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Nature-Based Solutions for Climate Resilience, Green Skills and Sustainable Communities

Join researchers, policy makers, businesses,
students, NGOs and innovation ecosystem representatives.



28 May 2026



09:30 – 14:00



Tech-Park Kaunas

Baršausko str. 59,
Conference Hall 3, Kaunas, Lithuania

RENATURE Multiplier Event 2026

This project has been funded with support from European Commission.
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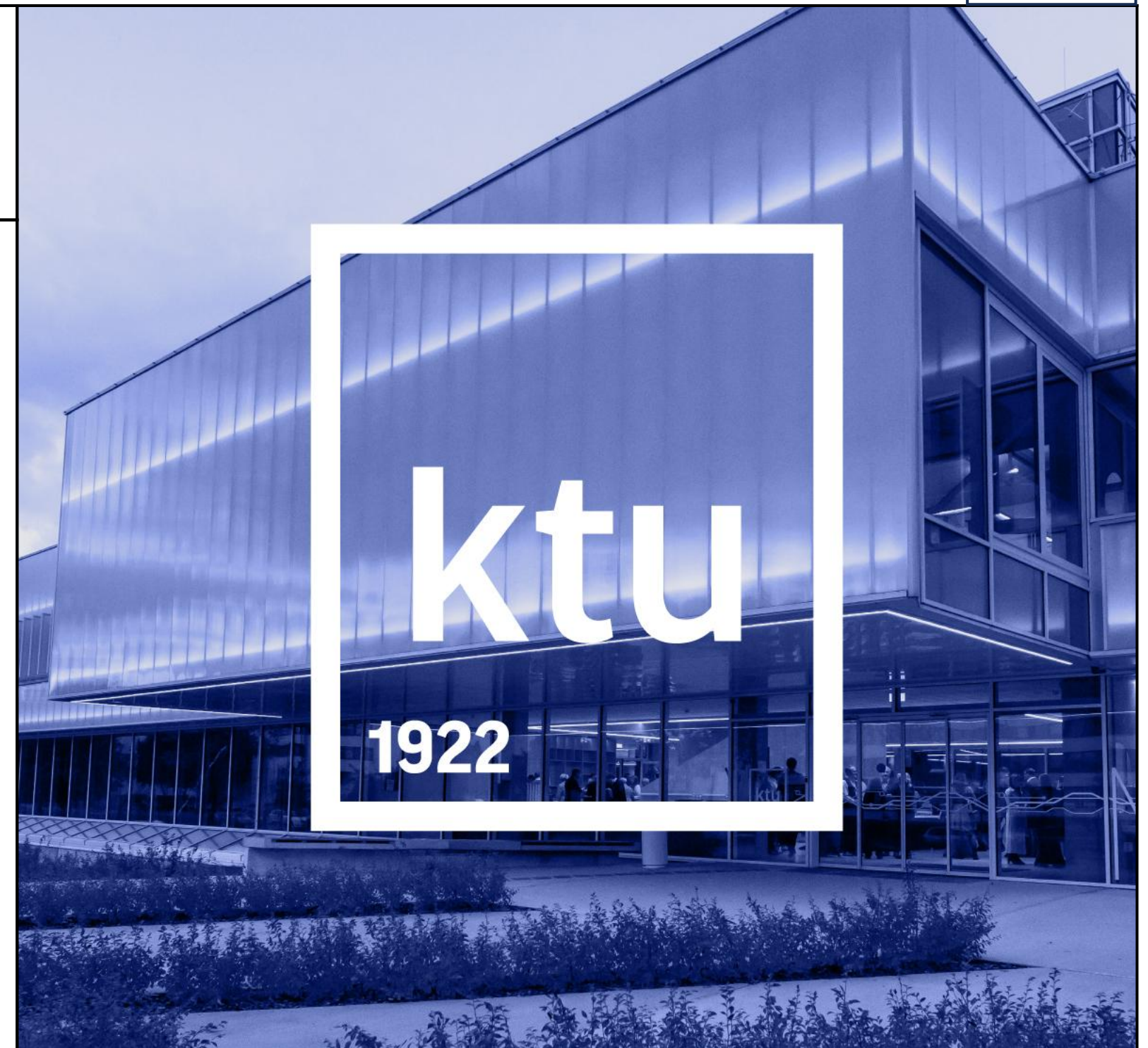
KAUNAS UNIVERSITY OF TECHNOLOGY

