DESTROY IT. ALSO TO UTILIZE THE SIDE PARTS OF THE RIVER.

LANDSCAPE
CREATE A SAFE PLACE AT THE END OF THE RIVERS BRANCHES TO INVITE PEOPLE TO NATURE-BASE AREAS TO ENJOY IT ALL OVER THE YEAR WITH DIFFERENT EXPERIENCES. THESE AREAS DEPEND ON THEIR SOIL WILL CONTAIN CHANNELS TO COLLECT WATER AND CREATE A SUSTAINABLE RAINWATER SYSTEM. WETLANDS WILL STAND PRESERVED AND WITH THE PATHS CREATED PEOPLE CAN PASS BY THEM. NEW RECREATIONAL AREAS ARE DEDICATED TO NEW ACTIVITIES, MOSTLY FUN TO INVITE RESIDENTS TO USE THESE SCENERIES AND ENJOY THE RIVER.

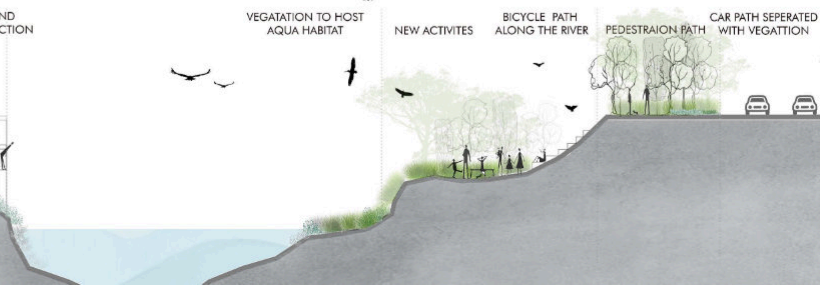
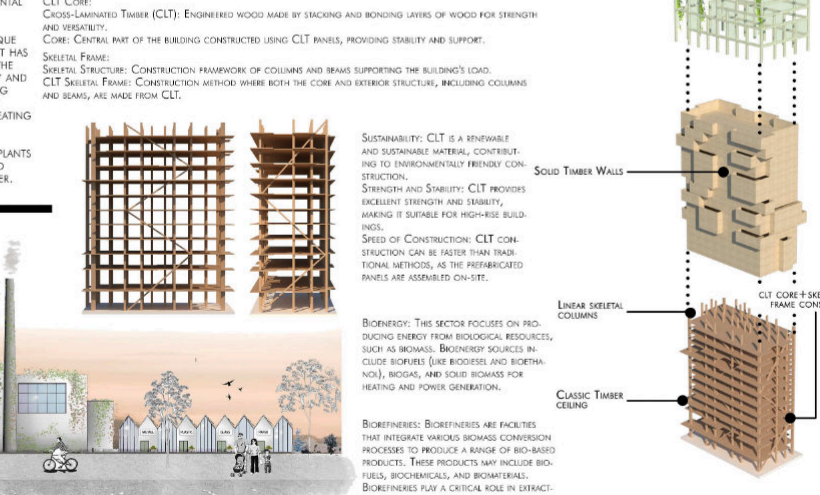
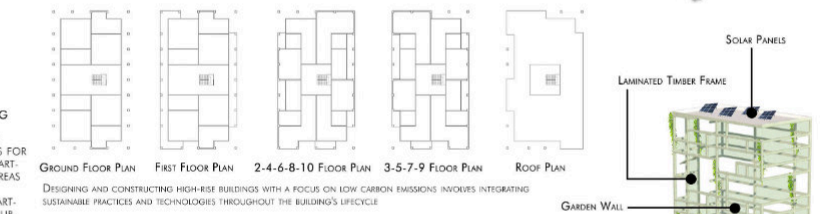
RESIDENTIAL
SUSTAINABILITY: TIMBER IS A RENEWABLE RESOURCE, AND USING IT IN CONSTRUCTION HELPS REDUCE THE CARBON FOOTPRINT OF BUILDINGS. TIMBER PRODUCTION REQUIRES LESS ENERGY COMPARED TO TRADITIONAL CONSTRUCTION MATERIALS LIKE STEEL OR CONCRETE, MAKING IT AN ENVIRONMENTALLY FRIENDLY OPTION.
ENERGY EFFICIENCY: TIMBER HAS EXCELLENT THERMAL INSULATION PROPERTIES, WHICH CAN CONTRIBUTE TO ENERGY EFFICIENCY IN BUILDINGS. TIMBER APARTMENTS CAN PROVIDE BETTER INSULATION, HELPING TO MAINTAIN COMFORTABLE TEMPERATURES AND REDUCE THE NEED FOR EXTENSIVE HEATING OR COOLING SYSTEMS.
CARBON SEQUESTRATION: TREES ABSORB CARBON DIOXIDE DURING THEIR GROWTH, AND USING TIMBER IN CONSTRUCTION HELPS SEQUESTER CARBON. THIS MAKES TIMBER BUILDINGS A POTENTIAL CARBON-NEUTRAL OR EVEN CARBON-NEGATIVE OPTION WHEN MANAGED SUSTAINABLY.
RECYCLABILITY: TIMBER CAN BE RECYCLED OR REUPLOUSED AT THE END OF A BUILDING'S LIFE CYCLE. THIS PROMOTES A CIRCULAR ECONOMY AND MINIMIZES WASTE.



TIMBER SOCIAL HOUSING
GROUND FLOOR AND FIRST FLOOR ARE THE SOCIAL AREAS FOR COMMERCIAL PLACES. 44 APARTMENTS AND 16 COMMON AREAS IS LOCATED IN EACH SOCIAL HOUSE AND THERE ARE 9 APARTMENT IN THE SITE WHICH IS SURROUNDING WITH ENVIRONMENTAL DESIGN.
EACH APARTMENT HAS UNIQUE DESIGN AND EACH APARTMENT HAS SUSTAINABLE MATERIALS. ALL THE FLATS HAS 16 M² BALCONY AND THE APARTMENT SURROUNDING WITH TERRACE FOR CREATING GREAT CIRCULATION AND CREATING GREAT SOCIAL AREAS.
ALL TERRACES HAS FULL OF PLANTS FOR FOOD PRODUCTION AND PLANTS ARE USING RIVER WATER.



- 1 NEW SOLAR PANELS
- 2 NEW SUSTAINABLE RECYCLING FACTORY
- 3 BOTANICAL GARDEN
- NEW RECREATIONAL CENTERS
- LANDSCAPE OF SITE
- NATURE BASE, OPEN AREAS ADAPTABLE TO DIFFERENT SEASONS
- NEW BUS STATIONS
- NEW BRIDGES
- PATH
- PRESERVED WETLANDS
- NEW BUS PATH
- NEW EDUCATIONAL TRAIL
- RESIDENTIAL AREA



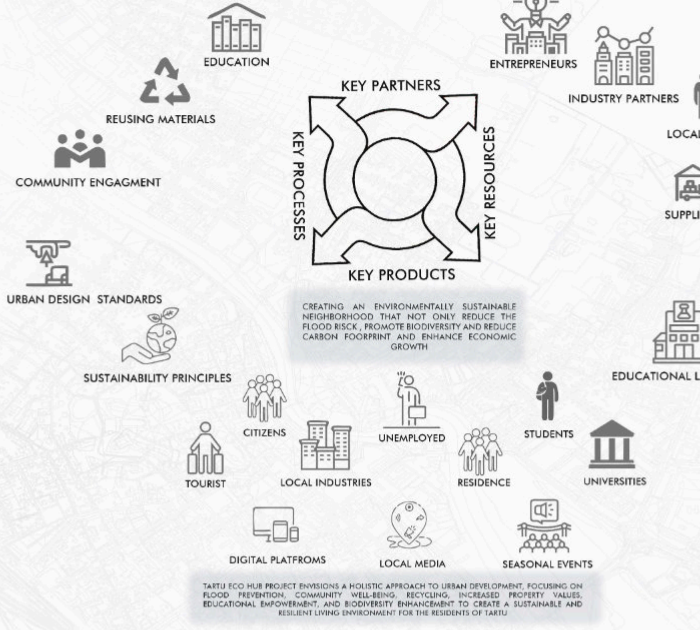
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LIVE IN HARMONY

FUNDING NAVIGATOR
MARINA MILLER
GRANT AND FUNDRAISING MANAGER
SHE IDENTIFIES FUNDING OPPORTUNITIES, WRITES GRANT PROPOSALS, AND BUILDS PARTNERSHIPS WITH ORGANIZATIONS AND DONORS WHO SHARE A COMMITMENT TO ENVIRONMENTAL SUSTAINABILITY.

COMMUNITY CATALYST
ERIK ROOS
COMMUNITY ENGAGEMENT COORDINATOR
HE IS A LOCAL RESIDENT AND COMMUNITY ENGAGEMENT EXPERT, PASSIONATE ABOUT INVOLVING THE COMMUNITY IN ENVIRONMENTAL INITIATIVES. HIS ROLE IS TO BRIDGE THE GAP BETWEEN THE PROJECT AND THE RESIDENTS OF TARTU. ANU ORGANIZES WORKSHOPS, TOWN HALL MEETINGS, AND PROGRAMS TO ENSURE THAT THE COMMUNITY IS INFORMED, INVOLVED, AND SUPPORTIVE OF THE WETLAND CONSERVATION EFFORTS.



A COLLABORATIVE TALE OF CONSERVATION

ECOLOGIST EXPLORER
MARKO TOOMAS
LEAD ECOLOGIST
HE BRINGS A WEALTH OF KNOWLEDGE AND EXPERIENCE TO THE PROJECT. HER ROLE INVOLVES CONDUCTING ECOLOGICAL ASSESSMENTS, ANALYZING BIODIVERSITY, AND RECOMMENDING SUSTAINABLE PRACTICES TO PRESERVE TARTU'S WETLANDS.
URBAN PLANNER
SOFIA LAANE
MUNICIPAL PLANNING COORDINATOR
SHE WORKS CLOSELY WITH THE MUNICIPALITY TO ENSURE THAT ANY CONSTRUCTION ACTIVITIES ARE CARRIED OUT IN AN ENVIRONMENTALLY RESPONSIBLE AND SUSTAINABLE MANNER. SHE FACILITATES COMMUNICATION BETWEEN THE PROJECT TEAM AND THE LOCAL GOVERNMENT.



Symbiotic Tartu

**Ruba Khaled Al-Hamzi, Asfia Islam,
Shamim Rokhsari, Diana Salazar**

Nürtingen-Geislingen University and
Weihestephan-Triesdorf University of Applied Sciences, Germany

Tartu is a continuously growing city in Estonia, with the Emajõgi river flowing right through the center of it. As it transformed it lost certain important natural landscape features; neglecting or burying the water streams, expanding on wetlands, loss of biodiversity and more which we explored further in the project by digging deeper and creating our base and overlaying the swot maps which leads the way to the concept, vision and mission.

