LIVING LAB COORDINATION PLAN

Deliverable 3.1 - version: v.3

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REVISION HISTORY

Version	Date	Author/reviewer	notes
v.0	06-05-2024	BOKU Team	creation
v.1	12-06-2024	BOKU Team	comments on draft
v.2	20-06-2024	BOKU Team	Update based on WP3 meeting, inserted revision history, LL logbook detail, update Fig. 2
v.3 (final version)	30-06-2024	BOKU Team / Interlayer Steering Committee	Final version revised

Content

Figures

Tables

Introduction

INTERLAYER focuses on how water retention technologies can contribute to improve resilience, adaptation and mitigation to hydroclimatic extreme events while increasing water availability and quality by balancing groundwater and surface water management practices. INTERLAYER will study groundwater and surface water availability and relate it to land use (including specific agricultural practices) and water quality from a synergetic perspective so that available Slow Hydrology (SH) techniques are used in future River Basin Management Plans. To do so, we set up four Living Labs (LL) in four contrasting European watersheds to include and compare different European edaphoclimatic regions with different geologic characteristics, see Fig. 1.

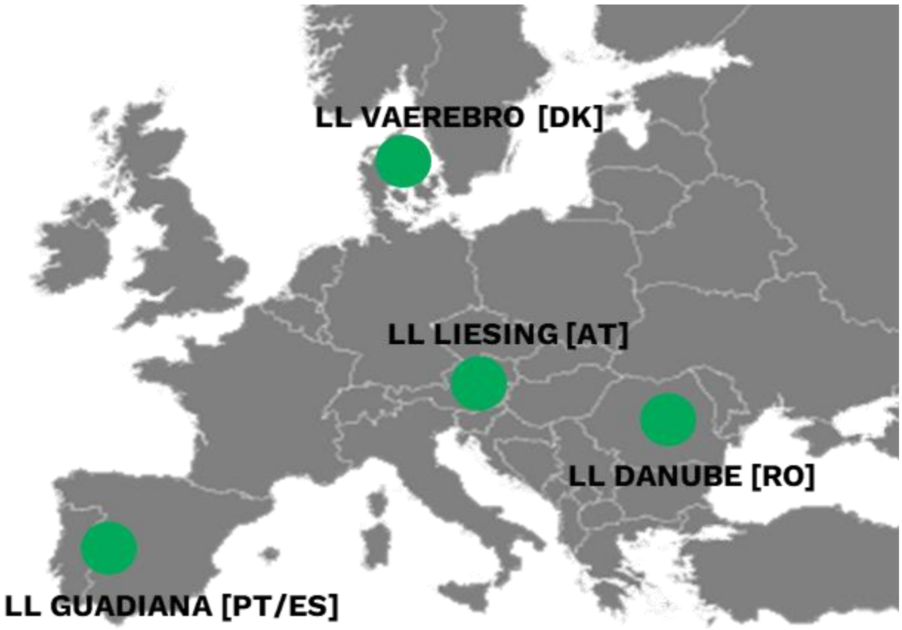

Fig. 1: INTERLAYERs four LLs, located in contrasting watersheds in different regions of Europe

Vaerebro River [DK] - The catchment of river Vaerebro is 153 km^2 and the river itself is 35 km long and one of the longest rivers in the capital region of Denmark, having its source in a biodiversity rich bog area, passing through mixed land use with small and medium sized villages, many spare-time farmers, often horse-hobby, and some agriculture, before discharging to Roskilde Fjord. This LL is set in a rural area within the peri-urban matrix in a regional context and allows a source-to-sea approach, in a region with a continental humid with warm summer climate. A mature formalized LL is established and ready for engagement.

Liesing River [AT] - The Liesing river is beside the Danube and the Wien river one of the main water courses in the city of Vienna. It flows 30 km through strongly populated regions in the south of Vienna. The catchment can be divided into a forest dominated area followed by an urban river section. This LL is set in a peri-urban and urban regional context, with high potential for replication due to stakeholder involvement rates (capitalized from other projects), in a region with a continental humid with warm summer climate.

Guadiana River Watershed [PT/SP] - The Guadiana watershed has a total surface area of 66 800 km^2 and is shared between Spain (83%) and Portugal (17%). Guadiana river is 810 km long, with 260 km in Portugal and 110 km along the border between the two countries. This LL will be set up in an international river with hot summer Mediterranean climate, encompassing the biggest artificial lake in Europe (Alqueva reservoir), as well as smaller reservoirs, rivers and streams. Flash-flood events and temporary streams are characteristic of the system. The LL allows for source-to-sea approach.

