



Brief Public Sector

European Alliance for Regenerative Agriculture

Regenerating Systemic Risk

A Case Study in the Valencia Watershed on the Impact Potential of Regenerative Agriculture

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Valencia

A Crisis with Compounding Costs

On 29 October 2024, certain regions in Valencia received over 400mm of rainfall in under 24 hours, with others experiencing rainfall over 700mm. The resulting floods caused the loss of 230 lives and estimated damages of over €20 billion, making it one of the deadliest and costliest disasters in recent Spanish history. Yet the rainfall alone did not cause this level of destruction. A systematically degraded agricultural landscape, stripped of its capacity to absorb and regulate water, translated an extreme weather event into a far more severe disaster.

This is not an isolated case. It is the clearest recent example of a structural and escalating pattern across Europe and beyond. Without addressing those underlying causes, public budgets will bear these costs again, and with greater frequency.

Growing, Structural Climate Exposure

Governments across Europe are increasingly serving as last-resort insurers for climate disasters that private markets can no longer absorb. Economic losses from climate extremes have risen by approximately €10 billion every 12 years¹ since the 1980s, with water-related events accounting for nearly half of all recorded disasters. This role is expanding as the protection gap widens.

→ Europe faces €100 trillion in total climate risk exposure². Of that, more than a quarter, €28.9 trillion, is specifically at risk from river flooding³.

→ 35%: Insured climate disaster losses in Europe, leaving €65 in every €100 of losses unrecovered and weighing directly on the real economy⁴.

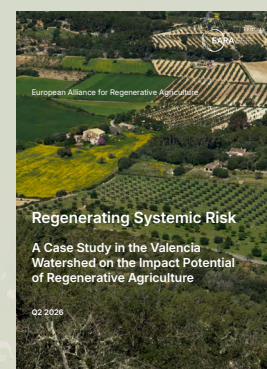
→ Spain's agricultural insurance loss ratio exceeds 100%, paying out more than it takes in. Annual losses average €2–3 billion, and a 1-in-50-year event could surpass €20 billion by 2050⁵.

Why Reactive Expenditure Is Insufficient

Current public responses follow a costly pattern: emergency relief, infrastructure repair, agricultural compensation, recovery funds. These address the consequences of landscape failure, not its drivers.

Flood management infrastructure does not restore the soil's capacity to absorb water but redirects water the landscape can no longer manage. As rainfall events intensify and soil degradation deepens, the carrying capacity of grey infrastructure will continue to be exceeded. Without addressing the structural degradation of agricultural land, future infrastructure investment will deliver diminishing returns against escalating risk.

Please find the full report to read or download [here](#) or visit our website eara.farm.



1 Data sourced from European Environment Agency (2023). Economic Losses from weather- and climate-related Extremes in Europe - 8th EAP. [\(LINK\)](#)
 2 EIOPA. (2022). [\(LINK\)](#)
 3 EIOPA. (2022). [\(LINK\)](#)
 4 EIOPA. (2022). [\(LINK\)](#)
 5 FI Compass 2025, Insurance and Risk Management Tools for Agriculture in the EU [\(LINK\)](#)

The Solution: Embedding Resilience in the Landscape

Regenerative agricultural management (cover cropping, reduced tillage, animal integration, organic amendments) can rebuild the soil's hydrological function and build resilience to both flood and drought. On conventionally managed land, approximately 86% of rainfall becomes surface runoff during a 200mm event. Introducing regenerative agriculture management fundamentally reduces runoff on the landscape. Under the same 200mm rainfall event:

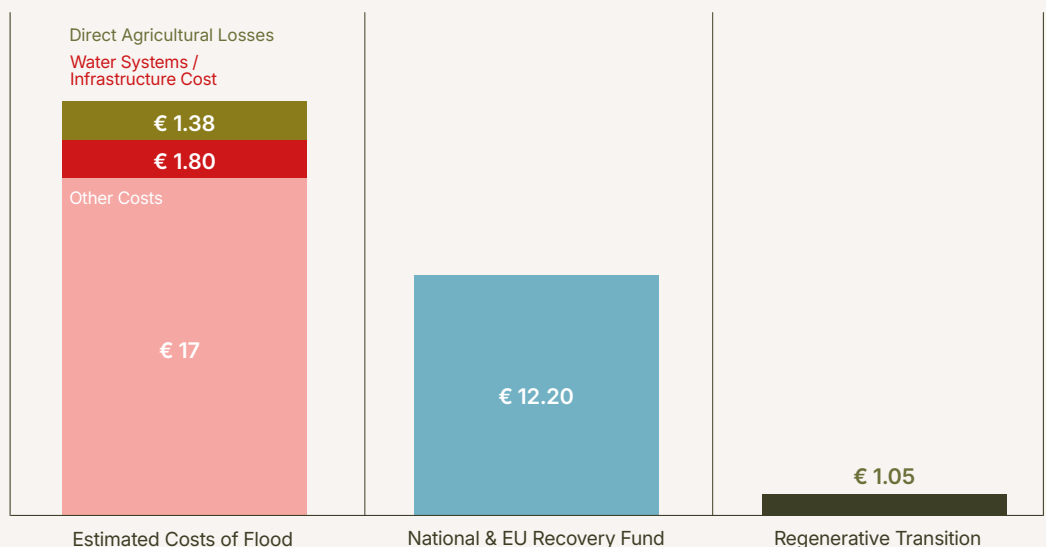
- **Surface runoff decreases by up to 60% compared to current systems**
- **This corresponds to an additional 212 billion litres retained in Valencian soils across 275,000 hectares of perennial farmland, rather than lost to surface flows and erosion.**
- **Water infiltration rates in well-established regenerative systems reach over 70mm per hour, against 20mm or below in conventional systems, effectively absorbing up to 60% of peak hourly rainfall, massively reducing mudslides, erosion, and downstream flood impact**

These outcomes are **achievable within 4 to 6 years**, comparable to major grey infrastructure projects. Unlike grey infrastructure, regenerative systems improve continuously rather than degrading over time, building greater capacity to manage both flood and drought with every passing year. The upstream catchment zones of Chiva, Turis, and Utiel are the highest-priority targets for intervention, given the rainfall intensity they receive and their topography, upslope of the Júcar watershed. Regenerating these zones could deliver disproportionate benefits downstream, reducing the speed and volume of water reaching urban areas before it accumulates into destructive flows. Paired with targeted hydrological interventions such as keyline swales, small retention basins, and managed riparian buffers, regenerative agriculture in these zones offers a comprehensive, evolving flood management system.

