Gaming policies for a pollinator-friendly landscape: A science-policy workshop

"Buzzing Table" event organised by the Safeguard and BioAgora projects, co-funded by the European Union
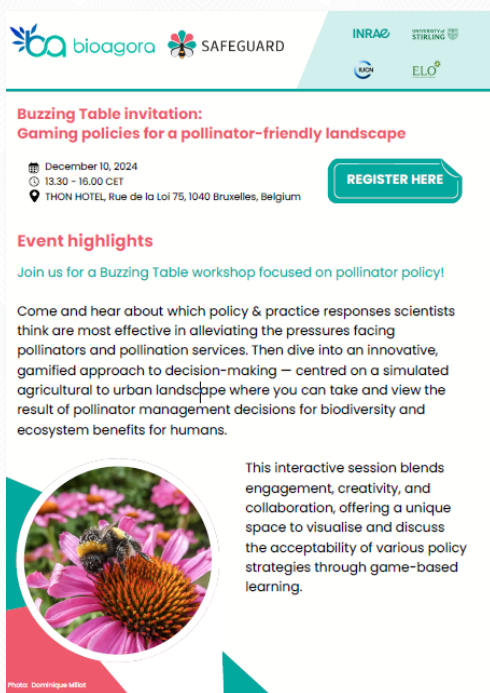

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Photo: Dominique Millot

Join the Buzz! Exploring Policy Tools for a Pollinator-Friendly Landscape

The "Buzzing Table" event *Gaming policies for a pollinator-friendly landscape*, held on December 10th, 2024 at the Thon Hotel in Brussels, was an exciting event that brought together scientists, policymakers and NGOs passionate about protecting pollinators and their vital role in our ecosystem.

The event was the result of a collaboration between the H2020 Safeguard project and the Horizon Europe BioAgora project. It focused on exploring a gamified approach to developing effective and acceptable policy changes for creating pollinator-friendly landscapes. Pollinators are essential for maintaining biodiversity and a healthy agricultural sector, directly impacting our food security and overall ecosystem health. Unfortunately, pollinator populations face many threats, making the need for impactful policy solutions more critical than ever.

Through a combination of presentations, live demonstrations, and interactive gaming sessions, the event fostered a collaborative environment for exploring and discussing policy options and their potential impact on shaping a sustainable future for pollinators and the vital services they provide.

Introduction to the Gaming Approach

Dr Adam Vanbergen (INRAE – National Institute for Agriculture, Food and the Environment) introduced the aim of the Buzzing Table workshop. This was to obtain insights from stakeholders on the *acceptability* (from their perspective) of policy and practice response options, previously identified by a scientific expert panel (>40 European experts) as being *effective* solutions for safeguarding wild

pollinators. The experts had assessed for agricultural, urban and semi-natural areas a set of responses to the pollinator crisis, and had drawn conclusions on those likely to be *most effective* at alleviating pressures on pollinators or directly improving their status.

Adam explained how the Buzzing Table workshop aimed to launch this dialogue with the policymaking and stakeholder community using a new online game (see Figure 1) designed by a team from the University of Stirling (Ms Rose McKeon, Dr Nils Bunnefeld, Dr Brad Duthie) with input from the expert assessment. This new game allowed the participants to make decisions on implementing the responses in a virtual landscape comprising urban, semi-natural and agricultural areas and to visualise the consequences.

