ILCA
Innovation Laboratories for Climate Actions

VILNIUS COLLEGE OF TECHNOLOGIES AND DESIGN

CASE STUDY

Setting up Innovation Laboratory on Climate Actions as an Agent of Change

Lithuania

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INTRODUCTION

Addressing climate change requires innovative solutions and collaborative efforts across various sectors. Innovation is crucial for developing new technologies, processes, and strategies to mitigate the impacts of climate change and adapt to its effects. Collaboration allows for the pooling of resources, expertise, and perspectives to tackle complex challenges more effectively. Climate Innovation Lab is a dynamic and participatory platform that fosters creativity, experimentation, and problem-solving. It brings together diverse stakeholders, including policymakers, researchers, entrepreneurs, and community members, to co-create and test innovative solutions to pressing issues such as climate change. Climate Innovation Labs serve as catalysts for change by providing a space for collaboration, ideation, and prototyping. In the context of climate change, a Climate Innovation Lab focuses specifically on developing and implementing innovative strategies to address climate-related challenges and to provide climate change mitigation and adaptation solutions. It aims to identify and scale up promising solutions, promote knowledge sharing and capacity building, and foster partnerships between different actors in the climate action ecosystem.

RATIONALE AND OBJECTIVES

The rationale behind establishing the Climate Innovation Lab stems from the urgent need to address the complex and interconnected challenges posed by climate change. Climate change presents multifaceted risks to communities, economies, and ecosystems, requiring innovative and collaborative approaches to mitigation, adaptation, and resilience-building. Traditional methods and solutions may not suffice in the face of rapidly evolving climate impacts, necessitating the creation of a dedicated space for experimentation, co-creation, and knowledge exchange.

Specific Objectives for Climate Innovation Lab:

- **Foster Collaboration:** The primary objective of the Climate Innovation Lab is to bring together diverse stakeholders, including government agencies, academia, businesses, non-profit organizations, and communities, to collaborate on climate action initiatives. By fostering partnerships and cross-sectoral collaboration, the Lab aims to leverage collective expertise and resources to tackle climate challenges more effectively.
- **Generate innovative ideas:** The Climate Innovation Lab serves as a creative hub for generating and incubating innovative ideas, technologies, and approaches to address climate change. Through workshops, brainstorming sessions, and hackathons, participants are encouraged to explore novel solutions and experiment with cutting-edge technologies and methodologies.
- **Accelerate implementation:** Another key objective of the Climate Innovation Lab is to expedite the implementation of climate actions on the ground. By providing support for project development, capacity building, and access to funding and technical assistance, the Lab aims to translate innovative ideas into tangible projects and initiatives that deliver measurable impacts in terms of emissions reduction, adaptation, and resilience.
- **Catalyze systemic change:** Beyond individual projects, the Climate Innovation Lab seeks to catalyze systemic change by influencing policy, institutional frameworks, and societal norms related to climate action. By advocating for transformative policies, fostering a culture of innovation, and empowering local communities, the Lab aims to create an enabling environment for sustainable development and climate resilience at all levels.

DESIGN AND STRUCTURE

First and foremost, it is important to note that the Lithuanian Innovation Laboratory for Climate Action combines the expertise and resources of two institutions: the LAMMC (a research institution) and the VTKD (a higher education institution). This collaborative model is rather unique in Lithuania, where academic research center and professional bachelor applied education college seldom collaborate more intensively. Notably, the synergy between different fields of activity – agriculture and forestry at LAMMC, and engineering and design at VTDK – brings diverse expertise and addresses various needs within the value chain. For instance, VTDK's expertise in biofuel research complements LAMMC's focus on developing and implementing new technologies related to energy crops.

The Climate Innovation Lab is designed to provide a conducive environment for creativity, collaboration, and experimentation. Its structure encompasses both physical and virtual elements to accommodate diverse stakeholders and facilitate remote participation.

Physical space:

For the physical space of the Lab, the infrastructure of LAMMC and VTDK is utilized. Both institutions have working areas equipped with all necessary tools and additional spaces such as meeting rooms and innovation studios where participants can gather for workshops, brainstorming sessions, and co-creation activities. The physical space is designed to inspire creativity and encourage spontaneous interactions among participants.

Virtual platform:

In addition to the physical space, the Lab also utilises a virtual platform or online collaboration tools to engage stakeholders from diverse geographic locations. Virtual meetings and webinars enable remote participation and ensure inclusivity, allowing individuals to contribute their ideas and expertise regardless of their location. To enhance cooperation among stakeholders, the website of the ILCA project is also utilized.

Organizational setup:

The Lab operates through temporary multidisciplinary teams comprising experts in agriculture, forestry, engineering sciences, policy, innovation, and community engagement. Key roles within the team include Lab Administrators (from LAMMC and VTDK) responsible for overall management and coordination, temporary facilitators from LAMMC and VTDK to lead workshops and activities, and experts (including researchers, lecturers, and other staff from LAMMC and VTDK) to provide guidance on climate solutions and technologies.

