BeeLife
European Beekeeping Coordination

Pollinators as Indicators in Policy Affecting the Landscape and Environment

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There is an increasing need to improve how we monitor the impact and efficiency of environmental or landscape policies. For this reason, BeeLife proposes that a *Pollinator Index* should be introduced as an impact indicator for policies. In need of more targeted measurements, authorities, conservation movements, researchers and citizens in general can find essential allies in pollinators. The index has the potential to help improve accountability, monitoring the effectiveness of public spending, and indicating when modifications are necessary. BeeLife insists on the importance of developing and applying a *Pollinator Index* in Europe.

Our planet faces significant challenges today. As a consequence, the decline in biodiversity in the last few decades has skyrocketed. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) shared evidence of this earlier in 2019 [1]. The situation poses a challenge for nature and therefore for citizens, farmers, beekeepers, researchers and even legislators and policymakers. These last two are particularly in need of measuring the effectiveness of their laws and policies. Researchers have identified the intensification of land use, primarily by agriculture, as the main factor affecting the environment and leading to biodiversity loss, with up to 75 per cent decline in insect biomass [2]. Therefore, legislation and policies that have an impact on this are particularly influential for the future of wildlife, nature and ourselves.

Even though legislation and policy surrounding agriculture is the primary concern, it does not exclude others that also influence the landscape and the environment. In Europe, besides the Common Agricultural Policy [3], which largely shapes land use, there are also other legal acts such as the Habitat [4] or Water [5] directives. Other relevant legislation refers to Pesticide Authorisation and Use [6]. With a wide range of impact on the landscape, it is crucial to improve measuring the effects of legislation and policies.

There is an increasing need for accountability and to improve environmental conditions. It is not only in the best interest of decision-makers to get to know better the efficacy of their legislation and policies. Civil society is also demanding more transparency and better results. Convinced by the vulgarisation of scientific findings on the decline of environmental health and growing pollution, citizens are more and more preoccupied with the environment and the loss of biodiversity [7]. Evidence of this are the manifestations and the rise of green political parties that focus on environmental issues, particularly during this year's European elections [8].

Besides, several European Citizens Initiatives (ECI) have been registered in the last few years by the Commission. For example, by the initiative of citizens through several NGOs, they introduced the initiative to Ban Glyphosate and Protect People and the Environment from Toxic Pesticides in 2017 [9]. It collected over a million signatures and helped in banning the herbicide after researchers around the globe had questioned its safety [10]. Currently, other ECIs continue to advance conservation efforts. Another recently registered ECI, Save Bees and Farmers, of which BeeLife is a member, also shows the involvement of civil society [11].

The need for better accountability is clear, and there are several forms it can take. To better understand the impact of legislation and policies, authorities, researchers and other organisations have already proposed several tools. Among them, they introduced a butterfly index [12], a farm bird index and forest bird index. These indexes monitor the population of the species in question and serve as a method to measure other conditions in the environment.

Focusing on the value that pollinators have for the health of ecosystems, and the relation they have with the flora, BeeLife is now proposing also to include a *Pollinator Index*. The aim is for it to serve as an objective tool to monitor the real performance of public policies and their impact on the environment. As with other indexes, it would include the monitoring of populations, in this case of both managed honeybees as other wild pollinators. It can be a useful tool to monitor the real performance of different legislation and policies and their impact on the environment. It could allow the calibration of public spending towards improving public decisions that target or influence pollinators.

The *Pollinator Index* would include the following parameters:

- Rate of winter and or summer honeybee colony losses. One of the primary sources of data for this is already available through the COLOSS Honeybee Research Association [13]. In collaboration with the association, along with projects that target beehive monitoring, comprehensive information can be recovered [14] [15] [16] [17] [18].

- Wild pollinators abundance and richness. The data acquired by monitoring using traditional traps, or new technologies under development for pollinator count, would be valuable to understand the situation in the field better. The butterfly index would also be comprised here [19] [20].

- Honeybee collected pollen pellets, analysed for their botanical origin and contaminant content. By examining pollen pellets, it is possible to associate the richness of resources and the potential toxicity from direct or indirect contact with plant protection products used in agriculture. It would also indicate possible links to land management practices in nearing areas to the apiaries [21] [22].

- The location and period of complaints that beekeepers or naturalists present to authorities, which would require an institutional involvement of tracking and making the information available. The first-hand knowledge from fieldwork is valued and presents an indication which works in synergy with the other parameters of the Index.

- Calculating the amount of honey or pollen produced per km2, including productivity per colony. By tracking these factors from beekeeping socioeconomics, in connection with previous parameters, the index benefits from trackings that might indicate problems with resource availability, toxicity or climatic events.

Table 1. Measurements and information provided from parameters for the *Pollinator Index.*

Measurements	Examples of information provided
Pollinator abundance and richness and honeybee colony losses rate.	• Identification of landscapes not favourable for pollinators. • Efficiency of policy measures aiming at multiplying food resources and habitat. • Efficiency of policy measures aiming at improving bee health. • Pollination potential.
Botanical abundance and richness of the area.	• Efficiency of policy measures aiming at multiplying food resources. • Indication of economic viability of producers depending on pollinators.
Lack of resources throughout periods of the year.	• Efficiency of policy measures multiplying food resources in time.
Level of pollution in areas where landscape or agricultural policies have a direct or indirect effect.	• Efficiency of policy measures reducing the environmental risks of pollutants. • Calibration of risk assessment procedures. • Allows to identify possible unexpected or unwilling (maybe even illegal) events in real time. • Possibility of identification of origin of pollution.
Amount of honeybee colonies per km2.	• Indicate the melliferous richness of a certain area along the year and if the weather/environmental conditions was/were good for honey production (availability of nutritional resources). • The evolution in time of this parameter could give an indication of the success of biodiversity friendly measures supported by the CAP, e.g. greening, agro-environmental measures, eco-scheme etc.

