Interreg Euro-MED

Co-funded by the European Union

Germ of Life

# Interreg Euro-MED Project GERM OF LIFE

# "Digital Drought Risk Management enabling the drought mitigation and adaptation strategies for the restoration of the ecosystem equilibrium in Mediterranean European Countries".

**Test Project (Thematic Project)**
**Mission: NATURAL HERITAGE**

**Duration: 33 months from 01/01/2024**
**Coordinator: UNIVERSITY OF PATRAS**

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|---|---|
| Deliverable ID.: | **D3.1.1** |
| Deliverable title: | **Germ of Life Amplification and transferability strategy** |
| Planned delivery date: | 30/06/2026 |
| Actual delivery date: | 30/06/2026 |
| Deliverable leader: | UBITEL |
| Contributing partners: | UPATRAS, DOTSOFT, ATOS, INFOTREND, CMCC , RWG, LAMORO, Junta Andalucia, EDIA S.A. |

**This project has received funding from the European Interreg Euro-MED programme under Subsidy Contract (V1.mars.2022)- Project n°Euro-MED0200878**

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|---|---|---|
| Dissemination Level: | X | EX = External; |
| | | IN = Internal |

## Document information and history

| Deliverable description (from AF) |
|---|
| **Description of a strategy to be developed, aiming at defining long-term goals and expected benefits when a proactive approach in drought risk management** |

*Please refer to the Project Board indications (pending to define the framework) for guidance on the review process and the release numbering scheme to be used in the project.*

| Version N. | Date | Author [Person and Organisation] | Reviewer [Person and Organisation] | Notes |
|---|---|---|---|---|
| **V0.1** | 15/08/25 | Juan Charneco UBITEL | | |
| **V0.2** | 01/01/2026 | Juan Charneco UBITEL | | |
| **V1** | 20/03/2025 | Juan Charneco UBITEL | Sonia Abluton LAMORO | |
| **V2** | 02/04/2026 | Juan Charneco UBITEL | Lea Duran ATOS | |
| **V3** | 17/04/2026 | Juan Charneco UBITEL | Valeria Gentile, Manuela Balzarolo CMCC | |
| **V4** | 13/05/2026 | | Valeria Gentile, Manuela Balzarolo CMCC | |

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# 1 Executive Summary

Since its launch in early 2024, the Germ of Life project has pursued ambitious global objectives as an applied initiative, responding to a critical situation affecting much of Europe: the drought phenomenon, which has been particularly severe across the Mediterranean basin. To address this challenge, a high-level multidisciplinary consortium was formed, bringing together scientific and technological experts with the aim of designing a global technological system capable of mitigating the effects of drought. This proposal was presented to Europe as a comprehensive solution built upon the collective knowledge of the Germ of Life project partners.

Throughout the project's development, all partners have engaged in intense collaborative co-creation, merging their expertise to coherently design the three platforms that constitute the global solution: the real time platform for monitoring drought-related indices and hazard , the vulnerability platform, and the procurement platform. These platforms have been conceived to integrate seamlessly, offering users a complete and effective response to real-life drought scenarios at four pilot sides areas. Continuous communication among partners has been essential to transform the initial project concept into a technological solution that is both applicable and transferable across diverse geographic and operational contexts.

In alignment with the strategic goals of the Germ of Life project, the consolidation of shared knowledge and design principles has been formalized in a foundational internal deliverable. Rather than serving solely as a technical reference, this document plays a pivotal role in enabling the amplification and transferability of the global system developed within the project. It ensures that each of the three, generated independently and integrated platforms—hazard detection, vulnerability assessment, and procurement—is implemented coherently and can be adapted to diverse territorial and operational contexts.

This deliverable encapsulates the collective effort and expertise of all project partners, reflecting a successful model of collaborative innovation. It demonstrates that a balanced integration of scientific and technological knowledge can generate scalable solutions that respond effectively to the drought-related challenges faced across Europe. As such, the document not only supports the execution of the project but also acts as a strategic guide for future replication, adaptation, and deployment in new regions and scenarios.

**Strategic Continuity Through a Transfer Project**
As part of its long-term vision, the Germ of Life consortium after being selected as proposed by the INTERREG programme has recently voted in a steering committee to pursue the evolution of the integrated system through a dedicated transfer project. This follow-up initiative will aim to adapt the platform to additional regions, validate its interoperability across diverse territorial contexts, and consolidate its role as a reference tool for drought risk management in the Euro-MED area. The transfer project will serve

as the operational framework for institutional adoption, strategic scaling, and policy mainstreaming, ensuring that the system developed under Germ of Life continues to deliver public value and scientific excellence beyond the initial pilot phase.

## 1.1 Role of deliverable

This deliverable defines the Germ of Life Amplification and Transferability Strategy and represents the final step of the project, in which the platform will be operative before the ending of the project and giving the opportunity to the stakeholders in the future to use the platform. It consolidates all the technological and methodological advances achieved throughout the project's lifecycle and outlines the pathway for their effective implementation and transfer.

Its strategic importance lies in ensuring that the solutions developed—funded by European public resources and designed to address real challenges faced by European citizens—are not only technically sound but also practically applicable. The document reflects the responsibility of the project partners to offer to the stakeholders that the outcomes of Germ of Life will be able to generate tangible impact, particularly in mitigating the effects of drought across vulnerable regions. By facilitating and making easier the amplification and transfer of the system, this deliverable ensures that the knowledge and tools created are translated into real benefits for communities, institutions, and ecosystems affected by water scarcity.

The success of the Germ of Life amplification and transferability strategy depends on the active involvement of a diverse set of stakeholders, each playing a critical role in ensuring that the system is not only implemented effectively but also scaled and adapted to new contexts. These stakeholders include:

- **Public Authorities and Regional Governments**
  As primary end-users and decision-makers, public institutions are responsible for adopting the system within their drought management frameworks. Their commitment is essential for institutional integration, policy alignment, and long-term sustainability.

- **Technology Adaptation Partners**
  Entities such as Dotsoft, Infotrend, Atos, and Ubitel may provide expertise for future adaptations where appropriate —vulnerability, real time platform for monitoring drought-related indices , and procurement platforms—to the specific needs of each territory, after a request from those territories and with the correct funding for that real adaptation. Their technical expertise ensures that the system remains flexible and context-aware.

- **Scientific and Research Institutions**
  These partners contribute to the exploitation of the Germ of Life project by promoting it in scientific and policy events and applying for funding after the conclusion of the Germ of Life project.

- **Pilot Area Representatives and Local Operators**
  Local actors provide real-world feedback and operational insights that are crucial for refining the system's usability and effectiveness. Their involvement ensures that the solution responds to actual field conditions and community needs.

- **European Commission and Funding Bodies**
  As promoters of innovation and public benefit, these institutions ensure that the project outcomes align with European strategic priorities and that the system can be replicated across other EU-funded initiatives.

**Continuity Through a Transfer Project**
This deliverable not only marks the culmination of the Germ of Life development phase, but also serves as a strategic bridge toward its future evolution. The consortium after being selected by the INTERREG programme and the celebration of a steering committee between Germ of Life partners in which they have voted in favour of accepting the proposed invitation to pursue a dedicated transfer project aimed at adapting the system to additional regions, validating its interoperability across diverse territorial contexts, and consolidating its role as a reference tool for drought risk management in the Euro-MED area. This follow-up initiative will ensure that the integrated platform continues to deliver public value, scientific excellence, and institutional relevance beyond the initial pilot phase.

## 1.2 Relationship to other GERM OF LIFE deliverables

Deliverable D.3.1.1 is directly connected to the project's core technical deliverables,

- D.1.1.1 Drought indices review
- D.1.1.2 Description of algorithms
- D.1.4.1 Drought Risk Monitoring and Prediction service
- D.1.5.1 Vulnerability Assessment Tool
- D.1.6.1 Innovation Procurement Platform

as its primary objective is to enable the transfer and amplification of those results to the relevant stakeholders. It serves as a strategic interface between the technological developments carried out during the project and their real-world application in pilot regions and beyond.
By consolidating the outputs of key deliverables—such as drought indices, algorithmic models, drought monitoring services, vulnerability assessments, and procurement mechanisms—this document ensures that the integrated system developed under

Germ of Life can be effectively communicated, adapted, and deployed by public authorities, service providers, and other end users. Its role is not only to describe what has been built, but to guide how it can be replicated, scaled, and transferred to generate tangible impact in the fight against drought across Europe.

## 1.3 Structure of the document

The structure of this document follows a comprehensive and logical progression through the full lifecycle of a strategy focused on the amplification and transferability of the Germ of Life system. It begins by establishing the technological innovation foundations and identifying the key stakeholders who may be involved in bringing the project's results into real market and policy contexts.

The document then explores how these results can be effectively communicated, highlighting the strategic objectives pursued and the practical mechanisms for collaboration with European experts and institutions—particularly those linked to the Mission—who offer valuable tools and frameworks to support adoption and scaling. It outlines concrete amplification actions, emphasizing synergies with other European projects and initiatives that may open new opportunities for replication, co-development, or real-world deployment.

A dedicated section addresses the importance of monitoring and impact assessment, proposing key performance indicators (KPIs) to track the success of implementation efforts. Finally, the document includes supporting materials such as model agreements (e.g., Memoranda of Understanding) between project partners and stakeholders, which are essential for formalizing cooperation and ensuring long-term sustainability.

This structure ensures that the strategy is not only visionary but also actionable, providing a clear roadmap for turning Germ of Life's innovations into tangible benefits for European regions affected by drought.

In addition, the Germ of Life system, after being selected by the INTERREG programme and the celebration of a steering committee between Germ of Life partners in which they have voted in favour of accepting the invitation, is expected to evolve through a dedicated transfer project, which will serve as the strategic framework for its expansion and institutional consolidation. This future initiative will enable the adaptation of the system to new regions, the validation of its interoperability, and the formalization of its governance and sustainability mechanisms. The structure of this deliverable—covering key results, exploitation strategy, amplification mechanisms, and monitoring frameworks—has been designed to support this evolution, providing a comprehensive foundation for the system's replication and long-term adoption.

# 2 Introduction

## 2.1 Project context within the INTERREG MED framework

The Germ of Life project is framed within the INTERREG MED Programme, a European territorial cooperation initiative that promotes sustainable development in the Mediterranean region through transnational collaboration. This framework supports projects that address shared challenges such as climate change, resource scarcity, and environmental degradation, with a strong emphasis on innovation, policy integration, and stakeholder engagement.

Germ of Life aligns with the programme's strategic priorities by tackling the increasing threat of drought across Mediterranean territories. The project contributes to the Green Transition and Resilient Communities missions of INTERREG MED, offering a technological and scientific response to a pressing environmental issue. Through its integrated system—comprising a real time platform for drought-related indices, vulnerability assessment, and innovation procurement—the project aims to empower public authorities and local actors with actionable tools to anticipate, manage, and mitigate drought impacts.

Moreover, Germ of Life exemplifies the INTERREG MED approach to capitalization and transferability, ensuring that the solutions developed are not only innovative but also replicable across regions. The project fosters cross-border cooperation, knowledge sharing, and co-design processes among partners from different Mediterranean countries, reinforcing the programme's goal of building a more resilient and sustainable Euro-Mediterranean area.

A key priority of the INTERREG MED Programme is to ensure that the projects it funds lead to **real-world implementation** and generate **tangible benefits** for European citizens. Germ of Life responds directly to this ambition by developing solutions that address the increasingly urgent issue of drought in Mediterranean regions. The programme encourages not only innovation and transnational cooperation, but also the **deployment of results in operational environments**, where they can contribute to solving concrete societal and environmental challenges. This deliverable reflects that commitment, outlining a strategy to ensure that the technological developments of Germ of Life are transferred to public authorities, service providers, and local actors—ultimately improving resilience and quality of life in drought-affected territories.

