Ecosystem services of agricultural landscape

Jana Špulerová, Žubuš Halada, Marta Dobrovodská, Peter Bezák

Institute of Landscape Ecology SAS, Slovakia
Seminatural habitats regarding agricultural landscape

- Assessment of non-forest woody vegetation for landscape planning
- Despite small size of seminatural habitats of agricultural landscape, these patches often act as refuges for biodiversity and may provide a wide range of ecosystem services (ES) to populations and human society.
Seminatural habitats regarding agricultural landscape

• Significance of habitats for nature conservation

V – wetland habitats, L – lines of trees, P – grassland, R – small forest, S – forest
Seminatural habitats regarding agricultural landscape

- Landscape ecological significance: hemeroby, vulnerability, regional rareness, species richness, feedstuff potential, melliferous potential, stability degree

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Biodiversity research of historic structure of agricultural landscape in Slovakia

project supported by the EEA Financial Mechanism, Norwegian Financial Mechanism and state budget of the Slovak Republic, 2009 - 2011

Project objectives:

1. Complex inventory and typology of historic structures of agricultural landscapes (HSAL) in relation to their biodiversity

2. Detailed, interdisciplinary research (investigation of biodiversity in relation to ecological and socio-economical conditions of the site) in 3 pilot areas.

3. The elaboration of a „Strategy for protection and management of valuable biotopes of HSAL“ in pilot areas with respect to principles of sustainable development
Interdisciplinary research of biodiversity in 3 pilot areas

- Man-conditioned habitats of the agricultural landscape - special attention was given to vegetation connected to the forms of anthropogenic relief
- Relationships between natural conditions, land use, and culture (natural and socio-economical limits at present and in the past)
- Analyses of biotic, abiotic conditions, land use, socio-economic conditions, demographic and sociological conditions on cadastral level
Interdisciplinary research of biodiversity in 3 pilot areas

Svätý Jur
- Historic structures of vineyards landscape

Liptovská Teplicka
- Historic structures of arable-land and grasslands

Hrinová
- HSAL with dispersed settlement
Ecosystem services

The assessment was oriented to:

• **Habitat services** – biodiversity evaluation of favourable conservation status of a natural and seminatural habitat and species, identification of driving forces, and threats to the biodiversity of HSAL.

• **Cultural-historical services** – based on presence of typical features of HSAL: *preserved small scale structure of plot division, primary land use was not changed during collectivization of agriculture, original forms of anthropogenic relief and/or features of traditional agricultural technologies have been preserved*.
Project results

• Pilot areas – preserved original agricultural landscapes, which did not lose shape and contour of the cultural-historical countryside (areas are less accessible and remote, having marginal areas with extreme conditions of nature).

• Traditional agricultural historic structures often create specific living conditions for biota, which have been documented by high species richness and occurrences of many rare and threatened species (e.g. 327 spiders, 45 threatened and 2 new sp.); Species richness is dependent upon complex factors and corresponds with: Abiotic factors; Type habitat; Orientation; Method of cultivation

• Results shows high significance of these habitats as islands of species-rich habitats, they provide also many other environmental services.
Significance and ecosystem services of historic structures of agricultural landscapes  
(National grant agency VEGA project – 2011 -2014)

Particular objectives:

• to get new knowledge on goods and ecosystems services provided by ecosystem in HSAL

• to study and quantify ecosystem goods and services on the examples of pilot areas - to compare significance of HSAL with other agricultural landscapes, which were reclaimed and don't have features of HSAL
Significance and ecosystem services of historic structures of agricultural landscapes

• Development of methodological concept: selection and proposal of suitable indicators for quantitative and qualitative assessment of ecosystem goods and services provided by historic structures of agricultural landscapes.

• Habitat services: maintenance of genetic diversity, maintenance of life cycles of migratory species

• Regulating services: GIS tools and special program for modelling will be used for assessment of water and soil regulation, visualization of landscape view, etc.

• Cultural ecosystem services - indicators for recreation and ecotourism, aesthetic, inspirational, educational, sense of place, cultural heritage.

• Provisioning services (food, water - irrigation, cooling, raw material, medical resources, ornamental resources - have not decided yet)

• Sociological survey will be oriented on perception of HSAL by land owners and users, as well as visitors of the area.
Regional scale – Poloniny National park, NE Slovakia, ca 300 km²

Study area is dominated by forests - grasslands are the second largest ecosystem, building a water reservoir and resettlement of this area
Socio-ecological study of landscape and biodiversity changes in mountain area of the Poloniny NP in context of global changes

- Semi-natural grasslands in main focus
- Assessment ecosystem services provided by grasslands and proposal of suitable management for maintenance of ecosystem services
- Changes in provision of ecosystem services after CAP start in Slovakia - comparison of scenarios
Main aim of the project:

to develop causal chains of human-nature processes in the target region

- Detailed study of socio-ecological interactions, in the area, including ecosystem services provision,
- Proposal of causal chains of human-nature processes in the landscape
- Identification of suitable future management of the region that will maintain the multi-functionality and ecosystem services provision.
- Synthesis of biological research in the target region
Thank you for attention