**GIS-Enabled
Outdoor Work and Study
Ecosystems for Sustainable
Personal, Professional, and
Planetary Wellbeing**

dr. Inga Gurauskienė

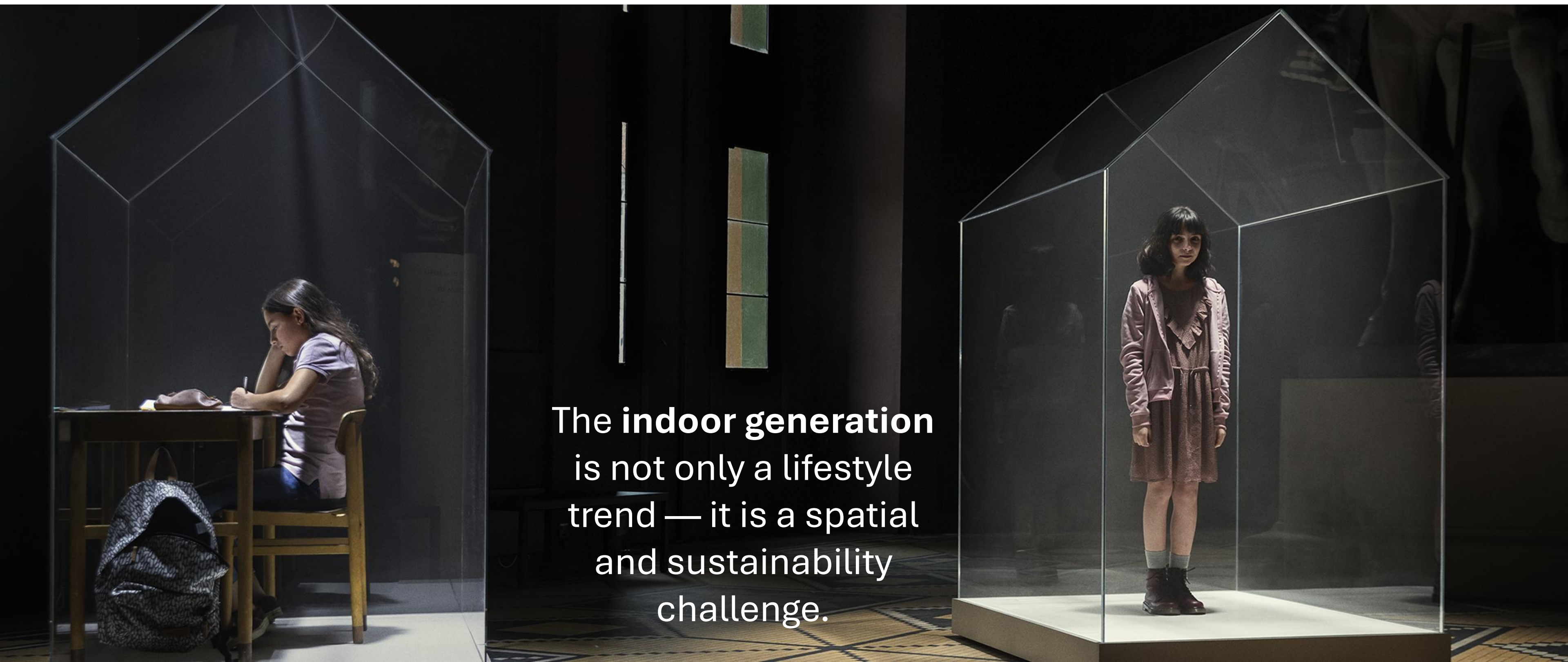
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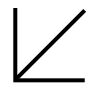
RENATURE conference
2026 05 28, Kaunas

The wellbeing challenge



The **indoor generation** is not only a lifestyle trend — it is a spatial and sustainability challenge.

The wellbeing challenge



The wellbeing challenge is the **growing imbalance** between how we organize work and study and what people and the planet need to thrive. Most work and study environments were designed for productivity optimization, not holistic wellbeing.

How can universities **redesign** work and study ecosystems to **reconnect people with nature**?

This challenge requires spatially informed, nature-based ecosystems where **outdoor work and study become part of institutional practice**.