Concept: Footsteps Towards The Future

Our strategic approach employs the Green-Blue Footsteps concept, strategically addressing a city's strengths, weaknesses, opportunities, and threats. Applying a methodical acupuncture-like transect along rivers and streams, we categorize footstep interventions into research, educational, public interest, and climate adaptation. Each focuses on specific city sections, fostering a greener fabric and water course management. Through three phased implementations over 30 to 50 years, we aim for sustainable urban development, mitigating challenges and enhancing resilience for a vibrant and eco-friendly tomorrow.

Focus Area

Knowing the pros and cons and the areas of opportunities that Ihaste Dich offers, such as its residential and commercial areas, its interaction with the forest, areas of protection and connection with the main river Emajogi and with our vision for the future we were able to choose Ihaste Dich for awareness, reconnection and activation of its population.

HONORABLE MENTION

Our proposal is divided into four zones, each zone has different interventions following the green-blue footsteps typology

Zone 1.- Riverfront Activation: Floating Gardens

Zone 2.-Educational: Floating Library, Botanical garden, Adm.research center, Retention point & Tree house (bird observatory)

Zone 3.- Semi-Urban park: Biomarkers & pocket parks & Community eco-park.

Zone 4.- Natural Retreat: Leisure corner for the elderly people, extension of tartu Oak tree park and protection of the flower Shining.

All these areas are connected by bicycle & pedestrian roads and these interventions are designed for different station changes in Tartu.

Transformation and Implementation

To transform Tartu into Symbiotic Tartu, we provide each zone with a footstep, monitored by administration. Locals earn points for eco-friendly services, redeemable for benefits like farmers market space or farming school priority. 3 Phases include community-engaged growth, riverbank naturalization, and by third phase, creating wildlife sanctuaries and integrating gardening into children's education will be achieved.

116 SYMBIOTIC TARTU GREEN / BLUE FOOTSTEPS

Analysis : Digging Deep Into Tartu

SWOT ANALYSIS

STRENGTH



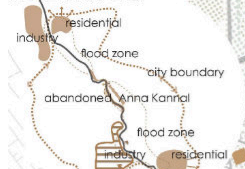
WEAKNESS



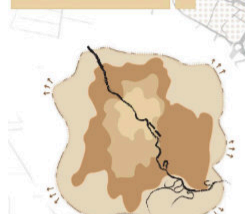
OPPORTUNITY



THREATS



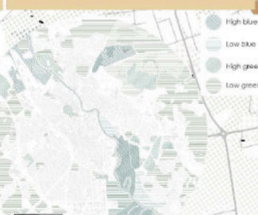
CITY GROWTH



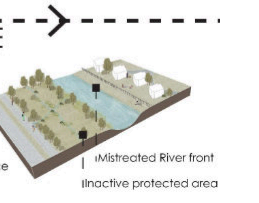
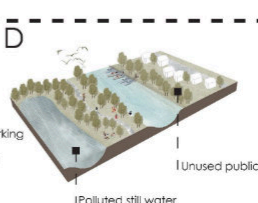
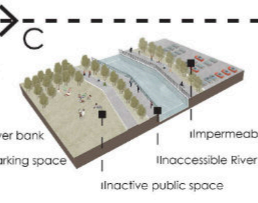
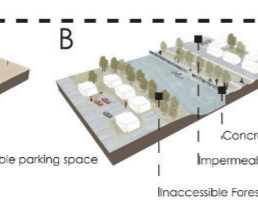
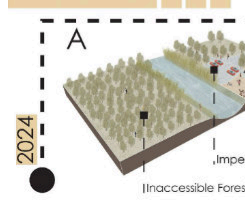
FUTURE DEVELOPMENT



LANDSCAPE VALUE MAP



TYPOLOGIES



Tartu is a continuously growing city in Estonia, with the Emajõgi river flowing right through the center of it. Tartu has transformed drastically in recent centuries losing certain important features: neglecting or burying the water streams, amongst other losses, which we will explore further in the project.

LOCATION



16 SYMBIOTIC TARTU GREEN / BLUE FOOTSTEPS

Concept : Footsteps Towards The Future

SWOT ANALYSIS



GREEN FOOTSTEPS



BLUE FOOTSTEPS



PHASE 2nd and 3rd



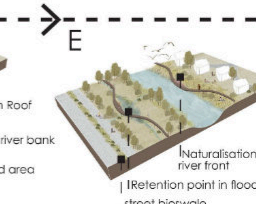
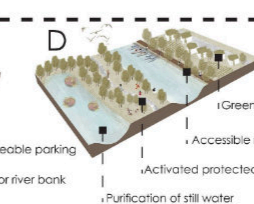
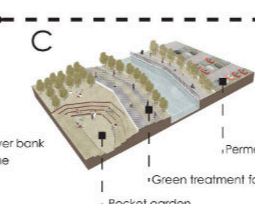
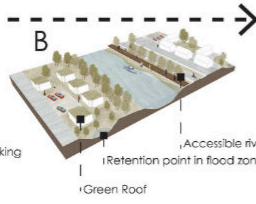
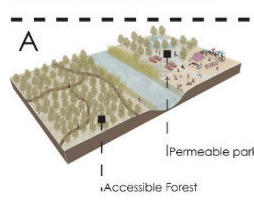
With the help of our analysis we were able to decide for each context what kind of footprint intervention is needed, and then phases that the city can have work on over the next thirty fifty years.

- PHASE 1
- PHASE 2
- PHASE 3

- Old City
- Residential
- Military
- Commercial
- Governmental
- Parking

- Beach
- Agriculture
- Grassland
- Forest/Shrubland
- Green areas
- Recreational

TYPOLOGIES



After realizing the importance of the river and the streams that once were, we decided to take the methodological approach of acupuncture along a transect. The acupuncture being out Green/Blue Footsteps and the transect being the Emajõgi River and the streams.

1 RESEARCH-EDUCATIONAL FOOTSTEPS

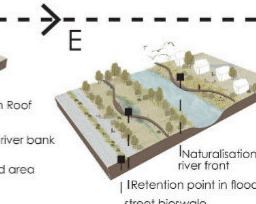
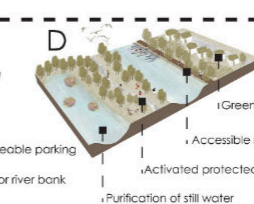
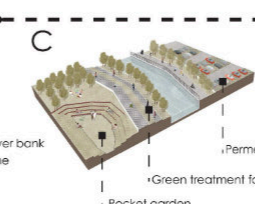
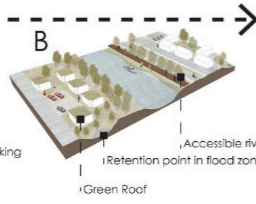
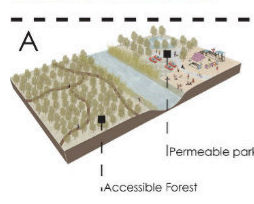


2 PUBLIC INTEREST FOOTSTEPS



As the name may hint a green footprint is working towards the green fabric of the area and the blue footprint is related to the waterscapes in context. Our vision of footsteps comes into three types: research educational based green/blue footsteps, Public interest based green/blue footsteps and climate adaptation activities based green/blue footsteps.

TYPOLOGIES



Co-Diary

**Xianjie Pan, Chenyue Meng, Bei Chen,
Xinyu Wang, Changhong Sun, Menglin
Huang, Hanqing Zhao, Zihang Zhou**

Huazhong Agricultural University

Co-Diary. Landscape as a solution to active urban vitality.

Emajõgi flows through different parts of Tartu, where rivers, people, and cities together create diverse landscapes. Nowadays, Tartu is facing the challenges of urban expansion and climate change, as well as the increasing demand for public space. Tartu is currently characterized by flowing rivers, convenient transportation, and a large area of natural open areas.

