
Workshop WEFE Nexus Solutions & Tools

Towards the WEFE Nexus Operationalization

Resolution from the WEFE Nexus Solutions and Tools Workshop

Preamble

Climate change, land degradation, freshwater depletion and desertification are accelerating at an unprecedented pace. The Mediterranean region stands at the epicenter of these adverse impacts. Increasing temperatures, prolonged droughts, extreme flood events, soil degradation, and ecosystem decline threaten water availability, energy security, and agricultural productivity, with profound implications for social stability and human wellbeing across both European and MENA countries.

The Water–Energy–Food–Ecosystems (WEFE) Nexus, applied within a source-to-sea continuum approach, offers an integrated and operational framework capable of addressing these interconnected challenges. By recognizing interdependencies among sectors and scales—from catchments to coastal and marine systems—the WEFE Nexus enables more coherent assessments, optimizes trade-offs, and maximizes synergies that promote water, energy, and food security, ecosystem sustainability, and improved quality of life.

Siloed sectoral approaches are no longer sufficient. Integrated governance, science-based and data-driven innovation, active stakeholder participation, and aligned financing are essential to confront the systemic nature of climate and desertification impacts in the Mediterranean and beyond.

Proposition

Science has developed and continues to advance a wide range of innovative solutions capable of mitigating and adapting to climate change and land degradation impacts. These include Nature-Based Solutions (NbS) for flood mitigation and drought resilience; agroecological and regenerative agricultural practices to enhance soil fertility and carbon sequestration; sustainable water management technologies; renewable energy integration in agricultural systems; and ecosystem restoration strategies that reinforce both productivity and biodiversity.

Numerous pilot and demonstration projects across the Mediterranean region provide proof of concept that these solutions are technically viable and socio-economically beneficial. Researchers and practitioners are actively developing and testing methodologies, frameworks, and digital tools to enable scaling up. Replication, and contextual adaptation of these solutions across diverse environmental and socio-economic conditions has not been widely applied.

Furthermore, science has produced a robust suite of integrated impact assessment tools, modelling platforms, and key performance indicators (KPIs) designed to evaluate trade-offs and co-benefits across water, energy, food, and ecosystem domains. However, these tools alone are not sufficient to support evidence-based planning, optimize system design, and facilitate monitoring and evaluation of policy interventions and investment outcomes.

On the other hand, European and regional institutions are committed to mainstreaming the WEFE Nexus in policy processes. The European Commission, together with MENA partner countries, as well as key regional political institutions, such as the Union for the Mediterranean, the Barcelona Convention/ UNEP MAP, the League of Arab States, all contribute in advancing policy alignment and integrated planning that reflect WEFE Nexus principles. At the same time, financial institutions (including Official Development Assistance (ODA), multilateral (EIB, EBRD) and bilateral (KfW, AFD, etc) Development Finance Institutions (DFIs), specialized funds (GEF, GCF, Adaptation Fund, etc)) are progressively aligning investments and green funds with WEFE Nexus priorities despite the difficulties of quantifying co-benefits, institutional silos and the fragmented funding landscape.

Of particular importance in this context, the ‘Strategy for WEFE Nexus in the Mediterranean Source to Sea continuum’ presents a comprehensive strategic framework to support countries in strengthening policy and action integration across WEFE sectors and to promote leveraging of financial resources towards sustainability and climate-resilience objectives across borders. The Strategy was developed through a dual and inter-connected (formal amongst governments and informal amongst stakeholders) regional participatory consultation process, within the institutional framework of the Union for the Mediterranean (UfM), the Barcelona Convention/UNEP MAP and the European Union, and with the technical support of the Global Water Partnership-Mediterranean

(GWP-Med) within the GEF UNEP/MAP Med Programme, the EU Water & Environment Support (WES) and Water, Environment Support Biodiversity Climate Action (WES BCA) Projects, the Partnership for Research and Innovation in the Mediterranean Area (PRIMA). Aiming to catalyze the shift from ‘Nexus thinking’ to ‘Nexus doing’ in the Mediterranean, and in full alignment with the Strategy’s 3 Goals, 8 Objectives and 40 Directions for Action, a regional framework for actions (aka Action Framework) is currently under elaboration to assist with the Strategy’s implementation, including by strengthening institutional capacities to improve project preparation and accelerate access to climate financing, by promoting synergies and identifying ways of leveraging necessary funding and by supporting meaningful participation in regional WEFE initiatives.

The Discussion

The framing questions of the workshop were:

1. Do we have the tools to assess all the components of the WEFE Nexus in an integrated way?
2. Does science provide innovative solutions to address the challenges of resource security, desertification and climate change impacts successfully?
3. Are the socio-ecological approaches effective in engaging stakeholders to adapt the solutions?
4. What are the inherent barriers in scaling up solutions and implementing policies that lead to resource security, environmental sustainability and improving the wellbeing of people?

In this workshop, 16 European funded projects (PRIMA, HORIZON, and INTERREG programs) shared experiences and presented project results that address the first three guiding questions. The final panel discussed the fourth question and contributed to identifying the roadblocks of upscaling and operationalizing WEFE Nexus solutions and recommendations on how to overcome them.

