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8th DANUBE ACADEMIES CONFERENCE

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8. КОНФЕРЕНЦИЈА АКАДЕМИЈА
ПОДУНАВСКЕ РЕГИЈЕ

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CONTENTS

TOPIC 1: Endangered Danube: What can we do?

Thomas Hein, Andrea Funk, Florian Pletterbaue, Daniel Trauner <i>Rivers under threat – challenges for biodiversity conservation in the Danube River</i>	9
Vladimir Stevanović <i>HIPPO effects on biodiversity changes in Danube accumulations</i>	17
Jasmina Šinžar-Sekulić, Aljoša Tanasković <i>Preliminary research of macrophyte production in Danube reservoirs – case study of two invasive plant species – native <i>Trapa natans</i> and alien <i>Paspalum paspalodes</i></i>	33
Momir Paunović, Béla Csany <i>Southern Corridor of Aquatic Invasive Network – the Danube river paradigm</i>	45
R. Kalchev, M. Beshkova, V. Evtimova, R. Fikova, H. Kalcheva, V. Tzavkova, V. Vassilev <i>Long-term trophic changes in Bulgarian–Romanian Danube River section and in adjacent wetland on Bulgarian territory during its restoration</i>	55
Jovan Despotović, Marko Ivetić, Mihajlo Gavrić, Aleksandar Šotić <i>Integrated evaluation of hydrologic, hydraulic and sediment processes on the Danube influenced by the Đerdap reservoir, aiming at projection of system safety accounting for global and climatic conditions</i>	79

Cristian Hera, Nicolae Panin <i>Strategy of Romania Development in the Following 20 Years, including the Lower Danube Problems – a strategy proposed by the Romanian Academy</i>	87
Boris Bourkinskyi, Paul Goriup, Oleg Rubel <i>Potential of innovation for biomass use in Danube region of Ukraine</i>	91
Pavol Sajgalik <i>WATERS initiative “People and water” coexistence in the Slovakian Danube region</i>	93
TOPIC 2: Universities in Transition	
Ivanka Popović <i>The role of higher education in developing an innovation spirit</i>	97
Alojz Kralj <i>Danube regions universities in transition: the issues and challenges</i>	99
Marijana Vidas-Bubanja <i>Education as a way to prepare Serbia for digitally connected world</i>	119
Georgi M. Dimirovski <i>Chinese approach in globalization era: information-based revolution of education, science and technology</i>	143
Dejan Popović <i>For whom are the Ph.D. schools in Serbia today?</i>	163

TOPIC 1:

Endangered Danube:
What can we do?

POTENTIAL OF INNOVATION FOR BIOMASS USE IN DANUBE REGION OF UKRAINE

Boris BOURKINSKYI**, Paul GORIUP*, Oleg RUBEL**

Reeds grow prolifically in the lower parts of the Prut, Danube and Dniester river basins in Ukraine, Moldova and Romania. Indeed, one of the largest extents of reedbeds in the world occurs in the region. However, extensive modification of floodplains since the 1950s (for flood control, irrigation and fisheries) has had significant impacts on wetland habitats and biodiversity, as well as wetland ecosystem services. In particular, monotonous reedbeds have become more widespread, and generally regarded as a nuisance. Yet, reeds mostly grow on land that is too wet or marginal for conventional agricultural production and represent a substantial source of biomass for construction materials, shade and shelter matting and renewable energy. Such use of reed biomass can contribute to climate change mitigation by:

- storing CO₂ on mid-term scales in construction materials;
- safeguarding carbon stocks in peat soils formed by the accumulation of reed rhizomes; and
- substituting fossil fuels with renewable biomass for energy production.

Assuming that about 70% of the reedbed area is accessible (excluding areas under strict protection or unsuitable for harvest), that a two-year harvest rotation is used, and that an average yield of 8 tons of dry reed per hectare is obtained, it is estimated that the project area could in time sustainably generate some 100,000 tons of reed biomass per year. In energy terms, this is equivalent

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to almost 50,000 tons of coal, or 39.5 million cubic metres of gas. Thus, using reed biomass would not only provide a substantial amount of energy, but also avoid emitting some 79,000 tons of CO₂ from burning fossil fuels.

The extent of organic soils, which are particularly suitable for paludiculture and carbon storage, covered significant areas in the Prut (3,873 ha; 3.3%) and lower Dniester (20,466 ha; 17.3%). Although further research is needed concerning the organic layer depth, organic bulk density and carbon content, assuming modest estimates of an average depth of 10 cm and 35 kg of carbon per cubic metre, the organic soils in the study areas contain in the order of 850,000 tons of carbon, and this amount is increasing as the organic matter accumulates over time.

These initial results from the Desk Study demonstrate that the wetland biomass resources (mainly reedbeds), as well as the organic soils, of the lower Prut, Danube and Dniester rivers are economically and environmentally significant in their own right. Further research, development and investment would allow these resources to be better managed and utilised while at the same time maintaining their ecological sustainability.

Given its wide occurrence and abundance, reed utilisation has the highest potential in the study area in the short term. It is currently harvested mostly for construction materials, but it can also be used as a source of organic chemicals and for energy by combustion or digestion for biogas. Indeed, since as much as 50% of the reed harvested for thatch is unsuitable for that purpose, amounting to several thousand tons a year in Vylkove alone, seeking other uses for this by-product would eliminate waste and increase economic efficiency.

Innovation for efficient and sustainable use of renewable resources is gaining global importance and needs transboundary efforts for optimisation. The “Triple Helix” approach is one in which the potential for innovation and economic development is enhanced by close, mutual interaction between government, research bodies, and industry. For example, in 2009 the European Commission established the European Institute for Innovation and Technology (EIT) to connect and stimulate cooperation between top-level research and development of academic and industrial research institutions. EIT currently administers five so-called Knowledge and Innovation Communities (KICs) from their headquarters in Budapest, Hungary.

Forming a Triple-Helix cluster is the best way to achieve innovation for sustainable use of wetland biomass, and obtain the inherent ecosystem benefits this approach entails. Such a ReedBASE cluster could cooperate to develop initiatives and address obstacles that impede ecologically and economically sustainable use of the considerable existing and potential wetland biomass resources available in the lower Prut, Danube and Dniester river floodplains.