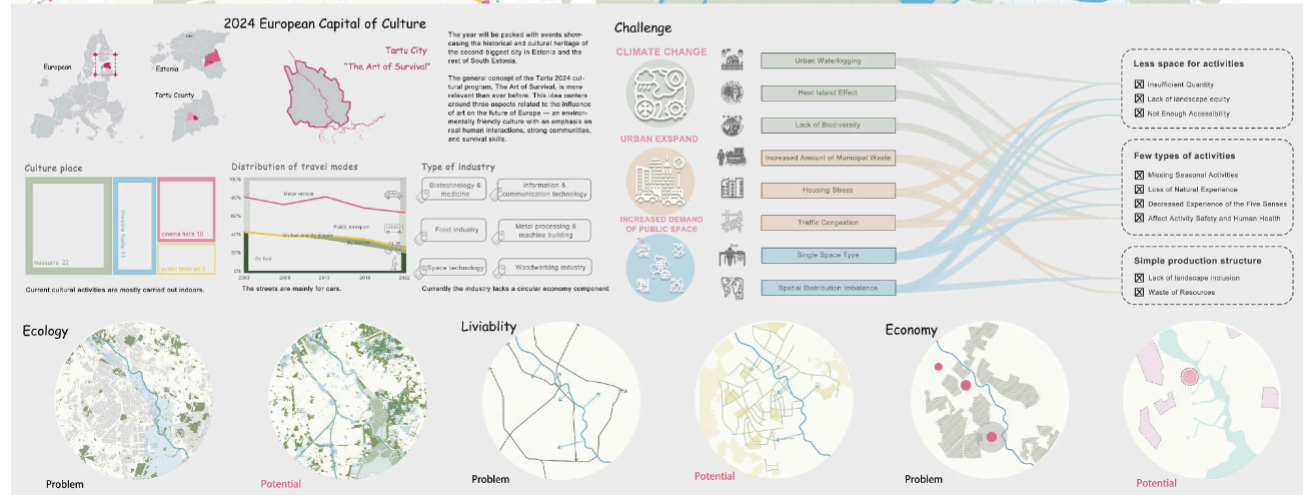
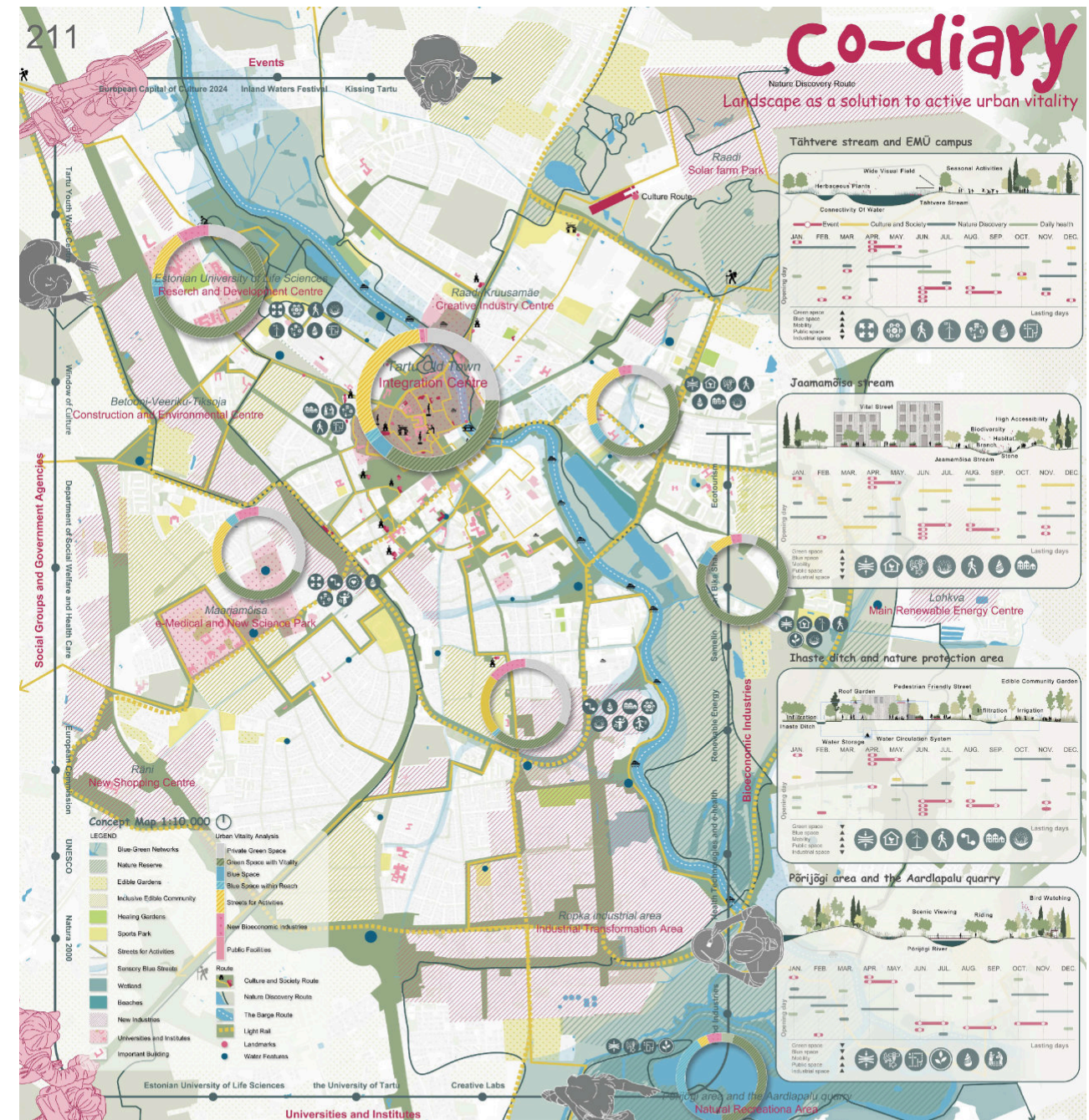
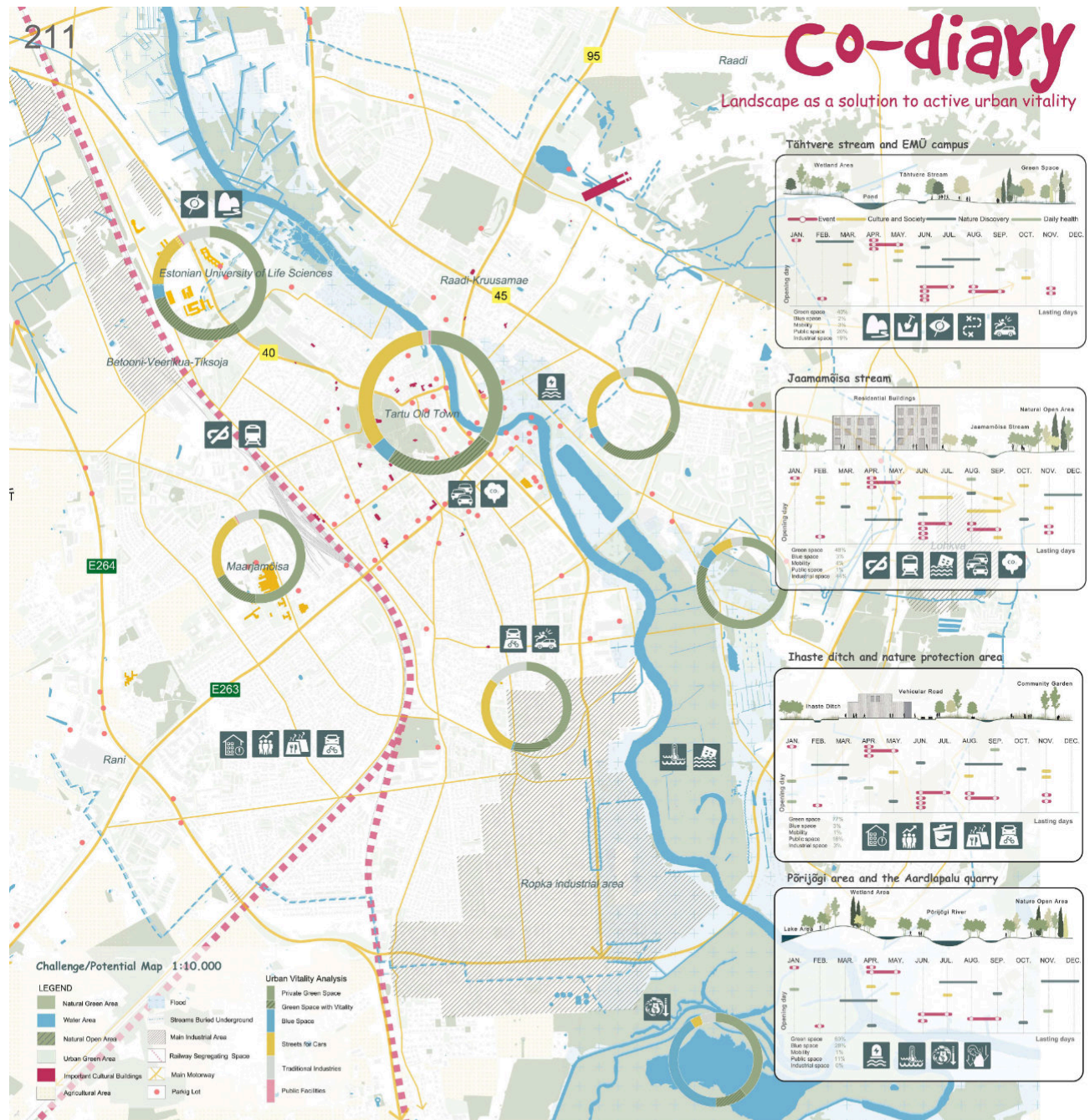
The concept of Co-Diary is to make Tartu a vibrant, blue-green city with shared prosperity, with universities, communities, and enterprises working together to shape the future of urban development. Existing green Spaces are connected to new ones, forming a resilient network with rivers that brings surrounding natural resources into the city. Healthy green infrastructure ensures the food security and mental health of citizens. Sensory blue infrastructure brings water features into the city and urban stormwater management ensures the safety of diverse activities. Streets are pedestrian-friendly and bike-friendly. Inclusive activities take place in the vitality urban area and are further linked to the surrounding unique natural areas. Renewable energy is being used to support the city.

HONORABLE MENTION

In a detailed focus area, the Estonian University of Life Sciences becomes the Research and Development Centre which is assembled as a demonstration area for the future bioeconomy. It brings together a mixed-use industrial cluster with a sustainable food industry at its core. Citizens, students, and tourists can

enjoy activities during the four seasons.

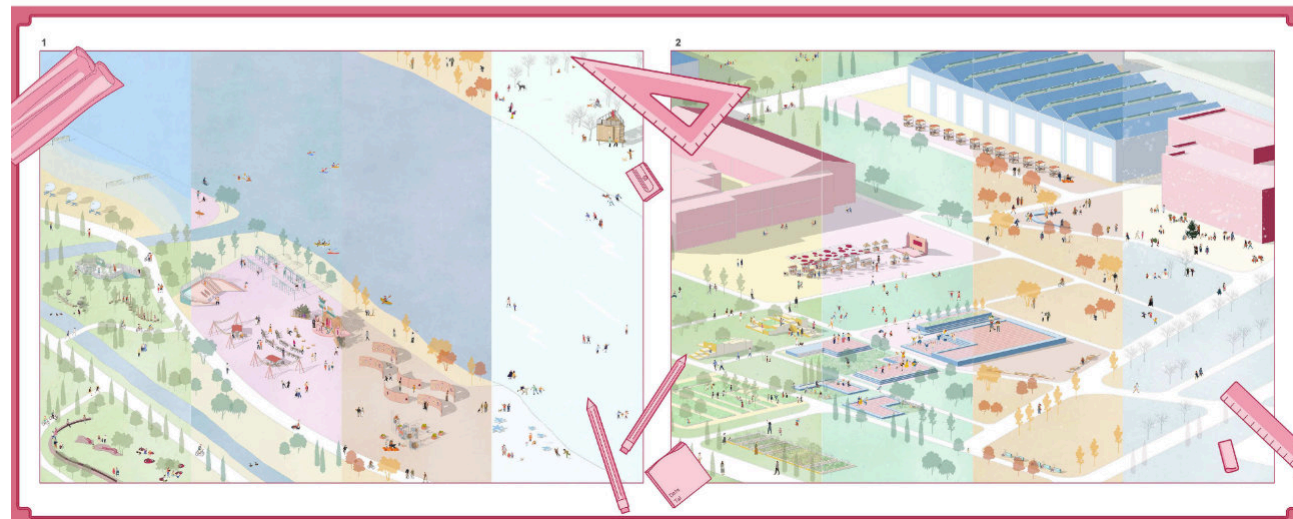
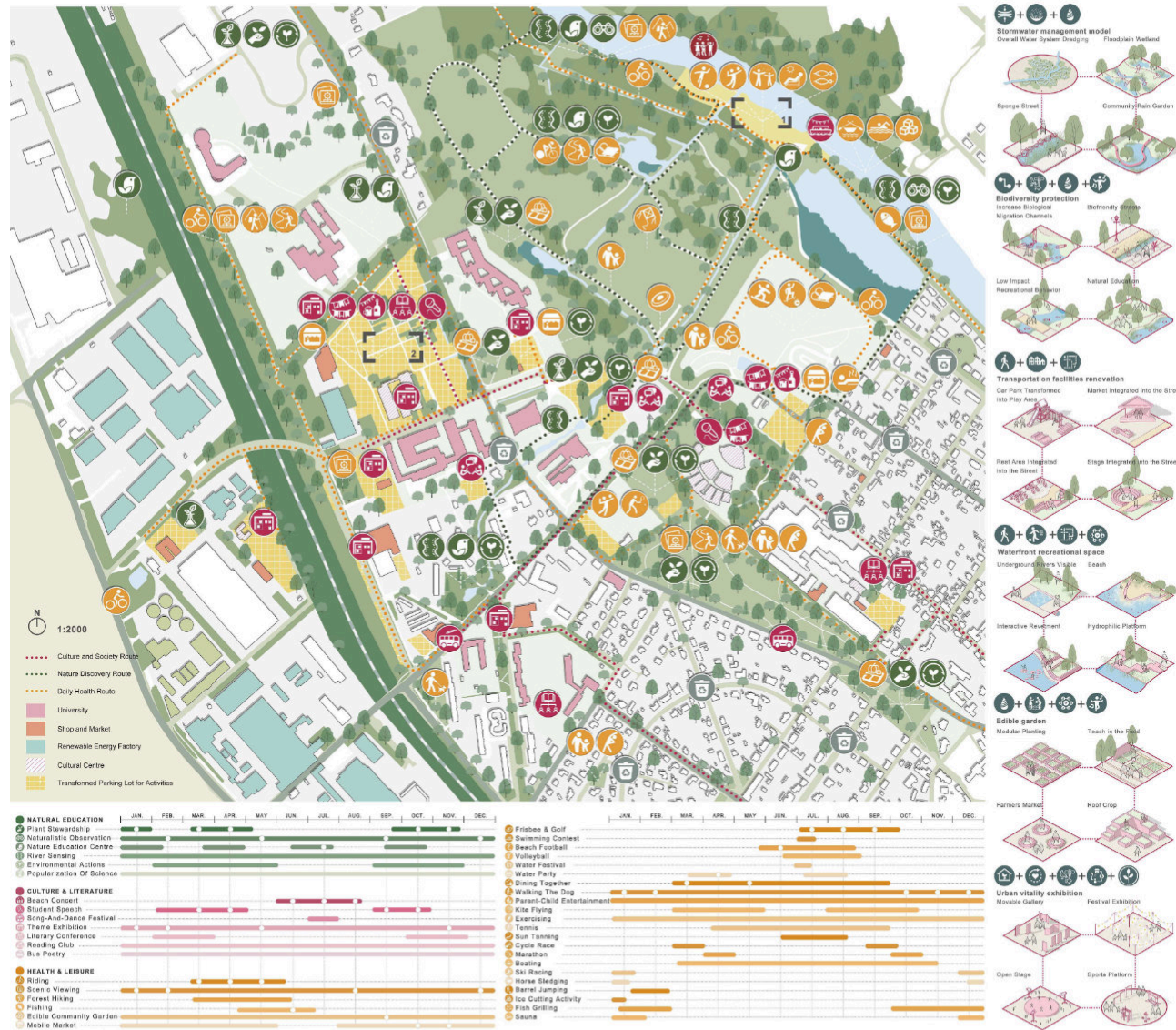
New activities are built through green, blue, and streets, interweaving new possibilities for living, working, and touring in the city. Tartu becomes a co-diary for all citizens.





