



Policy brief

Reconciling biodiversity values: inclusive pathways for transformative change in agriculture and protected areas

Agricultural productivity often faces tensions with Biodiversity conservation, shaped by diverse and sometimes conflicting stakeholder values, perceptions, and priorities. However, when these differences are acknowledged and explored through participatory approaches, they can become levers for transformative change.



Main findings

- From a socio-economic perspective, **divergent stakeholder values** can cause dissensus and controversies in conservation initiatives, impacting biodiversity conservation effectiveness.
- Engaging collaborators in **stakeholder-driven scenarios and agent-based model planning** can unearth shared conservation goals, providing a robust framework for enhancing biodiversity.
- **Multi-faceted evaluation** methods foster inclusivity, expanding understanding of diverse land-use visions, and facilitating trade-off management between biodiversity conservation and ecosystem service provision.
- Influencing **societal attitudes** towards sustainable practices is critical for biodiversity conservation and enhanced ecosystem service provision.
- **Incentives** for biodiversity-friendly practices help achieve conservation goals.
- **Comparative international studies** provide a robust framework for evaluating agricultural practices and protected area management, although improved **predictive models** are needed to optimize trade-offs in management practices.
- **User-friendly** modelling and decision support tools for forecasting biodiversity and ecosystem service provisions under different scenarios aid better decision-making.
- At the landscape level, **high crop heterogeneity and smaller field sizes** lead to healthier pollinator and natural pest predator populations across agricultural landscapes.
- In addition, **innovative agroecological pest management** practices like the establishment and maintenance of semi-natural elements for increasing natural pest control, contribute to biodiversity conservation and enhanced ecosystem service provision.



Policy recommendations

- Advance **Inclusive Conservation**, enhance stakeholder engagement and integrate diverse perspectives into decision-making processes using mixed-method approaches.
- Enhance **extension services and educational programs** to increase the environmental awareness of land users.
- Formulate **policies to reduce pesticide use**, and establish flexible policy frameworks that encourage innovation and the ability to adapt to new findings and changing circumstances.
- **Support farmers** in researching and developing innovative agroecological pest management approaches, and provide incentives to farmers for the adoption of sustainable practices that conserve biodiversity and enhance ecosystem services provision.
- Improve **predictive modelling capabilities** for agricultural landscapes to support biodiversity and pollinator populations.
- Promote **farm diversity**, small-holder operations, and reduced field sizes. Encourage diverse cropping systems, including the integration of non-crop plants within or near crop fields to enhance biodiversity and ecosystem service provision.
- Establish **semi-natural habitats** at the landscape scale, aiming for a minimum of 20% semi-natural habitat around agricultural areas to nurture pollinator populations and to mitigate major pest outbreaks.



Context

Biodiversity is the bedrock of ecosystems and human well-being. However, its appreciation can vary markedly among different stakeholders, often leading to discord and controversies regarding conservation practices and policies. This divergence in perception often has roots in individual and collective life paths, histories, imaginations, and frames of reference, including profession. When these elements are acknowledged and explored, they can become a potent catalyst for transformative change. Through open dialogue, collaborative scenario planning, and the assimilation of insights from international research and data into predictive models, stakeholders can unveil and appreciate the spectrum of perspectives. This collaborative endeavor facilitates convergence towards shared objectives, nurturing the creation of policies that are ecologically robust, socially just and economically viable. This holistic approach bridges the gap between differing viewpoints, fostering a unified pathway towards biodiversity conservation.

This policy brief highlights actionable recommendations, articulated through the lens of the BiodivERsA-funded research projects SECBIVIT, OBServ, and ENVISION. These projects spotlight the value of involving local communities in policy planning and educational outreach, along with a multi-method approach for inclusive assessments, to elevate awareness and foster a collaborative stance towards enhanced biodiversity conservation and sustainable land use practices. The SECBIVIT project explores the balance between grape production, biodiversity conservation, and ecosystem service delivery, focusing on vegetation and pest management. OBServ hones in on the tension between pollinator conservation and



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agricultural production, to fine-tune models predicting pollinator friendly landscapes. ENVISION delves into inclusive conservation research through stakeholder engagement and participatory scenario planning techniques, uncovering varied community and industry visions in protected area management. The projects leverage data across multiple countries, (including Spain, France, Germany, Austria, Romania, Sweden, The Netherlands, Argentina and the USA) employing mixed-method approaches to address research questions, thus presenting a roadmap for reconciling differing perspectives for effective biodiversity conservation.



