

D1.4: External Advisory Board - Midterm Advisory Report

Editors: Khater Carla



PRIMA
PARTNERSHIP FOR RESEARCH AND INNOVATION
IN THE MEDITERRANEAN AREA



REACT4MED Project (Grant Agreement No. 2122) is funded by PRIMA - Partnership for Research and Innovation in the Mediterranean Area, a Programme supported by Horizon 2020.



This page is intentionally left blank

Technical References	
Project Acronym	REACT4MED
Project title	Inclusive Outscaling of Agro-ecosystem REstoration ACTions for the MEDiterranean
Project coordinator	HMU
Project Duration	36 months
Deliverable No.	D1.4
Deliverable title	External Advisory Board - Midterm Advisory Report
Lead partner	HMU
Contributing partners	External Advisory Board
Author(s)	Carla Khater
Editor(s)	
Type	Text
Format	MS-Word
Language	EN-GB
Creation date	
Version number	
Version date	
Last modified by	
Due date	
Actual delivery date	
Rights	Copyright © 2022, REACT4MED Consortium
Dissemination level	CO (confidential, only for members of the consortium)
	PU (public)
	PP (restricted to other programme participants)
	RE (restricted to a group specified by the consortium)
	When restricted, access granted to:
Nature	R (report)
	P (prototype)
	D (demonstrator)
	O (other)

Revision history			
Version	Date	Modified by	Comments
1.0			

Copyright © 2022, REACT4MED Consortium

The REACT4MED Consortium grants third parties the right to use and distribute all or parts of this document, provided that the REACT4MED Project and the document are properly referenced.

THIS DOCUMENT IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS DOCUMENT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

REACT4MED External Advisory Board

Midterm Advisory Report

Project: REACT4MED - Inclusive Outscaling of Agro-ecosystem REstoration ACTions for the MEDiterranean (PRIMA, RIA)

1 Purpose of this report

This report assesses REACT4MED at its midpoint. It is submitted after the end of the grant period: the midterm and final Advisory Board reviews remain outstanding as formal deliverables, and this note discharges the first of them. Its observations and recommendations therefore describe the position as it stood at the midpoint and are addressed to the project's second half, with later developments noted only in the few places where knowing them would change what I write. Questions of legacy, custody and uptake are treated here only as they bore on decisions due at the midpoint; they belong properly to the final review. This report follows, but does not repeat, the formal periodic evaluation, which I have read and broadly agree with. It adds the view of an ecologist and governance specialist who works on restoration, protected areas and land management in the southern and eastern Mediterranean, including in fragile and post-conflict settings similar to some in which this project works. My overall assessment is positive. Because the project is sound, I focus here on the few issues that will decide whether its results last beyond the grant.

2 Overall assessment

The project is performing well on its science and its management. The knowledge produced in the first half is substantial and already useful beyond the consortium: the state-of-the-art review (D2.1), the WOCAT technology catalogue (Task 2.2), the erosion-organic-matter meta-analysis (D2.3), the drivers-of-change analysis (D2.4), the policy review (D6.1) and the SDG cross-cutting analysis (D6.2). The 8 Ecosystem Restoration Living Labs (ERLLs) are operational. The participatory methodology has been designed and applied through two workshop rounds. The LanDS toolbox has moved from concept to a working online prototype. Consortium management has been sound, as the early and clean partner substitution shows.

The quality of the work is not the problem. My concerns are about four things: whether the results will last after the grant; the biodiversity depth of a project focused mainly on soil, land and water; whether the science is strong enough to support the outscaling and machine-learning claims; and data governance. All four can be addressed in the time that remains, but only if they are treated as priorities now, not in the final months.

3 Scientific and technical progress

The science is convincing, and the drivers-of-change work (D2.4) is its strongest part. Grounding the projections in the ISIMIP framework and the SSP scenarios gives a defensible and comparable picture of what these landscapes face: warming of about 1.4 °C to 4.6 °C by 2100 depending on the pathway, drier precipitation under the higher-emission scenarios, and spatially uneven erosion and salinity around a baseline soil displacement of about 2.6 Mg ha⁻¹ yr⁻¹. The analysis does not force these differences into a single Mediterranean story. This is a strength.

Three points need to be made clearly.