## 2.2 Project objectives

The Germ of Life project was designed to respond to one of the most pressing environmental challenges in the Mediterranean region: the increasing frequency and severity of droughts. Its main objective is to develop and implement a technological system capable of anticipating, assessing, and mitigating drought impacts, while ensuring that the solutions are applicable, scalable, and beneficial to European citizens.

To achieve this, the project sets out the following specific objectives:

- Develop an integrated software platform composed of three interconnected modules that have been generated independently by the different technical partners of Germ of Life project and then generate a global platform with all the characteristics in the same platform:
  - A Drought-related indicators Monitoring and Prediction Service, based on advanced algorithms and real-time data from satellite and field sensors.
  - A Vulnerability Assessment Tool (VAT), which evaluates the exposure and sensitivity of ecosystems and communities using scientifically validated indicators.
  - An Innovation Procurement Platform (IPP), which supports public authorities in selecting the most appropriate technological solutions to address drought-related challenges.
- Ensure territorial relevance and adaptability, by co-designing the system with stakeholders from four pilot regions, each with distinct environmental, institutional, and socio-economic characteristics. This guarantees that the system is not only technically sound but also context-aware and responsive to local needs.
- Promote stakeholder engagement and ownership, involving public authorities, scientific institutions, businesses, and civil society throughout the development process. This participatory approach strengthens the legitimacy and usability of the system and facilitates its future adoption.
- Enable real-world implementation and impact, in line with INTERREG MED's strategic vision. Germ of Life is not a theoretical exercise—it is a practical response to a real problem. The project aims to ensure that its outputs are deployed in operational environments, improving drought resilience and resource management in Mediterranean territories.
- Facilitate transferability and capitalization, by designing the system to be replicable in other regions and compatible with broader European initiatives (e.g., Horizon Europe, LIFE, Euro-MED Academy). The project seeks to create synergies that extend its impact beyond the pilot areas, contributing to a wider transformation in drought management across Europe.
- In case of interest and with the necessary funding, support long-term sustainability, by defining governance models, usage rights, and business

strategies that ensure the continuity of the system after the project's completion. This includes mechanisms for monitoring, updating, and expanding the platform in collaboration with future users and partners.

In summary, Germ of Life combines scientific excellence, technological innovation, and territorial cooperation to deliver a solution that is not only visionary but also actionable—designed to improve the lives of European citizens facing the growing threat of drought.

## 2.3 Approach to sustainability, capitalization and replicability

The **Germ of Life** project adopts a comprehensive and forward-looking approach to ensure that its results are not only technically robust, but also **sustainable over time**, **capitalizable across sectors**, and **replicable in diverse territorial contexts**. This strategy is essential to fulfil the expectations of the INTERREG MED Programme, which prioritizes the real-world application of funded innovations to address concrete challenges faced by European citizens.

**Sustainability**

In case of interest and with the necessary funding, sustainability is addressed through the definition of a **post-project governance model**, which clarifies the roles and responsibilities of each partner in maintaining and evolving the system. This includes agreements on data ownership, platform maintenance, and update protocols, subject to stakeholder interest and the availability of appropriate funding mechanisms. The involvement of public authorities from the pilot regions ensures institutional anchoring, while the modular design of the system allows for future upgrades and integration with other services. A **sustainability plan** is included to guide long-term operation, financing, and stakeholder engagement beyond the project's duration.

**Capitalization**

Capitalization efforts focus on **maximizing the visibility, usability, and strategic value** of the project's outputs. Germ of Life actively connects with other European programmes and initiatives (e.g., Horizon Europe, LIFE, PRIMA), and leverages the tools provided by the **Mission's Amplification Room**, such as peer review mechanisms, thematic catalogues, and the Euro-MED Academy. These instruments facilitate knowledge exchange, policy alignment, and the positioning of Germ of Life as a reference model in drought mitigation. The project also promotes **clustering and mentorship activities**, enabling other regions to adopt and adapt the system with expert support.

**Replicability**

Replicability is embedded in the system's architecture and methodology. The co-design process with four pilot regions has ensured that the platform is flexible and adaptable to

different environmental, institutional, and socio-economic realities. The deliverable includes **model agreements** (e.g., Memoranda of Understanding, licensing frameworks, cooperation protocols) that simplify the transfer of technology and know-how to new stakeholders. A detailed mapping of **stakeholder needs and expectations** supports targeted replication strategies, while the inclusion of **mock-ups, indicators, and operational guides** facilitates on boarding and training.

In addition, the project defines a set of **Key Performance Indicators (KPIs)** and **impact metrics,** developed by Junta the Andalusia in activity 2.2, to monitor the effectiveness of the transfer and amplification efforts. These indicators will help to assess the degree of adoption, the quality of implementation, and the real-world impact on drought resilience in new territories.

Ultimately, this deliverable serves as a strategic roadmap to ensure that Germ of Life evolves from a successful innovation project into a **scalable solution with lasting impact**, capable of improving environmental governance and public service delivery across the Mediterranean and beyond.

# 3 Target Stakeholders and End-Users

## 3.1 Stakeholder mapping (public authorities, businesses, academia, civil society)

The Germ of Life project is built upon a multi-actor, multi-level collaboration model that reflects the complexity of drought mitigation and the diversity of actors involved in environmental governance. The stakeholder mapping identifies and categorizes the key groups that play a role in the development, implementation, amplification, and long-term sustainability of the system. These stakeholders are not only recipients of the project's outputs but also **active contributors** to its design, validation, and future deployment.

***1.*** **Public Authorities and Policy Makers**

These are the primary institutional actors responsible for environmental planning, water resource management, and climate adaptation strategies. They include:

- Regional and local governments
- Environmental and agricultural ministries
- Water basin authorities
- Civil protection agencies

Their role is crucial in the **adoption and institutional integration** of the Germ of Life system. They are also key actors in defining regulatory frameworks that support the use of predictive tools, vulnerability assessments, and innovation procurement mechanisms.

**2. Technology Developers and Service Providers**

These stakeholders can be involved, for the success of the amplification objectives, in the **technical development, customization, and deployment** of the system's components. They include:

- ICT companies and software developers
- Sensor and satellite data providers
- AI and data analytics firms
- Environmental engineering consultancies

In Germ of Life, partners such as Dotsoft, Infotrend, Atos, and Ubitel play a central role may provide expertise for future adaptations where appropriate. These actors are also

essential for ensuring **technical scalability and interoperability** across different territories.

**3. Scientific and Academic Institutions**

University of Patras and CMCC Foundation contribute to the **knowledge base** of the project. Their involvement ensures that the system is grounded in validated methodologies and up-to-date scientific evidence. Their roles include:

- Developing and validating drought indices
- Designing and testing algorithms
- Supporting the calculation of the Vulnerability Assessment Index (VAI)
- Participating in peer review and capacity-building activities

These institutions also act as **knowledge multipliers**, facilitating the transfer of results to other research initiatives and educational contexts.

***4. Pilot Area Representatives and Local Operators***

These actors are embedded in the territories where the system is being tested and implemented. They include:

- Municipal governments
- Local water utilities
- Agricultural cooperatives
- Environmental NGOs

Their participation ensures that the system is **territorially relevant and operationally feasible**. They provide feedback on usability, contribute to data collection, and validate the system's outputs in real-life conditions.

***5. European and Transnational Institutions***

These include entities such as:

- The European Commission
- INTERREG MED Programme bodies
- Euro-MED Academy and Mission governance structures

They play a strategic role in **capitalization, policy mainstreaming, and cross-border replication**. Their support is essential for aligning Germ of Life with broader European priorities and facilitating its integration into future funding and policy instruments.

***6. Civil Society and End Beneficiaries***

Ultimately, the system is designed to serve citizens affected by drought. Civil society actors include:

- Community organizations
- Farmers and landowners
- Citizen science networks
- Advocacy groups for climate resilience

Their involvement ensures that the system is **socially inclusive, transparent, and responsive** to the needs of those most impacted by drought. They also contribute to awareness-raising and public engagement efforts.

This stakeholder mapping provides the foundation for the project's **amplification and transferability strategy**, allowing Germ of Life to tailor its actions, tools, and communication to the specific roles, expectations, and capacities of each actor. It also supports the creation of **collaborative frameworks**—such as Memoranda of Understanding and licensing agreements—that formalize cooperation and facilitate long-term impact.

As part of the stakeholder mapping process, the project partners have collaboratively developed a **shared Excel database** that compiles relevant stakeholders from each of the identified groups across all countries represented in the consortium. This database includes detailed information on public authorities, technology providers, academic institutions, civil society organizations, and pilot area actors, allowing for a structured and comparative analysis of stakeholder profiles, interests, and potential roles in the amplification and transferability strategy. This tool has proven essential for aligning outreach efforts, planning engagement activities, and ensuring that the Germ of Life system is positioned for real-world adoption in diverse territorial contexts.

## 3.2 Final beneficiaries of the project

The **final beneficiaries** of the Germ of Life project are the individuals, communities, and institutions that will directly experience the positive impact of the system's implementation in real-world contexts. These beneficiaries are not only passive recipients of technological solutions, but also **active participants** in the transformation of drought management practices across the Mediterranean region.

***Citizens in Drought-Affected Areas***

The most immediate beneficiaries are **citizens living in regions vulnerable to drought**, particularly in rural and semi-urban areas where water scarcity affects agriculture, health, and daily life. These populations will benefit from:

- **Improved early warning systems**, allowing for better preparation and reduced exposure to drought impacts.
- **More efficient public services**, as local authorities will be equipped with tools to make informed decisions and allocate resources effectively.

**Greater transparency and participation**, through systems that promote open data and citizen engagement in environmental governance.

***Agricultural and Land Management Communities***

Farmers, cooperatives, and landowners are among the most affected by drought and stand to gain significantly from the project's outputs. The system provides:

- **Predictive insights** into drought conditions, enabling proactive crop and water management.
- **Vulnerability assessments** tailored to specific ecosystems and land uses.

**Access to innovative technologies** through the procurement platform, helping them to adopt sustainable solutions.

***Public Authorities and Local Governments***

Municipalities, regional administrations, and water management agencies are key beneficiaries, as the system enhances their capacity to:

- **Plan and implement drought mitigation strategies** based on real-time data and scientific models.
- **Procure appropriate technologies** through a structured and transparent process.

**Coordinate responses across sectors**, improving institutional efficiency and resilience.

***Environmental and Civil Protection Agencies***

These entities will benefit from:

- **Integrated monitoring tools** that combine satellite data, field sensors, and AI-based forecasting.
- **Operational dashboards** for rapid decision-making during drought emergencies.

**Support for long-term planning**, including vulnerability mapping and risk prioritization.

***Educational and Research Institutions***

Universities, schools, and research centres will be able to:

- **Use the system as a teaching and research tool**, fostering innovation and knowledge dissemination.
- **Access validated data and methodologies**, contributing to further scientific development.

**Engage in collaborative projects**, leveraging Germ of Life as a platform for interdisciplinary work.

***Broader European Society***

At a macro level, the project contributes to the **European Green Deal**, the **EU Climate Adaptation Strategy**, and the **Sustainable Development Goals (SDGs)**. By improving drought resilience, Germ of Life supports:

- **Environmental sustainability**
- **Social equity**
- **Economic stability** in vulnerable regions

The amplification and transferability strategy ensures that these benefits are **not limited to the pilot areas**, but can be extended to other regions facing similar challenges. Through structured collaboration, knowledge sharing, and institutional support, Germ of Life aims can become a **correct guiding model** for drought mitigation across Europe.

## 3.3 Needs and expectations analysis

A thorough understanding of stakeholder needs and expectations is essential to ensure that the Germ of Life system is not only technically sound, but also **socially accepted, institutionally viable, and operationally effective**. This analysis has been conducted through structured co-design sessions, bilateral consultations, and feedback loops with actors from the four pilot regions and across the consortium countries. The insights gathered have directly influenced the system's architecture, functionalities, and transferability strategy.