Key results

Farmers, protected area managers, conservationists, and policymakers often face conflicting priorities, necessitating an innovative approach for effective biodiversity conservation. Europe's biodiversity stands at a pivotal juncture, influenced by both relatively small protected areas, which serve as a cornerstone for meeting numerous biodiversity and sustainable development goals, and extensive farmlands, often narrowly perceived through the lens of agricultural productivity but essential for conserving biodiversity at the continental and global scale. The discord from diverse viewpoints, reflected globally in the heterogeneity of agricultural regulatory frameworks across countries, underscores the urgent need for transformative change, requiring shifts in the agricultural sector, societal attitudes and political will. Various methods, from stakeholder engagement strategies to predictive modelling, aim at bridging these gaps, offering vital scientific insights and introducing inclusive conservation methodologies. For instance, scenario planning in wind farm areas helped stakeholders understand how to balance renewable energy development with biodiversity goals, while in vineyards, similar tools guided managers in choosing pest control strategies that protect both pollinators and crop yields.

The ENVISION project examined the consequences of multiple visions for Protected Area (PA) management. It utilized a blend of quantitative and qualitative research methods under the umbrella of Inclusive Conservation. This effort led to the creation of decision

support tools to help resolve conflicts by engaging a diverse stakeholder base AND ensuring an inclusive approach to managing protected areas. By deploying participatory scenario planning tools and structured stakeholder engagement, the project captured diverse visions and values of stakeholders, including engaging local residents, protected area managers, and diverse industry groups, notably in the management of PAs around wind farms. Some of the stakeholders emphasized strict biodiversity conservation, others prioritized economic development such as wind energy or tourism, while additional groups focused on recreation, cultural identity, and traditional land uses like grazing or forestry. Participatory scenario planning allowed stakeholders to explore how these differing priorities might coexist or conflict, leading to a better understanding of trade-offs and fostering more collaborative, inclusive decision-making. These tools provide a structured approach for integrating varied stakeholder visions in protected area management. Policymakers can leverage these tools to make well-informed decisions that balance social, economic, and environmental objectives. They support socially equitable, economically viable, and environmentally sustainable outcomes.

The SECBIVIT project combined local focus groups, agent-based modelling under different climate change and policy scenarios, and international comparative studies to explore the effects of different management practices on biodiversity and ecosystem service provisioning in vineyards. By engaging stakeholders



across study regions, the project captured diverse behaviours, attitudes and socio-economic conditions influencing land use practices in vineyards, delving into the intricate interplay between grape production, biodiversity conservation, and ecosystem service provision. A pivotal aspect of SECIVIT's exploration centers around studying the impacts of inter-row management and pest control intensity within landscapes that differ in structural diversity. The focus is on discerning how these elements influence biodiversity conservation and ecosystem service provision between conventional and organic viticulture across multiple countries. The project's models, crafted to predict key ecosystem services in vineyard landscapes, underscore the importance of embracing sustainable agricultural management practices both at the site and landscape-scales. The findings support continued innovation to reduce pesticide use in vineyards—for example, by promoting fungus-resistant grape varieties and adopting sustainable pest control methods. One surprising result was that conventional vineyards in Austria and France showed a higher density of beneficial predatory mites compared to organic ones. This was likely due to the frequent use of inorganic fungicides in organic vineyards, which, while allowed under organic standards, can still harm natural pest enemies. These insights highlight the need for ongoing experimentation with agroecological pest management and the importance of developing locally tailored approaches that actively involve winegrowers in land stewardship. The research also highlights the importance of reducing agricultural pesticide use. The findings support several United Nation Sustainable Development Goals, the European Union Farm to Fork Strategy, as well as several key policy strategies within the European Green New Deal.

The OBServ project utilized stakeholder surveys alongside thorough modelling and data analysis to predict how agricultural landscapes influence pollinator diversity and, in turn, agricultural yields. The models, refined using a robust global database on crop pollinators, highlight the significance of landscape characteristics, especially the presence of semi-natural habitats around crop fields (targeting a minimum of 20% of habitat), in sustaining vibrant pollinator communities. Analyzing a decade-long dataset across Spanish landscapes, the project revealed that high crop heterogeneity and smaller field sizes are conducive to enhanced crop production, but not necessarily larger economic benefits. The research highlights a disparity between the present trend of expanding field sizes and extensive monoculture, versus the advantageous approach of maintaining smaller, diverse fields which boost the yield of pollinator-dependent crops. The study's findings present a case for a reassessment and modification of agricultural policies like the Common Agricultural Policy (CAP) to prioritize pollinator conservation and the ecosystem services they provide. The research affirms that conserving pollinators in agricultural settings is achievable, yet it necessitates targeted conservation initiatives and shifts in political resolve. Additionally, a cautionary remark is made concerning the varied nature of pollinator groups, signifying that conservation measures favoring one group may not inherently benefit others, thus accentuating the need for intricate monitoring systems and ongoing model refinement. OBServ intends to create an open library of modeled scenarios using the open-source environment k.LAB, in collaboration with stakeholders across four different countries.