Danube River [RO] - A stretch of the former floodplain of the Danube River, between Salcia and Maglavit villages consisting of 200 ha along the corridor at Salcia, with abandoned fish farm, arable land with mix uses, including planted forest and pasture. This LL is set up in a continental humid with a hot summer climate. The area has high potential for improvement of lateral connectivity through Nature-based solutions (NBS) implementation in order to re-connect the surface and groundwater to increase resilience and reduce the impact of drought.

As the LLs are located in different and contrasting European regions, they show different processes and settings in the landscape as well as various microclimatic, hydrological and geological characteristics. It is a great chance to observe four different watersheds. Nevertheless, it is also a challenging process to find common characteristics and methodologies fitting to all four LLs in order to generate comparable results.

The present LL Coordination Plan aims to generate a plan on how the research work can be structured and organized in a systematic way in order to generate reliable, comparable and useful project outputs. It should also build the basis for a good exchange and knowledge sharing with the other work packages.

Baseline plan

Timetable

The LLs are part of work package 3 – Living Labs, led by BOKU. It lasts for 33 months, starting in April 2024 and ending in December 2026 – three months before the end of the project. It includes three deliverables: *D3.1: Coordination plan living labs* (M3), *D3.2: Baseline report profiling all the four living labs* (M15*)* and *D3.3: Toolbox of NBS/slow hydrology techniques (Implementation, Cost-Benefits analyses, stakeholder integration)* (M33). Additionally, one milestone is implemented in month 24: *M3.4: Stakeholder workshops conducted.* These are marked in the timetable in Fig. 2. Every 12 months the LL coordination in WP3 reports to the consortium about the scientific and technical advancements.

Meeting structure

Starting from the Living Lab Workshop in April 2024, periodic meetings for LL coordination were set in approximately two-month periods. These meetings have the purpose of updating the partners on each LL and of ensuring a common strategy is being applied to all four LLs. After the first 12 months the interval will be doubled to four months, as in this phase of the project the overall strategy should be finalized and the workload is more related to each LL.

In April 2024 (INTERLAYER Kick Off) LL Vaerebro [DK] was visited. A rough timetable for excursions to the other LLs was developed at the LL workshop at the KO, marked in Fig. 2. However, this has to be seen as a suggestion and can be adjusted. The participation of each partner is dependent on their allocated (travel) budget. As a goal, visits from all partners to at least three LLs was agreed.

If necessary, additional short-term bilateral meetings can be organized between the partners.