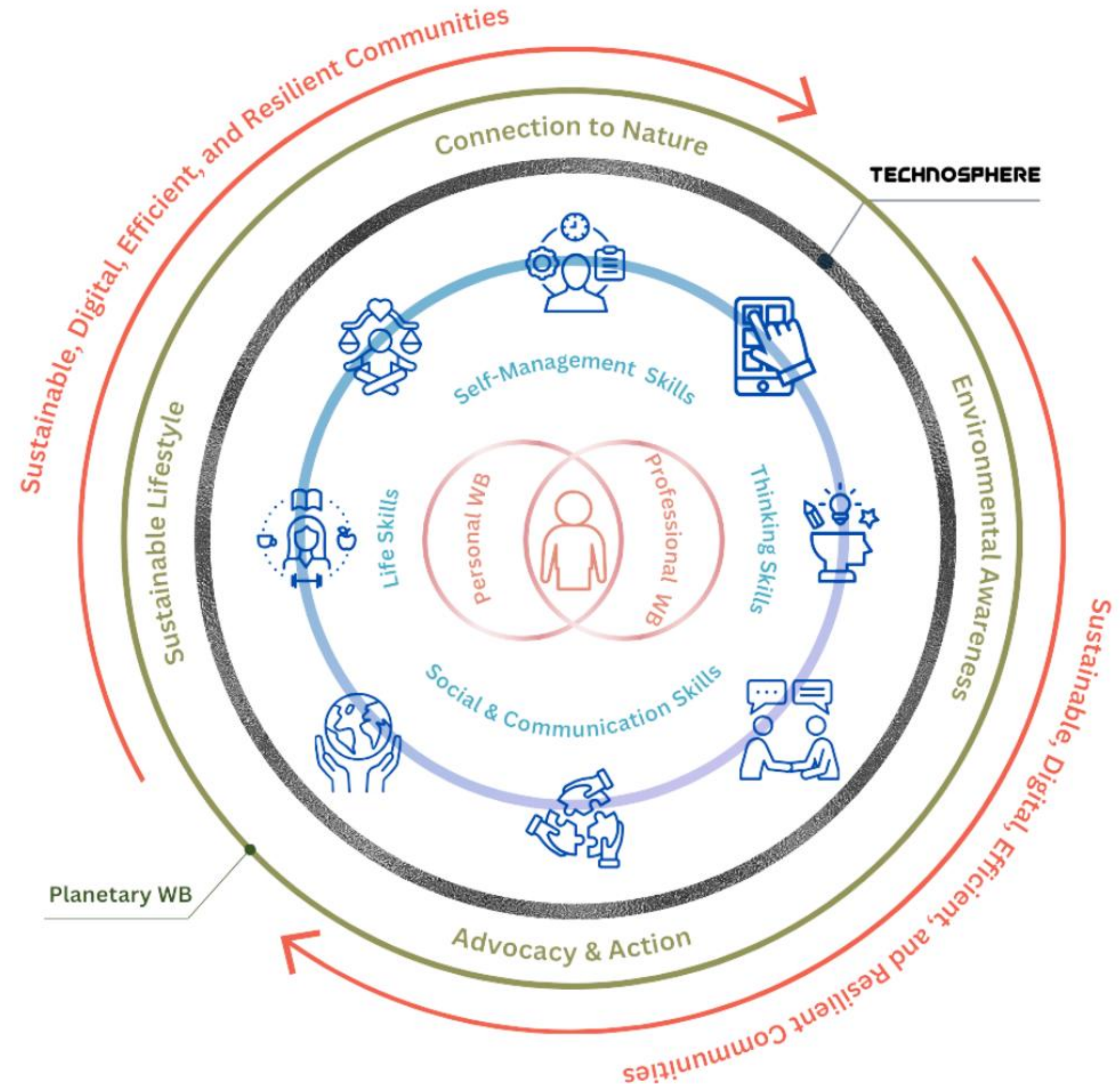
Triple wellbeing framework

SWEPPP holistic model in which wellbeing is created through the balance of:

Personal wellbeing — health, recovery, emotions, relationships, life satisfaction.

Professional wellbeing — purpose, productivity, learning, collaborative healthy work culture.

Planetary wellbeing — nature connection, sustainability, ecological responsibility, climate-conscious practices.



Nature-based solutions

Nature-based solutions (NbS) for sustainable well-being involve using and restoring ecosystems to address societal challenges while directly enhancing human health.