The implementation of the *Pollinator Index* has the potential to serve decision-makers in better establishing the goals and strategies. Thanks to a better understanding of the current challenges that pollinators face, they would be able to improve how legislation and policy shape land management. They would also be able to improve the design of tactics to achieve such objectives.

Another key feature of the Index would be enable authorities to calibrate public spending, taking into account a useful indicator of real conditions in the field. With the implementation of the Index as an impact indicator, it will be possible to modify, when necessary, the legislation and policies that target pollinators. Notably, it would enable authorities to identify the shortcomings or undesired effects and devise strategies to counter them.

Finally, the Index also comes as an answer to the pleads of civil society for transparency. It would allow citizens to understand the results of legislators and policymakers better, with a significant increase in transparency and accountability. Additionally, it would serve as a tool to verify that authorities are effectively spending public money for the preservation of public goods. With the growth of public concern for the environment and the protection of biodiversity, this Index would help civil society in ensuring their interests are seriously taken into account.

The European Commission is envisaging the creation of a *Pollinator Index* within the frame of the EU Pollinators Initiative. Nevertheless, it has still not seen the light, and it risks being left out of vital policies such as the CAP, which is currently under negotiation for reform. For this and its application to all other policies that impact pollinators, BeeLife requests and promotes a Pollination Index. BeeLife is at disposal to contribute to its creation, both with public institutions and researchers.

The *Pollinator Index* is a possible tool that promises to improve our understanding of our impact on the environment. BeeLife's motivation for supporting is to help improve conditions for pollinators in the long run. Pollinators are essential to not only the ecosystems they inhabit but also play an important role in our culture and identity. Therefore, having a tool to improve their conditions is in the best interest of nature in general and ourselves.

References:

[1] IPBES, 2019, Media Release: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates' Accelerating', recovered from: https://www.ipbes.net/news/Media-Release-Global-Assessment

[2] Hallmann, C. A. et al., 2017, More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLoS ONE12 (10): e0185809.

[3] European Commission, 2019, The common agricultural policy at a glance, recovered from: https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/

cap-glance_en#legalfoundations

[4] Council of the European Communities, 1992, COUNCIL DIRECTIVE 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, recovered from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=FR

[5] European Parliament & European Council, 2000, DIRECTIVE 2000/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2000 establishing a framework for Community action in the field of water policy, recovered from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060

[6] European Parliament & European Council, 2009, DIRECTIVE 2009/128/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides, recovered from: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32009L0128

[7] European Commission, 2019, Special Eurobarometer 48: Attitudes of Europeans towards Biodiversity, recovered from:

https://ec.europa.eu/commfrontoffice/publicopinion/index.cfm/survey/getsurveydetail/

instruments/special/surveyky/2194

[8] The New York Times, 2019, Europe's Green Parties Grow New Support, recovered from: https://www.wsj.com/articles/europes-green-parties-grow-new-support-11559122201

[9] European Commission, 2017, COMMUNICATION FROM THE COMMISSION on the European Citizens' Initiative "Ban glyphosate and protect people and the environment from toxic pesticides", recovered from: COMMUNICATION FROM THE COMMISSIONon the European Citizens' Initiative "Ban glyphosate and protect people and the environment from toxic pesticides".

[10] Torretta, V., Katsoyiannis, I., Viotti, P., & Rada, E. (2018). Critical review of the effects of glyphosate exposure to the environment and humans through the food supply chain. Sustainability, 10(4), 950.

[11] Save Bees and Farmers European Citizen Initiative https://beesfarmers.armada.digital/

[12] European Environment Agency, 2019, Grassland Butterflies Population Index 1990-2017, recovered from:

https://www.eea.europa.eu/data-and-maps/daviz/european-grassland-butterfly-indicator-3#

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[13] COLOSS Honeybee Research Association https://coloss.org/

[14] Van der Zee, R. et al., 2012, Managed honey bee colony losses in Canada, China, Europe, Israel and Turkey, for the winters of 2008-9 and 1009-10, Journal of Apicultural Research and Bee World 51, 100–114.

[15] Van der Zee, R., Gray, A., Pisa, L. & de Rijk, T., 2015, An Observational Study of Honey Bee Colony Winter Losses and Their Association with Varroa destructor, Neonicotinoids and Other Risk Factors. PloS one 10.

[16] Brodschneider, R. et al., 2016, Preliminary analysis of loss rates of honey bee colonies during winter 2015/16 from the COLOSS survey, Journal of Apicultural Research 55, 375–378.

[17] Brodschneider, R. et al., 2018, Multi-country loss rates of honey bee colonies during winter 2016/2017 from the COLOSS survey, Journal of Apicultural Research 57, 452–457.

[18] Gray, A. et al., 2019, Loss rates of honey bee colonies during winter 2017/18 in 36 countries participating in the COLOSS survey, including effects of forage sources. Journal of Apicultural Research 1–7.

[19] Hallmann, C. A. et al., 2017. More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLoS ONE12 (10): e0185809.

[20] Lebuhn, G. et al., 2013, Detecting Insect Pollinator Declines on Regional and Global Scales: Detecting Pollinator Declines, Conservation Biology 27, 113–120.

[21] Simon-Delso, N., Martin, G. S., Bruneau, E., Delcourt, C. & Hautier, L., 2017, The challenges of predicting pesticide exposure of honey bees at landscape level, Scientific Reports 7, 3801.

[22] Porrini, C. et al., 2003, Honey bees and bee products as monitors of the environmental contamination, Apiacta 38, 63–70.

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