Newsletter 01_2024

connect partners share information gain insights



Welcome to the first issue of the Europe-LAND Newsletter!

The Europe-LAND project just passed its 18 months mark. Much has happened over the first year and a half and with work picking up in all Work Packages, even more outputs are expected over the following months! Hence, the project is launching a newsletter series. Every 6 months a new issue will be published, covering various topics related to project outputs, ongoing work and exciting upcoming opportunities.

This first issue of the newsletter contains updates on the progression of our various Work Packages, including the newest public deliverables available right now.

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A harmonized database of European land-use data as a basis to assess land-use changes

By Martin Rudbeck Jepsen, Kristoffer Ansbak Petersen (University of Copenhagen, Denmark), Daniel Müller and Clemens Jänicke (Leibniz Institute of Agricultural Development in Transition Economies, Germany)

The Integrated Administration and Control System (IACS) of the EU keeps track of where and for what farmers apply for subsidies. The IACS data includes geometry of the fields, a crop code, and an ID of the applicant. Across Europe, the data are often held by the national paying agencies, usually an agricultural agency. Since early 2024, Work Package 2 of the Europe-LAND project has been approaching national paying agencies and other relevant stakeholders to obtain IACS data, with the goal of producing a harmonized database of available data across Europe. We have received substantial help from our Europe-LAND partners and their networks, and where we don't have partners, we have relied on our networks to identify relevant stakeholders to approach.

As of 01/11 2024, we have secured data from 27 countries (Figure 1). For two of these countries (Germany, and Italy) we could only obtain data for selected regions within them. The temporal and thematic resolution of



Figure 1: Spatial and temporal coverage of the Europe-LAND IACS data collection.



the data varies substantially across countries. For five countries/regions, time series of data of 11 to 20 years are available, for 12 countries/regions we have data of 6 to 10 years and land, whilst for the remaining countries/regions5 and less years of data could be obtained. Some countries provided data with 100+ crop codes, while others offer data classified into around 20 rough crop categories. We were able to secure the applicant IDs for the majority of the countries or regions (21 in total). Only a group of countries were not willing to share applicant IDs or anonymized versions thereof.

A major obstacle encountered were countries refusing to share (anonymized) applicant IDs. The arguments for this often relate to national legislation preventing disclosure of information that can be related to individuals. Despite our enquiries for anonymized versions of the ID, national authorities have argued that the data are only semi-anonymized as someone will have the encoding key. Another common obstacle are missing data. The reasons for missing data can be grouped in two: One reason regards missing responses to our emails, and another reason is that countries seemingly haven't produced the data yet, despite an EU demand that the data should be publicly available by 01/01 2024.

It has generally been a pleasure to work on this task. As scientists, the joy of receiving an email with links to national IACS data is almost unbeatable. It has also been a nice learning experience to see how the EU in general manages to introduce a system for producing uniform geodata on agricultural land use. Working with authorities from all across the EU has also demonstrated large differences in administrative systems, including response times to our emails and willingness and capacities to assist us in our data hunt.

Whilst the harmonized geodatabase constitutes an output of the project that had to be delivered by end of November 2024, we continue to collect data for the database, albeit with less intense effort. We focus particularly on the countries for which we don't have data yet, and next on annual updates for countries where we have secured data.

Connecting with stakeholders across Europe – Mirror workshops in 12 countries as a first step on our roadmap within the Living Lab Framework

By Mihaela Sima (Institute of Geography of the Romanian Academy, Romania)

Living Labs (LLs) are participatory, user-centred research environments focused on co-innovation by engaging diverse stakeholders—including citizens, researchers, businesses, and governments— to develop, test, and validate new solutions in real-life settings. LLs follow several principles: active user involvement, reallife settings, multi-stakeholder collaboration, multi-method approaches, and co-creation.

As part of the Europe-LAND Living Lab Framework, a Co-Creation Roadmap has been proposed, to embed LLs approaches in the participatory actions planned with the Europe-LAND stakeholders. Organising a series of joint participatory workshops at the national level, entitled "Mirror Workshops", since following a similar format across all 12 partners' countries, was the first stage of the Roadmap and an important aspect of WP3 activities in 2024.