These strategies - ranging from urban green spaces to ecological restoration - simultaneously fight climate change, protect biodiversity, and improve our daily quality of life.



Outdoor ecosystems concept



An outdoor ecosystem transforms outdoor space from passive scenery into an active wellbeing, learning, and working environment.

It is a connected spatial, social system that integrates:

Nature — green spaces, biodiversity, fresh air, shade, sunlight.

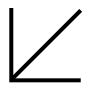
People — students, staff, researchers, communities.

Activities — studying, working, meetings, reflection, movement.

Infrastructure — seating, Wi-Fi, accessibility, lighting, weather protection.

Sustainability — low-impact use of space, climate awareness, ecological responsibility.

Why GIS?



GIS help to analyze different sustainability aspects based on multi-criteria spatial assessment of green spaces:

- spatial relationships,
- environmental quality,
- accessibility, and
- human behavior patterns and etc.

Research gap. Existing GIS assessments of urban green spaces focus on recreation or ecology — not on outdoor cognitive work and study.

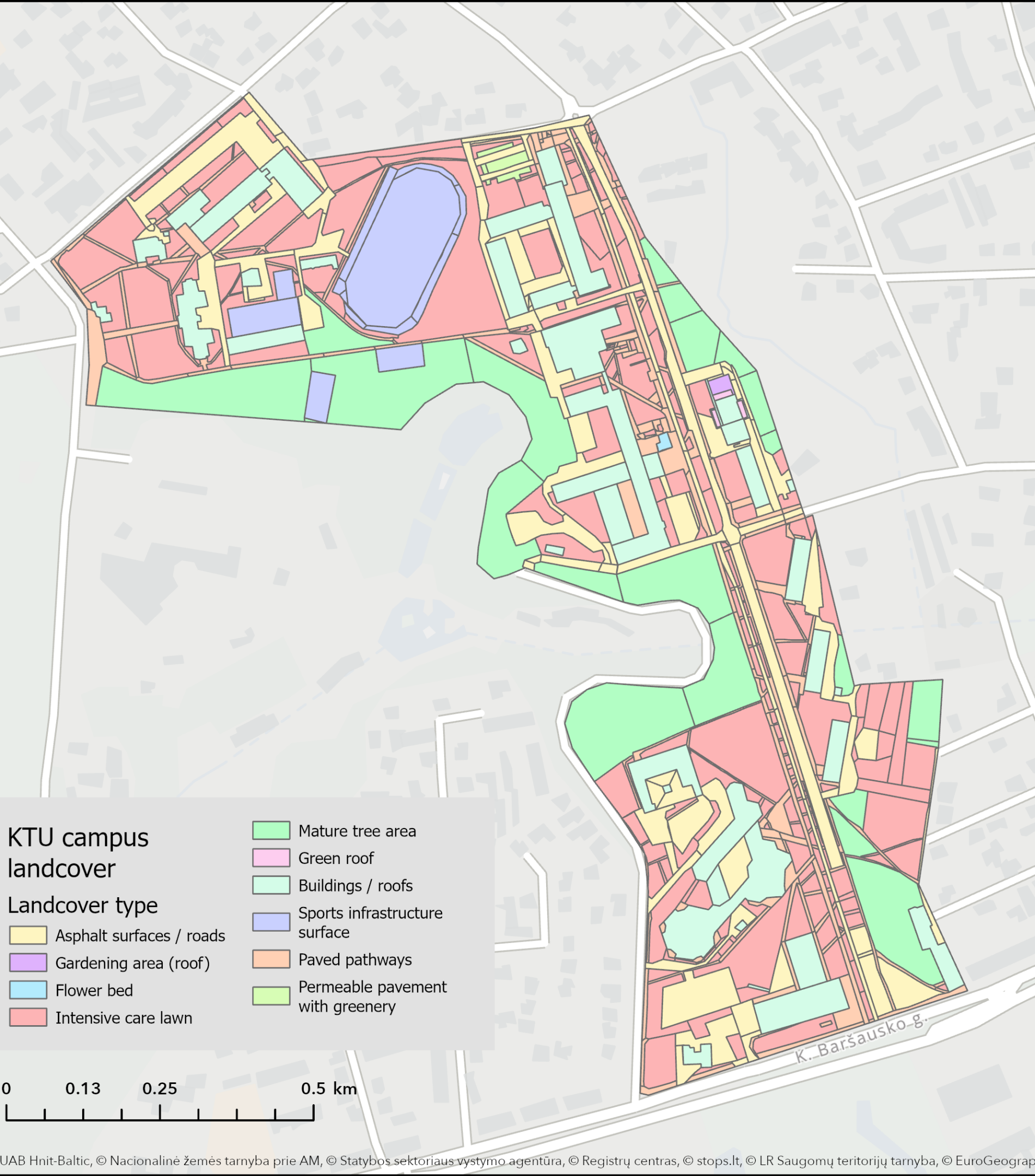
Research object and objective

Demonstrate a replicable GIS-based assessment of outdoor work and study suitability for future campus planning decisions.