Selection process and composition:

The selection process for participants in the Climate Innovation Lab is designed to ensure diversity and inclusivity. Stakeholders from various sectors, including government, academia, private sector, civil society, and community groups, are invited to participate based on their expertise, experience, and commitment to climate action. Multidisciplinary teams are formed to leverage the collective knowledge and perspectives of different stakeholders, fostering cross-sectoral collaboration and innovative problem-solving.

Unique features, methodologies and capacity:

The design of the Innovation Lab incorporates several unique features and methodologies to stimulate creativity, collaboration, and experimentation. These include design thinking workshops, PRIA (Prospective Rapid Impact Assessment) approach using and co-creation sessions, etc. Design thinking methodologies encourage participants to adopt a user-centric approach, empathising with the needs and experiences of communities affected by climate change. PRIA approach provides a platform for rapid ideation and innovation, allowing participants to develop practical solutions to specific climate challenges within a short timeframe. Co-creation sessions facilitate collaboration among stakeholders with diverse backgrounds and perspectives, fostering synergies and collective ownership of climate action initiatives.

Within the frame of Innovation Lab projects LAMMC and VTDK provides access to laboratories capable of offering a range of services related to novel products and innovative solutions aimed at aiding adaptation to climate change. For example, the Open Access Joint Research Centre of Agriculture and Forestry (LAMMC) provides a diverse array of services. It includes Agrobiology and Microbiology Laboratories, the Laboratory of Biological Signs, and the Laboratory of Timber Use, Quality, and Processing Technologies. These specialized open-access laboratories offer a range of experiments and services tailored to the agriculture and forestry sectors, catering to students, businesses, and researchers from other institutions. VTDK offers to stakeholders the infrastructure and expertise for research&services in the following fields: production of second and subsequent generations of biofuels (from waste and non-food raw materials); secondary use of industrial waste (technogenic feedstocks); solar energy as an alternative energy source; design services to bring a product to market (product package designing and prototyping; product/service branding); efficient use of resources and service costing methods in business.

Overall, the design and structure of the Innovation Laboratory are geared towards fostering an inclusive, collaborative, and dynamic environment where stakeholders can come together to co-create innovative solutions to address the challenges of climate change.

INNOVATION PROCESSES AND TOOLS

The Climate Innovation Lab employs various processes and tools to facilitate the generation, evaluation, and refinement of innovative ideas aimed at addressing climate actions:

- **Ideation sessions:** Regular brainstorming sessions are conducted to generate a diverse range of ideas related to climate change adaptation and mitigation. These sessions encourage participants to think creatively and explore unconventional solutions.
- **Design thinking workshops:** Design thinking methodologies are employed to empathize with stakeholders, define problem statements, ideate potential solutions, prototype concepts, and test and iterate solutions. This human-centered approach ensures that solutions are tailored to meet the needs of end-users.
- **Testing and Validation:** LAMMC and VTDK possess robust experimental capacity to conduct testing and validation exercises aimed at assessing the feasibility, effectiveness, and scalability of proposed solutions. Leveraging state-of-the-art laboratory facilities and equipment, the institutions can simulate real-world scenarios and evaluate the performance of innovative climate actions.
- **Stakeholder engagement tools:** Various tools and techniques are used to engage with stakeholders, including surveys, interviews, focus groups, and co-creation workshops. This ensures that diverse perspectives are considered throughout the innovation process and fosters a sense of ownership and buy-in among stakeholders.

To illustrate the aforementioned processes and tools, we can provide the following examples.

#1 INNOVATION WEEK: OUT-OF-THE-BOX SUSTAINABILITY – A STUDENT-STARTUP COLLABORATION:

Innovation Week represents an alternative teaching format with a high focus on real-world climate-change problems and College academic, non-academic staff and students' engagement in teaching and is a contemporary way of not only increasing students' learning experience but also of developing the skills of creative problem solving and critical, customer centric thinking. In 2023 Innovation Week was organised in a Hackathon format. It was a time-bound (48 hours) competitive event where students tackled a challenge set by an architectural design company JSC MADHOUZ to develop a concept for a mobile office, completely environmentally neutral and autonomous from centralised engineering networks, able to fully meet its needs. The challenge was addressed by 14 student teams: they considered which engineering systems, identity, interior solutions and materials to choose, and how to apply circular economy and sustainability trends. The winning team proposed to set up the office in old trolleybuses that are no longer in use and ready for disposal. This winning idea materialized unexpectedly for the students while riding an old Vilnius trolleybus and running late for college due to the snow that had blanketed the city. The winning team's idea not only resonated with the start-up but also captured the interest of Vilnius media, resulting in several articles in the public domain.