- First, the meta-analysis (D2.3) is narrower than its title suggests, and its main result is a caution, not a green light. The proposal frames the task as a meta-analysis of the variables behind restoration success. What was delivered is a rigorous study of one relationship: soil water erosion against soil organic matter content, based on about 148-150 effect sizes from around 71 studies across eight Mediterranean countries between 1984 and 2023. The statistics are careful. But the main finding is a slightly positive overall effect with most individual effect sizes negative (an association reversal, or Yule-Simpson paradox), and very high heterogeneity across scales. So, this deliverable does not tell us which restoration measures work best. Its honest message is that the signal depends strongly on context and scale. This matters for how the LanDS targeting procedure is presented (see Section 4): where the underlying relationship is this variable, the outputs must show uncertainty rather than give firm prescriptions.
- Second, the state-of-the-art review (D2.1) is weighted towards the northern Mediterranean. Its own structure is a pan-European synthesis “with comments to” the Middle East and North Africa, and it is honest about the lack of comparable cross-country data, including inside the EU. Its conclusions are sound: the main constraints on sustainable management are social and economic and tied to farmers' perceptions; some well-intended policies carry trade-offs; long-term, crop- and climate-specific evidence on effectiveness is lacking; and lighthouse farms and living labs are needed. But the northern weighting is real. For a project about outscaling to the southern and eastern Mediterranean, this gap should be closed in the final synthesis.
- Third, as an ecologist I note that biodiversity is named in the project's design - loss of biodiversity is one of the three degradation types the Israeli and Greek pilot areas address - but that it is not carried through into measurement. It does not appear as a cross-cutting variable in the indicator library, the meta-analysis or the drivers-of-change work. The framing remains strong on the abiotic side (erosion, salinisation, aridity, land use, climate) and thin on ecological function: vegetation, pollinators, soil biota, habitat connectivity, and the resilience that biodiversity provides. The project claims alignment with SDG 15, but that goal is about life on

land. Adding a small set of ecological-integrity indicators to LanDS, and making biodiversity an explicit thread in the final synthesis, would make the restoration claim ecologically, and not only pedologically, sound.

The delays on D2.4 and D6.2 were reasonable and well explained (ISIMIP data availability, and delayed pilot feedback). But the pilot-feedback cause recurs across the project. The dependence of the analytical and tool-building work on timely inputs from the pilot areas is the project's critical dependency. It should be managed as such, not handled as a series of one-off extensions.

4 The LanDS toolbox

LanDS, with the machine-learning procedure for identifying suitable areas, is the project's main innovation and its most likely lasting product. The prototype exists, is online, and uses a sensible open-source stack. Its architecture - repository, data viewer, indicators library, machine-learning procedure and public dashboard - is coherent. Pairing a bottom-up logic from the living labs with a top-down logic from regional and satellite data is well conceived. Keeping the indicators library openly accessible is good practice. The WOCAT catalogue compiled under Task 2.2 is a concrete asset that should feed the toolbox. It draws on WOCAT's Mediterranean-wide holdings, which is the right basis for a review, and the resulting distribution across countries reflects what that database already contains rather than any choice made by the project. The question it raises is the reciprocal one: how much of what the eight pilot areas are learning will be documented and submitted back into WOCAT. A project whose premise is capturing and outscaling Mediterranean restoration practice should leave that commons larger than it found it, and doing so would be among its more durable contributions.

My concerns, in order:

- The risk that a well-built tool falls into disuse after the grant is the most common way projects like this fail to leave a mark, and LanDS is exposed to it. The machine-learning procedure in particular needs a clearer statement, for non-specialists and adopters, of the decision it improves, the users it is for, and its advantage over existing tools. The technical description is strong; the case for adoption is not yet.
- I also have a point about the honesty of the machine-learning outputs, and here I draw on my own work. Predictive approaches that identify suitable areas often rest on statistical relationships rather than on field data, and they can appear more confident than the evidence allows. This is well established independently of anything in this project; the high heterogeneity and scale-dependence found in D2.3 corroborate it from within the project's own evidence base. The LanDS targeting outputs should therefore show their uncertainty and their sources clearly, and be presented as an aid to judgement, not a replacement for it. This is also a matter of credibility with the technical stakeholders the project needs most, who will quickly distrust an over-stated map.

- LanDS needs not a home but a mandate. Hosting is settled: the toolbox sits with SoftWater, a university spin-off that intends to continue, and the codebase is on GitHub, so the asset itself cannot be lost. What is not settled is maintenance. There is no written agreement, the arrangement covers the server rather than the content, and no one has been named to update the indicator library or refresh the data once the grant ends. The risk is therefore not that LanDS disappears but that it ages: the same interface, ageing inputs, suitability outputs that no one has checked against the field for several years, still carrying the authority of a project-endorsed tool. That is in some ways worse than no tool at all. The test I apply to the living labs below applies here too - continuity resting on a good understanding between individuals rather than on institutional commitment is a fragility - and the remedy is small: put the understanding in writing, stating what SoftWater covers and for how long, who holds the indicator library afterwards, and under what licence the repository is released. Beyond that, associating the tool with an established network carrying a mandate of its own would keep its knowledge circulating. FAO (the evaluator's suggestion) is a good candidate, and CIHEAM Bari's existing relationships with FAO, the UNCCD and others are the shortest route to it. I would add the WOCAT network, whose methodology the project already uses; the UNCCD knowledge and monitoring architecture; and, from my field, the UNESCO-MAB Biosphere Reserve and UNESCO Global Geoparks networks, which include Mediterranean sites that are governance-ready and have active communities of practice.
- Finally, the indicator set is still being validated by the Pilot Area Leaders and local experts. This validation decides the credibility of both the library and the dashboard. It should be resourced and finished early, not left to compete with the dashboard build and the closing webinar.