The method was applied to the **KTU student campus** in Kaunas, Lithuania.

Case area: 30 ha campus

Open spatial data and standard **ArcGIS Pro** tools were used.



GIS methodology



A GIS-based suitability assessment was developed to identify university green spaces with the highest potential for outdoor work and study.

Suitability indicators:

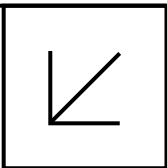
- **Tree cover density (TCD)** — shade provision
- **Normalized Difference Vegetation Index (NDVI)** — vegetation condition and restorative potential
- **Proximity to campus buildings** — functional accessibility

Analysis method:

- Indicators were combined using **Weighted Linear Combination**. This enabled a multi-criteria GIS suitability assessment

**Open data → indicator rasters → 1–5 reclassification →
→ weighted linear combination → suitability map**

University research case



Vegetation is strongest near the boundary of Ažuolynas Park, where NDVI exceeded 0.65.

Significant canopy deficit on the core campus.

Campus compactness means proximity to buildings is generally not the limiting factor.

Indicator	Min	Max	Mean
NDVI (mean, May–Sep)	0.034	0.87	0.48
Tree Cover Density (%)	0	88	12.88
Building distance (m)	0	116.64	27.88

All spatial data were projected to LKS 1994 Lithuania TM, EPSG:3346

NDVI was calculated from Sentinel-2 Red and NIR bands, then averaged for May–September (NDVI = (NIR – Red) / (NIR + Red))

Used equal weights: TCD 0.33, NDVI 0.33, building proximity 0.34 (S = Σ(w_i × x_i))