#2 APPROACHES INCREASING STAKEHOLDERS' ENGAGEMENT:

- **PRIA method:** We initiated a workshop in collaboration with Taurage city, focusing on the crucial themes of adaptation and preparedness for climate change. In order to better engage local community and seeking for optimum solution Prospective Rapid Impact Assesment method (PRIA) was applied. This methodology was developed in Finnish regional climate roadmap case (Mustajoki et. al 2023 A portfolio decision analysis approach for selecting a subset of interdependent actions: The case of a regional climate roadmap in Finland. Science of The Total Environment. Volume 912, 20 February 2024, 169548 https://doi.org/10.1016/j.scitotenv.2023.169548.

During the session, organized by LT Innovation Lab and Taurage city, the participants (municipality representatives, business, youth organizations, associations) identified over 80 potential actions across three categories (individual, household, and city). In a subsequent workshop, scientists from VTDK and LAMMC contributed their perspectives to the identified actions and conducted evaluations. The application of the approach would make it possible to efficiently select the most important actions and design an action plan that would facilitate the process of adapting to the negative effects of climate change.

- **VBOF method:** Holding a session aimed at intensifying cooperation between VTDK and LAMMC scientists, colleague from Savonia UAS (Finland) applied Visual Boundary Object Facilitation (VBOF) Method. VBOF represents a contemporary and interactive approach that unites various stakeholders. By utilizing visual aids to encapsulate different perspectives, whether individual or collective, workshops employing VBOF, whether conducted in-person or virtually, offer an inclusive and equitable platform for open dialogue. Visual stimuli prompt participants to examine topics from fresh viewpoints, fostering insightful discussions and facilitating deeper understanding.

#3 EMPOWERING ENTREPRENEURS: BRIDGING SCIENCE AND START-UPS:

- Developing novel product ideas and preparing project proposal for funding:Innovation Laboratory facilitated consultancy series wherein the start-up MISKANTAS team collaborated with VTDK scientists to conceive a novel product idea – an artificial intelligence-based model focused on predicting emissions from internal combustion engines. This innovation not only ensures the seamless integration of biofuels and blends into the transport sector but also yields environmental and economic benefits while maintaining transport mobility and conserving natural resources. Moreover, the development of emission prediction tools using artificial intelligence represents a cutting-edge synthesis of advanced deep learning, data analysis, and domain expertise, fostering advancements in artificial intelligence and data science. The resulting R&D product would benefit authorities, car manufacturers, biofuel producers, the energy sector, environmental organizations, and researchers. Building on this concept, VTDK assisted the start-up in preparing a project proposal that, upon success, would secure the start-up with €86,000 for R&D activities.

- Design services to bring a product to market: the links with MB Biofita start-up was established through LAMMC. In the initial session LAMMC identified the needs of this startup and asked VTDK to help in terms of product branding identity design and product package designing and prototyping. VTDK, LAMMC and MB Biofita had a common session, where the needs of startup were discussed and was agreed on consultancy within the period of 2 months to develop and prototype the package for their novel product.

COLLABORATION AND ENGAGEMENT

The Climate Innovation Lab employs several strategies and approaches to foster collaboration and engagement among its participants and external stakeholders, ensuring a diverse range of perspectives and expertise are brought to bear on climate action initiatives.

Multidisciplinary teams: The Lab brings together multidisciplinary teams comprising experts from various fields, including agriculture and forestry science, policy, innovation, and community engagement. This diversity of backgrounds and perspectives encourages cross-disciplinary collaboration and the exploration of innovative solutions from different angles.

Co-creation workshops: The Lab organizes co-creation workshops and brainstorming sessions where participants can collaborate on generating and refining ideas for climate actions. These interactive sessions facilitate creative thinking, idea exchange, and collaboration among stakeholders.

Stakeholder engagement: The Lab actively engages with external stakeholders, including government agencies, NGOs, businesses, and communities, to ensure broad-based participation and input in its activities. This engagement takes the form of consultation meetings, focus groups, and partnerships with external organizations.

Knowledge sharing platform: The Lab provides platforms for knowledge sharing and information exchange, such as webinars and seminars. These platforms enable stakeholders to share best practices, lessons learned, and innovative solutions, fostering a culture of collaboration and continuous learning.

Partnerships and Networks: The Lab cultivates partnerships and networks with relevant stakeholders in the climate action ecosystem to leverage collective expertise, resources, and influence. By collaborating with like-minded organizations and initiatives, the Lab can amplify its impact and drive collective action on climate change.

Outreach and Awareness Campaigns: The Lab conducts outreach and awareness campaigns to engage a wider audience and mobilize support for climate action initiatives. These campaigns raise awareness about the importance of addressing climate change, educate stakeholders about available solutions, and inspire action at the individual and community levels.