The Economics Are Compelling

The financial argument for public investment in regenerative agricultural transitions is direct and well-supported by the Valencia data. A targeted intervention in the highest-risk upstream zones would cost roughly **€316 million over five years**. At less than half the proposed water management budget, this solution addresses the root cause of flood amplification rather than its downstream consequences, and improves continuously rather than degrading over time.

Comparative Costs of Flood Damage to 5-year Regenerative Transition
(in Billion €)



The Security Case

Regenerative agriculture offers a compelling case for both climate and geopolitical resilience. EARA's research has shown it is possible to reduce synthetic nitrogen use by 61% and pesticide use by 75%, while sourcing 100% of animal feed from within the EU. Regenerative systems substantially lower exposure to price volatility that has destabilised conventional farming in recent years. Fertiliser prices tripled following the war in Ukraine, stabilised at double pre-war levels, and have since risen a further 50% in response to the Iran conflict. Regenerative farmers are structurally more resilient to this pattern of compounding shocks. Beyond risk reduction, the approach delivers tangible economic gains, with gross margins improving by 20% per hectare alongside yield parity and greater yield resilience over time. The result is a single transition that simultaneously strengthens regional food security, reduces dependence on global input markets, and builds the long-term adaptive capacity against both climate change and increasingly unstable geopolitics.

Redirecting Existing Funds

The transition does not require new funding streams. Existing public instruments can be aligned and targeted more effectively:

- **CAP (2023–2027 Spanish Strategic Plan):** Historically, €3.9 billion has been allocated to environmental interventions. Valencia represents 8% of Spanish agricultural production. Directing 8% toward Valencia yields €310 million, sufficient to support a significant portion of the full transition.
- **Valencia Recovery Fund:** Of the €768 million proposed for flood mitigation, €500 million is earmarked for water supply, sanitation, and wastewater treatment. Regenerative land management delivers proven water filtration and retention co-benefits; a portion of this allocation directed toward agricultural transition would serve both objectives simultaneously.
- **Spanish State Pact on Climate Emergency (2025):** President Sánchez's State Pact explicitly promotes regenerative agriculture as a core climate adaptation tool, alongside updated water plans and permanent recovery funds for climate-impacted regions. This report's recommendations are directly aligned with these commitments and provide an evidence base for their implementation.

Concrete Steps for Public Authorities

Public sector action is essential to create the enabling conditions for landscape-scale regeneration. Governments cannot address these risks through recovery expenditure alone, and farmers cannot deliver this transition without a coherent policy framework and targeted support.

Redirect existing funds	Establish performance-based incentives	Integrate landscape hydrology in plans
<p>Rather than focusing adaptative and preventative funding from recovery budgets to grey infrastructure, a share should enable the regenerative transition of agricultural land. This is not a reallocation away from flood protection; it is a more cost-effective and durable form of it.</p>	<p>Outcome-based payments that reward measurable improvements in SOC, soil cover, and input reduction create an incentive for farmers to transition without requiring indefinite subsidy. Performance-based frameworks reduce fiscal exposure over time as improving landscape function reduces the frequency and severity of events that trigger public recovery expenditure.</p>	<p>Updated land-use regulations and water plans should incorporate soil health and hydrological function as material factors in planning and flood risk assessment. For example, addressing conventional management practices that increase runoff risk (bare soils, repeated tillage) within updated regulatory frameworks for agricultural land in upstream catchments.</p>

While national recovery payments remain a critical part of climate crisis response, municipal and regional governments can help convene local transition partnerships that bring together farmers, insurers, banks, researchers, supply chains, and public bodies. This would spread the cost and risk of the transition period across the actors that benefit from a more resilient landscape, rather than placing the burden solely on individual farms.

As systems mature and margins improve, public support can shift from underwritten guarantees to performance-based payments, building resilience into the landscape through collaborative, collective effort. This is not a call for a new spending stream, but for better alignment of existing public instruments with long-term resilience outcomes.

Valencia as a Transferable Framework

While grounded in Valencia, the framework and policy recommendations within this report are directly transferable to other high-risk agricultural regions. Significant climate-related damage to rural and peri-urban areas amplified by degraded agricultural landscapes are a global phenomenon. The increasing cost of climate disasters is already excluding high-risk zones from affordable insurance, placing greater fiscal pressure on public authorities at every level.

What is required now is the institutional commitment to act before the next event, rather than only in response to it. Every year of delay increases both the risk and the cost.

To engage EARA's pragmatic, action-oriented network for context-specific analysis, policy development support, or regional application of this framework, please contact us at solutions@eara.farm.

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About the European Alliance for Regenerative Agriculture

The European Alliance for Regenerative Agriculture is the independent, farmer-led coordination, advocacy and collective action organisation of the movement of regenerative agriculture at the European level. EARA is striving to enable the transformation of our agrifood ecosystems through accountable ecologic, economic and social regeneration.

More information can be found on our website at www.eara.farm.