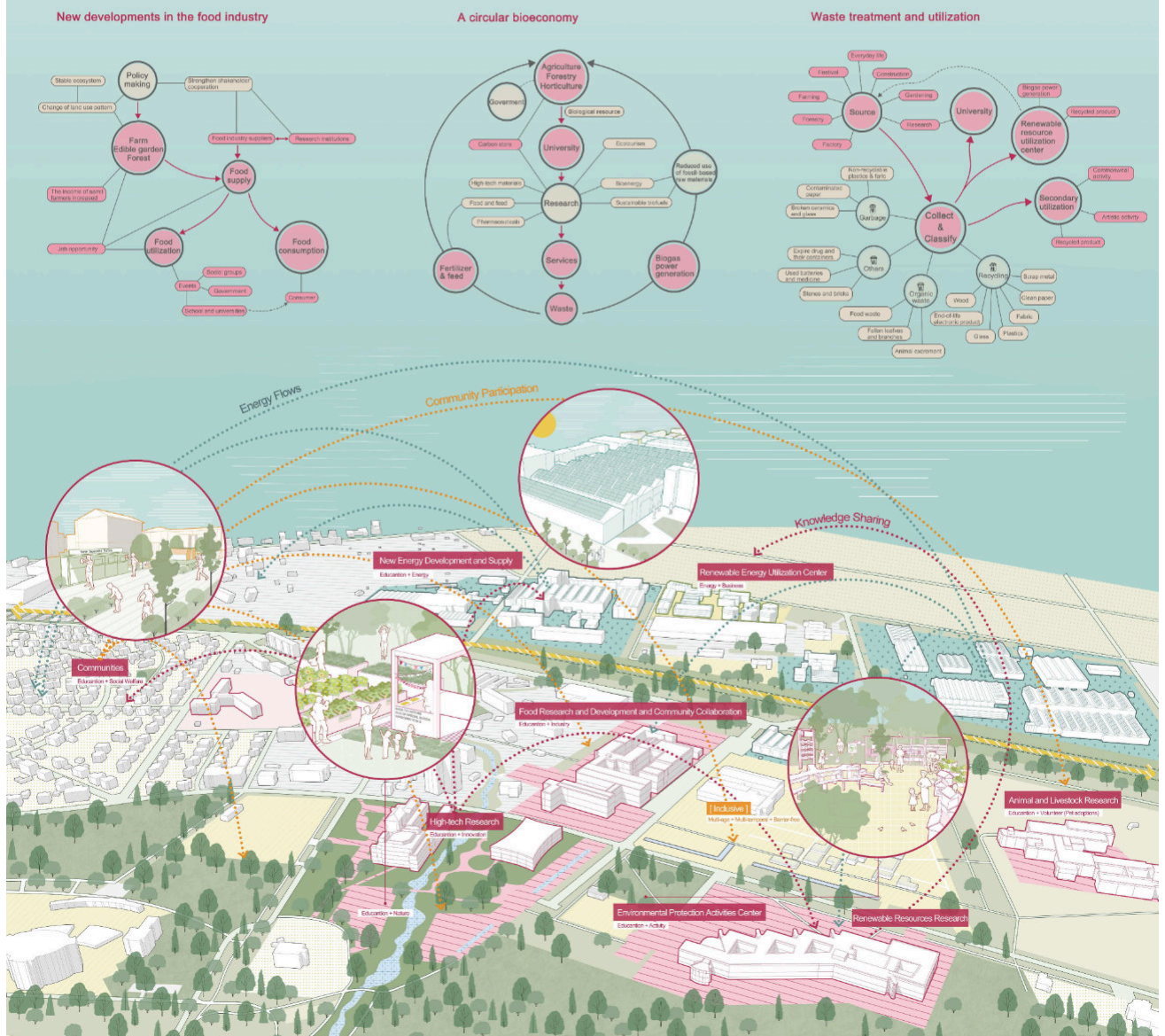
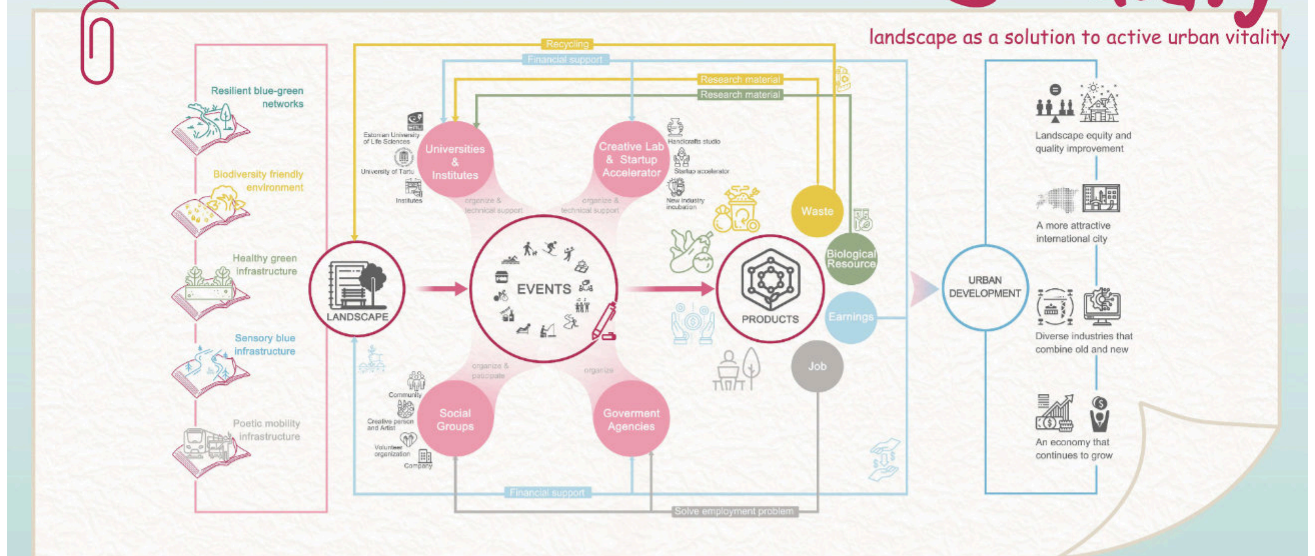
co-diary

Landscape as a solution to active urban vitality



co-diary

landscape as a solution to active urban vitality



The Tartu Hive

**Sean Moyano, Chiara Moretti,
Harrison Wade**

Sapienza University Rome

The city of Tartu has a multitude of great resources to utilize in terms of creating a more unified and connected cityscape through multiple means including economic, social, ecological, and environmental. To accomplish these goals, we created in depth analyses looking at the existing blue green network, environmental risks, urban sprawl trends, the industrial coverage and existing cultural heritage sites, and referred to a SWOT analysis to aid in the process of creating a future forecast of the city based on current trends and what was deemed necessary to change for future growth. A series of circular economy models were created that identify the current issues and how they are all related to each other and with a series of thoughtful interventions the quality of life of residents and the overall city landscape could see drastic positive changes while progressing towards the future.

Suburbanization has been deemed the main culprit for many of the issues that Tartu is currently facing. Residents have moved farther from the city, leading to major land consumption that impacts biodiversity and agricultural land, greater needs for residents to purchase vehicles, and rising costs of agricultural products, amongst other issues. By identifying the areas where urban sprawl has taken place, we can focus on discouraging this practice going forward by creating co-living housing for residents and university students. In this way, it could be possible to lower the dependence of personal vehicles and promote the use of public transportation along with encouraging foot traffic and non-motorized means of mobility.

FINALIST

Sensitive land areas should be protected by lowering carbon emissions, enhancing elements of biodiversity by creating ecological corridors that attract pollinators and identifying major environmental risks. It was deemed a priority to focus on filtering out impurities in water runoff through purification systems to keep all waterways and biodiversity areas healthy.

Moreover, industrial areas located in Tartu are a major contributor to carbon emissions and there are proposed methods to promote these industries in an eco-friendlier way, for example the lumber industry will have more strict regulations of forest management that also encourages the use of local wood formed into cross laminated timber, extending its lifespan and structural capabilities for new construction.

Last, there is a need to empower locals with access to a variety of resources that encourage interaction with each other and the environment including green spaces, parks, small businesses, community gardens, etc. that promotes the art of survival and working as one. We want to use every resource at our disposal including collecting rainwater for non-potable uses, and harvesting wind energy along roadways that can power outdoor lights by using wind from passing vehicles. We believe that by implementing these elements in Tartu, the city will work as a hive, able to repair itself and create a more self-sufficient community by reconnecting the fragments and utilizing all its resources in a thoughtful way. The hive will function properly only when all its components (social, economic, ecological and environmental) work together for the common goal of improving the quality of life of its inhabitants, creating a stronger sense of community and improving environmental qualities.

We decided that the Tähtvere Stream site was a great sandbox to implement these interventions because of the existing infrastructure and resources available that could use greater interconnection such as the university, the river, recreational elements, industrial areas, residential areas, and green areas. Moreover, this area is currently facing some of the major threats that were deeply analyzed, such as the suburbanization given by the future expansion of the nearby residential area, the fragmentation of services, the possible loss of biodiversity and the industries nearby. The Tartu Hive aims to create a strong, interconnected, and more self-sufficient community, that can be exemplified by future communities.