5 The Living Labs, governance and local ownership

This is the part I follow most closely, because it is where my own work lies and where Mediterranean restoration projects usually succeed or fail. The design is good: back-casting from a shared vision, building transdisciplinary capacity among partners new to this way of working, and aiming for stakeholder ownership rather than consultation. This is how good restoration works in general: it orients and accelerates a natural trajectory rather than imposing an outcome. Setting up working living labs in all eight pilot areas, with 272 stakeholders in the first workshop series, is a real achievement.

Three points. The non-achievement of Milestone 3.3 (co-development of local-scale indicators and metrics) is a substantive shortfall, as the evaluation noted, because much later work depends on it: the LanDS indicators, the WP5 assessment, and the WP6 policy relevance. I would ask WP3 for a dated recovery plan.

Ownership is not the same as attendance. As the living labs move into the harder phase of back-casting and identifying barriers, the test is whether the same stakeholders return

across rounds and whether local institutions start to carry the work themselves. It is worth tracking the continuity and depth of engagement, not just the number of participants.

Institutional continuity cannot be assumed anywhere in this region, and in some pilot countries the wider political environment adds to that. My work in post-conflict settings suggests that restoration governance needs redundancy as a matter of course, and not only where disruption is expected: more than one champion, and knowledge held in institutions rather than in individuals, so that one departure or interruption does not end the living lab. This should be built in deliberately, in every pilot area rather than in a selected few, while there is time.

6 Policy and alignment with international agendas

The policy work is a strength and is well connected to the main frameworks: the EU Green Deal, the UNCCD agenda, and the SDGs. The cross-cutting analysis (D6.2) is honest. It recognises that the political effect of the SDGs has so far been mostly discursive, that Mediterranean countries are well off track for 2030 on land, climate, biodiversity and water, and that fragmented governance and weak data systems are the structural barriers. Treating land restoration as a lever across several goals at once (SDGs 15, 13, 2, 6 and 1) is correct, and the use of the water-energy-food-ecosystems nexus and the One Health and planetary health concepts is the kind of integrated thinking the region needs. My one suggestion: the policy outputs should reach their audiences as usable instruments - short briefs written for specific national and sub-national decision-makers in each pilot country, in the relevant languages, rather than one large report. Policy influence in this region is gained one interlocutor at a time.

7 Dissemination and communication

The scientific dissemination is strong: the publication and conference record is substantial, and the website has exceeded its targets on new users and page views. The wider communication is weaker than the work deserves. No newsletter was issued during the period covered by this report, which is a shortfall on one of the cheapest and most controllable channels available; I understand the first appeared subsequently, and the observation stands as one about the first half rather than about the project as a whole. The public events calendar has likewise not been maintained since mid-2023. Engagement on social media (LinkedIn, Facebook, and the video channel in particular) is modest in absolute terms and in interaction, even where follower targets were partly met; the near-absence of interaction, not the follower count, is the real signal. Impact measurement is also too coarse: figures aggregated across all events hide what matters in a project spanning nine countries and several languages, where the same message is received very differently in each.

None of this reduces the science. But a project whose whole purpose is outscaling cannot afford a weak outreach engine. The dissemination gap is a risk to the main objective. I would ask WP7 to treat the second half as a communications relaunch: a regular content

calendar, deliberate engagement of key institutions and stakeholders, the newsletter restored, and a proper method for measuring impact. The LanDS dashboard launch and webinar are good moments to build a campaign around.

8 Data governance, FAIR compliance and preservation

The Data Management Plan (D1.3) commits the project to FAIR principles, the Open Research Data Pilot, gold open-access publication, and DOI-assigning repositories such as Zenodo. It also states that hosting for the data and the REACT4MEDhub is covered by the grant and guaranteed to remain available after the project ends. That is a real legacy provision and should be credited.

Three things temper it. The guarantee covers data hosting only, not the maintenance of LanDS as software or the stewardship of the living labs. The working arrangement for sharing and preserving data is Microsoft Teams, with backups on physical media every six months; Zenodo and DOIs appear as intention rather than as the actual archive, and a proprietary collaboration tool is not a preservation repository. And the periodic report states the plan does not need updating, which I would question on these grounds. A light revision in the second half, moving the working archive to DOI-backed storage and naming who will hold the REACT4MEDhub afterwards, would be worth the effort.