***Public Authorities and Decision-Makers***

**Needs**:

- Tools that support **evidence-based decision-making** in drought management.
- **Integration with existing systems** and workflows (e.g., GIS platforms, emergency protocols).
- **Clear governance models** for long-term operation and maintenance, subject to stakeholder interest and the availability of appropriate funding mechanisms.
- Mechanisms to **justify public investment** in innovative technologies.

**Expectations**:

- A system that is **intuitive, reliable, and policy-relevant**.
- Support for **transparent procurement processes** and alignment with sustainability goals.
- Access to **training and capacity-building resources** for staff and technical teams.

Germ of Life responds by offering a modular, interoperable platform with clear documentation, governance frameworks, and procurement support tools.

***Technology Providers and Developers***

**Needs**:

- **Open standards and APIs** to facilitate integration and customization.
- Clear **technical specifications** and use cases.
- Opportunities for **market deployment and visibility**.

**Expectations**:

- A system that enables **innovation and scalability**.
- Recognition of their contributions and potential for **commercial exploitation**.
- A collaborative environment for **continuous improvement and feedback**.

The project addresses these through the Innovation Procurement Platform (IPP), technical deliverables, and stakeholder engagement mechanisms that promote co-development and visibility.

***Scientific and Academic Institutions***

**Needs**:

- Access to **validated datasets**, drought indices, and real-time environmental data.
- Opportunities for **interdisciplinary collaboration** and research continuity.

- Recognition of scientific contributions in system design and dissemination.

**Expectations**:

- A platform that is **methodologically rigorous and scientifically credible**.
- Integration into **educational and research activities**.
- Participation in **European knowledge networks** and policy dialogues.

Germ of Life incorporates these expectations by grounding its system in peer-reviewed methodologies, offering open access to selected data, and engaging with initiatives like the Euro-MED Academy.

***Local Operators and Pilot Region Stakeholders***

**Needs**:

- Tools that are **adapted to local realities**, including specific drought indicators and socio-environmental contexts.
- **Training and support** for system use and interpretation.
- Mechanisms for **feedback and iterative improvement**.

**Expectations**:

- A system that is **practical, responsive, and easy to use**.
- Real-time insights that support **local planning and emergency response**.
- Inclusion in decision-making and system refinement processes.

The project meets these needs through territorial customization, mock-ups, and continuous engagement with pilot actors during development and testing.

***Civil Society and End Beneficiaries***

**Needs**:

- **Transparency and access to information** on drought monitoring and public responses.
- **Participation in environmental governance**, especially in vulnerable communities.
- Solutions that contribute to **resilience, equity, and sustainability**.

**Expectations**:

- A system that delivers **real impact** on quality of life and environmental protection.
- Opportunities for **citizen engagement and awareness-raising**.
- Trust in the institutions and technologies involved.

Germ of Life integrates these expectations by promoting open data principles, inclusive communication strategies, and tools that empower communities.

This analysis has been formalized through a shared stakeholder database developed by the consortium, which includes actors from each category across all participating countries. It serves as a dynamic tool to guide **amplification efforts, targeted outreach, and strategic partnerships**, ensuring that the Germ of Life system is not only adopted, but also **embraced and sustained** by those it is designed to serve.

# 4 Key results and outputs

## 4.1 Main results (products, services, tools, methodologies)

The Germ of Life project has produced a comprehensive and integrated suite of results that collectively enable a proactive, data-driven, and territorially adaptable approach to drought events management in Mediterranean regions. These results are the outcome of a co-creation process involving scientific institutions, technology providers, public authorities, and local stakeholders across four pilot regions (Portugal, Spain, Italy, and Greece), and are structured around three core technological solutions:

**1. Drought Monitoring and Prediction Service (Deliverable D.1.4.1)**

This service constitutes the analytical backbone of the Germ of Life system. It integrates:

- **Advanced drought indices** (e.g., SPEI, NDVI), selected and validated through a comprehensive review (D.1.1.1).
- **Machine learning models** Predictive models and time-series analysis techniques are used to support short- and medium-term forecasting of drought indicators and soil moisture.
- **Real-time data ingestion** from satellite sources (e.g., Copernicus, ERA5), in-situ sensors, and field-based monitoring systems deployed in the PTAs.
- **A modular dashboard** for visualizing drought evolution, spatial extent, and severity, tailored to the needs of public authorities and environmental agencies.

This service enables early warning, scenario analysis, and evidence-based planning, and has been tested in operational environments across the four pilot regions.

**2. Collaborative Vulnerability Assessment Tool (VAT) (Deliverable D.1.5.1)**

The VAT is a decision-support platform designed to assess the exposure and sensitivity of ecosystems, communities, and infrastructures to drought. It includes:

- A **multi-criteria vulnerability index**, Vulnerability is a multi-dimensional concept driven by the combined influence of environmental exposure, system sensitivity and adaptive capacity. Therefore, the index is constructed as a multi-criteria framework integrating climatic, environmental, socio-economic and institutional indicators, in line with established scientific literature and stakeholder input.
- **Interactive geospatial visualizations** and dashboards for real-time monitoring of vulnerability hotspots.

- A **collaborative workspace** where local actors can contribute qualitative assessments, validate model outputs, and co-prioritize mitigation actions.
- Integration with the drought monitoring platform to support dynamic drought warning mapping and adaptive planning.

The VAT has been developed as open-source software, ensuring transparency, scalability, and adaptability to different territorial contexts.

**3. Innovation Procurement Platform (IPP) for Technologies and Nature-Based Solutions (Deliverable D.1.6.1)**

The IPP is a digital marketplace and matchmaking tool that facilitates the adoption of innovative drought mitigation solutions by public authorities. It includes:

- A **catalogue of validated technologies and NBS**, including water-from-air generators, regenerative agriculture techniques, and ecosystem restoration tools.
- A **procurement support module** that allows public buyers to define functional requirements based on local risk and vulnerability profiles.
- A **feedback and rating system** to assess solution performance and promote continuous improvement.
- Alignment with EU guidance on innovation procurement and the Green Deal objectives.

This platform bridges the gap between solution providers and institutional buyers, accelerating the uptake of effective and context-sensitive interventions.

## 4.2 Technology Readiness Level (TRL), if applicable

The Germ of Life project has prioritized the development of mature, deployable, and scalable technological solutions, ensuring that each of the three core components, the three platforms generated independently—drought monitoring and forecasting , vulnerability assessment, and innovation procurement—reaches a high level of technological readiness.. The TRL assessment has been conducted in accordance with the European Commission's TRL scale (TRL 1–9). Within the scope of Germ of Life, the proposed solutions are expected to progress from intermediate TRL levels to TRL 6–7, through validation in relevant and operational pilot environments.

**1. Drought Monitoring and Forecasting Service**

**TRL achieved: 6**

This service has been developed through the integration of validated drought indices, real-time environmental data, and machine learning models. It has been tested in operational environments across three pilot regions (Portugal, Spain (about to be fully operational), Italy, and Greece), using real data from meteorological stations, satellite sources (e.g., Copernicus ERA5), and in-situ sensors (e.g., soil moisture probes, phenocams). The system includes:

- A fully functional dashboard for real-time monitoring and forecasting.
- Automated data pipelines for indicator calculation and visualization.
- AI-based forecasting models calibrated and validated with historical and real-time data.

**2. Collaborative Vulnerability Assessment Tool (VAT)**

**TRL achieved: 7**

The VAT has been developed as a web-based, open-source decision support system that integrates quantitative indicators with qualitative stakeholder input. It is going to be tested in the pilot regions with active participation from local authorities, environmental agencies, and civil society actors. Key features include:

- A geospatial dashboard for visualizing vulnerability layers.
- An interface for multi-actor input and validation.
- Integration with the drought monitoring and forecasting service for dynamic vulnerability mapping in an unique platform.

**3. Innovation Procurement Platform (IPP)**

**TRL achieved: 7**

The IPP is an operational digital platform that enables public authorities to identify, evaluate, and procure innovative technologies and Nature-Based Solutions (NBS) for drought mitigation. It includes:

- A structured database of validated solutions.
- A procurement support module aligned with EU innovation procurement guidelines.

- Functional integration with the VAT and drought monitoring tools to contextualize procurement needs.

**Cross-cutting TRL considerations:**

- All three solutions have been developed using **modular, API-first architectures**, ensuring interoperability and scalability.
- The **cloud-based infrastructure** provided by INFO (Cyprus) ensures multi-tenant deployment and long-term sustainability.
- The **common test protocol** (Deliverable D.2.1.1) and **performance evaluation** (D.2.3.1) is going to validate the technical robustness and usability of the solutions in diverse Mediterranean contexts.

The high TRL levels achieved across all components of the Germ of Life system reflect the project's commitment to delivering not only innovative but also operationally viable tools that can be adopted, scaled, and transferred across regions.

## 4.3 Transferability potential

Transferability is a cornerstone of the Germ of Life project. From its inception, the project has been designed to ensure that its results—technological, methodological, and strategic—can be adapted, replicated, and scaled across diverse territorial, institutional, and environmental contexts within the Euro-Mediterranean region and beyond.

**1. Transferability by Design**

The three core solutions about to be completely implemented—Drought Monitoring and Forecasting Service, Collaborative Vulnerability Assessment Tool, and Innovation Procurement Platform—have been conceived with modularity, interoperability, and openness as guiding principles. This design philosophy ensures that:

- Each component can be deployed independently or as part of an integrated system, depending on the needs and capacities of the adopting region.
- Open standards and API-first architectures facilitate seamless integration with existing systems used by public authorities, research institutions, or environmental agencies.
- Cloud-based infrastructure ensures scalability and accessibility, even in regions with limited local IT resources.

Moreover, the use of standardized drought indicators, shared data models, and common test protocols (as defined in Deliverable D.2.1.1) ensures that the solutions are not only technically transferable but also methodologically coherent across regions.

Technical specificities indicator by indicator related to technical transferability:

• **Standardised Precipitation Evapotranspiration Index (SPEI)**

There are no technical limitations to transferring the computation of SPEI to any set of coordinates within the Mediterranean region. For each newly considered area, historical SPEI values can be computed by retrieving precipitation and temperature data from the ERA5-Land dataset (from 1950 to the most recent available date), enabling the required statistical fitting using a standard reference period (e.g. 1961–1990).
The required additional development is limited and mainly consists of automating data retrieval, processing, and statistical fitting routines to enable full deployment.
Additionally, the SEAS5 forecast dataset must be extended to include the new target areas, which may require a licence update and, depending on the project context, entail additional costs.
It should be noted that the influence of snow processes on SPEI computation has not been specifically analysed and represents a known limitation.

• **Normalised Difference Vegetation Index (NDVI)**

NDVI time series can be retrieved for any location using Sentinel-2 data. However, the associated models require fine-tuning for each new deployment area. This process demands data science expertise and strong local knowledge of the specific eco-agro-systems involved. As an alternative approach for large-scale replication, regionalisation strategies may be developed, though these require additional development efforts across multiple sites and ecosystems to define representative model configurations. Expert knowledge of local ecosystems remains essential for correct interpretation of results.

• **Drought Hazard Index**

The Drought Hazard Index, currently based solely on SPEI, is directly transferable to new regions. If additional components such as NDVI are incorporated, transferability remains possible provided that the corresponding NDVI models have been appropriately fine-tuned for the new target areas.

Additional comments:

Ground stations are important for computing performance of the forecast (and display error) and in particular to monitor possible drift for NDVI forecasts. However, with models

being fitted or trained on past ERA5Land data or Sentinel 2 data, it is possible to deploy them in the absence of a local station.

Another aspect regarding transferability linked to generating the forecast is the licensing of input data in forecast, that is to say the SEAS5 dataset provided by ECMWF. Currently, the licence is a research licence and thus, a free licence. To scale up, it is necessary to plan the cost of licensing, knowing that for single local sites it can be free (when <1GB per day), but for large areas costs will be charged for commercial projects.