The mirror workshop series, with the proposed title "Present land use and land management challenges and future perspectives", has been organised in the period June-October 2024 in Romania, Germany, Austria, Poland, Latvia, Greece, Portugal, Slovakia, Denmark, Italy, Estonia and Czechia. The workshop aimed to increase stakeholders' understanding of various key factors contributing to past, present and future land use/land cover change, and potential pathways for sustainability, particu-



Figure 1: Mirror workshop in Romania, June 2024

larly addressing current and proiected climate change and biodiversity challenges. In addition, the workshop aimed to contribute to raising awareness among land use and land management stakeholders future chalof lenges related to the intensification of climate change

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impacts and biodiversity decline. By collaboratively exploring and assessing a country's policy support towards making more sustainable land use decisions, the core idea was that participants would gain a deeper understanding of how policy is shaping national land use/land cover development.

The workshops, organised in-person or online, were attended by over

200 stakeholders: decision-makers (e.g. representatives from the ministries or related state agencies of agriculture, forestry sector, environmental protection, biodiversity and conservation), academia, environmental NGOs and land use and management associations, as well as business representatives.

The results of the mirror workshops will be used for a comparative analysis of joint challenges the countries are facing in terms of sustainable land management, the main focus being on aspects related to policy support, farmers' challenges, proposed solutions, as well as to define a common vision on Land Futures.

What lessons have we learned from this exercise? The mirror workshops have shown that we work together very well as a team in Europe-LAND.



Figure 3: Mirror workshop in Portugal, October 2024

Collaborating with our stakeholders brings more value to our results, as there is a good level of knowledge and awareness among the stakeholders on climate change issues, and numerous examples of good land sustainability practices already established in the countries could be identified. Furthermore, common challenges were found across countries that could benefit from common solutions.

The next participatory action as part of the Co-Creation Roadmap is to organise interviews with key regional and local level stakeholders for the eight case studies of the Europe-LAND project, spanning from Portugal, Germany, Estonia, Poland, Slovakia, Czechia, Austria and Romania.



Figure 4: Conceptual map of the discussions during the Mirror Workshop in Romania.

Land use and land cover modelling as a management tool in protected areas

By Janis Krumins and Maris Klavins (University of Latvia, Latvia)

Modelling of land use and land cover (LULC) is essential for understanding and addressing the complex environmental and socio-economic impacts of land transformation driven by human activities as well as natural factors. Rapid urbanization, agricultural expansion, and industrial development highlight the growing need for predictive LULC models, which play a critical role in various domains, including climate change mitigation, biodiversity conservation, hydrological management, agricultural planning, and urban development.

LULC changes significantly influence carbon dynamics by affecting terrestrial carbon pools, including vegetation cover, soil carbon levels, and greenhouse gas (GHG) fluxes. Predictive LULC modelling is thus instrumental in quantifying potential carbon storage and examining the climate implications of land-use decisions. This modelling supports strategic planning by identifying areas suitable for carbon mitigation actions, such as afforestation and reforestation projects.

LULC models are essential in identifying areas vulnerable to habitat conversion and fragmentation—significant drivers of biodiversity loss. By forecasting regions at risk of deforestation or habitat degradation, predictive models enable conservation planning aimed at maintaining ecological resilience and species preservation. These models guide the prioritization of zones for protection, offering critical support for biodiversity conservation in rapidly changing landscapes.

Based on this potential of LULC models, Europe-LAND, under the lead of the University of Latvia, is undertaking a modelling and mapping of expected LULC changes in Europe to aid in reaching policy objectives such as climate change mitigation and biodiversity conservation.