The event was characterized by the participants as “knowledge accelerator”. Twenty-four presentations provided examples of tools used to access the WEFE Nexus, innovative solutions and stakeholder engagement approaches that facilitate the co-design and adaptation of the solutions to local context. The workshop participants underlined that siloed sectoral approaches are no longer sufficient. Integrated governance, science-based innovation, stakeholder participation, and aligned financing focusing on integrated WEFE NbS based solutions are essential to confront the systemic nature of climate and desertification impacts in the Mediterranean and beyond. The participants reaffirmed the urgency of coordinated science-based and policy-aligned action, even though it was acknowledged that positive steps to this direction have been made.

Nevertheless, significant barriers remain. Participants identified the following inherent challenges to scaling up and policy implementation:

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1. **Institutional silos and fragmented governance structures**, which hinder cross-sector coordination. These silos can be found both within Ministries as well as between different Ministries and create significant barriers for the implementation of integrated solutions. Within the governance challenges, issues of inclusivity and participation, as well as attention to diversity/gender+ aspects are often overlooked and inadequately addressed.
 2. **Difficulties in quantifying co-benefits and avoided costs**, limiting the ability to demonstrate full value to investors and decision-makers.
 3. **Fragmented and project-based funding landscapes**, which impede long-term systemic transformation. Agroecological practices take long time to realize positive results that would benefit economically the farmers and these results are beyond the typical 2-4 years duration of demonstration projects. Moreover, more attention is needed towards searching for affordable and easy-to-use solutions, along with user-friendly financing mechanisms that can be accessed by the different types of stakeholders, including the farmers.
 4. **Capacity gaps at local and regional levels**, affecting implementation and monitoring.
 5. **Regulatory misalignments and risk-averse investment environments**, which slow innovation uptake. An example of regulatory misalignment is the Eco Schemes which have incorporated complex protocols, require time to produce results and end up being a barrier to scaling up rather than a means of promotion of integrated WEF management.
 6. **Insufficient support and guidance** towards on the ground implementation at technical and financing levels in the form of capital investment and longevity support until yielding measurable results, that constrain upscaling at landscape scale.

Resolution

To overcome these barriers, the workshop calls for:

1. **Innovative solutions grounded in science (particularly Nature-Based and agroecological approaches) that are effective and ready for scaling.** However, the **positive results of these solutions take time.** This is especially true for the implementation of agroecological practices promoted by the Common Agricultural Policy that take decades for the farmers to see the improvement in soil health and increases in agricultural production.
2. **Integrated scientific tools and methodologies for assessing these solutions should be systematically embedded into policy and investment decision-making processes.** There is a need to **standardize and harmonize Nexus assessment tools** and KPIs to improve comparability and transparency. It is also important to develop **protocols of practice** that can be combined by **WEFE Nexus labeling** of products that will create demand and inform the consumers of the best practices while creating added value to the products.
3. **Socio-ecological and participatory approaches are indispensable to ensure local adaptation, stakeholder ownership, and long-term sustainability.** A common feature that emerges from many WEFE Nexus projects is the farmers' lack of access to pertinent knowledge and need for training. Farmers learn through practice, imitation and seeing tangible results, and as a rule do not trust formal learning. Permanent **living labs and regional demonstration hubs** can be used to accelerate scaling and replication.
4. **Enhancing capacity-building initiatives and knowledge exchange platforms** across the Mediterranean are important to implement. At Mediterranean/cross-regional level, enhancing the WEFE4Med Community of Practice as a 'clearing house' of good/best practices and demo applications readily available to all stakeholders will facilitate the exchange of knowledge, the networking and synergetic action and the scaling up of WEFE integrated solutions. Given that its aim is to foster the adoption of integrated WEFE Nexus approaches that maximize synergies and balance trade-offs, the WEFE4MED NCoP can actively support multi-stakeholder collaboration by connecting scientists, policymakers and practitioners to co-develop and implement WEFE Nexus solutions.
5. **Demonstration pilots and costed transition pathways are essential to move from proof-of-concept to implementable transformation.** Targeted pilot initiatives provide practical and visible evidence of the socio-ecological and economic viability of WEFE Nexus solutions. Beyond scientific validation, such pilots are critical for building trust among farmers, land managers, national authorities and investors, allowing stakeholders to observe concrete outcomes and become active proponents of change. Increasingly, pilot initiatives are also developing **costed transition pathways** that integrate Nature-based Solutions, agroecological

practices and smart agriculture into coherent national or regional strategies. By combining technical solutions with economic analysis of costs, benefits and transition dynamics, these approaches help governments and financial actors move from isolated pilot projects toward operational and scalable transformation strategies.

6. **Scaling up requires institutional reform, harmonized policy frameworks, improved valuation of co-benefits, and aligned financing mechanisms.** Scaling up necessitates strengthening of governance and integrated policy frameworks and cross-ministerial coordination mechanisms as well as developing financing instruments that explicitly reward co-benefits and long-term resilience gains. Integrated policy frameworks should acknowledge differences across settings in the Mediterranean, enable inclusivity and utilize language and communication appropriate for practice and policy. Emerging policy processes - including the implementation of the EU Nature Restoration Law, the next cycle of River Basin Management Plans under the Water Framework Directive, and the recent initiatives under UNEP-MAP and the Union for the Mediterranean such as the ‘Strategy for WEF E Nexus in the Mediterranean Source to Sea continuum’ - provide important opportunities to embed WEF E-informed approaches and integrated assessment tools into operational planning and investment strategies, also by strengthening synergetic approaches that encourage partnerships.



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