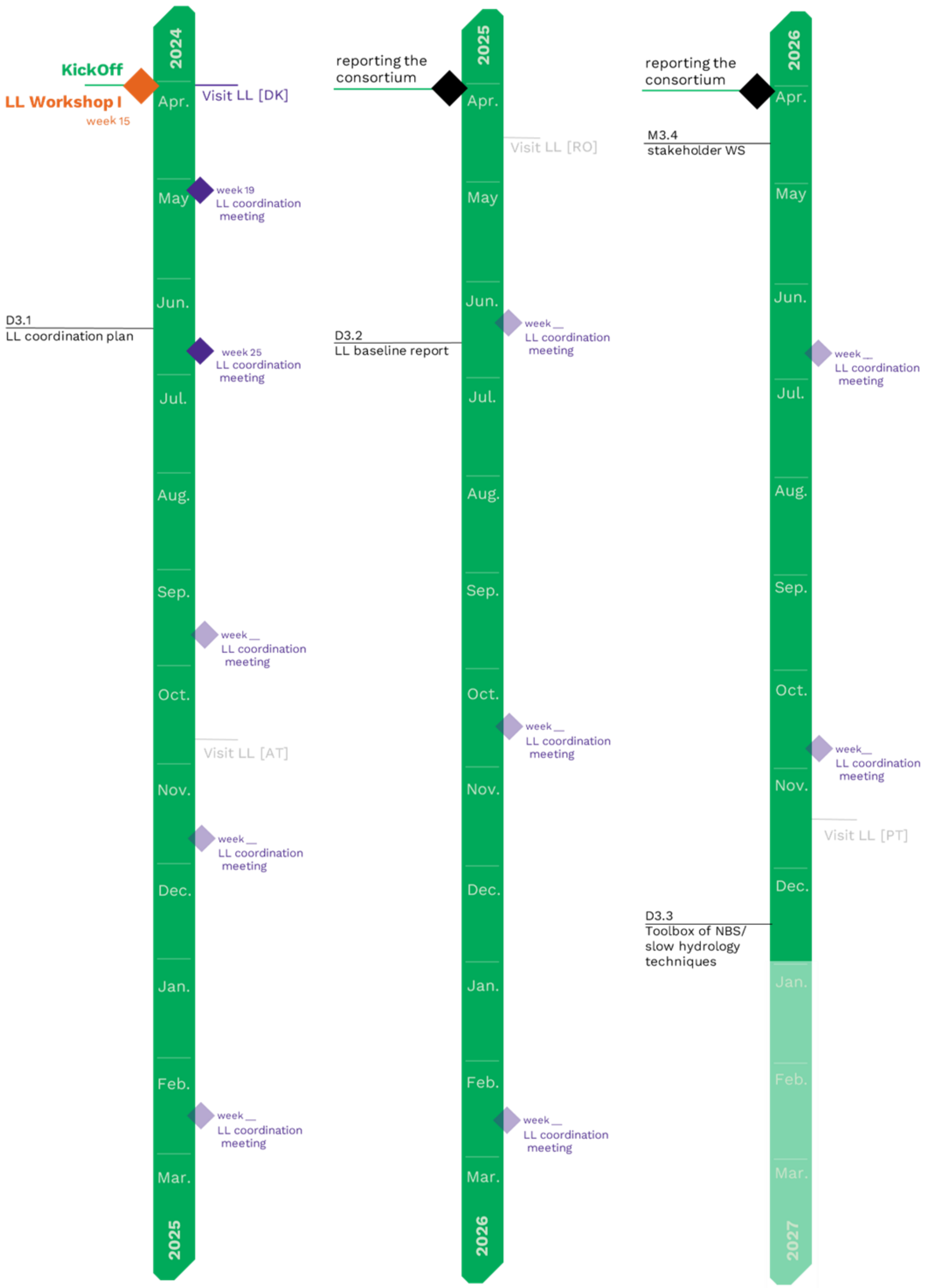

Fig. 2: Preliminary timetable and meeting structure of WP3 - Living Labs

Contact persons

Tab. 1: Responsibilities and contact persons for all LLs

LL Vaerebro [DK]	Marina Bergen Jensen [UCPH] Peter van der Keur [GEUS] Helene Lykke Strøbech [Capital Region of Denmark (RegionH)]	mbj@ign.ku.dk pke@geus.dk helene.lykke.stroebech@regionh.dk
LL Liesing [AT]	Helene Müller [BOKU] Magdalena von der Thannen [BOKU] Hans Peter Rauch [BOKU]	helene.mueller@boku.ac.at magdalena.von-der-thannen@boku.ac.at hp.rauch@boku.ac.at
LL Guadiana [PT/ESP]	Miguel Potes [UEVORA] Maria Helena Novais [UEVORA]	mpotes@uevora.pt hnovais@uevora.pt
LL Danube [RO]	Albert Scrieciu [GeoEcoMar] Andrei Toma [GeoEcoMar]	albert.scrieciu@geoecomar.ro andrei.toma@geoecomar.ro