We can exemplify the previously mentioned approaches to improving collaboration and engagement with the following examples:

#1 Public engagement

- **Engaging citizens at exhibition platforms:** Agrovision 2024, also known as Agrovizija, stands as one of Lithuania's premier agricultural machinery and technology exhibitions, attracting agribusiness professionals, citizens, and academia biennially. The event serves as a pivotal platform for showcasing the latest achievements in agricultural science and machinery, addressing the most relevant topics in the field. Amidst this vibrant setting, our participation takes on a distinct purpose: to engage with diverse audiences and disseminate our ideas effectively. Through interactive discussions and innovative engagement techniques, such as the exploration of a large poster illustrating the eco-neighbourhood concept, we aim to foster dialogue and understanding among attendees. Visitors will have the opportunity to actively participate by voting on proposed solutions (in the fields of buildings&infrastructure, environement, community, local food systems) , providing invaluable insights into end-user needs. Additionally, we have planned panel discussions featuring relevant experts to delve deeper into the eco-neighbourhood concept. This strategic utilization of the Agrovision platform underscores our commitment to public engagement and the dissemination of sustainable ideas to our target groups, including businesses related to agriculture, citizens, and academia.
- **Contest for high school students:** Vilnius College of Technology and Design invited 10th and 11th-grade students to contribute sustainable ideas for an eco-settlement concept. Students could choose and explore various aspects of eco-neighbourhood such as education, green spaces, food systems, waste management, health, social justice, energy, transport, buildings, water conservation, and climate innovations. Through research, development, and presentation phases, students unleashed their creativity to propose solutions addressing specific climate challenges with economic, environmental, and social benefits. The projects were judged on criteria including creativity, innovation, sustainability, and presentation quality, empowering students to understand and apply climate solutions in real-world contexts. Such initiatives play a pivotal role in fostering environmental awareness and encouraging innovative problem-solving among students. By providing a platform for exploration and collaboration, contests like these contribute to the development of critical thinking skills and empower young minds to become active participants in creating a more sustainable future.

#2 Initiatives driving cooperation between LAMMC and VTDK teams

To intensify cooperation between LAMMC and VTDK teams the following initiatives were implemented in 2023:

- A practical workshop organized and implemented by the college for LAMMC PhD students to develop their presentation skills to effectively communicate research ideas to the business community.
- A seminar facilitated by Savonia UAS helped to identify the intersection of the scientific interests of researchers from both institutions and explore possible project initiatives;
- The joint seminar of VTDK and LAMMC researchers and scientists aimed to analyse and deepen the insights of Tauragė city community's climate actions;

IMPACT AND SUCCESS STORIES

The Climate Innovation Laboratory has generated tangible impacts and success stories through its collaborative and innovative approach to addressing climate change challenges. Here are some specific examples of successful initiatives and projects that have emerged from the Lab's activities:

#1 Fast climate roadmap demonstration: "Taurage adaptation to climate change roadmap"

Between November 2023 and February 2024, experts from the Innovation Lab conducted an initiative with Taurage (an EU Mission 2030 city). The aim of the initiative was to engage with the city's community to discuss the problems arising from the negative impact of climate change on their living environment and to identify potential solutions to these issues. During this initiative, the Prospective Rapid Impact Assessment (PRIA) method was employed.

PRIA is a method that offers excellent opportunities for various interest groups to participate in the decision-making process. It is particularly suitable for developing strategic plans at different levels and of various types.

The first phase of the discussion was held in collaboration with the Tauragė municipality on 7 November 2023. During the discussion, participants were divided into three groups, each tasked with identifying problems stemming from the adverse effects of climate change. These problems were categorized into three levels: individual, household, and city. Participants then scored the identified problems, selecting the five most significant issues for each level from a comprehensive list. Subsequently, participants formulated actions to address these problems.

In the second phase the assessment of the potential impacts of actions to adapt to adverse effects of climate change on nature, social, business, and territorial risks was conducted. The second phase occurred on 16 November 2023, hosted by LAMMC and attended by experts including researchers, PhD students, and lecturers from LAMMC and VTDK.

The initial part of the meeting focused on discussing the most significant issues and actions identified by the Tauragė community in response to the adverse effects of climate change. Subsequently, during the second meeting, experts expanded upon the list of potential actions. A total of 85 actions were compiled, and experts evaluated them based on four criteria: environmental impacts, social threats, business threats, and territorial threats.

Each action was categorized according to its level of impact ("Person", "Household", "City") and the specific problem it addressed. The PRIA methodology was utilized to assess the importance of these actions, with the severity of their impact evaluated using a 5-point Likert scale.

To assess the significance of the actions, the InTo decision-making tool was employed. This tool, provided by the ILCA consortium coordinator Savonia UAS, Finland, evaluates the significance of each action on a portfolio basis. Experts assigned the highest scores to the fifteen actions deemed most significant for the Tauragė municipality.