Nils Bunnefeld (University of Stirling) then presented how such a gamified approach to decision-making had been used in previous conservation research. Notable successes included projects centred on conflicts around conservation of African elephants (Gabon) and goose populations (Scotland). In these projects, players managed a mosaic of virtual agricultural and natural landscapes as well as animal populations. In-game benefits to simulate the effects of management of wildlife and land yielded valuable insights for policy making. For example, these earlier cases showed how the gaming approach allowed for hitherto ignored voices to be expressed to create a careful balance of wildlife and agriculture and revealed that communities with higher levels of trust and perceptions of fairness and access to financial benefits or compensation contributed to a reduction in conflict over conservation goals. Such games' emphasis on online technology can facilitate broader engagement and enable the exploration of diverse strategies across various scenarios, offering valuable lessons for policymakers and inspiring actions (e.g. participatory approaches to find common ground, government compensation system to address damages caused by wildlife).
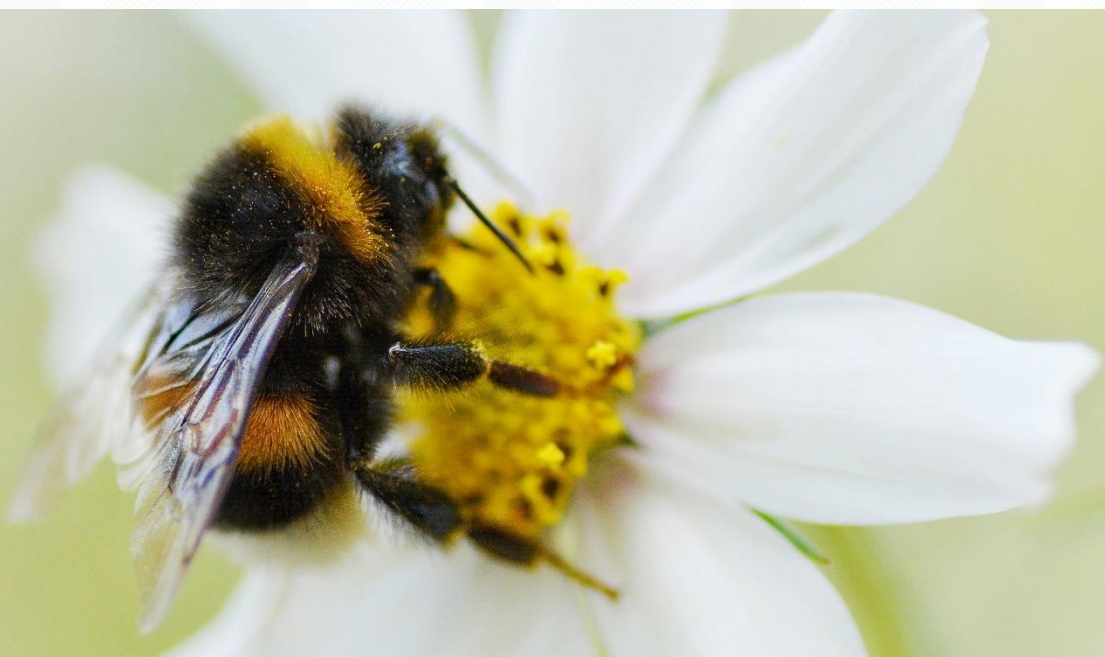

Photo: Kristīne Zāle

Introduction to the Pollinator-Friendly Landscapes Game

The participants (Table 1) were then asked to apply this approach with a bespoke game for eliciting understanding of the relationships between different actions to safeguard pollinators in the European landscape. This game focused on the creation of a pollinator-friendly landscape, incorporating three distinct habitat types: semi-natural, agricultural and urban areas represented by cells (sub-squares) in the virtual landscape (Figure 1). Players were able to choose responses (Table 2) to manage these habitat parcels to improve their suitability for wild pollinators, with some responses being more effective in specific contexts. The game allowed players to experiment with different strategies of response over a simulated sequence of 5 rounds (= years) of decision-making.

Table 1. Stakeholder and research organisations that participated in the Buzzing table event: Gaming policies for a pollinator-friendly landscape, 10 December 2024 in Brussels. A total of 16 individuals from the stakeholder organisations participated as individual players in the decision-making game. EC: European Commission; EU: European Union, MS: Member State.