Modelling of land use/land cover change in a protected area in Latvia

Latvia, where forests cover over half of the land area, relies on forest ecosystems for carbon sequestration, biodiversity, and economic activities. Predictive LULC modelling in Latvia is crucial for evaluating future forest cover scenarios and informing sustainable forest management practices aligned with national climate commitments within the EU. These models also assess risks of habitat loss, fragmentation, and land conversion, exacerbated by agricultural expansion and urbanization, aiding in the protection of key biodiversity areas such as Natura 2000 sites that support ecological connectivity.

Given Latvia's increasing extreme weather events, including warmer winters and altered precipitation patterns, predictive LULC modelling provides valuable insights into landuse interactions with climate change impacts, such as flooding and drought risks. For instance, models can identify areas where reforestation or wetland restoration might mitigate flooding, offering targeted protection for communities and agricultural sectors from future climate challenges.

Predictive LULC models help identify pressures from surrounding land uses, such as urbanization and agricultural expansion, to support and inform the management of protected areas. By detecting edge effects like human-wildlife conflict, invasive species intrusion, and pollution, these models facilitate the establishment of buffer zones and regulatory measures to protect ecological integrity. For protected area managers, predictive modelling supports decision-making on habitat suitability, species distribution, and ecosystem resilience, particularly in biosphere reserves where buffer and transition zones are critical for sustainable development.

A team at the University of Latvia, led by Prof. Maris Klavins, applied LULC modelling to the Teiči Nature Reserve in Eastern Latvia (Figure 5) to project future land-use scenarios and inform conservation strategies that protect its ecological integrity against anticipated pressures. The relatively small area of the nature reserve was ideal to validate the modelling methodology, as predicted LULC changes based on historical data could be compared to observed changes, thus refining the accuracy of future forecasts.

The study offers a comprehensive

peat bog increases, and stable water bodies. However, since 1991, significant shifts have occurred, such as the expansion of transitional woodlandshrubs and reductions in peat bogs, largely driven by socio-economic factors including urbanization and population growth.

Future projections underscore potential continued losses in peat bogs and waterbodies under various legislative scenarios, emphasizing the need for adaptable conservation strategies to counter external pressures like agricultural expansion and climate change.



Figure 5: Landscape of Teiči Nature Reserve

assessment of LULC changes in the Teiči Strict Nature Reserve from 1982 to 2023 and models potential changes up to 2064 under four legislative scenarios. The historical analysis reveals that the reserve maintained stability from 1982 to 1991, with minimal urban expansion, slight To find out more about the Teiči Nature Reserve and the work undertaken by the team at the University of Latvia, check out the new publication of the study on our website: https://europe-land.eu/results/



In future work, we will map and model changes in land use and land cover within the North Vidzeme Biosphere Reserve. This work will build on our current methods to see how protected areas in the Baltic region respond to both natural and human pressures. We also plan to focus on changes in Baltic forests, studying patterns of forest loss, growth, and fragmentation. These efforts will help us understand how forests in this region might adapt to future changes, such as shifts in land use and climate. By modelling different scenarios, we aim to provide useful insights for developing flexible conservation strategies that can respond to future environmental challenges in Northern Europe.

The potential of telecoupling frameworks to examine human-environment interactions – an analysis of existing methodologies

By Danka Moravčíková and project team (Slovakian University of Agriculture in Nitra, Slovakia)

In Europe-LAND, we perceived the telecoupling framework as an appropriate paradigm for examining human-environment interactions in contemporary societies. It was first proposed by Liu et al. (2013) and is deeply rooted in coupled humannatural, human-environment or social-ecological systems analysis. Since its inception, telecoupling has been applied in various fields to develop more specialised frameworks to address specific issues. It draws specifically on systemic thinking when dealing with human-environment interactions such as land-use change, while also emphasising the need to understand the networked relations of actors that mediate cross-scalar flows and feedbacks between systems.