The results of the analysis are provided to the researchers, working on the strategic document (Tauragė Climate Change Adaptation Plan). It is expected, that the most promising set of actions proposed by the community, enriched by scientists' perspectives and analyzed using the portfolio method, will be included in the Plan.

#2 Innovation week supported by the Innovation Laboratory

Innovation Week offers a dynamic approach to education, emphasizing real-world climate change challenges and engaging college staff and students across academic and non-academic realms. It enhances students' learning by fostering creative problem-solving skills and critical, customer-centric thinking. The week cultivates individual skills like social intelligence, personal development, professional expertise, and transformative abilities, while also nurturing teamwork. Collaboration within innovation teams is crucial, drawing on diverse perspectives, professions, and personal traits to tackle complex climate change adaptation issues. Despite potential barriers such as personality differences, values, backgrounds, and knowledge gaps, the event promotes effective teamwork. By igniting students' creativity and passion, Innovation Week propels them towards entrepreneurship and the exploration of climate-neutral solutions.

Between 2022 and 2023, VTDK organized two Innovation Weeks. The first, held in autumn 2022, adopted a boot camp format spanning three days, aimed at delivering an immersive learning experience. Following the principles of the Stanford Design Thinking approach, students were guided through all stages of a user-driven innovation process. Tasked with challenges set by the College and three external companies, participants collaborated in teams of 4-5 individuals. Each challenge centered on devising climate-friendly solutions tailored to the respective company's profile. Throughout the event, guest speakers delivered public lectures, enriching the learning experience. On the fourth day, teams presented their solutions to a jury, leading to the recognition of two winning teams:

- **Team 1** proposed an interactive solution for the college community: an app designed to track and record sustainability efforts, incentivizing participation through point accumulation.
- **Team 2** envisioned an app to support Red Cross volunteers in organizing activities and accessing real-time information, enhancing their efficiency and effectiveness in service delivery.

The 2023 Innovation Week adopted a Hackathon format, a competitive event spanning 48 hours, wherein students were tasked with addressing a challenge posed by an architectural design company. Their objective: to conceptualize a mobile office that is entirely environmentally neutral and independent from centralized engineering networks, capable of satisfying all its needs autonomously. Fourteen student teams took on the challenge, deliberating over engineering systems, identity, interior solutions, materials selection, and the integration of circular economy and sustainability principles. The winning proposal suggested repurposing old trolleybuses, no longer in use and slated for disposal, as the site for the office.

Comparing the two Innovation Week formats, the boot camp format, where teams collectively tackle a single problem, holds an advantage: it facilitates easier comparison and evaluation of proposals. Additionally, the 2023 Innovation Week revealed that teams comprising students from diverse study programs generated more effective proposals. These interdisciplinary teams produced concepts of greater complexity, higher quality, and increased detail.

Innovation Weeks in the College was an events aimed at strengthening the capacity of our students to develop innovative, climate-neutral solutions to problems in the business world. Students from different study programs, faculties and study years' work is developed in consultation with mentor teachers from different faculties to solve real word tasks submitted by start-ups. The diverse formats and interdisciplinary collaboration showcased in Innovation Weeks underscore the critical role of experiential learning in fostering innovative solutions to complex real-world challenges.

3 Ideas pitching training for PhD students

Pitching training was conducted for PhD students, offering them a valuable opportunity to learn various presentation techniques and craft short pitches for their academic ideas, potentially transformative innovations. Through this training, PhD students acquired insights into effectively presenting innovative ideas to both business and society, enriching their skills and knowledge in the process. Developing the ability to effectively present scientific ideas is crucial for fostering successful collaboration between science and business, as well as engaging society.

4 Collaborative actions for new project ideas elaboration

Working collaboratively, teams from LAMMC and VTDK have jointly developed the idea for a new international project application (AGRIBIA). Should the application receive funding, both institutions will collaborate on research initiatives focusing on various segments of the agri-food value chain. Joint experiments will be conducted to explore the effectiveness of utilizing biobased fertilizers and improvers derived from biogas production waste. A temporary group comprising qualified scientists and other research staff from both institutions has been formed to facilitate this collaborative effort. Collaborative efforts in elaborating new project ideas have involved various activities, including brainstorming sessions, team meetings, workshops, and collaborative meetings where stakeholders exchanged ideas, provided feedback, and collectively refined concepts. The objective of these actions was to leverage the diverse expertise and perspectives of team members, along with those of other consortium partners, to generate innovative and feasible project proposals.

5 Identifying novel channels and platforms for dissemination and collaboration

The International Exhibition "Agrovizija" serves as a significant platform for engaging with new stakeholders, disseminating information about the Climate Innovation Lab, and establishing connections with potential collaborators. As one of Lithuania's largest agricultural technology and innovation exhibitions, "Agrovizija" attracts agricultural business professionals seeking the latest advancements in the field. The live exhibition features outdoor cultivation of various agricultural crops and showcases powerful agricultural machinery such as tractors, drills, and sprayers. Alongside these displays, attendees can explore state-of-the-art agricultural machinery and engage in discussions on topical agricultural issues facilitated by both Lithuanian and foreign scientists. For the Climate Innovation Lab, "Agrovizija" presents an invaluable opportunity to network with stakeholders, raise awareness about the laboratory's initiatives, and forge partnerships that align with its objectives. Through participation in this exhibition, the Lab can explore new ideas and collaborations that contribute to its mission of driving climate innovation.