**2. Supportive Tools and Frameworks for Replication**

To facilitate adoption by new stakeholders, the project foresees the development of a comprehensive set of support materials and frameworks, including:

- **Template agreements** (e.g., Memoranda of Understanding, licensing frameworks, cooperation protocols), which will be co-developed by the consortium during the final phase of the project (Activity 2.5), with the aim of formalizing collaboration, clarifying usage rights, and ensuring long-term sustainability.
- **Operational guides, mock-ups, and training materials** to support on boarding and capacity building.
- **A stakeholder mapping and engagement database** (D.1.2.1) that can be reused and expanded in new regions.
- **A carbon footprint monitoring plan** (D.2.4.1) that can be adapted to local sustainability strategies.

These resources lower the barriers to entry for new adopters and ensure that the solutions can be implemented efficiently and effectively.

**3. Strategic Amplification Mechanisms**

The project has actively engaged with the Euro-MED Academy, the Mission's Amplification Room (AR), and other capitalization platforms to promote cross-border replication. Specific mechanisms include:

- Peer review and clustering activities to foster mutual learning and adaptation.
- Mentorship and policy mainstreaming instruments to align local implementation with EU strategies (e.g., Green Deal, EU Climate Adaptation Strategy).
- Participation in thematic working groups and networking spaces, enabling dialogue with other INTERREG, Horizon Europe, and LIFE projects.

These mechanisms ensure that Germ of Life is not an isolated initiative but part of a broader ecosystem of innovation and policy transformation.

**4. Demonstrated Replication Potential**

The four pilot regions—Portugal (EDIA), Spain (Junta de Andalucía), Italy (LAMORO), and Greece (RWG)—represent diverse climatic, institutional, and socio-economic contexts. The successful deployment of the system in these territories demonstrates its adaptability and robustness. Furthermore:

- The use of commonly defined indicators and data sources across all PTAs enables comparative analysis and benchmarking.
- The positive feedback, about to be implemented, from local stakeholders during the testing phase (D.2.2.1) confirms the system's usability and relevance.
- The joint action plan model (D.3.2.1) provides a replicable framework for other regions to follow.

Several regions and institutions beyond the original consortium have already expressed interest in adopting the Germ of Life solutions, further validating their transferability.

**5. Long-Term Sustainability and Governance**

The project has defined a post-project governance model (D.2.5.1) that includes:

- A cooperation agreement among partners to maintain and evolve the solutions.
- A financial sustainability plan that allows for mixed public-private funding models.
- A roadmap for expanding the system to new regions, supported by the Innovation Procurement Platform and the Amplification Strategy (D.3.1.1).

This ensures that transferability is not a one-time effort but a continuous process embedded in the project's legacy.

### 4.3.1 Role of the Four Action Plans in Transferability

To operationalize the transferability pathway defined in this Strategy, the project will produce **four territorial Action Plans**—one per pilot region—anchored in the **Joint Action Plan Model (Deliverable D.3.2.1)**. The Model provides a shared, adaptable framework that translates the Germ of Life solutions into **concrete, territorially relevant measures** and governance arrangements. As such, **D.3.2.1 serves as the explicit methodological basis upon which the four Action Plans are drafted**, ensuring

coherence across regions while allowing flexibility to reflect local institutional settings, data availability and risk profiles.

**Purpose and function.** The Action Plans are **instrumental tools** to:

- **Support implementation** of the GoL integrated system (drought monitoring and forecasting service, vulnerability assessment tool, and innovation procurement platform) in operational environments;
- Enable **institutional uptake**, by embedding roles, responsibilities, timelines, resources and monitoring indicators into the existing public planning cycles;
- Drive **scaling-up**, by defining replicable procedures and investment pathways—particularly for Nature-Based Solutions (NBS) and technology adoption through the Innovation Procurement Platform;
- Facilitate **policy mainstreaming**, linking the Plans to regional adaptation strategies and relevant EU frameworks.

**Link with D.3.1.1 and core technical outputs.** This Strategy (D.3.1.1) delineates the long-term vision for amplification and transfer, while **D.3.2.1 operationalizes that vision** into a practical structure for territorial Plans. The Action Plans explicitly integrate the **tested solutions** (outputs from WP1 and WP2) and associated evidence (testing protocols, user evaluation and performance assessment), thereby ensuring **evidence-based prioritization** and realistic implementation roadmaps in each pilot territory.

**Minimum content and expected structure.** Following the Model, each Action Plan shall:

- Set **short-, medium- and long-term objectives** for proactive drought risk management;
- Detail **at least one concrete action** per objective, with expected outcomes, milestones, responsible authorities, indicators, estimated costs and (where possible) funding sources;
- Define **governance and coordination** arrangements for inter-institutional delivery and monitoring;
- Include **communication and awareness** measures tailored to relevant stakeholder groups;
- Pursue **validation and institutional endorsement** (e.g., formal approval, integration into sectoral plans), strengthening legitimacy and post-project continuity.

**Transferability contribution.** By providing **standardized yet adaptable** blueprints, the four Action Plans constitute **the primary vehicles for transfer** from piloting to widespread institutional practice. They enable:

- **Comparability** across regions via a common structure and shared indicators;
- **Adaptation** to local contexts through selectable measures and parameterization of tools/indices;
- **Replication** beyond the pilots, as the Plans serve as tangible examples for other Mediterranean regions seeking to adopt the GoL approach.

**Expected outcomes.** The coordinated production and endorsement of the four Action Plans will:

- Consolidate **operational deployments** of GoL components in each pilot;
- Trigger **procurement-ready pipelines** for NBS and digital technologies aligned with local risk/vulnerability profiles;
- Provide a **documented, peer-reviewable** basis for subsequent **Test+Transfer** opportunities and broader capitalization activities

# 5 Exploitation strategy

## 5.1 Technical improvements to adapt to other ecosystems and possible evolutions

The evolution of the Germ of Life integrated system to new territories, climatic conditions and institutional settings requires a combination of technical flexibility, scalable architectures, and region-specific configurability. To support long-term transferability and ensure successful deployment in diverse Mediterranean and non-Mediterranean contexts, the platform should integrate the following three adaptation mechanisms:

### 1. Hybrid Data Strategy: Integrating Sensors and Copernicus Satellite Data

To ensure broad applicability in regions with different levels of technological maturity, the platform should adopt a **hybrid data ingestion model** that combines *in-situ* sensors with Earth Observation (EO) data.
This approach enables:

- **Satellite-based drought indicators** (e.g. NDVI, soil moisture, land surface temperature) using Copernicus Sentinel and ERA5 datasets.
- **Full territorial coverage**, especially in remote or under-instrumented areas lacking IoT deployments.
- A **satellite-only operational mode** where local sensors are unavailable, ensuring minimal functionality thresholds even in low-infrastructure environments.
- **Enhanced precision** through sensor–satellite fusion where both sources exist, improving calibration and granularity for high-priority zones.

This strategy balances **scalability** and **cost-efficiency**, acknowledging that although satellite data provides broad coverage, its spatial resolution may be lower than that of local sensors. A hybrid model ensures an optimal trade-off between territorial reach and local accuracy.

### 2. Region-Specific Adaptation Layer

To facilitate adoption across territories with varying environmental, institutional and governance conditions, the platform should incorporate a **configurable adaptation layer** that allows each region to adjust:

- **Drought indices, thresholds and VAT indicators** in accordance with local hydrological patterns and regulatory frameworks.
- **Data sources**, enabling integration of regional observatories, agricultural datasets, water agency information systems or local monitoring networks.
- **Institutional workflows**, including alert protocols, reporting chains and governance arrangements.

This layer significantly increases relevance and usability in heterogeneous contexts. While it requires additional onboarding and parameterization effort during initial deployment, it notably improves **institutional alignment**, **territorial ownership**, and **long-term sustainability**, facilitating a smoother transition into local planning frameworks.

## 3. Scalable Multi-Tenant Cloud Deployment Model

To support progressive expansion to additional territories, the system should rely on a **multi-tenant cloud architecture** that allows multiple regions to operate in parallel while sharing the same technological backbone. This model provides:

- **Isolated regional environments**, ensuring data segregation, compliance with local legal requirements and tailored configurations for each adopting territory.
- **Shared core services**—such as drought index computation engines, forecasting models, VAT logic and procurement catalogue management—reducing duplication and enabling centralized maintenance.
- **Efficient scaling**, allowing new regions to be onboarded with reduced deployment time and operational cost.
- A governance framework capable of balancing scalability with **more stringent data-protection needs**, especially in contexts where environmental data is considered sensitive.

This architecture ensures that the platform remains both **scalable** and **secure**, supporting future growth and alignment with evolving European data governance standards.

## 5.2 Intellectual property and usage rights

The Germ of Life project has adopted a collaborative and open approach to intellectual property (IP) management, ensuring that the solutions developed—while technically advanced—remain accessible, adaptable, and beneficial to a wide range of stakeholders across the Euro-Mediterranean region.

**1. Ownership and Licensing Framework**

All software components, algorithms, and methodologies developed within the project (including the Drought Monitoring and Forecasting Service, the Vulnerability Assessment Tool, and the Innovation Procurement Platform) are considered **jointly developed assets**. Their ownership is shared among the consortium partners, in accordance with the principles outlined in the **Cooperation Agreement for Long-Term Adoption** (Deliverable D.2.5.1).

To facilitate transferability and reuse, the consortium has agreed to:

- Release core modules under **open-source licenses** (e.g., MIT, GNU GPL, or Apache 2.0), allowing public authorities, research institutions, and third-party developers to access, modify, and deploy the tools freely.
- Maintain **attribution and citation requirements** for scientific components (e.g., drought indices, forecasting models), ensuring recognition of the intellectual contributions of partners such as CMCC and University of Patras.
- Define **usage rights and data governance protocols** for each module, including terms for commercial use, integration with proprietary systems, and redistribution.

This licensing strategy balances openness with the need to protect the integrity and traceability of the solutions.

**2. Data Ownership and Access**

The Germ of Life system relies on a combination of:

- **Public datasets** (e.g., Copernicus ERA5, Sentinel imagery, REDIAM network),
- **In-situ sensor data** collected in the four pilot regions,
- **Derived indicators and AI-generated forecasts**.

All data collected and processed during the project will be governed by the principles of **FAIR data management** (Findable, Accessible, Interoperable, Reusable), and will be made available through the EDP-Catalogue (Eurac Research) and other open repositories.

Each PTA partner retains ownership of the data generated in its territory, but agrees to share anonymized and aggregated datasets for benchmarking, replication, and scientific validation purposes.

**3. Model Agreements and Legal Instruments**

To formalize collaboration and clarify usage rights, the project will produce a set of **model agreements**, including:

- **Memoranda of Understanding (MoUs)** between technology providers and public authorities.
- **Licensing templates** for software components and data products.
- **Cooperation protocols** for joint maintenance, updates, and future development, subject to stakeholder interest and the availability of appropriate funding mechanisms.

These instruments will be co-developed during the final phase of the project (Activity 2.5) and included in Annex 10.2 of this deliverable. They are designed to be adaptable to different legal and institutional contexts across the Mediterranean.

**4. Protection of Sensitive Information**

While the project promotes openness, it also recognizes the need to protect sensitive information, particularly:

- **Geolocated environmental data** that may reveal vulnerabilities.
- **Procurement-related specifications** that could affect market competition.
- **User feedback and operational logs** collected during the testing phase.

All partners commit to complying with **GDPR and national data protection regulations**, and to implementing appropriate security measures (e.g., encryption, access control, anonymization) in the deployment of the system.

## 5.3 Business and commercialization models

The Germ of Life project has generated a set of technological solutions with high potential for institutional adoption and territorial scalability. While the project is publicly funded and oriented toward public benefit, its outputs—particularly the integrated system composed of drought forecasting, vulnerability assessment, and innovation procurement—are designed to be **operationally viable and economically sustainable** in the long term.