053 TARTU HIVE TARTU – EMUJAGI RIVER AND ITS WATERCOURSES

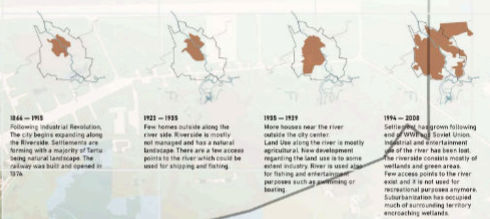
The city of Tartu as the Cultural Capital of 2024 has a multitude of great resources to offer in terms of creating a more unified and connected city through multiple means. Including economic, social, ecological, and environmental. To accomplish these goals, five general aspects were made through researching population demographics, social structures, urban heat island, and major trends pertaining to each specific site.

We referred to a SWOT analysis to aid the process of creating a future forecast of the city based on current trends and what was deemed necessary to change for future growth. Through the SWOT analysis, we created the framework for addressing specific goals, strategies, and solutions for the Emuajagi River and its water courses.

MACRO TO MICRO



MORPHOLOGY OF TARTU



1864 – 1918
Following the Russian Revolution, the city began expanding along the Riverside. Settlements are forming with a majority of Tartu being rural landscape. The city was built and spread in 1918.

1918 – 1919
Few houses outside along the river side. Riverside is mostly not managed and has a natural landscape. There are a few access points to the river which could be used for shipping and boating.

1919 – 1929
More houses near the river outside the city center. Land use along the river is mostly agricultural. There is a need for a river side area for boating and recreation.

1929 – 1939
Settling the river side following the end of the Russian Revolution. Industrial and urban expansion along the river side. The river side is mostly agricultural land. There is a need for a river side area for boating and recreation.

1939 – 1949
Settling the river side following the end of the Russian Revolution. Industrial and urban expansion along the river side. The river side is mostly agricultural land. There is a need for a river side area for boating and recreation.

SWOT ANALYSIS



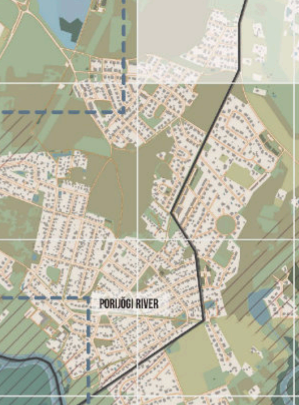
STRENGTHS
• Low unemployment rate
• Tartu is a city with a strong identity
• Tartu is a city with a strong identity
• Tartu is a city with a strong identity

WEAKNESSES
• Low unemployment rate
• Tartu is a city with a strong identity
• Tartu is a city with a strong identity
• Tartu is a city with a strong identity

OPPORTUNITIES
• Low unemployment rate
• Tartu is a city with a strong identity
• Tartu is a city with a strong identity
• Tartu is a city with a strong identity

THREATS
• Low unemployment rate
• Tartu is a city with a strong identity
• Tartu is a city with a strong identity
• Tartu is a city with a strong identity

TRENDS TO 2050



LEGEND



POPULATION



MEDIAL SPLIT



ECOWAT

RIVER BANK TYPOLOGY & FUNCTIONS

HEAT ISLAND & WATER COURSES

DAYLIFETIME & WIND ANALYSIS

053 TARTU HIVE TARTU – EMUJAGI RIVER AND ITS WATERCOURSES

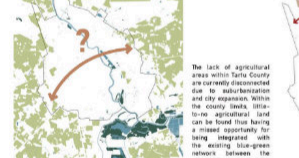
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GOALS



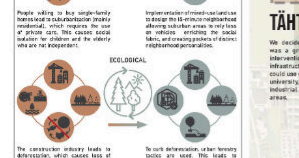
STRATEGIES



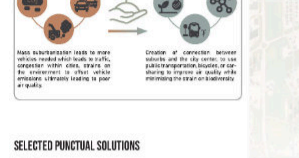
SOLUTIONS



BLUE-GREEN NETWORK



ENVIRONMENTAL RISK



URBAN SPRAWL



INDUSTRIAL COVERAGE



CULTURAL HERITAGE



LEGEND



POPULATION

MEDIAL SPLIT

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053 TARTU HIVE TARTU – EMJAJÄRVI RIVER AND ITS WATERCOURSES

Tähtvere Stream is currently fragmented into distinct areas: urban, suburban, and rural. The stream is a vital part of the city's identity and a key element in its development. The stream is a vital part of the city's identity and a key element in its development. The stream is a vital part of the city's identity and a key element in its development.

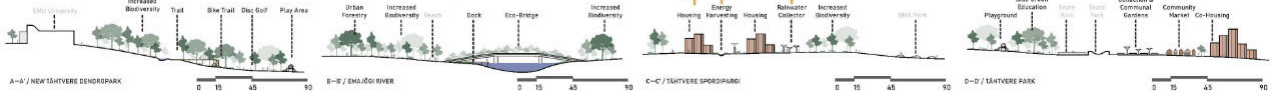


TÄHTVERE STREAM MASTER PLAN



STRATEGIC INTERVENTIONS

SITE SECTIONS



CIRCULAR ECONOMY – SYSTEM THINKING

The "hive mentality" means to refer to how bees function together for the hive's benefit. The hive is a collective organism, and the bees work together to create a strong and resilient structure. This concept is applied to the design of the Tartu Hive, where the community is seen as a collective organism that works together to create a strong and resilient structure.



NEIGHBORHOOD CONNECTIVITY



"Sharing Knowledge to create a collective intelligence"



THE TÄHTVERE STREAM HIVE CELL STRUCTURE

The Tartu Hive is a community of people who live and work together. The hive is a collective organism, and the bees work together to create a strong and resilient structure. This concept is applied to the design of the Tartu Hive, where the community is seen as a collective organism that works together to create a strong and resilient structure.



053 TARTU HIVE TARTU – EMJAJÄRVI RIVER AND ITS WATERCOURSES

Tartu is a city with a rich history and a vibrant culture. The city is a key element in its development. The city is a key element in its development. The city is a key element in its development.

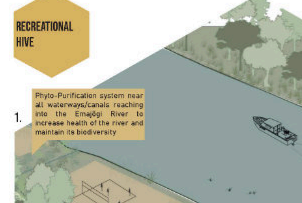
WIVE ECONOMY FOR A RESILIENT FUTURE



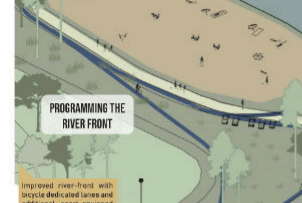
TARTU HIVE A Co-Housing Community



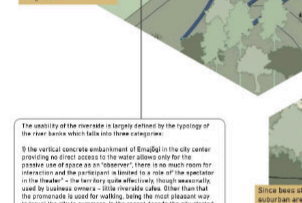
RECREATIONAL HIVE



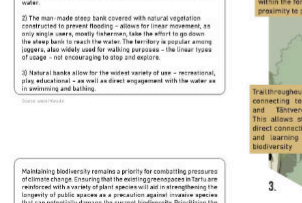
PROGRAMMING THE RIVER FRONT



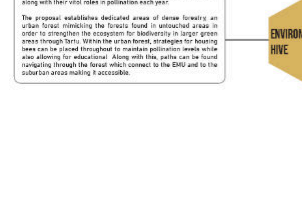
ENVIRONMENTAL HIVE



IMPROVE BIODIVERSITY



SELF-SUFFICIENT ENERGY COLLECTION & DISTRIBUTION



There is also an important element of celebrating the history of Tartu. The city is a key element in its development. The city is a key element in its development. The city is a key element in its development.

USER PERSONAS



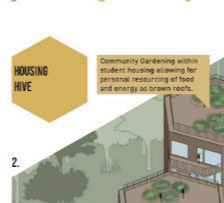
KEY PLAN



RECREATIONAL HIVE



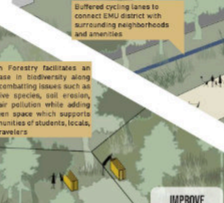
HOUSING HIVE



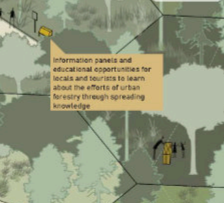
ENVIRONMENTAL HIVE



IMPROVE BIODIVERSITY



SELF-SUFFICIENT ENERGY COLLECTION & DISTRIBUTION



ENERGY COLLECTION HIVE



Tartu Technology of Nature

**Alicja Reglinska, Antoni Hope,
Natalia Wolska, Kamila Wysocka,
Justyna Wasilewska**

Gdańsk University of Technology

Welcome to the Tartu Eco-Educational Hub, where nature, innovation, and education meet along the spectacular Emajogi River. Project based on:

Education and Research: Come on a journey of discovery as we explore the areas of permaculture and aquaculture. Our hub specializes in expertise and promoting the development of new academic areas in biotechnology and innovative agriculture.

Recreation: Dive into the wonders of the waterfront by transforming the Emajogi River into a paradise for water and sports enthusiasts. From cycling and fishing to rowing and kayaking, our project inspires riverfront tourism.

Technology: Ambitions are high, setting our sights on creating a zero-emission district or, even better, a positive energy district. Enter the future with us, integrating cutting-edge technologies to confront urban heat islands.

Nature: Embedded in the sponge city concept, our project exemplifies the fusion between urban life and nature. We are addressing the challenge of climate change by using blue-green infrastructure in new green spaces.

Agriculture: Come to see the secrets of permaculture and the experimental swamp cultivation. These fields are unique - they are breathing laboratories where sustainable processes bloom.

FINALIST

Model: Tartu Eco-Educational Hub is a joint effort of universities, Tartu City Council, Tartu Region, Estonian Government, European Union, environmental NGOs, secondary schools, local companies and Karula National Park Authority. Together we want to create a solid network for a sustainable future.

In our pursuit of sustainability, key processes guide our steps: management of EU funds, research, education, and reliable support for retention and recruitment. Our center rests on the pillars of knowledge, technology, partnerships, location, and funds, laying the foundation for sustainable initiatives and educational endeavors.

The offerings include courses, community gardens, locally produced food, coworking spaces, conferences, workshops, with attractive financial benefits - for tourists, students, and researchers/entrepreneurs. Join us on this one-of-a-kind journey, where the rhythm of the river tunes in with the beat of education, agriculture, recreation, technology and nature. The Tartu Eco-Education Hub is not just a project; it is a symphony of cooperations, processes, resources, values, products and services.