6 A new model of PhD studies combined with startup establishment

A new model of PhD studies involves combining doctoral research with the establishment of startups. The successful implementation of innovations in practice necessitates more efficient approaches. One such method is the integration of doctoral research focused on developing innovative products or services with the establishment of start-ups, followed by the practical implementation of innovations. The Climate Innovation Lab could indeed serve as an effective intermediary between doctoral students and potential funders for implementing innovations in practice.

LESSONS LEARNED

1. Ambitious vision and effective communication are important in driving innovation

Building strong partnerships through ambitious vision and effective communication is essential for driving innovation. Our business partner advised: “Have an ambitious vision and communicate it boldly. Even if you don’t succeed in the end, raise your flag boldly and keep talking. Otherwise, you have no chance of bringing this idea into life.” We took that to our institution discuss the needs and activities of the laboratory with scientists and management

We also have found, that close collaboration with top management facilitates strategic decision-making and enables the implementation of important changes.

2. Engage community for further actions

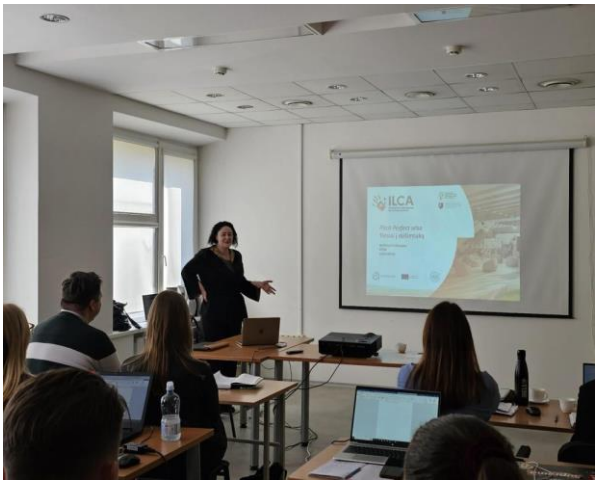
Engaging with local communities, as demonstrated in the Taurage initiative, is essential for understanding climate change challenges and co-creating solutions. Collaboration between stakeholders, including experts, researchers, students, and community members, enhances the effectiveness and relevance of initiatives.

3. Innovative learning formats are helpful

- Utilizing innovative learning formats, such as boot camps and hackathons, fosters experiential learning and interdisciplinary collaboration. These formats enable students to tackle real-world challenges, develop creative solutions, and enhance their critical thinking skills.
- Providing entrepreneurial education for students and academic staff promotes multidisciplinary collaboration, engages stakeholders, and fosters innovation. Formats like Innovation Week are effective in promoting student interest and public awareness of climate-neutral solutions.

4. Empower your idea developers – advantage of pitching

Providing training in presentation techniques, as seen in the pitching training for PhD students, equips individuals with the skills to effectively communicate their ideas and innovations. Strong presentation skills are crucial for engaging stakeholders, attracting funding, and driving the implementation of innovative solutions.



5. Bridging research and entrepreneurship plays crucial importance

- The integration of doctoral research with startup establishment offers a practical approach to implementing innovations. This model promotes the translation of research findings into real-world solutions and facilitates collaboration between academia and industry.
- Collaborative efforts in developing project ideas, as demonstrated in the AGRIBIA project, leverage diverse expertise and perspectives to generate innovative and feasible proposals. Activities such as brainstorming sessions, team meetings, and workshops facilitate the exchange of ideas and collective refinement of concepts.
- Facilitating partnerships between research and industry, providing incubation and acceleration support, and promoting knowledge sharing enhance innovation and business development. Effective communication and collaboration between academia and industry are crucial for driving impactful research and fostering entrepreneurship.
- Organizing workshops and events to share funding opportunities and address industry challenges promotes knowledge sharing and facilitates collaboration. Engaging with companies and stakeholders in problem-solving sessions enhances the quality and relevance of research and innovation initiatives.