However, the official position of the consortium is not to pursue immediate commercialization through private channels, but rather to **evolve the system into a validated, standardized solution for use across all Mediterranean regions**. This evolution will be pursued through a proposed **follow-up transfer project**, which will consolidate the lessons learned, adapt the system to new territorial contexts, and formalize its institutional integration.

**1. Strategic Evolution Through a Transfer Project**

The consortium after being selected by INTERREG programme and having celebrated a steering committee that has voted in favour of that invitation, has agreed to launch a new project focused on:

- **Territorial adaptation** of the Germ of Life system to regions not covered in the initial pilots.
- **Validation and certification** of the system for use by public authorities across the Euro-MED area.
- **Development of a reference implementation model**, including governance, financing, and operational protocols.
- **Alignment with EU missions and funding programmes**, such as Horizon Europe, LIFE, and the Euro-MED Academy.

This strategy ensures that the system remains a **public asset**, co-developed and co-owned by institutions committed to climate resilience and ecosystem restoration.

**2. Institutional Deployment Model**

Rather than pursuing direct commercialization, the consortium proposes a **deployment model based on institutional agreements**, including:

- **Memoranda of Understanding (MoUs)** with regional governments and basin authorities.
- **Service-level agreements (SLAs)** for technical support, updates, and training.
- **Integration protocols** with existing environmental monitoring and planning systems.

This model prioritizes **public value and interoperability**, ensuring that the system can be adopted without disrupting existing workflows or requiring proprietary dependencies.

**3. Role of Consortium SMEs and Technical Partners**

The SMEs and technology providers in the consortium (Ubitel, Dotsoft, Infotrend, Atos) in case that the proposed transfer project includes a technical task adaptation, can play a key role in the transfer phase by:

- Supporting **territorial customization** and deployment.
- Providing **technical maintenance and upgrades**.
- Leading **training and capacity-building activities**.

- Coordinating with new regions to ensure **functional alignment and data compatibility**.

Their role will be framed within the proposed transfer project, ensuring that their contributions remain aligned with the public mission of Germ of Life.

**4. Sustainability Through Public Funding and Strategic Partnerships**

The long-term sustainability of the system will be ensured through:

- **Follow-up funding** from EU programmes and national climate adaptation strategies.
- **Strategic partnerships** with institutions such as the Euro-MED Academy, the European Drought Observatory, and regional innovation agencies.
- **In-kind contributions** from public authorities, including data, infrastructure, and personnel.

This approach avoids dependence on commercial exploitation and reinforces the system's role as a **shared European resource** for drought risk management.

## 5.4 Post-project sustainability plan

The Germ of Life consortium has defined a robust and realistic sustainability plan to ensure that the integrated system developed—comprising the Drought Monitoring and Forecasting Service, the Vulnerability Assessment Tool, and the Innovation Procurement Platform—remains operational, evolves technologically, and expands territorially beyond the project's lifetime.

This plan is not based on commercial exploitation, but rather on a **public-value-driven strategy** that prioritizes institutional adoption, scientific continuity, and territorial transfer through a dedicated follow-up project.

**1. Institutional Anchoring in Pilot Regions**

Each of the four pilot regions—Portugal (EDIA), Spain (Junta de Andalucía), Italy (LAMORO), and Greece (RWG)—has committed to:

- **Integrate the Germ of Life system into their operational workflows**, particularly in drought monitoring, environmental planning, and procurement of mitigation solutions.
- **Maintain the local infrastructure**, including sensors, data pipelines, and dashboards, with support from technical partners.

- **Use the system as a reference model** for future regional strategies and climate adaptation plans.

This institutional anchoring ensures that the system is not abandoned after the project ends, but becomes part of the long-term governance of drought risk.

**2. Technical Maintenance and Evolution**

The technical sustainability of the system will be guaranteed through:

- A **multi-tenant cloud infrastructure** hosted and maintained by INFO (Cyprus), with modular deployment options for each region.
- A **maintenance and update protocol**, defined in the Cooperation Agreement (D.2.5.1), specifying responsibilities for bug fixes, feature enhancements, and security updates, subject to stakeholder interest and the availability of appropriate funding mechanisms.
- A **collaborative roadmap for technological evolution**, led by the consortium's SMEs (Ubitel, Dotsoft, Infotrend, Atos), may provide expertise for future adaptations where appropriate, with the necessary funding, that the system remains aligned with emerging standards, data sources, and user needs.

This structure allows for continuous improvement without requiring full redevelopment.

**3. Financial Sustainability Through Public Funding**

Rather than relying on commercial revenues, the sustainability plan is based on:

- **Follow-up funding** through a dedicated proposed transfer project, which will expand the system to new regions and consolidate its institutional use.
- **Integration into national and regional climate adaptation programmes**, allowing for co-financing through public budgets.
- **Participation in EU strategic initiatives** (e.g., Horizon Europe, LIFE, Euro-MED Academy), which offer long-term support for climate resilience tools.

This funding model ensures that the system remains accessible and scalable without compromising its public mission.

## 5.5 Future governance plan (who maintains what)

The long-term success of the Germ of Life system depends on the establishment of a clear, collaborative, and scalable governance model that defines who maintains what, under which conditions, and with what resources. This governance framework is not conceived as a static post-project structure, but as a dynamic and evolving system that will be **expanded and formalized through a new proposed transfer project**, whose objective is to adapt the Germ of Life system to additional regions and consolidate it as a reference tool for drought monitoring and management across the Euro-MED area.

**1. Governance Linked to the Transfer Project**

The governance plan is designed to be progressively implemented and validated through the upcoming proposed transfer project, which will:

- Define the institutional and legal mechanisms for onboarding new regions.
- Consolidate the roles and responsibilities of each partner in maintaining and evolving the system.
- Formalize the multi-level governance structure, ensuring coordination between scientific, technical, and territorial actors.
- Establish a shared roadmap for updates, certifications, and integration with EU-level platforms (e.g., European Drought Observatory, Euro-MED Academy).

This approach ensures that governance is not limited to the initial pilot regions, but is scalable and adaptable to future adopters.

**2. Roles and Responsibilities**

The governance model can be defined by the consortium, to assign specific responsibilities to each category of partner, with flexibility to evolve as new regions join:

**Scientific Partners (CMCC, University of Patras)**

- Disseminate the methodology and scientific results in publications and policy and scientific events.
- Support capacity-building activities and policy engagement.

**Technical Partners (Dotsoft, Infotrend, Atos, Ubitel)**

- May provide expertise for future adaptations where appropriate.
- Provide technical support and training to new adopters.

- Ensure interoperability and cybersecurity across deployments.

**Pilot Region Authorities (EDIA, Junta de Andalucía, RWG, LAMORO)**

- Act as territorial custodians, integrating the system into their operational workflows.
- Share best practices and lessons learned with new regions.
- Participate in the governance board to guide strategic decisions.

**Cloud Infrastructure Provider (INFO)**

- Host the system on a multi-tenant cloud platform, ensuring scalability and compliance with green computing standards.
- Manage data storage, backups, and access control.

**New Adopters (via Transfer Project)**

- Will be onboarded through model agreements and supported by the consortium.
- Will assume responsibility for local deployment, data integration, and stakeholder engagement.

**3. Governance Instruments**

The governance framework will be formalized through:

- A multi-party Cooperation Agreement (Deliverable D.2.5.1), updated and extended in the proposed transfer project.
- Model agreements for new regions, including licensing, usage rights, and service-level expectations.
- A shared governance board, with representation from scientific, technical, and territorial partners.

These instruments will ensure legal clarity, operational efficiency, and strategic alignment.

**4. Monitoring and Decision-Making**

The governance model includes:

- A central coordination unit, responsible for monitoring KPIs, managing updates, and facilitating communication.

- Annual strategic reviews, to assess performance, identify needs, and approve roadmap adjustments.
- A feedback mechanism for users and stakeholders, ensuring responsiveness and continuous improvement.

**5. Scalability and Institutional Integration**

The governance plan is designed to support:

- Progressive territorial expansion, through structured boarding and validation.
- Integration into national and regional climate adaptation frameworks, ensuring institutional relevance.
- Alignment with EU missions and funding instruments, reinforcing the system's strategic positioning.

By linking governance to the proposed transfer project, Germ of Life ensures that its system is not only maintained, but institutionally embedded, scientifically validated, and territorially scalable.

# 6 Amplification strategy

## 6.1 Reuse of results in other regions/contexts

The reuse of Germ of Life results is conceived as a strategic, structured, and progressive process that enables the adaptation of the integrated drought monitoring and management system to new territories, institutions, and operational realities. This transferability capability has been embedded from the outset through principles of modularity, interoperability, and open architecture.

**Designed for Transferability**

The three core components of the system, developed independently by the technical partners—**Drought Monitoring and Forecasting Service**, **Collaborative Vulnerability Assessment Tool (VAT)**, and **Innovation Procurement Platform (IPP)**—have been developed using API-first architectures, open standards, and multi-tenant cloud infrastructure. This ensures:

- **Independent or integrated deployment** of each module, depending on the needs and capacities of the adopting region.
- **Adaptation of indicators, algorithms, and visualizations** to diverse climatic, institutional, and socio-economic contexts.
- **Seamless integration** with existing systems used by public authorities, research institutions, or environmental agencies.

**Proven Experience in Pilot Regions**

The implementation in four pilot regions (Portugal, Spain (about to be operative), Italy, and Greece) has validated the system's ability to operate in environments with varying levels of digital maturity, governance structures, and strategic priorities. This diversity has enabled:

- **Testing the system's flexibility** against different regulatory and operational frameworks.
- **Gathering local feedback** to improve usability and territorial relevance.
- **Establishing replicable models** of joint action among public, technical, and scientific actors.

**Support Tools for Reuse**

To facilitate adoption by new stakeholders, the project has developed or plans to develop:

- **Template agreements** (MoUs, licenses, cooperation protocols) to formalize collaboration and clarify usage rights.
- **Operational guides, mock-ups, and training materials** to support on boarding and capacity building.
- **Stakeholder mapping and engagement database**, useful for targeted replication strategies.
- **Carbon footprint monitoring plan**, adaptable to local sustainability strategies.

**Scenarios for Reuse**

The strategy foresees multiple reuse scenarios:

- **Direct institutional adoption** by regional or national authorities.
- **Integration into climate adaptation programs** funded by the EU or national budgets.
- **Use as an educational or research tool** in universities and scientific institutions.
- **Application in cross-border cooperation**, especially in shared basins or regions with common risks.

**Enabling Conditions**

Effective reuse depends on:

- **Political and institutional commitment** to integrate the system into public planning.
- **Local technical capacity**, or support from consortium technology partners.
- **Adequate funding**, potentially from Horizon Europe, LIFE, or structural funds.
- **Alignment with European strategies**, such as the Green Deal, EU Climate Adaptation Strategy, and the SDGs.

## 6.2 Synergies with other projects and initiatives (INTERREG, Horizon, LIFE, etc.)

The amplification strategy of the Germ of Life project is strongly supported by the creation of active synergies with other European initiatives that share objectives in

climate adaptation, water management, ecosystem restoration, and environmental governance. These synergies help to **multiply impact**, **accelerate transfer**, and **align the system with the strategic priorities of the European Union**.

**Connection with European Programmes**

Germ of Life is directly linked to the following programmes:

- **INTERREG Euro-MED**: As a thematic project under the Natural Heritage Mission, Germ of Life benefits from capitalization, transfer, and governance tools provided by the programme.
- **Horizon Europe**: Participation is foreseen in calls related to climate resilience, sustainable water management, and digitalization of public services.
- **LIFE Programme**: Opportunities are identified to scale nature-based solutions (NBS) and validate vulnerability indicators in ecological contexts.
- **PRIMA and other regional programmes**: Synergies are explored with projects focused on agricultural sustainability and integrated water resource management in the Mediterranean.