TARTU TECHNOLOGY OF NATURE

CITY DEVELOPMENT



LOCATION CONTEXT



WATER-BASED SYSTEM WATER PRESENCE IN THE AREA

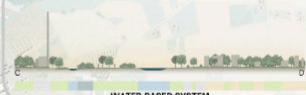


Cross-section A-B



Area 3: Jaamamõisa Stream

Cross-section C-D



Area 2: Ihaste Ditch

Cross-section E-F

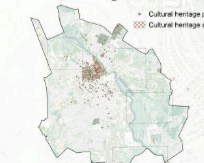


Cross-section G-H

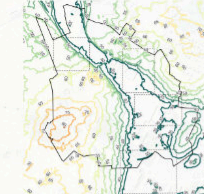


SECTORAL ANALYSES

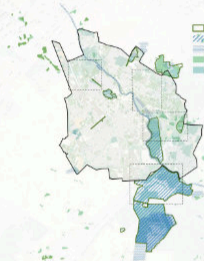
Cultural heritage



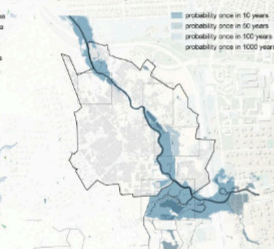
Relief



Protected areas



Flood probability



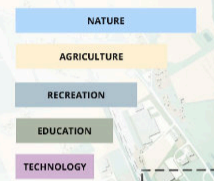
COLLAGE OF VIEWS OF THE EMAJÕGI RIVER IMPORTANCE OF WATER IN THE LANDSCAPE



0 500 1 000 m

TARTU TECHNOLOGY OF NATURE

WATER-BASED SYSTEM WATER PRESENCE IN ACTIVITIES



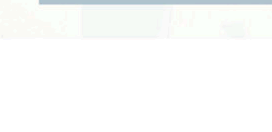
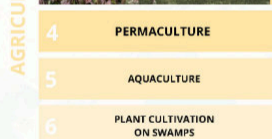
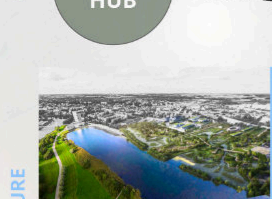
Area 4: Tähtvere stream



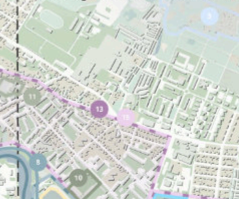
GOALS REACHED



RELATIONS WITHIN THE HUB



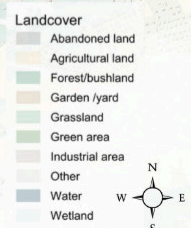
Area 3: Jaamamõisa Stream



Area 2: Ihaste Ditch

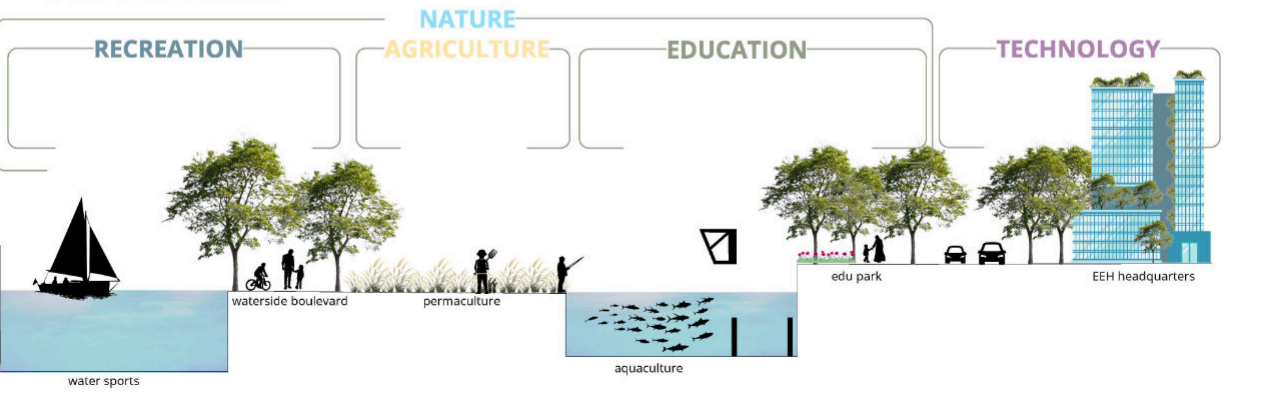
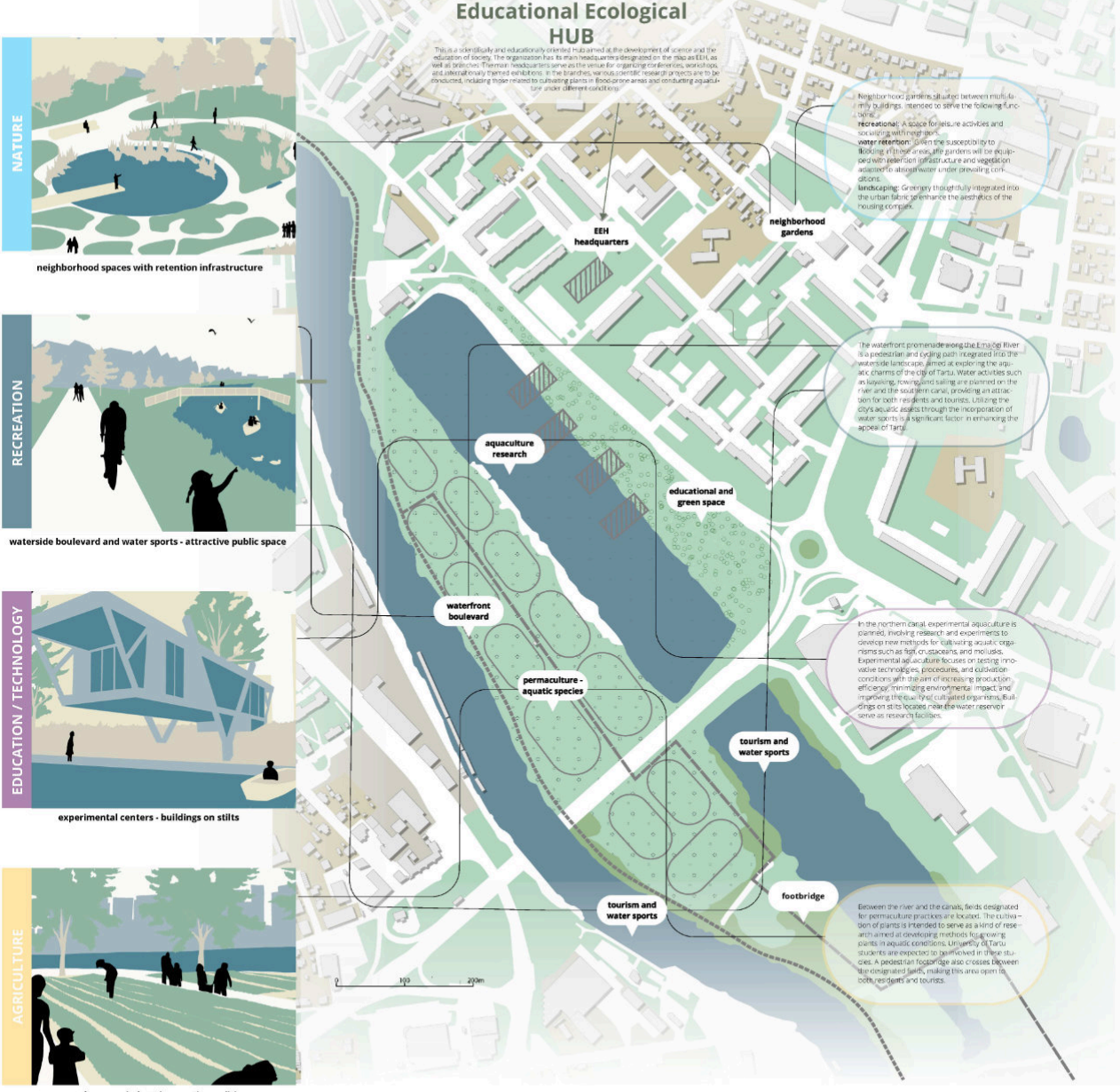


Area 1: Porijõgi River



0 500 1 000 m

TARTU TECHNOLOGY OF NATURE



TARTU TECHNOLOGY OF NATURE

PERMACULTURE - COMMUNITY GARDEN



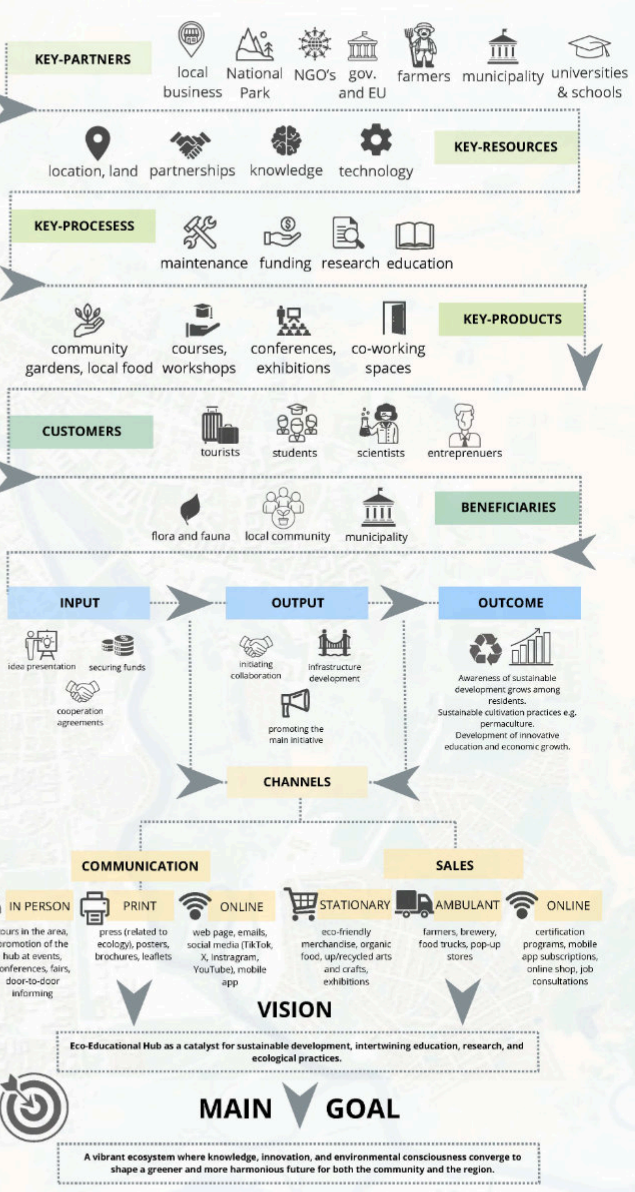
EXPERIMENTAL SWAMP



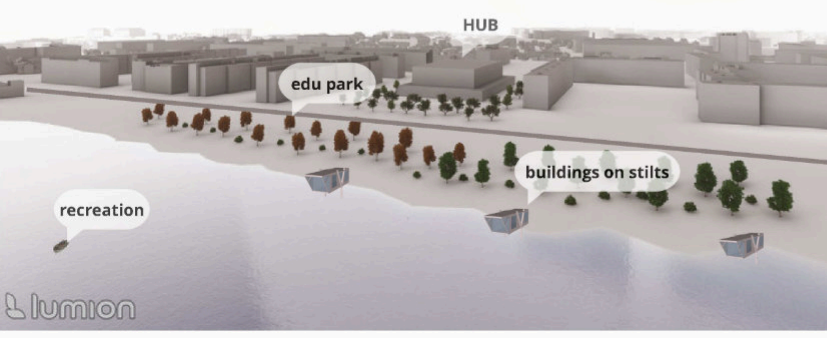
FOOTBRIDGE



SOCIAL-BUSINESS MODEL CANVA



3D SCHEME OF OF AREA NEARBY THE NORTHERN ANNE CANAL



BUILDING ON STILTS



A More Inclusive Future

**Guan Ruofei, Lyu Xinyi, Zhu Jiaojiao,
Cao Fangxin, Zhang Hao, Lai Meihui,
Gong Yuqu, Ma Yuewen**

Huazhong Agricultural University

Facing with multiple pressures from the environment, economy, as well as unresting political conflicts, we are attempting to fully revitalize Tartu through a coupled revitalization of ecological and public space with the river as the backbone to create a more inclusive future.