Content related plan

Methodical approach

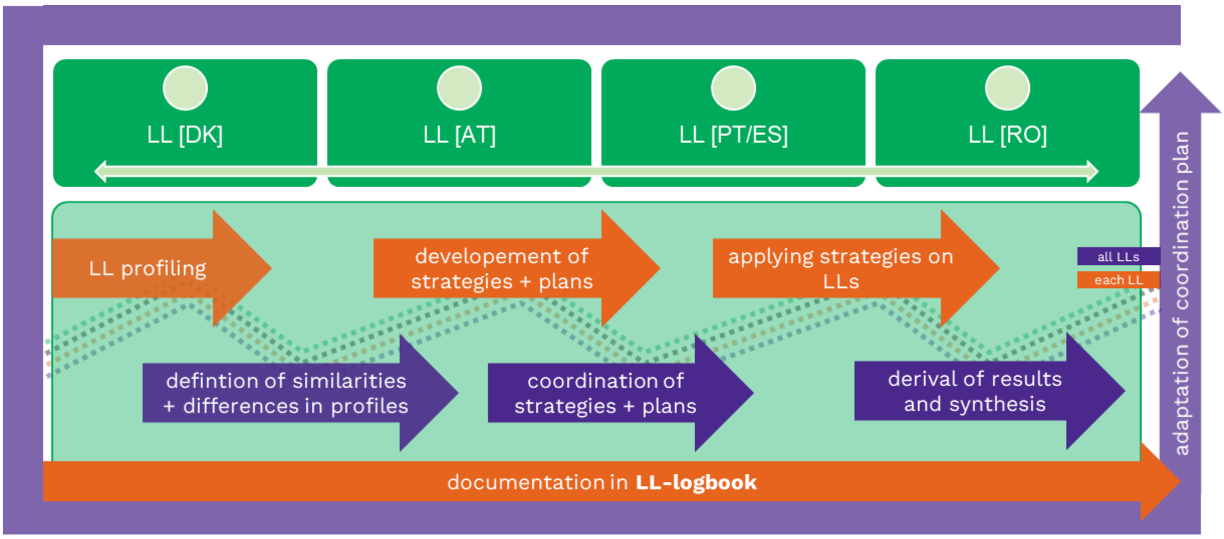

Fig. 3: Content related plan - methodical approach in different steps

The methodical approach is followed in different steps, see Fig. 3. As a first step, all LLs are characterized. Through a uniform questionnaire focusing on catchment, climate, landscape, processes, ecosystem services and modelling approaches, a comparable profile of each LL is developed. Additionally, data for each LL is collected, in order to support the development of models. Further a first rough assessment of importance/relevance of processes and benefits ranked from low to high in five classes should be introduced.

Based on this preliminary characterization a comparison of the four LLs should be enabled. Similarities and differences can be defined. They build the input for the development of strategies, methods and plans of interventions, monitoring and modelling on LLs scale. In order to generate a more uniform approach over the whole project this step is accompanied by reflections on possible harmonization of approaches over all four LLs. The information is collected, reviewed in the LLs meetings and put together and adapted to a common LL strategy, which is further on applied to all four LLs.

A plan related to the section described above is developed at the start of the project. With growing knowledge on the LL's, adaptations and changes of this predefined part might be necessary to achieve the intended useful project outputs.

The documentation and the exchange take place via a LL – log book, containing separate sections for each LL and a combined section that sets the input from all LLs in context.

The first part of the Logbook is related to a general section containing a profiling section, in order to derive similarities and differences of all LLs, and a documentation section, referring to LL meetings. The second part is related to all four LLs and provides space for documentation of LL activities, stakeholder meetings and work in progress. The LL Logbook should not be a standalone document and it is intended to collect ideas, links, information's and to inspire each other's.

WP3: Objectives, synergies and benefits

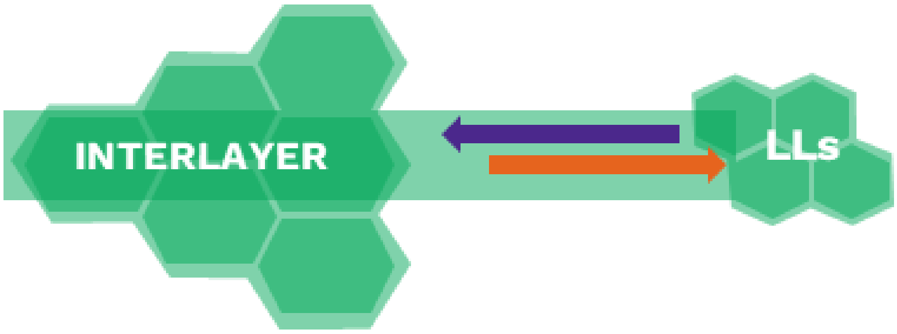

Fig. 4: Relationship, interaction and exchange between LLs and the INTERLAYER project

The LLs are core elements of the INTERLAYER project. They are included and explored in combination in one work package dedicated to all four LLs (WP3). The objective of WP3 is to align, compile and analyze findings from all INTERLAYER's Living Labs demonstrations to support other WPs and to provide strong evidence-based knowledge on INTERLAYER intervention practices and impact on extreme hydrology mitigation and ecosystem services at catchment level. Therefore, WP3 is strongly interacting with all other work packages (

Fig. 4). For a successful progress in the project a close exchange between the WPs is necessary. In

Tab. 2 - Tab. 4 information on the tasks, deliverables and milestones from WP3 as well as potential synergies and benefits from other WPs are collected.

What tasks are included in WP3?