The team of Work Package 5 conducted a systematic review on methodologies in telecoupling models research and produced a research report on telecoupling frameworks. As a public deliverable, it was published (https://europe-May 2024 in land.eu/results/). The review was specifically designed to inform the project's objectives by synthesizing existing methodologies and identifying suitable approaches for modelling telecoupling within the context of sustainable land use, climate change, and biodiversity in Europe. The analysis presents an interdisciplinary overview of the ways in which the telecoupling concept has been used to disclose socioeconomic and environmental interactions over distances, pays special attention to the ways in which social science disciplines contribute to this area of



Figure 6: Workshop of the SUA project team in January 2024.

research, and synthesizes the range of methodologies applied across studies on telecoupling models, encompassing primarily quantitative and primarily qualitative research approaches.

The literature review highlights the importance of integrating quantitative and qualitative research approaches to capture the full spectrum of telecoupling interactions. Quantitative methodologies exhibit high certainty due to detailed reporting and broad applicability, while qualitative approaches face challenges related to the variability in application and reporting. Practitioners involved in land-use planning and management should consider adopting a multi-method approach to better understand and respond to the interconnected impacts of their decisions on climate change and biodiversity. The results are intended to catalyse further research, inform policy development, and guide practical applications in managing land use sustainably.

After conducting this review, we know more about what a telecoupling framework can be and how its empirical application to real-world scenarios in Europe (to our eight case studies) could look like. To do this, we have started to work on developing our Europe-LAND telecoupling framework that will include evaluation of various socio-spatial structures in the EU context via drafting the structure of an internal data set,



taking into account knowledge acquired from other Work Packages. We released our first proposal to project partners for discussion by the end of November 2024 (D5.2), and will now gather structured inputs from them. Using all this information, we will develop the Europe-

LAND telecoupling framework, test it and assess a regional variety of concrete land-use causes and transition examples from various biogeographical regions (drawing upon the datasets of the mentioned eight case studies).

A word from our sisters

Europe-LAND has two 'sister' projects, that received funding from the same programme. We are committed to collaborate and build synergies whenever possible to maximize our projects' reach and impact. Find below some short messages from both project teams and information to learn more about our sisters.

PLUS Change is excited to share the results of the Possible Landscapes sessions that have been held in each of the 12 Practice Cases!

Possible Landscapes runs parallel to the project, supporting processes of co-creation, exploration, data creation and effective communication of results. By employing creative arts and storytelling methodologies, the aim of each session is to develop new visions of land use that add ecological, social and economic value to the living environment. Check out the audio-visual stories <u>here.</u>

Check out six new Policy Lab videos from the **MOSAIC project**!

These videos highlight how each policy lab is working with local stakeholders to develop sustainable land-use policies. Policy Labs are all tackling different challenges and are located in Belgium, Denmark, Hungary, Portugal, Switzerland, and Europe-wide.

Watch the videos on YouTube: <u>https://www.youtube.com/@MOSAIC-Project</u>

Find out more about the MOSAIC project: <u>https://www.mosaic-eu-</u> <u>rope.eu/about</u>

Upcoming capacity building opportunities

Europe-LAND regularly offers webinars, seminars and other project events and resources that are open to our stakeholders and free of charge! The next upcoming opportunities to connect and get involved are listed below.

You can find up-to-date information on all our project events on our website: <u>https://europe-land.eu/events/</u>

29th January 2025 10:00-11:00 (CET) - Expert Webinar #8 – Towards an interactive digital Toolbox

This webinar offers an insight into the progress made on the digital Europe-LAND Toolbox, a collection of scientific tools providing information for spatial and temporal land use changes in Europe, to explore past and current land uses. Data from the recently published harmonized IACS database was incorporated to test and improve functionalities. Sign up to the webinar here: <u>https://forms.office.com/e/HjXDQYHqbv</u>

16th May 2025 – International Workshop on the outcomes of the Mirror Workshops – Save the date!

The learnings and outcomes of the 12 mirror workshops conducted in all 12 project countries within the Living Lab Framework will be presented during this online event.



Thank you for reading! We hope that you have enjoyed our first edition of the newsletters and that you will follow us in the future!

In the meantime, check out our project website to find out more:

www.europe-land.eu/

Sincerely yours,

The Europe-LAND Project Team

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