The program is based on Tartu's history and culture, taking into account climate change, population inflation, biodiversity conservation, as well as the planning and implementation of a zero-carbon economic and social transition. It will adopt online-offline integration of shared-economy, shared-transportation and other modes to activate creative industry and ecological economy, leading to the construction and renewal of zero-carbon communities.

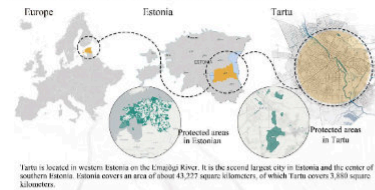
Targeted to construct "the Cultural Capital of Europe", bringing along the revitalization of public life, including poetry, music, dance, water activities, nature education, urban agriculture, etc., the program is designed to create a multi-verse human-nature community, and ultimately to create a new model of more harmonious and sustainable urban development.

FINALIST

A MORE INCLUSIVE FUTURE

177 River revitalization orientated development for Tartu

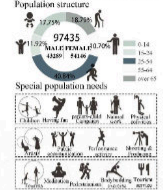
1 Location & Protected area analysis



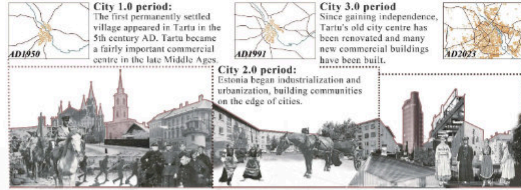
2 Cultural context



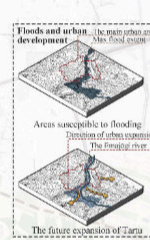
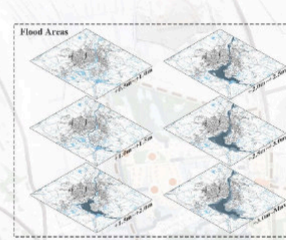
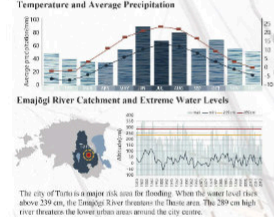
3 Crowd behavior



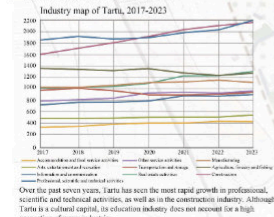
4 Timeline



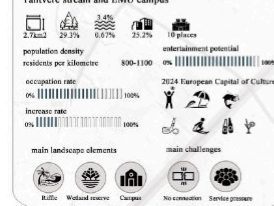
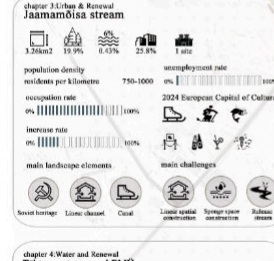
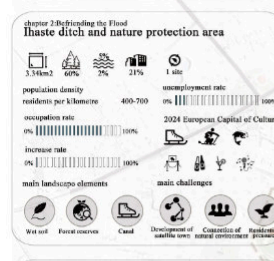
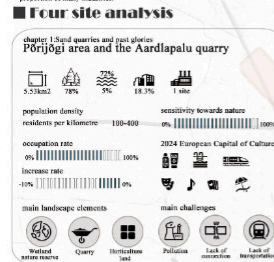
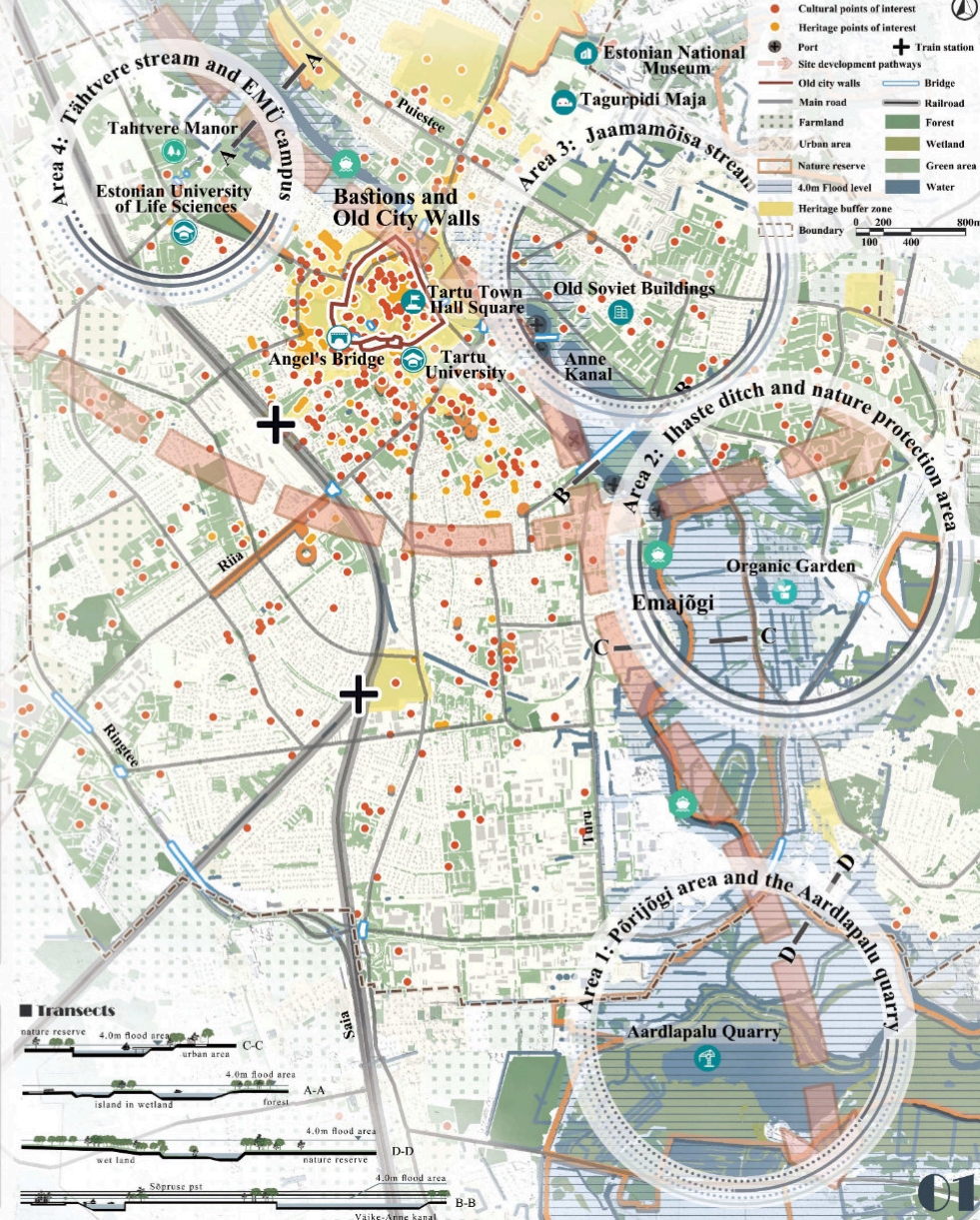
5 From the river



6 Current economy

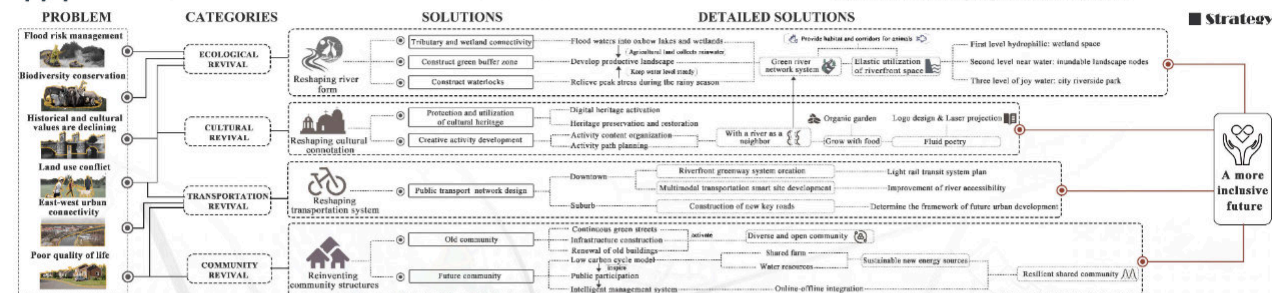


7 Basic analysis

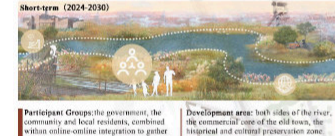


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8 Short, medium and long term vision



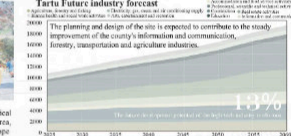
9 Plan generation



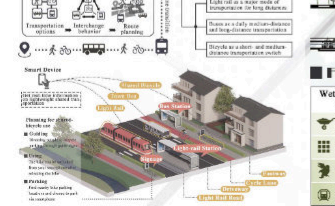
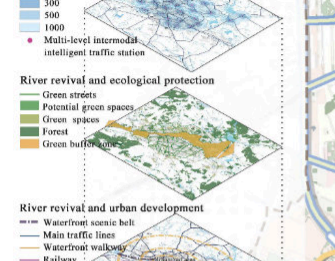
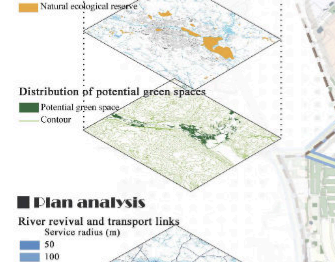
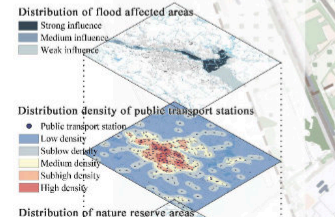
10 Master plan



11 Economic forecast



12 Plan analysis



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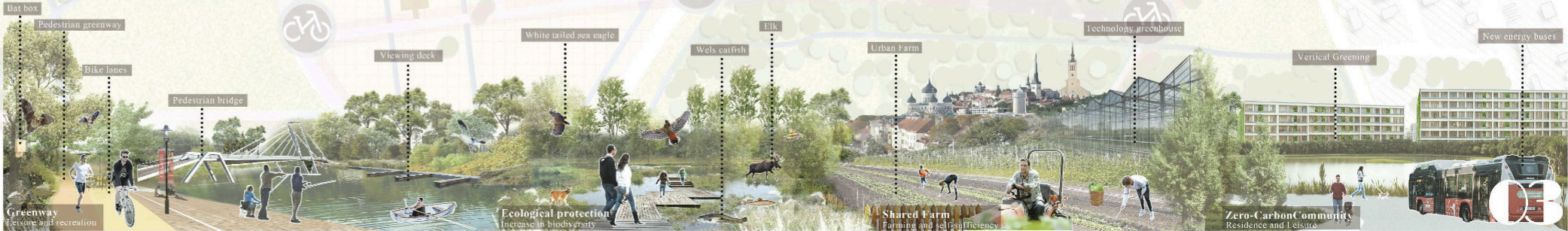
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■ Detailing area 2 design

In Tartu 4.0, we envisioned to transform Tartu from 4 aspects, including ecological, cultural, transportation, and community revitalization. Area 2 is designed to connect all existing water system, build a light traffic network, create a future zero-carbon community, a wetland conservation area, a well-planned Emajõgi waterfront, a shared farm. In addition, our structure design aims to harmoniously fuse energy landscape with cultural landscape.