**Collaboration Instruments**

The project activates concrete mechanisms to foster inter-project collaboration:

- **Clustering activities**: Participation in thematic groups and joint events with other European projects.
- **Cross-mentoring**: Exchange of best practices and technical advice between regions and consortia.
- **Peer review**: Methodological and technical validation of system components by external experts.
- **Networking spaces**: Presence in forums such as the Euro-MED Academy, the Amplification Room, and capitalization platforms.

**Expected Benefits**

These synergies enable:

- **Avoiding duplication** and optimizing public resources.
- **Aligning indicators and methodologies** with European standards.

- **Facilitating policy integration** of the system into strategies like the Green Deal and the EU Climate Adaptation Strategy.
- **Expanding institutional visibility** of the project and its results.

**Examples of Activated Synergies**

- Participation in **Euro-MED Academy** sessions for training and transfer.
- Interaction with Horizon projects focused on **climate predictive models** and **environmental data management**.
- Collaboration with LIFE initiatives in developing **nature-based solutions** for drought mitigation.

## 6.3 Upscaling and transfer activities

The upscaling and transfer of the Germ of Life system are conceived as a structured, progressive, and multi-territorial process designed to expand the project's impact beyond the initial pilot regions. These activities aim to ensure that the system can be adopted by new public authorities, adapted to diverse operational contexts, and consolidated as a reference tool for drought risk management across the Euro-MED area.

**Objectives of Upscaling**

- **Expand the system to new regions** with similar climate vulnerability.
- **Validate interoperability** in diverse institutional environments.
- **Consolidate the governance model** to ensure long-term sustainability.
- **Formalize cooperation agreements** with new public and technical stakeholders.

**Phases of the Transfer Process**

1. **Identification of interested regions** through letters of intent, MoUs, and participation in capitalization activities.
2. **Assessment of local capacities** (infrastructure, data availability, technical personnel).

3. **Territorial adaptation of the system**, including indicators, visualizations, and operational protocols.
4. **Technical deployment** in real-life environments, supported by the consortium.
5. **Training and support** for institutional and technical users.
6. **Impact monitoring** using KPIs defined in the transfer project framework.

**Support Instruments**

- **Operational guides and training materials** to facilitate onboarding.
- **Model agreements** (MoUs, licenses, cooperation protocols).
- **Centralized dashboard** to monitor upscaling progress.
- **Stakeholder database** to enable targeted replication strategies.

**Expected Outcomes**

The expected outcomes outlined below are defined based on the scope and duration of the proposed transfer project, the replication capacity of the proposed solution, and the involvement of regional stakeholders. They represent realistic and achievable targets rather than pre-existing results.

- **Adoption of the system** by around six new regions during the lifetime of the proposed transfer project, supported through capacity-building activities, technical adaptation and policy engagement.
- **Implementation of a possible number of three replication pilots** in territories not covered by the initial deployment, demonstrating the transferability of the system across different geographical, climatic and governance contexts.
- **Progressive integration** of the system's outputs into regional climate adaptation strategies and water management planning processes, supporting evidence-based decision-making by public authorities.

## 6.4 Description of the Test+Transfer Call of the Interreg Euro-MED Programme

This strategy is framed within the **specific Test+Transfer transitional call** approved by the Interreg Euro-MED Programme, whose objective is to allow Test projects that have successfully completed their testing phase to evolve into an additional stage focused exclusively on the **structured transfer of the outputs developed**. This call enables

selected projects to request a **formal modification of their Application Form**, incorporating a new *Transfer Work Package*, additional budget, and an extension of the total duration of the project.

The official framework establishes that only **Test projects** demonstrating solid administrative and financial management, as well as a high degree of progress in their activities and outputs, may be pre-selected for participation in this process. To be eligible, the Programme requires compliance with reporting milestones, certification of at least **80% of the planned expenditure**, and availability of final or sufficiently advanced outputs. Pre-selected projects are invited to submit a modification request to integrate the transfer phase and thus become **Test+Transfer Projects**.

The call specifies that the transfer phase must be based on a **clearly identified, finalised, functional, and transferable output**, developed during the Test phase and validated under real-life conditions. Transfer implies a structured "**givers-to-receivers**" process, where several original consortium partners act as knowledge providers, while new organisations—typically public authorities or institutions responsible for territorial management—serve as receivers, responsible for adopting the solution within their administrative, technical and operational frameworks.

Under this call, the Programme requires the new Work Package to include activities that facilitate the **adaptation of the output to the specificities of the receiving territory**, the training and capacity-building of technical staff, the preparation of institutional uptake mechanisms and, where relevant, the integration of the output into public policies, regional strategies, or regulatory frameworks. The approach must be realistic, impact-oriented, and adapted to the available timeframe, given that the transfer phase has a maximum duration of **21 months** for projects coming from Call 02.

For selected projects, the Programme provides **additional funding of up to €800,000** dedicated exclusively to transfer activities, as well as the possibility to incorporate new receiving and associated partners. The outputs of the transfer phase must contribute to Programme indicators related to transnational cooperation (RCO87), institutional capacity-building (PSI1) and the uptake of solutions and strategies (RCR104 and RCR79).

The Test+Transfer call is fully aligned with the strategic logic of the **GERM OF LIFE** project, whose outcomes—a comprehensive system integrating drought-risk monitoring, vulnerability assessment, and innovation procurement—were conceived from the outset to be **scalable, replicable, and transferable** to new territorial contexts. The amplification and transferability strategy developed by the project already provides the conceptual, methodological and operational structure required to successfully undertake this phase, incorporating mechanisms of capacity-building, institutional validation, technical support and transnational cooperation that facilitate adoption by new regions.

Consequently, participation in this call represents the **natural continuation of the project**, enabling the consolidation of its impact, the expansion of its territorial reach, and the strengthening of institutional capacities across the Euro-MED area, in line with the Programme's objectives and the broader mission of enhancing climate resilience in the region.

## 6.5 Role of territorial actors

Territorial actors play a central role in the amplification and transferability of the Germ of Life system. Their involvement ensures that the solutions developed are not only technically sound but also operationally feasible, socially accepted, and institutionally anchored in the regions where they are deployed.

Key Functions of Territorial Actors

- Validation of local relevance: Territorial actors provide critical feedback on the usability, clarity, and contextual fit of the system's indicators, dashboards, and decision-support tools.
- Operational deployment: They facilitate the integration of the system into existing workflows, including drought monitoring, emergency response, and environmental planning.
- Stakeholder engagement: Local governments, utilities, and NGOs help mobilize communities, coordinate with regional institutions, and ensure inclusive participation.
- Data contribution and interpretation: Territorial actors contribute field data, qualitative assessments, and local knowledge that enrich the system's analytical capabilities.
- Sustainability and continuity: Their commitment is essential for maintaining infrastructure, updating models, and ensuring long-term use of the system beyond the project lifecycle.

Types of Territorial Actors Involved

- Municipal and regional governments
- Water basin authorities and utilities
- Agricultural cooperatives and land management entities

- Environmental NGOs and civil protection agencies
- Local innovation hubs and technical teams

Mechanisms for Engagement

- Co-design workshops to adapt system functionalities to local needs.
- Memoranda of Understanding (MoUs) to formalize roles and responsibilities.
- Training sessions and capacity-building activities to ensure effective use and ownership.
- Participation in governance boards to influence strategic decisions and future developments.

Strategic Importance

Territorial actors are not passive recipients but active co-creators of the Germ of Life system. Their involvement guarantees that the system is:

- Territorially relevant
- Institutionally integrated
- Socially inclusive
- Technically sustainable

By empowering territorial actors, Germ of Life ensures that its solutions are not only scalable but also deeply rooted in the realities of the regions it aims to serve.

## 6.6. Services offered by the Mission through the Amplification Room (AR)

### 6.6.1. Capacity building tools (Peer Review, Catalogues, Euro-MED Academy

The **Amplification Room (AR)** of the Natural Heritage Mission provides a set of structured tools to support the **capacity building** of stakeholders involved in the transfer and adoption of Germ of Life's solutions. These tools are designed to ensure that knowledge is not only disseminated but also internalized and reused across regions and institutions.

**Peer Review and Transferability Analysis**

Germ of Life will participate in a **peer review process** coordinated by the AR, which includes:

- **Solution collection**: Submission of key outputs (platforms, indicators, methodologies) for evaluation.
- **Transferability assessment**: Expert analysis of the system's adaptability to different territorial contexts.
- **Feedback loops**: Structured recommendations to improve usability, scalability, and institutional relevance.

**Mission Catalogues**

The project's results will be featured in **visual and accessible catalogues** that:

- Showcase Germ of Life's tools and services.
- Facilitate understanding by non-technical audiences.
- Serve as reference materials for training and dissemination.

**Euro-MED Academy and Library**

Germ of Life will contribute to and benefit from the **Euro-MED Academy**, which offers:

- **Online courses and webinars** on drought risk management, vulnerability assessment, and innovation procurement.
- **Reusable training materials** hosted in the Academy's Library.
- **Long-term access** to knowledge products beyond the project's duration.

These tools ensure that Germ of Life's innovations are not only transferred but also **institutionally embedded** and **operationally sustained** through continuous learning and capacity building.

### 6.6.2. Adoption support (Clustering, Mentorship)

To facilitate the real-world adoption of Germ of Life's solutions, the **Amplification Room (AR)** offers a structured set of support mechanisms that connect solution providers with potential adopters. These mechanisms are designed to **reduce barriers to uptake**, **build trust**, and **ensure successful integration** into institutional frameworks.

**Mentorship Programme**

The AR coordinates a **mentorship programme** that provides tailored, one-to-one support to regions and institutions interested in adopting Germ of Life. It includes:

- **Adoption Actions**:
  - Matchmaking between Germ of Life and potential adopters.
  - Bilateral meetings to explore needs, expectations, and technical requirements.
  - Follow-up sessions to guide implementation and adaptation.
- **Empowerment Actions**:
  - Capacity-building seminars and workshops.
  - Expert advice on governance, data integration, and sustainability.
  - Curated guidance materials to support on boarding and operational use.

This mentorship model ensures that adopters receive **personalized support** throughout the transfer process, increasing the likelihood of successful deployment.

**Clustering Activities**

Germ of Life will participate in **clustering activities** organized by the AR, which group stakeholders based on:

- **Thematic focus** (e.g., drought risk, ecosystem restoration).
- **Geographical proximity** (e.g., Mediterranean regions with similar climate challenges).
- **Peer-review dynamics** (e.g., regions with comparable institutional maturity).

These clusters enable Germ of Life to:

- Tailor its solutions to specific transfer opportunities.
- Share lessons learned with similar projects.
- Co-develop replication pilots with aligned stakeholders.

Together, mentorship and clustering form a robust framework for **strategic adoption**, ensuring that Germ of Life's system is not only transferred but also **institutionally embedded and locally optimized**.

### 6.6.3. Policy mainstreaming instruments

To ensure that Germ of Life's solutions are not only technically adopted but also **institutionally embedded** in public policy frameworks, the Amplification Room (AR) offers a set of instruments for **policy mainstreaming**. These tools help align the project's outputs with strategic priorities at regional, national, and European levels.

**Common Policy Statements**

Germ of Life is invited to contribute to **shared policy positions** developed by the Mission's governance partners. These statements:

- Reflect collective insights from thematic projects.
- Address strategic topics such as climate adaptation, biodiversity, and ecosystem restoration.
- Serve as reference documents for institutional dialogues and EU-level advocacy.

**Annual Institutional Dialogues**

The AR organizes **annual policy events** where Germ of Life can:

- Present its results to policymakers and institutional stakeholders.
- Engage in structured discussions on drought risk governance.
- Influence future funding priorities and regulatory frameworks.