Finally, D2.3 is embargoed pending a journal manuscript. This is legitimate, but it sits against the commitment that all deliverables be public, and should be lifted once the paper appears.

9 Gender, youth and inclusion

The project has taken gender seriously and is moving in the right direction. Women in the consortium rose from about 30 to 34 per cent over the first period, and the design gives explicit place to women and younger practitioners in the living labs. Workshop participation stayed near 29 per cent women. Formally this exceeds the project's own target of 25 per cent female empowerment, and that is precisely my concern: the target is set too low to be informative, and meeting it should not be read as success. This should not be treated only as a reporting matter. In much of the Mediterranean, women and young people are central to land and water stewardship in practice, even where they are under-represented in formal settings. Convening them in earnest - through workshop timing, format and outreach adapted to each pilot - would improve both the equity and the ecological realism of the co-produced knowledge.

10 Legacy

REACT4MED will finish with outputs worth keeping: a working toolbox, eight functioning living labs, and a body of policy-relevant knowledge. The question for the second half is who holds them afterwards.

The DMP already guarantees data hosting after the project ends, which is a good start. Two cases remain: LanDS as software, and the living labs as institutions. Both can be settled within the current timeline if addressed now rather than in the final months. What is needed is a decision on where LanDS will be maintained and under whose mandate, and a named institution in each pilot country to carry its living lab forward. An exploitation and sustainability plan with real institutional commitments behind it is the most valuable of the remaining deliverables, even though it is not the most scientific.

There is an opportunity here too. Restoration offers real economic openings built on solid scientific foundations, and institutions that take on the work of maintaining what the research creates can seed that activity. A durable custodian for LanDS, and a modest economy of use around it, would secure the project's legacy more effectively than any closing event.

11 Recommendations for the second half

In order of priority:

- Develop the sustainability arrangements now. Beyond the data-hosting guarantee already in the DMP, put the SoftWater hosting arrangement in writing and secure a named maintenance commitment for the LanDS indicator library and its data, with the repository licence stated; consider associating the tool with a network holding a mandate of its own (FAO, reached through CIHEAM Bari's existing relationships, the WOCAT network, the UNCCD architecture, or the MAB and Geoparks networks); name the local institutions that will sustain each living lab; and define how the policy outputs will reach specific decision-makers.
- Present the LanDS and machine-learning outputs with due caution. Show their uncertainty and sources, in line with the heterogeneity found in D2.3, and sharpen the case for adoption for non-specialists.
- Relaunch communications. Establish the newsletter on a regular schedule, maintain the public events calendar, adopt a content calendar with deliberate engagement of key institutions, and introduce impact measurement disaggregated by event, country and audience, anchored on the LanDS launch.
- Recover Milestone 3.3 and finish the indicator validation early, against a dated plan reported to the Board.
- Strengthen data governance. Move the working archive from Microsoft Teams to DOI-backed storage, name the post-project custodian of the REACT4MEDhub, lift the D2.3 embargo once the manuscript is published, and revise the DMP.
- Make the biodiversity and ecological-function dimension explicit, through ecological-integrity indicators in LanDS and as a clear thread in the final synthesis.
- Correct the northern weighting of D2.1 in the final synthesis, and ensure that practices documented in the pilot areas are submitted back into the WOCAT database rather than only drawn from it.

- Manage pilot-to-analysis information flow as a named, monitored dependency, owned jointly by the living labs and the modelling teams.
- Deepen inclusion. Track the continuity and depth of stakeholder engagement, not just headcounts, and raise the participation of women and younger practitioners in a way adapted to each pilot.
- Build governance redundancy into the fragile-context pilots: more than one champion, and knowledge held in institutions rather than individuals.

12 Closing

REACT4MED is a well-conceived and well-run project on one of the most important problems facing the Mediterranean. My recommendations are weighted towards reach, persistence, ecological depth, and honest uncertainty, rather than towards the research itself, which is largely where it should be. The task of the second half is to make sure the knowledge and tools the project has produced do not stay inside the project, that they are neither over-claimed nor left to lapse, but matched to institutions and actors who will carry them on. I remain available to the coordinator and the work-package leaders on any of the above, and would be glad to help open the way into the protected-area and MAB and Geoparks networks, where the LanDS toolbox and the living-lab model could find a lasting home.

Respectfully submitted,

Carla Khater, External Advisory Board, REACT4MED

Research Director- CNRS Lebanon

Advisor to the Minister- Ministry of Environment- Lebanon

+9613871539

ckhater@gmail.com

ckhater@cnrs.edu.lb

Carla Khater