

DEVELOPMENT OF A HUNGARIAN-ROMANIAN ECOLOGICAL AND SOCIO-ECONOMICAL RESEARCH COOPERATION IN THE SOUTHERN GREAT PLAIN

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Introduction

Trans-boundary regions of the Great Plain of the Carpathian Basin have many similarities and many differences. History of the formation of the basic rock and soils is the same, climatic conditions and water regime are very similar, landscape history is also similar, land use practices, however, are significantly different since long time that have resulted in different landscape and habitat structure. As the potential pool of flora and fauna is the same for the whole territory of the southern Great Plain, the deviation of the natural vegetation and fauna of the two sides of Hungarian-Romanian border may be due to the differences of land use.

Valleys of the rivers Körös and Maros are considerable landscapes of the Great Plain. The two rivers connect the human population of trans-boundary regions, and determine land use possibilities. In order to strengthen the sustainable land use we have to know the functioning of natural habitats and landscapes, the connecting and mediating role of the rivers.

In 2010, a new joint research project was organized by the Department of Ecology, University of Szeged and the Department of Ecology and Environmental protection, "Vasile Goldiș" Western University Arad. The aim of this project is to improve the ecological research activity and quality in the southern region of the Great Plain. Several studies have been implemented in the territory of the Tisza valley that evaluated the geography and hydromorphology of Körös and Maros region (Andó 1995, 1997, Jakab 1995, 1997, Kiss and Sipos 2005, Oroszi and Kiss 2005, Sipos *et al.* 2007, Fialka *et al.* 2007), flora and vegetation of the two rivers (Drăgulescu 1995, Drăgulescu and Macalik 1997, Molnár *et al.* 1997, Margóczy *et al.* 2000, Makra 2005), revealed the structure of particular animal communities (Sárkány-Kiss and Hamar 1995, Domokos *et al.* 1997, Markó 1997) and analysed the relationships among landscape elements, habitat structure and structure of biota (Gallé *et al.* 2000, Gallé 2002, Rakonezai 2006). Two monographs are devoted to summarize the results of the latest expeditions along the rivers Körös (Hamar and Sárkány-Kiss 1995) and Maros (Sárkány-Kiss and Hamar 1997). Above publications, however, do not take care for the

transboundary differences in land use practices; evaluation of the effect of land use on the habitat and biota structure in the Great Plain is rather sporadic (e.g. Bellon 2004, Minca *et al.* 2007).

In the recent project, we planned to reveal the effect of the land use practices on the development of landscape structure, on the structure of natural vegetation and fauna. We intended to improve the Hungarian national habitat evaluation system, and apply for the transboundary region; and to assess ecosystem goods and services in the same target area.

Expected results and impacts:

- We contribute to the elaboration of efficient and sustainable land use models that support and enhance the life of the trans-boundary region's inhabitants on long term, and at the same time preserve's the natural landscape and biodiversity. The economic growth and the quality of life depend on the rational use of natural values.

- The project provided with a good opportunity to improve a joint, Hungarian and Romanian, system for habitat and ecosystem goods and services evaluation. This new tool will help the public relevant bodies to develop effective sustainable development policies for the region.

- The human resources of the two partner universities were enhanced through experience exchange and participating in training sessions. Furthermore, the implementation of the project produced conditions and possibilities for further co-operation.

Members of the project team

This project was carried out in the framework of *Hungary-Romania Cross-border Cooperation program 2007-2013* as a joint research activity of "Vasile Goldiș" Western University of Arad as the lead partner and of University of Szeged as the project partner.

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VGWU: Vasile Goldiș Western University Arad; USZ: University of Szeged; BUAV: Banat University of Agricultural Sciences and Veterinary Medicine Timisoara; WUT: Western University Timisoara

Study area

Investigations were carried out in two characteristic river valleys of the Great Plain. The two rivers – Körös/Criș and Maros/Mureș – connect transboundary areas. Their floodplains are similar in Hungary and Romania. Two representative areas were selected in the region of Körös/Criș; one was near Gyula (N46° 35' E21° 16') at the Hungarian side, and the other near Varsand (N46° 36' E21° 20') at the Romanian side. These two sites were very close to each other (Fig. 1). Two representative areas were also selected along river Maros/Mureș at Magyarcsanád (N46° 8' E20° 38'; Hungary) and at Bezdin (N46° 7' E21° 1'; Romania). Size of the selected areas was ca. 9 km² each, and represented the landscape structure and land use practices most characteristic for the target area.

The project consists of four main fields of investigation. The most characteristic landscape elements of the studied region are the two rivers: Mureș/Maros and Criș/Körös that run on a loose alluvium in the Great Plain, therefore the riverbeds are rather variable. One research activity aims to reveal the hydromorphology and to improve the knowledge on the processes of the formation of riverbed. Water regime of the rivers, frequency, intensity and duration of floods strongly determine the vegetation of the floodplain. Natural vegetation types are characteristic elements of landscapes, and provide habitat for the elements of the fauna. Thus the second research activity focused on the recent state of the vegetation (vegetation mapping), and on the history and development of the recent vegetation pattern. As the cenoses consist of plants and animals, it is evident that the investigation of actual fauna of the target areas is important and is the third group of studies. At last, the main biotic impact on the landscapes is that of the man. In the fourth project part we attempt to reveal the relationships of the local inhabitants and the habitat types, and to evaluate the ecosystem goods and services characteristic for the target areas.



Figure 1. Location of the experimental sites in the trans-boundary region.

According to the four areas of interest, field data collections were implemented by four groups of experts on the basis of the objects and purposes. One group studied the hydromorphology of the rivers. Two groups dealt with the vegetation and fauna of the sites selected. The fourth group met with representatives of the local inhabitants in order to make interviews for ecosystem goods and services evaluation. Details of the methodologies are described in each chapter

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