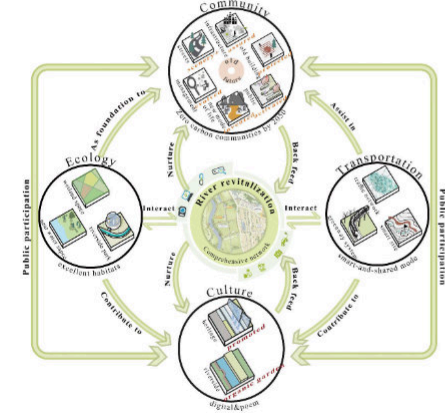
■ Vision rendering



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■ Landscape system model of river revitalization



■ Future vision analysis

Integration for human-nature relationship



Integration of green circular economy



Integration for community formation



Native species preservation

On the basis of scientific and natural distribution of existing species, provide various types of habitat and services with the living, feeding, and breeding needs of native species, and form a sustainable ecosystem.

Habitat stabilization and maintenance

Integration and optimization of existing natural resources, including vegetation, water, and soil, to form a sustainable ecosystem.

Increased riverfront accessibility

Improve the accessibility of the riverfront, including the construction of pedestrian paths, bicycle paths, and public spaces, to enhance the riverfront's attractiveness.

Riverine green corridors

Green corridors are an important part of the riverfront, providing a natural habitat for native species and a green space for residents.

Urban water systems

Water systems are an important part of the riverfront, providing a natural habitat for native species and a green space for residents.

Community energy program

Community energy programs are an important part of the riverfront, providing a natural habitat for native species and a green space for residents.

Establishment of a common farming platform

The platform is a common platform for farmers, providing a natural habitat for native species and a green space for residents.

Organic food offerings

Organic food offerings are an important part of the riverfront, providing a natural habitat for native species and a green space for residents.

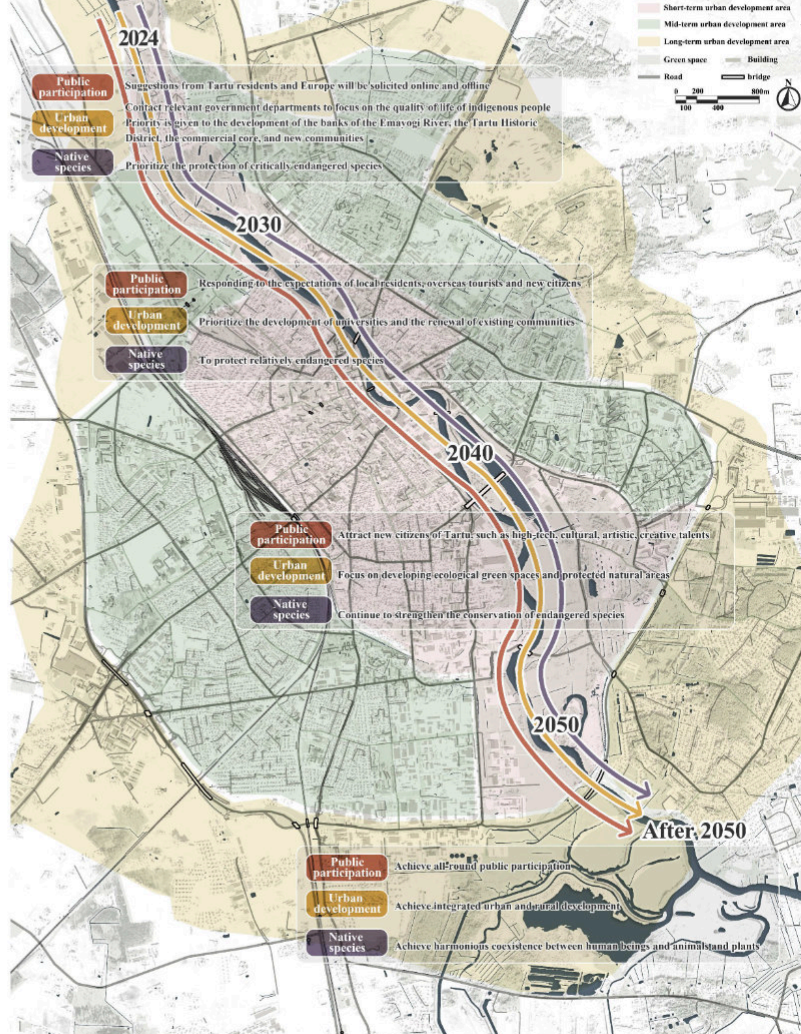
Biomethane plants

Biomethane plants are an important part of the riverfront, providing a natural habitat for native species and a green space for residents.

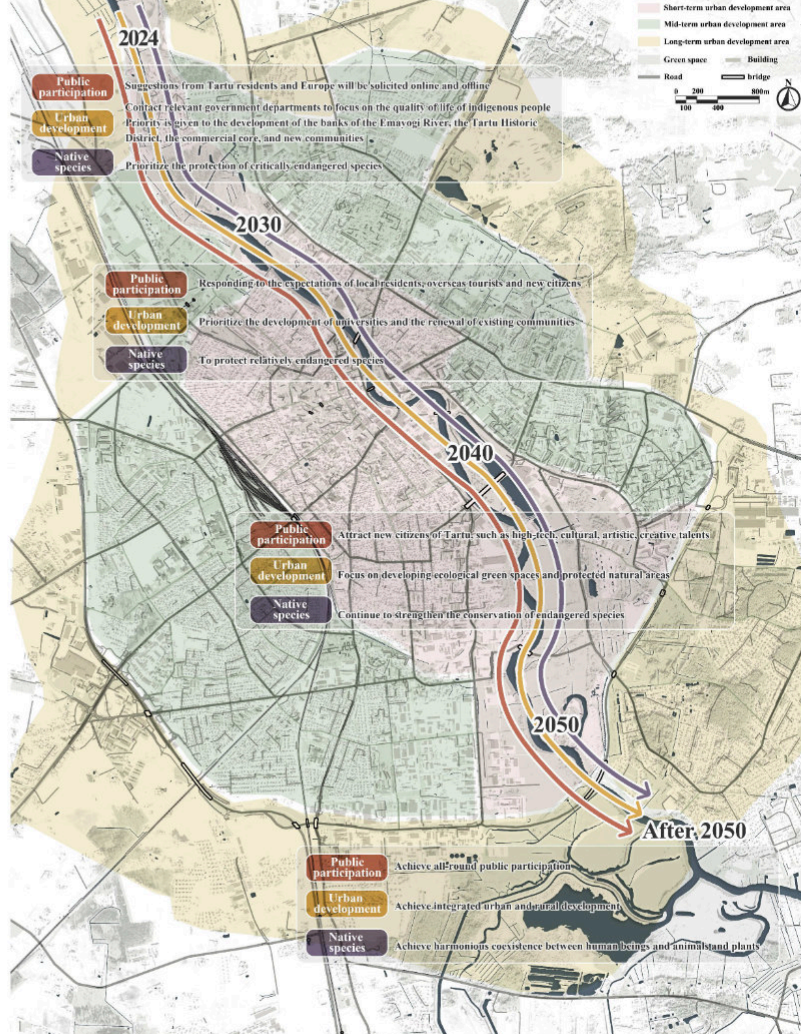
Green building construction

Green building construction is an important part of the riverfront, providing a natural habitat for native species and a green space for residents.

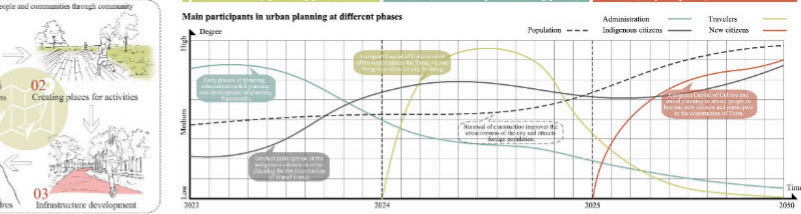
■ Urban development time series planning map



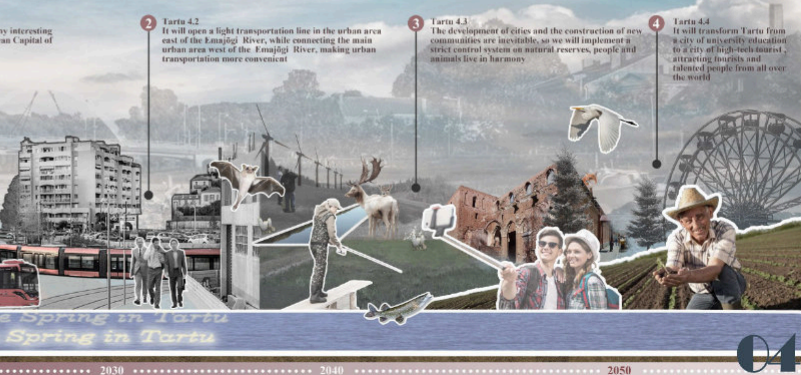
■ Urban development time series planning map



■ Urban development time series planning map



■ Urban development time series planning map



■ Future vision renderings



There will be three developmental phases for the future Tartu. The Tartu 4.0 expresses our efforts to connect nature with broader social, cultural and ecological values, which will address the pressing challenges of the human-river-city relationship. We are also dedicated to use landscape to provide a complementary and pervasive solutions to Estonian urbanization, which could ultimately be brought to other cities with similar conditions.

■ Urban development time series planning map



■ Urban development time series planning map



■ Urban development time series planning map





International Student Competition Exhibition

Exploring Tartu Emajõgi and its watercourses

This preview shows the 8 finalists and winning project of the Tartu Student Competition.

We received 38 submissions from 10 different countries in total.

All projects have been intensively evaluated by an international jury of eight experts.

We will soon present all submissions online.

See you at the Landscape Forum Tartu and South Estonia: June 24 - 28, 2024

<https://forum.ln-institute.org/>