Organisation	Type	Sector/Scale
DG Agriculture	European Commission	Agriculture/EC
DG Environment	European Commission	Environment/EC
Copa-Cogeca	Farming organisation	Agriculture and farming/EU & MS
IEEP	Policy think tank	Environment/EC
ELO	Landowners, land managers, rural business	Agriculture, Forestry/EU & MS
Promote Pollinators	International governments	Agriculture, Forestry Environment/ International & MS
IFOAM-Organics international	Farming organisation	Agriculture and farming /EU & MS
IUCN	NGO	Conservation/EU & International
Butterfly Conservation Europe	NGO	Conservation/EU
TU Delft	University	Research & Education MS
The Pollinators.org	NGO	Environment/MS
INRAE	Research organisation	Agriculture, Food Environment/MS
University of Stirling	University	Research & Education/MS
University of Reading	University	Research & Education/MS

A feature of the game was that participants could immediately view the outcomes of decisions taken to apply one or several responses (Table 2) in terms of how they affected the **State** of wild pollinators (and the resources they need) and any resulting **Impacts** on benefits that come to people and nature from wild

pollinators. Players can command switches for selecting or dropping different responses within or across different semi-natural, agricultural and urban areas, and learn through immediate visual feedback (Figure 1) on their likely effects on habitat resources and pollinator biodiversity. The overall goal for? the participants was to try and increase the level of these indicators across the landscape, while comparing and contrasting outcomes of different selected responses.

Figure 1. Screen capture of the application 'Gaming policies for a pollinator-friendly landscape' showing the agricultural (yellow), urban (grey) and seminatural (green) zones in a common landscape. Responses could be implemented or not (ticked/unticked) in separate zones (sub-rectangles) or implemented across all zones of a particular habitat type (intensive agriculture, urban or semi-natural). Then the player advances time by a year and visualised the changes to the state of each part of the landscape (sub-rectangles) and the overall level of change in landscape-scale impacts.
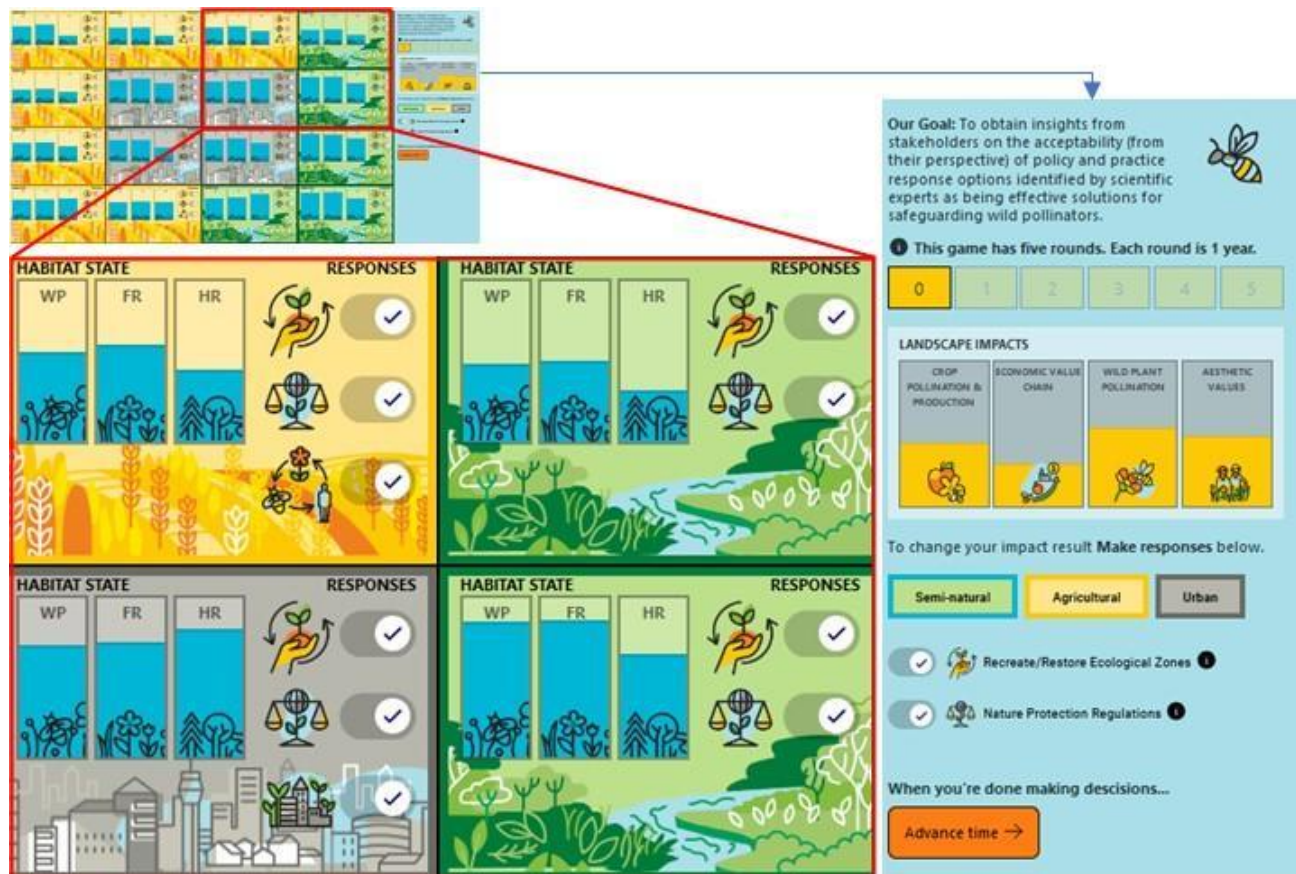
The starting levels of the parameters of the game for each cell within the simulated landscape (Figure 1) were set to mimic some baseline naturally occurring variability between places (cells within the virtual landscape). Participants were allotted to play from two baseline landscape scenarios, automatically set to start from either a degraded or a restored state, allowing players to compare the effectiveness of different strategies in these different contexts.