6. Develop strategic collaboration with for sustainable partnerships

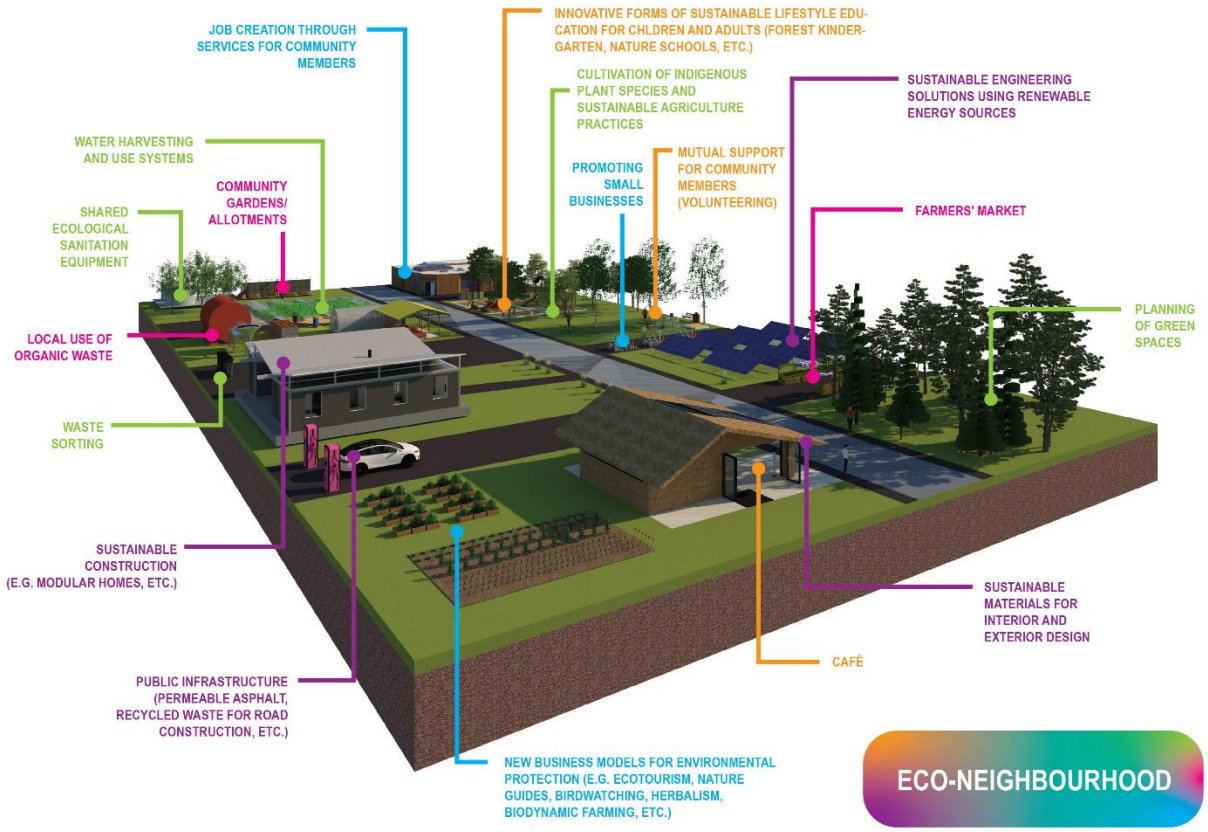
Adopting a strategic approach to collaboration with start-ups, prioritizing those already contributing to sustainable practices, can lead to successful partnerships and meaningful outcomes. This approach ensures alignment with organizational goals and enhances the impact of collaborative efforts.

FUTURE DIRECTIONS AND SUSTAINABILITY

LAMMC and VTDK, in collaboration with stakeholders over the past two years, have identified opportunities for synergies by leveraging each other's expertise. Moving forward, we have chosen to adopt an umbrella concept of an eco-neighbourhood, which addresses the urgent need for climate change adaptation. The eco-neighbourhood encompasses various aspects, including:

- **Sustainable buildings and infrastructure:** This involves the use of wooden modular houses, sustainable materials for interior and exterior design, engineering solutions utilizing renewable energy sources, permeable asphalt, and incorporating recycled waste for road construction.
- **Community**: Innovative approaches to sustainable lifestyle education, such as forest kindergartens and nature schools, alongside initiatives for mutual support among community members, an active community council, and organizing joint events like the Harvest Festival and Neighbours' Day. Additionally, facilitating exchanges of goods like books and clothes.
- **Environment:** Practices such as cultivating indigenous plant species, implementing sustainable agriculture, water harvesting and usage systems, green space planning, and providing shared ecological sanitation equipment and waste sorting facilities.
- **Local food systems:** Establishing community gardens/allotments, promoting farmers' markets, and utilizing organic waste locally.
- **Economy:** Creating job opportunities through services for community members, supporting small businesses, and exploring new business models for environmental protection, such as ecotourism, nature guides, birdwatching, and biodynamic farming.

By focusing on these interconnected elements, we aim to provide a platform for collaboration among multidisciplinary teams and foster the creation of solutions relevant to adapting to the consequences of climate change.