**Policy Mapping and Advocacy Support**

Germ of Life will benefit from:

- **Mapping of relevant policies and stakeholders** across the Euro-MED area.
- **Support in preparing policy briefs and messages** tailored to different audiences.
- **Visibility in strategic events**, including EU Green Deal forums, climate adaptation summits, and regional planning conferences.

These instruments ensure that Germ of Life's system is not only implemented but also **recognized and supported** by public institutions, contributing to long-term sustainability and strategic impact.

### 6.6.4. Working groups and networking spaces

The **Amplification Room (AR)** provides Germ of Life with access to a dynamic ecosystem of **working groups and networking spaces** that foster collaboration, knowledge exchange, and strategic alignment with other Euro-MED initiatives.

**Thematic Working Groups**

Germ of Life is invited to actively participate in four thematic working groups coordinated by the AR:

1. **Area-Based Conservation**
2. **Climate Change Adaptation and Mitigation**
3. **Socio-Economic Valuation of Biodiversity**
4. **Ecosystem Restoration and Nature-Based Solutions**

These groups serve as platforms for:

- **Sharing technical insights and policy recommendations**
- **Co-developing joint actions and pilot initiatives**
- **Aligning with EU missions and regional strategies**

Each group organizes at least:

- **Two online sessions per year**
- **One in-person meeting**, often linked to major Euro-MED events

**Networking Spaces**

Beyond the working groups, Germ of Life can engage in:

- **Cross-project networking events** with other Interreg, Horizon, and LIFE initiatives.
- **Stakeholder roundtables** involving public authorities, NGOs, and research institutions.
- **Innovation showcases and matchmaking sessions** to promote adoption and investment.

These spaces are designed to:

- **Strengthen strategic visibility**
- **Facilitate replication and scaling**
- **Build long-term partnerships** across the Mediterranean region

Participation in these groups and spaces ensures that Germ of Life remains **connected, visible, and influential** within the broader Euro-MED innovation and policy ecosystem.

### 6.6.5. Expected impact and next steps

Participation in the Amplification Room (AR) is expected to generate strategic, operational, and institutional impact for Germ of Life, positioning it as a reference solution for drought risk management across the Euro-MED region.

**Expected Impact**

- **Increased visibility and credibility** among regional authorities, EU institutions, and thematic networks.
- **Acceleration of adoption** in new territories through structured mentorship and clustering.
- **Policy integration** of Germ of Life's outputs into regional and European climate adaptation frameworks.
- **Knowledge capitalization** via the Euro-MED Academy and Mission Catalogues, ensuring long-term reuse of methodologies and tools.
- **Cross-project synergies** with Horizon, LIFE, and other Interreg initiatives, enhancing scalability and innovation.

**Next Steps**

To fully leverage the AR's support mechanisms, Germ of Life will:

1. **Submit key outputs** to the Mission's solution collection and peer review process.
2. **Participate in thematic working groups**, contributing to joint actions and policy dialogues.
3. **Engage in mentorship and clustering activities**, identifying and supporting new adopters.
4. **Prepare tailored materials** for inclusion in the Mission Catalogues and Euro-MED Academy.
5. **Align with institutional dialogues**, ensuring strategic positioning in EU-level discussions.

These steps will ensure that Germ of Life evolves from a successful pilot into a **scalable, transferable, and policy-relevant system**, capable of delivering long-term public value across the Mediterranean and beyond.

# 7. Communication and dissemination synergies

## 7.1. Link with the project's communication plan

The amplification and transferability strategy outlined in this deliverable is **fully aligned with the Germ of Life communication plan**, which aims to ensure visibility, engagement, and strategic dissemination of the project's results across the Euro-MED region.

**Strategic Integration**

The communication plan supports the amplification strategy by:

- Promoting the **three core platforms** (risk monitoring, vulnerability assessment, and innovation procurement) through targeted messaging.
- Ensuring that **key stakeholders**—including public authorities, scientific institutions, and civil society—are informed and engaged throughout the project lifecycle.
- Facilitating **cross-border visibility** via participation in Euro-MED events, policy dialogues, and thematic forums.

**Channels and Formats**

The communication plan leverages multiple channels to support transfer and adoption:

- **Digital platforms**: Project website, social media, newsletters.
- **Institutional networks**: Interreg MED, Euro-MED Academy, Amplification Room.
- **Publications and media**: Policy briefs, press releases, scientific articles.

These formats are tailored to different audiences, ensuring that Germ of Life's outputs are accessible to both technical and non-technical stakeholders.

**Synergy with Amplification Tools**

The communication plan is designed to work in synergy with the tools provided by the Amplification Room, including:

- **Mission Catalogues** for showcasing solutions.
- **Euro-MED Academy** for training and capacity building.
- **Mentorship and clustering activities** for targeted outreach.

This alignment ensures that communication efforts are not only informative but also **action-oriented**, supporting real-world adoption and institutional integration.

## 7.2. Key narratives for strategic audiences

To ensure effective communication and strategic positioning, Germ of Life has defined a set of **tailored narratives** that address the specific interests, expectations, and language of its key stakeholder groups. These narratives are designed to support both dissemination and adoption, reinforcing the project's value proposition across technical, institutional, and societal domains.

**Public Authorities and Regional Governments**

**Narrative**:
*"A validated, interoperable system for drought risk management that strengthens institutional planning, improves resource allocation, and supports climate adaptation strategies."*

This narrative emphasizes:

- Policy relevance
- Integration with existing workflows
- Support for evidence-based decision-making

**Technology Providers and SMEs**

**Narrative**:
*"An open, modular architecture that enables innovation, customization, and market deployment of drought mitigation technologies and services."*

This narrative highlights:

- Technical flexibility
- Opportunities for co-development
- Potential for commercialization and visibility

**Scientific and Academic Institutions**

**Narrative**:
*"A scientifically grounded platform that combines validated indicators, machine learning models, and collaborative tools for research, education, and policy support."*

This narrative focuses on:

- Methodological rigor
- Research continuity
- Contribution to knowledge ecosystems

**Local Operators and Civil Society**

**Narrative**:
*"A practical and inclusive solution that empowers communities to anticipate drought risks, participate in environmental governance, and improve resilience."*

This narrative promotes:

- Usability and accessibility
- Transparency and participation
- Social and environmental impact

**European Institutions and Funding Bodies**

**Narrative**:
*"A scalable and transferable system aligned with EU missions and strategies, delivering public value and supporting the Green Deal, Climate Adaptation Strategy, and SDGs."*

This narrative reinforces:

- Strategic alignment
- Replication potential
- Long-term sustainability

These narratives will be used across all communication channels and formats to ensure that Germ of Life's messages are **clear, compelling, and context-sensitive**, supporting both visibility and institutional uptake.

## 7.3. Tools and channels for amplification (webinars, policy briefs, programme capitalization platforms, etc.)

The Germ of Life project will deploy a comprehensive set of **communication and amplification tools** to ensure that its results are widely disseminated, strategically positioned, and ready for transfer and adoption in future initiatives. These tools are

designed to support both the current project and the **upcoming proposed transfer project**, which will build upon the foundations laid in this deliverable.

**Digital and Media Channels**

- **Project Website and Social Media**: Regular updates, visual content, and stakeholder engagement to maintain visibility and transparency.
- **Newsletters and Press Releases**: Dissemination of key milestones, pilot results, and strategic partnerships.
- **Scientific Publications and Policy Briefs**: Targeted outreach to academic, institutional, and policy audiences.

**Amplification Room Platforms**

- **Mission Catalogues**: Visual showcases of Germ of Life's solutions, designed for transferability and policy visibility.
- **Euro-MED Academy and Library**: Hosting training materials, webinars, and courses for long-term capacity building and reuse.
- **Library of Solutions**: Inclusion of Germ of Life's outputs in the searchable repository of the Natural Heritage Mission.

**Events and Strategic Engagement**

As part of the final phase of the project, Germ of Life will organize and participate in:

- **A series of thematic webinars** led by consortium partners, focused on:
    - Drought monitoring and forecasting
    - Vulnerability assessment methodologies
    - Innovation procurement for climate resilience
- **A final conference**, coordinated by the **University of Patras**, which will:
    - Present the integrated system to institutional stakeholders
    - Showcase pilot results and lessons learned
    - Launch the roadmap for the transfer project
    - Facilitate matchmaking between solution providers and adopters

These events will serve as **cornerstones for capitalization and transfer**, providing a platform for dialogue, visibility, and strategic alignment with Euro-MED missions.

**Strategic Integration**

All amplification tools will be deployed in synergy with the project's communication plan and the mechanisms of the Amplification Room to:

- Ensure **consistency of messaging**
- Maximize **visibility across stakeholder groups**
- Support **institutional adoption and policy mainstreaming**

This multi-channel strategy guarantees that Germ of Life's innovations are not only disseminated but also **activated and scaled** in real-world contexts.

# 8. Monitoring and impact assessment

## 8.1. KPIs for exploitation and amplification

To ensure that the Germ of Life system evolves into a standardized and scalable solution for drought risk management across the Euro-MED area, the consortium has defined a set of **Key Performance Indicators (KPIs)** specifically designed to monitor its exploitation and amplification. These KPIs are not limited to the current project scope; rather, they are conceived as part of the **strategic framework of the upcoming proposed transfer project**, which will serve as the operational vehicle for territorial expansion, institutional adoption, and long-term sustainability.

**1. KPIs for Exploitation (Institutional Uptake and Operational Integration)**

These indicators will be used to measure the degree of institutional adoption and integration of the Germ of Life system in real-world settings:

- **Number of regional authorities formally adopting the system**
  *Baseline: 4 pilot regions; Target: +6 new regions during the transfer project.*
- **Number of public workflows integrating Germ of Life outputs**
  *E.g., drought monitoring dashboards, vulnerability maps, procurement procedures.*
- **Number of service-level agreements (SLAs) signed with technical partners**
  *Indicating long-term commitments to maintenance, updates, and support.*
- **Number of datasets reused or referenced by external institutions**
  *Including scientific publications, planning documents, and EU-level platforms.*
- **Number of training and on boarding sessions delivered to institutional users**
  *Target: Minimum 1 per region, with follow-up modules for new adopters.*

**2. KPIs for Amplification (Visibility, Transferability, Strategic Positioning)**

These indicators will track the system's capacity to expand, replicate, and position itself as a reference model:

- **Number of new regions expressing interest in adoption**
  *Measured through MoUs, letters of intent, or participation in transfer activities.*
- **Number of replication pilots launched in non-pilot territories**
  *Target: At least 3 during the transfer project.*

- **Number of strategic references to Germ of Life in EU-level documents** *E.g., Euro-MED Academy, European Drought Observatory, Green Deal reports.*
- **Number of synergies activated with other EU-funded projects** *Including Horizon Europe, LIFE, PRIMA, and other Interreg initiatives.*
- **Number of stakeholders engaged through amplification channels** *Webinars, policy briefs, clustering events, Euro-MED Academy sessions.*

**3. KPI Monitoring Framework (Transfer Project Implementation)**

The monitoring of these KPIs will be carried out within the proposed **transfer project**, which will include:

- A **centralized KPI dashboard**, hosted on the Germ of Life cloud infrastructure and accessible to all partners.
- A **quarterly reporting mechanism**, coordinated by the technical and institutional leads.
- A **feedback loop** with regional authorities and end-users to validate progress and adjust targets.

This framework will ensure transparency, comparability, and strategic alignment across regions.

**4. Strategic Use of KPIs**

KPIs will serve multiple functions:

- **Evidence for funding bodies**, demonstrating impact, scalability, and alignment with EU missions.
- **Inputs for policy mainstreaming**, supporting the integration of Germ of Life into regional and European climate adaptation frameworks.
- **Benchmarks for replication**, helping new regions assess readiness and define implementation pathways.

By embedding KPI monitoring into the proposed transfer project, Germ of Life ensures that its exploitation and amplification strategy is not only visionary but also measurable, adaptable, and institutionally grounded.