Table 2. The subset of Responses scored as being effective at improving (directly or indirectly by reducing the level of pressure) the State of wild pollinators and the resulting Impacts on benefits to ecosystems and human well-being. These variables were used to parameterise the online simulation game and informed by expert scoring during a Delphi-type assessment of the Pressures-State-Impact-Response of wild pollinators in Europe.

Responses	States	Impacts
Recreating/restoring ecological zones *(agricultural, urban and semi-natural zones)*	Wild pollinator abundance and diversity Floral resource diversity and abundance Habitat resources (e.g. nest sites)	
Nature protection regulations *(agricultural, urban and semi-natural zones)*	Wild pollinator abundance and diversity Floral resource diversity and abundance Habitat resources (e.g. nest sites)	Crop pollination Economic value chain Wild plant pollination Aesthetic values
Ecological intensification of agriculture *(agricultural zones only)*	Wild pollinator abundance and diversity Floral resource diversity and abundance Habitat resources (e.g. nest sites)	
Urban greening *(urban zones only*)	Wild pollinator abundance and diversity Floral resource diversity and abundance Habitat resources (e.g. nest sites)	

Following the presentations on the broader context, purpose of the workshop and a run-through of the features of the game, attendees then were divided into three arbitrary groups to play the game, as individuals but being able to interact with other group members and discuss the game itself, the process and outcomes. Thereafter, the participants were encouraged to discuss together the acceptability of different response options and provide feedback on the gaming tool itself.

Group Feedback

A lively discussion followed, with participants from each of the three groups sharing their experiences and offering valuable feedback. The three distinct groups, each offered unique perspectives and insights on the game's strengths, weaknesses, and areas for potential improvement.

- Group 1 emphasised the need for a more comprehensive simulation that incorporates the costs and constraints associated with implementing conservation actions, recognising the crucial role of these factors in real-world policymaking. They also highlighted the importance of explicitly demonstrating how different conservation measures may interact and potentially conflict with one another, as well as how these interactions are modelled within the game.

- Group 2 found the game's complexity to be somewhat challenging, expressing a desire for a more intuitive and user-friendly interface with

clearer oversight of actions. They also expressed a need for greater transparency in the model, particularly in understanding the underlying mechanisms that drive specific outcomes. Furthermore, they emphasised the importance of presenting the game from the perspective of local decision-makers, considering economic and aesthetic factors as primary concerns.