Concept of an Eco-neighbourhood

As the Climate Innovation Lab looks towards the future, we consider several key strategies to ensure its continued impact and long-term sustainability:

1. **Scaling up impact:** Lab should focus on scaling up the impact of its successful initiatives by expanding their reach and replicating them in other communities and regions. This should involve partnering with government agencies, NGOs, and private sector organizations to leverage resources and expertise for broader implementation.
2. **Diversifying funding sources:** To sustain its operations, Lab should explore diverse funding sources, including grants, corporate sponsorships, donations, and revenue-generating activities. Developing sustainable funding models will be crucial for maintaining the Lab's activities and expanding its reach over time.
3. **Strengthening partnerships:** Lab should strengthen its partnerships with a wide range of stakeholders, including government agencies, research institutions, civil society organizations, and local communities. Collaborative partnerships can facilitate knowledge exchange, resource sharing, and collective action towards addressing climate change challenges.

4. **Capacity building and knowledge sharing:** Lab should continue to invest in capacity-building initiatives and knowledge-sharing platforms to empower individuals and organizations with the skills, knowledge, and resources needed to address climate change effectively. Building a network of climate champions and practitioners will enhance the Lab's reach and impact.
5. **Innovation and adaptation:** Lab should remain adaptive and responsive to emerging climate change challenges and opportunities. Continuously innovating and experimenting with new approaches, technologies, and solutions will ensure the Lab remains relevant and effective in addressing evolving climate-related issues.
6. **Replication and adaptation:** Lab should explore opportunities to replicate or adapt its model in other contexts or activity trends facing similar climate change challenges or innovation development procedure. By sharing best practices, lessons learned, and toolkits, Lab should inspire and support the development of new activity trends and innovative business ideas.

CONCLUSION

Innovation Laboratories play a pivotal role as catalysts for driving climate action. As agents of change, they reinforce the critical importance of advancing sustainable solutions to combat climate change. These laboratories serve as hubs of creativity and ingenuity, where interdisciplinary teams collaborate to develop and implement innovative technologies, policies, and strategies. By fostering experimentation and exploration, Innovation Laboratories empower individuals and organizations to push the boundaries of conventional thinking, accelerating the transition to a low-carbon economy. Their contributions extend beyond mere invention; they inspire collective action and spark transformative change on local, regional, and global scales. In a world facing unprecedented environmental challenges, Innovation Laboratories stand as beacons of hope, offering tangible pathways towards a more resilient and sustainable future.

The establishment of a Climate Innovation Laboratory is influenced by numerous factors. The nature of Lab work varies depending on the sector to which Lab activities are directed, the proficiency and dedication of team members involved in organising assigned tasks, as well as their motivation. However, several general observations can be made regarding what is required to ensure the laboratory's viability and efficiency. Several elements are essential for the functioning of the laboratory, without which its operation could be challenging:

- **Investment and Funding**: State and private sectors entities should allocate increased funding towards the establishment and expansion of Climate Innovation Laboratories focused on climate actions. This investment is crucial for fostering research, development, and implementation of innovative solutions.
- **Collaborative Partnerships**: Encourage collaboration and partnerships between academic institutions, research organizations, businesses, and government agencies to leverage diverse expertise and resources in Climate Innovation Laboratories. Cross-sector collaboration can amplify the impact of climate initiatives and facilitate knowledge-sharing. We can exemplify such cooperation and knowledge sharing through our joint activities, such as the development of the ABRIBIA application for a new project, pitching seminars for PhD students, and others, where innovative ideas for climate actions were generated.
- **Capacity Building**: Prioritize capacity building initiatives to equip individuals and teams within Innovation Laboratories with the skills, knowledge, and tools needed to address complex climate challenges effectively. Training programs, workshops, and mentorship opportunities can enhance innovation and accelerate the adoption of sustainable practices.

CONCLUSION

- **Policy Support**: Advocate for supportive policy frameworks at the local, national, and international levels to incentivize and facilitate the establishment of Innovation Laboratories focused on climate actions. Policies that promote research and development, incentivize green technology adoption, and establish regulatory frameworks for sustainability can create an enabling environment for innovation.
- **Community Engagement**: Foster engagement with local communities and stakeholders to ensure that Innovation Laboratories address pressing climate issues that directly impact people's lives. Community involvement can provide valuable insights, enhance the relevance of solutions, and promote social acceptance and adoption.
- **Knowledge Sharing and Dissemination**: Promote open access to research findings, data, and best practices generated by Innovation Laboratories to facilitate knowledge sharing and dissemination. Sharing successes, lessons learned, and failures transparently can accelerate progress and inspire further innovation in the field of climate action.
- **Monitoring and Evaluation**: Establish mechanisms for monitoring and evaluating the effectiveness and impact of Innovation Laboratories on climate actions. Continuous assessment of outcomes and adaptation of strategies based on evidence can enhance the efficiency and relevance of these initiatives over time.

Are you interested in partnering with our Innovation Laboratory or having us develop a custom solution for you?

Let’s work together!

Registration Form