Tab. 2: Information on tasks required for WP3

Task	Description
3.1	**Coordination of the LL's sites**
3.2	**Vaerebro River LL – DK (GEUS) – Front Runner on Slow Water Technologies – Rural Context:**
3.2.1	• Suggest nature-based solutions (NBS) that locally increase temporal storage (detention/retention) and recharge to shallow groundwater are tested and for this demonstration sites are prepared. E.g. vegetated detention belts to increase resilience towards drought with targeted co-benefits approved by relevant stakeholders;
3.2.2	• Development of materials for communication of challenges and options to involved stakeholders, and for co-creation of interventions.
3.2.3	• Expert elicitation and stakeholder involvement, including i) Assessment of impact on water quality (leaching of pesticides, nitrate etc.) ii) Raising awareness of the two-faced climate challenge of drought and flooding, and engage stakeholders in integrated assessment of a wide range of co-benefits/SDGs
3.3	**Liesing River – AT (BOKU) – Front Runner on Slow Water Technologies – Urban Context**
3.3.1	• Definition of Boundary conditions: Inventory of status quo, local conditions and a classification of the watershed and river stretches according to (landuse, hydrology, vulnerability); Mapping the complex natural and man-made structures and processes impacting hydrology;
3.3.2	• Carrying out Inventory and analysis of the implemented NBS and possible conditions for future implementation of NBS that push slow hydrology in the LL;
3.3.3	• Cost – benefits estimations for different planned measures and techniques including calculations concerning Live cycle assessments and benefits from ecosystem services;

3.4 3.4.1 3.4.2 3.4.3 3.4.4	**Task 3.4: Guadiana River Watershed LL Implementation - PT/SP (UEVORA) – Follower Rural Context** • Watershed characterization: detailed watershed characterization in terms of meteorological conditions, Land Use and Land Cover, physico-chemical and aquatic biological communities; mapping the complex natural and man-made structures and processes impacting hydrology; map the slow hydrology techniques / NBS already implemented in the watershed; • Case-study: an affluent to the Guadiana River will be selected as a pilot (Ardila River) to test NBS/slow hydrology techniques considering the most pressing challenges in the watershed. In this pilot area, a map will be produced with the location and morphometry of different hydrological states (e.g. pools, dry riverbed) during the dry phase based on the wetness and water table depth indexes, both to be extracted from a hydrologically correct digital terrain model. Further, water quality and aquatic communities will be monitored to evaluate the impact of the application of the NBS/slow hydrology techniques; • Cost – benefits estimations for the planned measures and techniques including Live cycle assessments and benefits from ecosystem services. • Establishment of dialogue between stakeholders, local population and the project team will be held to collectively build an agenda that supports the phasing and structuring of project results in a participatory process, engaging and mobilizing key stakeholders across the watershed.
3.5 3.5.1 3.5.2 3.5.3	**Danube River RO – (GeoEcoMar)** • Collection of baseline information - watershed characterization in terms of meteorological conditions, Land Use and Land Cover, physico-chemical and aquatic biological communities; mapping the complex natural and man-made structures and processes impacting hydrology; map the potential location and types of slow hydrology techniques that can be used in the intervention area. • Cost – benefits estimations for the planned measures and techniques including Live cycle assessments and benefits from ecosystem services. • Identify and prioritize together with the most relevant stakeholders, the most fitted NBS for improving the local water related risks, through the organization of formal and informal meetings.

What deliverables and milestones are related to WP3?

Tab. 3: Information on deliverables and milestones of WP3

D/M	Deliverable / Milestone Description	Deadline
M3.1	Coordination plan developed	**Jun. 24**
D3.1	Coordination plan living labs	**Jun. 24**
M3.2	Baseline report for all living labs completed	**Jun. 25**
D3.2	Baseline report profiling all the four living labs	**Jun. 25**
M3.3	Report of NBS/slow hydrology techniques carried out	**Mar. 25**
D3.3	Toolbox of NBS/slow hydrology techniques (Implementation, Cost-Benefits analyses, stakeholder integration)	**Dec. 26**
M3.4	Stakeholder workshops conducted	**Dec. 26**

What synergies and benefits from other WPs can support WP3?

Tab. 4: Information on synergies and benefits from other WPs

WP	Task	Deliverable	Deadline
1	1.4	Data management activities [D1.1]	Oct 24
2	2.1	Inventory of NBS methodologies for surface water retention, slow hydrology and groundwater recharge [D2.1]	Oct. 24
2	2.2	Co-development of innovative interventions for slow hydrology to prepare catalogue of idea [-]	
4	4.1	Preliminary draft report on future climate at local scale in each LL [D4.1]	Oct. 24
4	4.2	Report on water retention hydrologic processes and options for online sensor monitoring for different types of the Living Labs [4.2]	Oct. 25
4	4.3	Final climate simulations and report (publication anticipated) on the compatibility of planned actions with future climate in each LL [D4.4]	Apr. 26