Figure 1: From monoculture to diversity, this vineyard landscape transitions to a sustainable ecosystem. Varied flora and semi-natural habitats provide differing habitat structure, attracting beneficial species, enhancing pollinator services and natural pest control, and promoting biodiversity, vineyard health and productivity. On the left an extensive vineyard, extensive agriculture example on the right. (image source: Silvia Winter)



Policy recommendations

The insights from SECBIVIT, OBServ, and ENVISION projects provide a cohesive narrative that underscores the significance of collaborative efforts, diverse participant stakeholder engagement, inclusive conservation and innovative strategies in addressing the challenges posed by divergent values and representations of biodiversity. The comparative and collaborative essence of these projects lends a robust foundation for assessing trade-offs and fostering compromises for transformative change in biodiversity conservation. **Key recommendations are to:**

- **Promote and support farm diversity, small-holder farms, and reduced field sizes. Support the establishment of non-crop plants within and adjacent to crop fields.** Advocate for at least 20% semi-natural habitat preservation and restoration around agricultural zones. This strategy, diverging from prevalent large-scale monoculture, proposes a shift towards varied small-holding agricultural frameworks and smaller field dimensions to enhance yields of pollinator-reliant crops, nurture robust pollinator populations and boost natural

pest predator populations. It also mitigates pest outbreaks and reduces pesticide use.

- **Support farmers in adopting agroecological pest management practices to promote biodiversity and reduce pesticide use.** Provide incentives for innovating new techniques, such as the use of fungus-resistant grape varieties and practicing sustainable pest management practices, to encourage the adoption of viticultural management that conserves biodiversity and enhances ecosystem services provision. Recognize and reward efforts by individuals, communities, and organizations that contribute to innovative techniques for biodiversity conservation and ecosystem services enhancement. Rewarding farmers for sustainable practices can reconcile economic and ecological objectives.
- **Enhance predictive ability:** Improve predictive modelling capabilities for landscape pollinator populations and biodiversity. Being able to predict which agricultural landscapes allow pollinator populations to thrive enhances agricultural



productivity and biodiversity. Understand that conservation actions beneficial to one group may not necessarily benefit others.

- **Adopt inclusive conservation by fostering enhanced participation in stakeholder engagement and integrating diverse perspectives into decision-making processes.** Employ mixed-method approaches that include scenario planning to create a shared understanding of different stakeholder policy and management visions.
- **Encourage open dialogue, providing forums where conflicting and synergistic values and interests are openly discussed and considered.** Develop new tools and structures for stakeholders to better consider conflicting values, attitudes, beliefs and interests in biodiversity conservation. Consider conflict resolution approaches that recognize, soften and reframe tensions around trade-offs and values.
- **Develop tailored decision-support tools** and educational programs to enhance stakeholder capacity for informed dialogue on biodiversity and ecosystem service values. Establish dynamic platforms for knowledge sharing and on-going engagement activities to broaden public and political awareness.
- **Establish policy frameworks that facilitate the reduction of pesticide use in perennial crops, including vineyards.** Ensure the flexibility to adapt to new findings and changing circumstances. Plan and use an iterative approach and facilitate regular communication and collaboration between researchers, policymakers, land managers and practitioners to align conservation and biodiversity goals with policy initiatives.



Link to sources

[ENVISION](#)
[SECBIVIT](#)
[OBServ](#)

The scientific publications used in this policy brief can be found in the information sheet of this briefing, downloadable from:
www.biodiversa.eu/policy-briefs/

Photos: Unsplash

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About this Policy Brief

This Policy Brief is part of a series aiming to inform policymakers on the key results of the biodiversity research projects funded by Biodiversa+ and provide recommendations to policymakers based on research results.

The series of Biodiversa+ Policy Briefs can be found at www.biodiversa.eu/policy-briefs/.

This publication was commissioned and supervised by Biodiversa+, and produced by Alyson McHugh.

The key research results presented here were co-drafted and validated by researchers from the research projects: ENVISION, SECBIVIT and OBSerc funded by the Biodiversa+ BiodivScen research call on scenarios of biodiversity and Ecosystem Services.

The policy recommendations made do not necessarily reflect the views of all Biodiversa+ partners.



Co-funded by
the European Union
under Grant Agreement
No 101052342 and No 642420



Produced in April 2025.