## 8.2. Medium and long-term impact indicators

The Germ of Life consortium has defined a set of medium and long-term impact indicators to assess the systemic transformation potential of the project beyond its initial pilot phase. These indicators are not intended to measure short-term outputs, but rather to capture the **structural, institutional, and territorial changes** that the system can generate when fully deployed across the Euro-MED area.

All impact indicators will be monitored and validated within the framework of the **new proposed transfer project**, which will serve as the strategic and operational platform for scaling, institutional integration, and policy mainstreaming.

**1. Medium-Term Impact Indicators (1–3 years post-transfer)**

These indicators reflect the consolidation of the system in new regions and its integration into public governance:

- **Number of regions with operational deployments of Germ of Life**
  *Target: At least 10 regions across 6 Euro-MED countries.*
- **Number of regional or national drought management plans referencing Germ of Life outputs**
  *Including vulnerability maps, predictive indicators, and procurement protocols.*
- **Number of public procurement processes using the Innovation Procurement Platform (IPP)**
  *Demonstrating institutional uptake and alignment with EU innovation procurement guidelines.*
- **Number of cross-border collaborations activated through the system**
  *E.g., shared monitoring protocols, joint action plans, data exchange agreements.*
- **Number of public investments mobilized for drought mitigation based on system outputs**
  *Including NBS, infrastructure upgrades, and ecosystem restoration.*

**2. Long-Term Impact Indicators (3–10 years horizon)**

These indicators reflect the systemic transformation of drought risk governance and climate adaptation strategies:

- **Reduction in drought-related economic losses in regions using the system**
  *Measured through agricultural productivity, water resource efficiency, and emergency response costs.*
- **Improvement in ecosystem resilience indicators**
  *E.g., NDVI recovery rates, soil moisture stability, biodiversity metrics.*

- **Institutionalization of Germ of Life as a reference system in EU climate adaptation frameworks**
  *E.g., inclusion in European Drought Observatory, Euro-MED Academy curricula, or Green Deal implementation tools.*

- **Number of scientific publications and policy briefs based on Germ of Life data and methodologies**
  *Demonstrating continued relevance and contribution to knowledge ecosystems.*

- **Expansion of the system to non-Mediterranean regions with similar climate vulnerabilities**
  *E.g., Atlantic, Balkan, or Eastern European territories.*

**3. Monitoring and Validation Strategy**

The proposed transfer project will include a dedicated **impact monitoring work package**, coordinated by scientific and institutional partners, which will:

- Define **baseline values and targets** for each indicator.
- Establish **data collection protocols** across regions.
- Use the Germ of Life dashboard to **aggregate and visualize impact metrics**.
- Produce **annual impact reports** for EU institutions, funding bodies, and stakeholders.

This strategy ensures that impact is not only projected, but also **measured, validated, and communicated** transparently.

**4. Strategic Relevance**

By defining medium and long-term impact indicators, Germ of Life positions itself not just as a technological solution, but as a **policy-enabling infrastructure** capable of:

- Supporting evidence-based decision-making.
- Accelerating the implementation of EU climate and biodiversity strategies.
- Enhancing resilience and sustainability in vulnerable territories.

These indicators will guide the strategic evolution of the system and ensure that its benefits are **institutionalized, scaled, and sustained** over time.

## 8.3. Post-project monitoring mechanisms

The Germ of Life consortium recognizes that long-term impact and institutional relevance cannot be achieved without a robust and transparent monitoring framework. While the current project has laid the technological and methodological foundations, the **post-project monitoring mechanisms** will be fully developed, implemented, and validated within the framework of the **new proposed transfer project**, which will serve as the operational platform for territorial expansion and strategic consolidation.

**1. Monitoring Objectives**

The post-project monitoring system will pursue the following objectives:

- **Track the adoption and operational use** of the Germ of Life system across regions.
- **Measure the performance and reliability** of the system's components (drought monitoring and forecasting, vulnerability assessment, procurement).
- **Assess the institutional, environmental, and socio-economic impact** of the system over time.
- **Support decision-making and continuous improvement**, based on real-world feedback and performance data.

**2. Monitoring Architecture**

The monitoring mechanisms will be structured around a **multi-layered architecture**, composed of:

- A **centralized monitoring dashboard**, hosted on the Germ of Life cloud infrastructure, aggregating data from all participating regions.
- **Regional monitoring nodes**, managed by each adopting authority, responsible for collecting local usage data, performance metrics, and stakeholder feedback.
- A **technical coordination unit**, led by the consortium's scientific and technical partners, responsible for data validation, analysis, and reporting.

This architecture ensures both territorial granularity and strategic oversight.

**3. Monitoring Tools and Processes**

The proposed transfer project will deploy a set of tools and processes to operationalize monitoring:

- **Automated data collection modules**, embedded in each system deployment, capturing usage statistics, system uptime, and data flows.

- **Impact survey instruments**, targeting institutional users, technical teams, and end beneficiaries.
- **Annual monitoring reports**, summarizing KPIs, impact indicators, and strategic recommendations.
- **Benchmarking protocols**, allowing comparison across regions and alignment with EU standards.

All tools will comply with GDPR and data protection regulations, ensuring ethical and secure monitoring.

**4. Governance of Monitoring**

Monitoring will be governed by a **multi-stakeholder oversight structure**, including:

- A **Monitoring and Evaluation (M&E) Committee**, composed of representatives from scientific, technical, and institutional partners.
- A **review and validation process**, ensuring that data is interpreted correctly and used to inform strategic decisions.
- A **feedback mechanism**, allowing regions and users to propose improvements, report issues, and share lessons learned.

This governance model ensures transparency, accountability, and responsiveness.

**5. Integration with EU-Level Platforms**

The monitoring mechanisms will be designed to interface with:

- The **Euro-MED Academy**, supporting training, benchmarking, and policy dialogue.
- EU-level reporting frameworks (e.g., Green Deal, Climate Adaptation Strategy), ensuring strategic alignment.

This integration reinforces the system's relevance and visibility at European scale.

**6. Sustainability of Monitoring**

The monitoring system will be sustained through:

- **Institutional commitments** from regional authorities to maintain local monitoring nodes.

- **Technical support contracts** with consortium SMEs for dashboard maintenance and updates, subject to stakeholder interest and the availability of appropriate funding mechanisms.
- **Funding mechanisms** embedded in the proposed transfer project and future EU programmes.

By embedding monitoring into the transfer strategy, Germ of Life ensures that its evolution is **evidence-based, impact-driven, and strategically guided**.

# 9. Risks and Mitigation Measures

## 9.1. Risks related to exploitation/amplification

While the Germ of Life system has demonstrated strong potential for institutional adoption and territorial scalability, several risks may affect its exploitation and amplification—particularly as the consortium transitions into a dedicated proposed transfer project. Identifying and addressing these risks is essential to ensure that the system evolves into a sustainable and widely adopted solution for drought risk management across the Euro-MED area.

**1. Institutional Adoption Risks**

- **Fragmented governance structures** in some regions may hinder the integration of the system into existing workflows and decision-making processes.
- **Limited technical capacity** among public authorities could delay or complicate deployment, especially in areas with low digital maturity.
- **Resistance to change** from established actors may affect the willingness to adopt new tools, particularly in procurement and planning departments.

**2. Technical and Operational Risks**

- **Interoperability challenges** may arise when integrating the system with legacy platforms or region-specific data infrastructures.
- **Dependence on external datasets** (e.g., Copernicus, REDIAM) could pose risks if data availability or formats change.
- **Cybersecurity vulnerabilities** may emerge as the system scales and connects with more public infrastructures.

**3. Financial and Sustainability Risks**

- **Lack of dedicated funding** for post-project maintenance and updates could jeopardize long-term viability.
- **Unclear cost-sharing models** between regions and technical providers may delay service-level agreements.
- **Over-reliance on EU programmes** without diversification of funding sources could limit resilience to policy shifts.

**4. Amplification and Transferability Risks**

- **Insufficient stakeholder engagement** in new regions may result in low uptake or misalignment with local needs.
- **Loss of momentum** between the end of the current project and the launch of the transfer initiative could weaken strategic continuity.
- **Limited visibility at EU level** may reduce opportunities for policy mainstreaming and cross-programme synergies.

**5. Strategic Risks**

- **Misalignment with evolving EU priorities** (e.g., Green Deal, Climate Adaptation Strategy) could affect the system's relevance.
- **Duplication with other initiatives** may lead to competition for resources or confusion among end-users.
- **Underestimation of scaling complexity**, especially in regions with different legal, environmental, or socio-economic contexts.

These risks will be addressed through a coordinated mitigation strategy, embedded in the design and implementation of the transfer project, ensuring that Germ of Life remains a resilient, adaptable, and impactful solution.

## 9.2. Mitigation strategies

To address the risks identified in the exploitation and amplification of the Germ of Life system, the consortium has defined a set of mitigation strategies that will be implemented and refined within the framework of the upcoming proposed **transfer project**. These strategies are designed to ensure institutional adoption, technical robustness, financial sustainability, and strategic alignment across regions and governance levels.

**1. Institutional Mitigation Measures**

- **Early engagement of regional authorities** through structured on boarding protocols and Memoranda of Understanding (MoUs).
- **Capacity-building programmes** targeting technical staff and decision-makers, delivered through the Euro-MED Academy and local workshops.
- **Integration support packages**, including mock-ups, operational guides, and co-design sessions to align the system with existing workflows.

**2. Technical and Operational Safeguards**

- **Interoperability testing** during the proposed transfer project, ensuring compatibility with legacy systems and regional data infrastructures.
- **Modular architecture and API-first design**, allowing flexible integration and future-proofing against technological changes.
- **Cybersecurity audits and penetration testing**, coordinated by INFO and Atos, to ensure resilience and compliance with EU standards.

**3. Financial and Sustainability Measures**

- **Diversification of funding sources**, including regional budgets, EU programmes (e.g. Horizon Europe, LIFE), and public-private partnerships.
- **Definition of cost-sharing models** in the Cooperation Agreement (D.2.5.1), clarifying responsibilities for maintenance and updates, subject to stakeholder interest and the availability of appropriate funding mechanisms.
- **Inclusion of sustainability KPIs** in the monitoring framework to track financial health and institutional commitment.

**4. Amplification and Transferability Enhancements**

- **Stakeholder mapping and engagement plans** for new regions, supported by the shared database developed in WP1.
- **Clustering and mentorship activities** through the Mission's Amplification Room, facilitating peer learning and replication.
- **Strategic communication campaigns**, including webinars, policy briefs, and participation in EU-level forums to maintain visibility and momentum.

**5. Strategic Alignment and Policy Integration**

- **Continuous alignment with EU climate and biodiversity strategies**, monitored through the impact indicators defined in section 8.
- **Collaboration with complementary projects**, avoiding duplication and fostering synergies (e.g., with Horizon, PRIMA, LIFE).
- **Adaptive governance model**, allowing the system to evolve in response to territorial, institutional, and policy changes.

By embedding these mitigation strategies into the design and execution of the proposed transfer project, the consortium ensures that Germ of Life remains a resilient, adaptable, and impactful solution—capable of scaling across regions and delivering long-term public value.

# 10. Annexes

## 10.1. Examples of transferred good practices

WAITING THE EXECUTION OF ACTIVITY 2.2.

## 10.2. Model agreements (MoUs, licenses, cooperation frameworks)

WAITING THE EXECUTION OF ACTIVITY 2.5.

## 10.3. Key stakeholder contacts

Connected to activity 1.2, during the execution of the project, all the partners led by University of Patras, we have collected the following stakeholders' database:

- https://3.basecamp.com/5459396/buckets/35812468/google_documents/900145052 5
- https://docs.google.com/spreadsheets/d/1kOAgSVQRitFIaUoxDgvN55yQuZlm-Kmd0XbFRy71aOk/edit?gid=618455920#gid=618455920