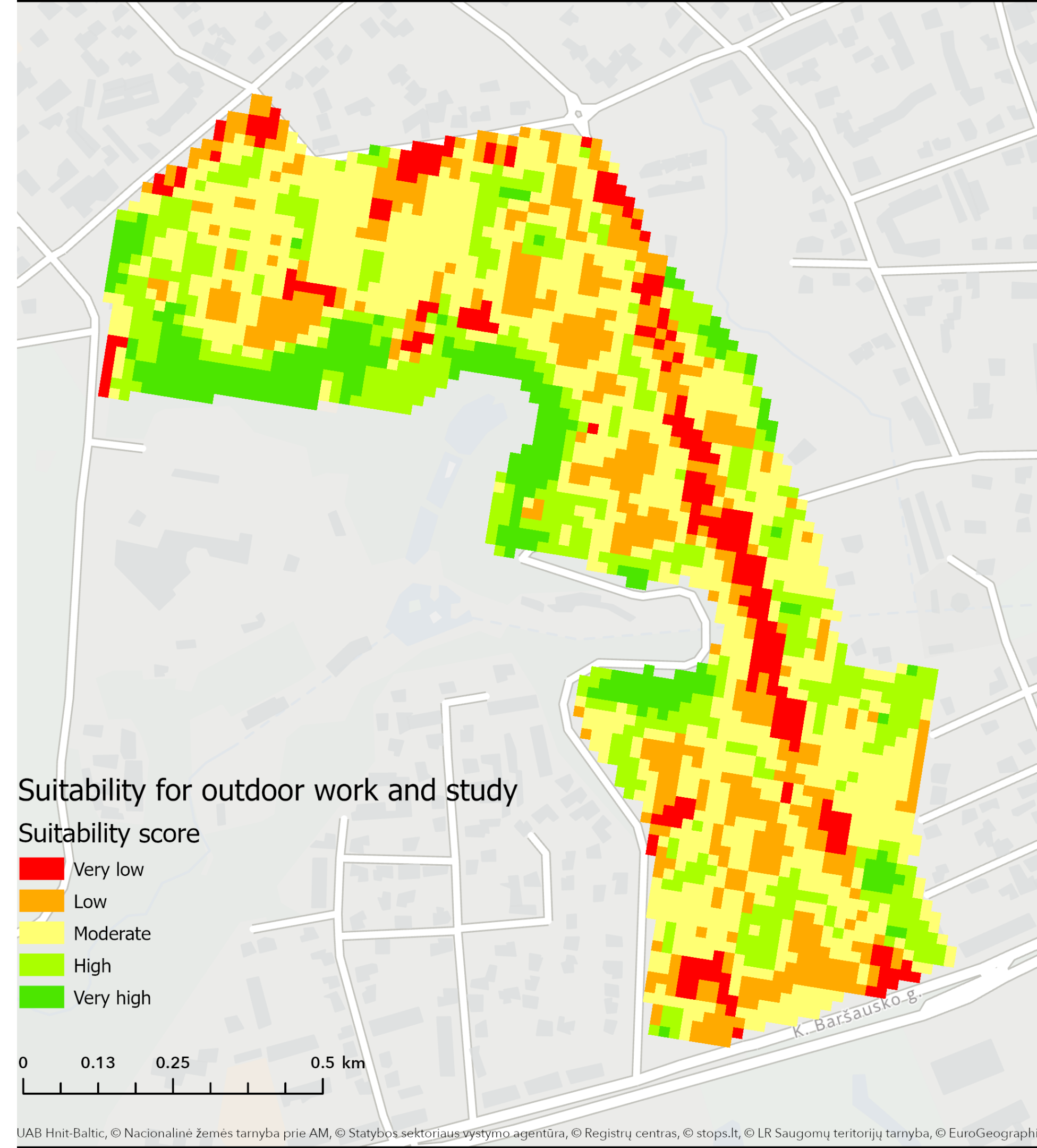
Combined suitability map

High suitability: Transition zones between the main campus and adjacent park areas.

Typical conditions: moderate–high tree cover, NDVI above 0.4 and 25–75 m distance to buildings.

Low suitability: Core campus — academic buildings surrounded by open, unshaded surfaces

Expand tree planting in courtyards and along building perimeters.



Key GIS findings



- Equal weighting is a neutral assumption and may overemphasize ecological quality – survey of the KTU community – next step of analysis
- The best outdoor work and study potential is near Ažuolynas Park and other green transition zones.
- The main barrier in the core campus is shade deficit: mean tree cover density is only 12.88%.
- Next step – analysis of infrastructure (wifi, outdoor furniture, shelters and electricity accessibility); environmental conditions (noise, wind, microclimate)
- Different scenarios are planned for the specific high suitability areas in order to apply NbS oriented to wellbeing and sustainability
- The methodology is replicable using open-access data (Copernicus, Sentinel-2).

SWEPPP overview



While GIS provides the analytical framework, sustainable wellbeing requires a broader social and organizational ecosystem.

SWEPPP operationalizes sustainable wellbeing through interdisciplinary collaboration and real-life practices.

GIS identifies opportunities.

