IALE 2025
European Landscape Ecology Congress
Landscape Perspectives in a Rapidly Changing World

Bratislava, Slovakia
September 2-5, 2025

Book of Abstracts

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Editors:

Juraj Lieskovský, Zuzana Baránková, Viktória Miklósová, Hubert Hilbert, Zuzana Ponecová

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Identifying Priority Areas for Establishing New Hedgerows in Germany

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Hedgerows in agricultural landscapes offer multiple ecosystem services, including erosion control, improvement of the microclimate or habitats for flora and fauna. Notably, hedgerows can sequester almost as much carbon per hectare as forests, serving as effective carbon sinks. Hedgerows can play an important role in achieving climate protection and biodiversity goals. However, extensive removal of hedges has occurred due to land consolidation practices in Germany. Consequently, there is a critical need for new hedgerows which varies regionally.

Utilizing landscape and agricultural structure data, this study aims to (1) analyze the distribution of existing hedgerows and adjacent production systems in Germany, (2) define priority areas for the establishment of new hedgerows and (3) determine the potential for new hedgerow planting and their contribution to climate protection goals. Analyses were conducted based on a novel hedgerow map for Germany derived from remote sensing data and agricultural land management data obtained from the Integrated Administration and Control System (IACS). The objective of defining priority areas was twofold: firstly, to identify regions where new hedgerows would maximize environmental benefits; secondly, to identify regions where implementation constraints were minimized. Environmental, economic and policy aspects (e. g. conflicting bird protection goals) were considered.

Data pertaining to biodiversity effects, erosion and landscape aesthetics were taken into consideration to identify regions with high need for new hedges. Subsequently, key parameters influencing hedgerow distribution in Germany were identified using generalized additive mixed models including agricultural use, field size, location in protected areas, distance to forests and relative height. The results were used to ascertain areas where new hedges would be most compatible with the prevailing agricultural structure, thus reducing spatial constraints. The potential of new hedgerows was determined based on field boundaries to minimize operational constraints. Various planting scenarios were then calculated, and their respective climate protection effects estimated. Regions of high demand and high feasibility have been identified where planting is particularly advantageous.

This study demonstrates that the implementation of new hedgerow planting initiatives can enhance carbon sequestration capacity within the land use sector. It is the first study to encompass the distribution of hedgerows on a nationwide scale in Germany. These findings can inform the development of targeted subsidies for hedgerow expansion and support climate change mitigation and biodiversity efforts.

Oral presentation