- Group 3 observed a consistent trend: restoring and recreating habitats were frequently identified as the most effective strategies across all habitat types. They also noted the relatively limited impact of natural protected areas on the overall landscape and highlighted the significant economic benefits associated with actions that directly benefit pollinators.

Group 3 also offered several valuable suggestions for game improvement:

- Linking the different landscape elements (cells in the virtual landscape) to accommodate the fact that pollinators are mobile. For example, enhancing agricultural practices in one landscape parcel to benefit pollinators might be expected to spillover to a neighbouring area producing a degree of improvement there. Therefore, enactment of policies through management responses in agriculture, urban, or semi-natural areas should have reciprocal positive effects on improving overall landscape quality for pollinators.

- Incorporating a historical perspective: Improving the in-game visualisation of the history of cause-effect arising from choices taken would better allow players to view and learn from previous decisions and would enable them to refine their strategies more effectively. This could be achieved through timeline graphs that show the in-game state variables over the course of the game play.

- Including cost and information gaps: This would provide a more realistic and practical experience, helping players understand the trade-offs involved in decision-making.

General Discussion

The subsequent plenary discussion highlighted the need to incorporate a broader range of potential outcomes, including negative effects, to create a more realistic simulation of real-world challenges. Participants emphasised the game's potential for evolution and adaptation at the EU level, recognising its relevance to member states. They explored how the game could facilitate diverse approaches to decision-making, making it easier to ask questions and explore potential solutions.

The discussion also touched upon several crucial areas for further potential development and ambition:

- Connecting the game to real-world monitoring data: This would allow players to apply their knowledge and work towards implementing the EU's Nature Restoration Law and Article 10.

- Improving the clarity and transparency of the game's variables and their interactions.

- While the current game mechanics may not fully capture the nuanced impact of policy interventions, it's important to acknowledge the significant role that policy plays in real-world conservation efforts. Further development of the game should aim to more accurately reflect this crucial aspect, to be able to be an effective tool for policymakers.

Overall, the decision makers from policy and NGO institutions present in these sessions demonstrated a welcoming attitude towards the development of new tools that can facilitate informed and effective policymaking. They also recognised the potential to educate and learn as powerful tools for promoting conservation efforts and the positive impact such a tool can have in building trust within and across stakeholder communities and actively engaging them in conservation decision-making processes. The new pollinator-friendly landscapes game holds promise for raising awareness and helping a decision-making process for those in charge of protecting pollinators.

It is important to acknowledge that while this gamified approach shows promise, developing effective tools for complex policy decisions remains an ongoing challenge. The Stirling team expressed enthusiasm for the level of participation and highlighted the importance of securing adequate funding to further refine and improve this tool, recognising its potential to assist policymakers in addressing critical environmental challenges. By incorporating feedback and addressing the identified limitations, these games can be further developed to become even more effective in achieving conservation goals.

The BioAgora and Safeguard Projects were delighted to host this event. While the game presents opportunities for further refinement, the overall approach proved successful and will contribute to the delivery of the Integrated Assessment Framework for pollinators (Safeguard project WP5) and a pilot demonstration of the potential approached within the European Commission's future Science Service for Biodiversity (BioAgora project: pollination demonstration case). Overall, while work remains to do, participants expressed significant engagement with and enthusiasm for developing such tools to support their policymaking responsibilities, pointing towards a promising future for gamified approaches in this domain.

Photo: Bruno Martins

Next steps

The organising projects and institutions will carry out further work in 2025. This will include:

- Completing the analysis of the expert elicitation exercise (and data from the Brussels stakeholder workshop) with the goal of producing a scientific paper and an associated policy brief.

- Review the feedback and data from the workshop 'Gaming policies for a pollinator-friendly landscape' (10 December 2024, Brussels) and discuss with the University of Stirling the feasibility of evolving the game further for use in more workshops (online or in person).

- Explore the potential for a follow-up workshop, either online or in person, with stakeholders from EU and/or MS (subnational) scales to explore further the utility of the Integrated Assessment Framework and the associated game.

Acknowledgements

Photo: Håkon Grimstad