Butterfly effect: infrastructures and tools to connect biodiversity and society via pollination services

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Abstract:
Biodiversity is responsible for several ecosystem services, where expecially pollination covers a key role. However, in many highly industrialized areas around the world, pollinators safeguard faces multiple challenges, including climate change, increased temperatures driven by soil sealing and urbanization, limited floral resources and nesting sites and the widespread use of pesticides. These environmental pressures, together with the low consciousness regarding the ecological and economic importance of pollinators, represent major barriers to their conservation.
Within EU Horizon projects “Butterfly” and “ProPollSoil” we address these issues through the creation of a Living Lab (LL): a network of 28 entities representative of the society and distributed in urban and agricultural areas of the Lombardy region, primarily in and around the city of Milan.
The Living Lab includes green recreational areas, allotments and agricultural farms, environmental managers, journalists and foundations.
In the projects pollinator biodiversity is assessed within a multidisciplinary framework that evaluates their ecosystem services, including ecological, social and economic perspectives. Integrating DNA based tools, field monitoring, literature and economic valuations, we estimate the effect of pollination on productivity and nutritional values of fruit crops. The LL serves as a key infrastructure for assessing environmental and human aspects of pollinator and flower biodiversity in recreational green areas and allotments, helping to improve our understanding of how people interact with and value biodiversity in these spaces.
Together with these analyses, we are developing a data-driven tool suggesting planting and habitat design to support pollinators in the Living Lab sites. This tool is based on Species Distribution Model and plant-pollinator interactions which will feed into an interactive web application, and it will be tested in a co-creation framework within the Living Labs of the projects. The stakeholders will receive clear and practical advice tailored to their local soil, climate and species pool.
The results will help to halt and potentially reverse pollinator decline by raising awareness, providing knowledge and new tools for farmers, land managers, institutions, and citizens, to trigger significant positive changes in biodiversity, pollinator-dependent farming practices and related businesses, community behaviours and policies.