**SWEPPP activates them through Sustainable Wellbeing Education:
People, Policy, and Practice.**

Triple wellbeing framework

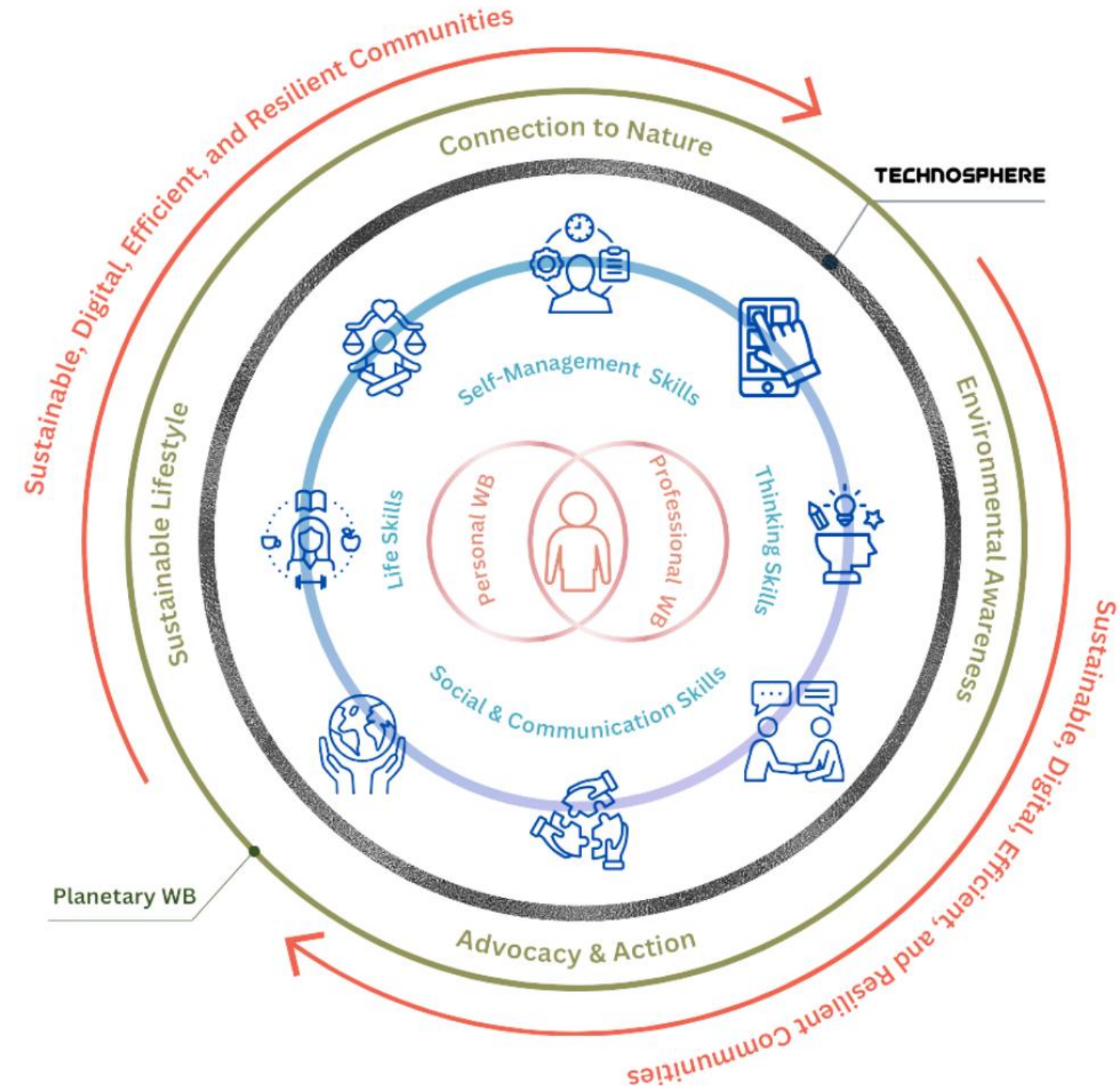


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Menu



Education . Collaboration . Exchange

Enhancing Sustainable Well-being Education in Europe and beyond

Project Results

Explore and download our open-access materials to dive deeper into the project results.

Sustainable Well-being Curriculum:

A modular framework designed to integrate well-being into sustainability contexts, suitable for educators and professionals.

Sustainable Well-being Courses:

Micro-learning units based on the curriculum, aimed at providing accessible education on sustainable well-being.

Sustainable Well-being for Everyone Guide:

A user-friendly resource intended to motivate individuals to enhance personal and workplace well-being, grounded in the project's curriculum and courses.

Nature as Teacher

When faced with a problem, ask the question:

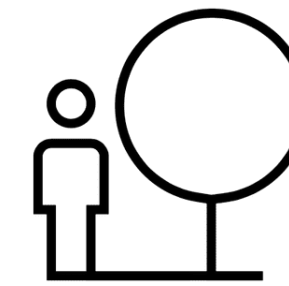
Nature has already solved many of the problems we are grappling with. Animals, plants, and microbes are the consummate engineers.

**“What organism needs to solve the same problem to survive....
What Would Nature Do?”**



LEARNING FROM NATURE NOT ABOUT NATURE

Future ecosystem vision



OUTDOOR OFFICE DAY

Outdoor Office Day 2026 (11th of June)

SWEPPP + KTU Wellbeing program – Outdoor Month at KTU

Integration of outdoor activities at KTU

Further research integrating students and community of KTU

- Centre of Interdisciplinary Competences for Sustainability (CICS)
- MSP Sustainable Consumption and Production
- MSP Sustainable and Smart Urban Environment

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Thank you

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