

society and (3) to provide means to improve the scientific excellence of all involved partners by intensified and focussed educational activities. EcoManAqua focuses in particular on aquatic biodiversity change (e.g. invasive species), the imbalance of the sediment transport as well as hydromorphological and water quality change. It acknowledges that varying and intensifying human uses led to societal conflicts related to the provision of riverine ecosystem services such as production of goods, transport, power generation, limited self-purification potential and regulation of the regional water balance, tourism and conservation and restoration of heritage sites to name but a view. These management challenges are emphasized by ICPDR and they are expected to lead to even more severe changes, if future drivers of change such as climate change and demographic shifts and the effects of multiple pressures are taken into account. The activities implemented by the network aim in general to achieve a better understanding of complex interacting societal and environmental processes.

Short and long-term students and teachers exchange including joint supervisions of master and PhD students as well as further educational joint activities should help to

- Establish a well-working active network in the field of aquatic sciences and ecosystem management based on the common strategy of the network
- Increase and improve the number of students' and

teachers' mobility and establish joint activities such as summer schools or short term excursions

- Exchange expertise to foster targeted joint research activities especially in Central, East and South East Europe-Programs.
- Explore the potential of joint programs based on existing programs and initiate new activities in that direction to guarantee long term cooperation
- Disseminate, promote and publish network activities in cooperation with existing networks and based on the well-established capacity among partners
- Improve the level of mutual use of ICT communication (SKYPE, web conferences, other web based tools, e-mails) and of communication tools of involved partners
- Built bridges to further EUSDR initiatives and intensified linkages to other existing networks and stakeholder groups.
- Foster contributions to international conferences in the field of interdisciplinary aquatic sciences and ecosystem management in the region in the coming years.

Further details on the programme and mobility opportunities can be found at <http://www.ceepus.info/#nbb>.

Irvine K, Weigelhofer G, Popescu I, Pfeiffer E, Păun A, Drobot R, Gettel G, Staska B, Stanica A, Hein T, Habersack H (2016): Educating for action: Aligning skills with policies for sustainable development in the Danube river basin. *Science of the Total Environment* 543 A, 765-777

HR 21 – a new interdisciplinary Doctoral School to address present and future challenges of Human-River-Systems in the 21st century

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Inter- and multidisciplinary approaches are required today by many research funds and programs. Interdisciplinarity is a major term and guiding principle of a multitude of individual research projects. Many researchers acknowledge that this is needed to solve the pressing challenges of today's societies and the earth's environment. Nevertheless, it is often concluded that the term is used as a mere buzzword and lacks adequate consideration in the practical implementation of projects. One reason might be a lack of training and expertise which is necessary to tackle the complexity evolving from inter- and multidisciplinary research.

Recognising the need for education in inter- and multidisciplinary research, the University of Natural Resources and Life Sciences, Vienna (BOKU), has developed and established

a new Doctoral School. PhD-students shall be enabled to address and understand riverine landscapes as complex systems which are subject to inherent natural dynamics and processes and simultaneously affected by long-term multiple pressures which are driven by changing societal demand, far-ranging technical interventions and an intense use of partly conflicting ecosystem services. The industrialised riverine landscapes (IRL) we find today are heavily modified and thus hybrid systems. Complex interaction between environment and societal processes and the co-evolution of these two spheres urgently require a socio-ecological systems approach in both science and management.

The faculty of the doctoral school involves 15 scientists from BOKU and the Alpen-Adria Universität Klagenfurt (AAU)/ Faculty for Interdisciplinary Studies in Vienna (IFF). They join their expertise in terrestrial and aquatic ecology, engineering and technical sciences focusing on water engineering in river systems, social sciences and humanities addressing land and water use competition, ecosystem services, spatial planning, (urban) infrastructures and resource demand (e.g. hydropower, water supply) as well as cultural programs in the past, present and future of IRL.

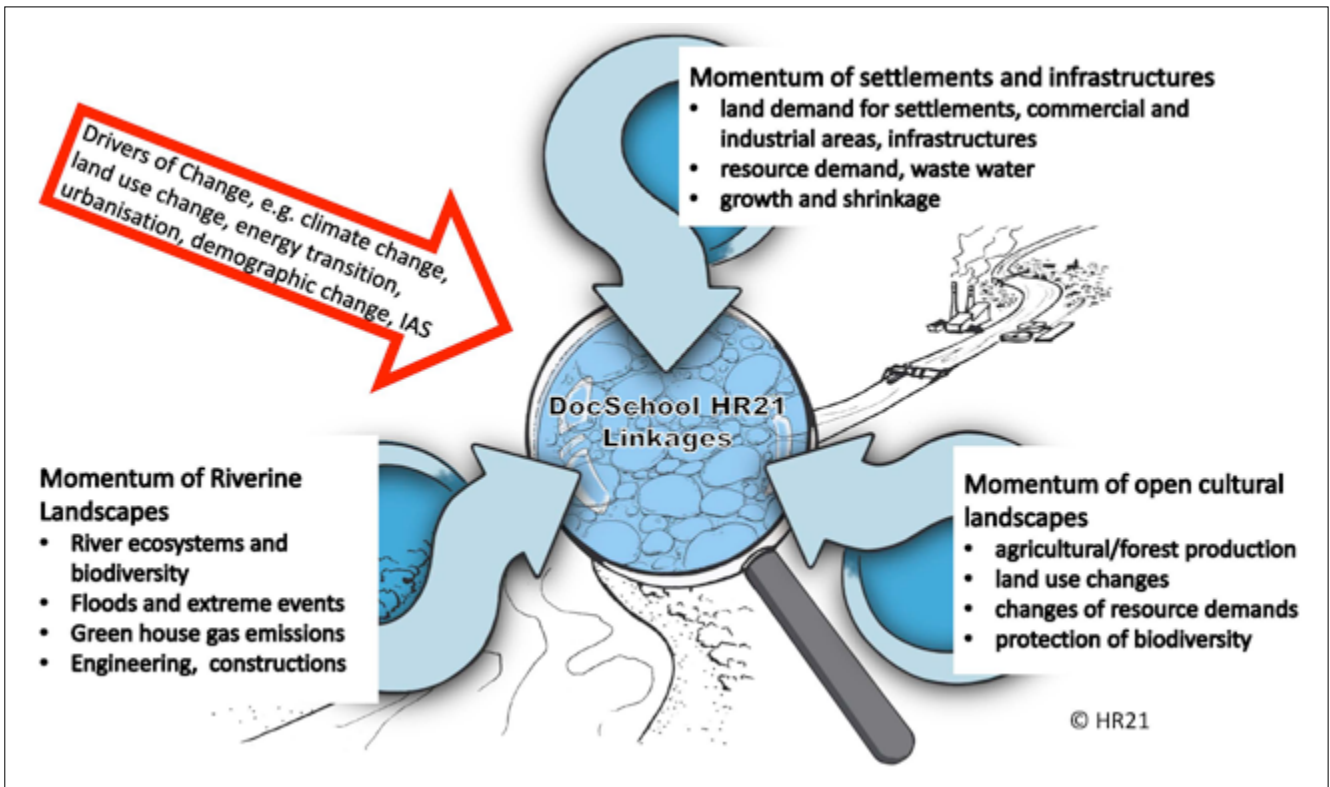


Figure 1. The interdisciplinary approach of HR21

HR21 aims to address critical knowledge gaps in IRL- and coupled socio-ecological systems research as well as to develop new analytical and modelling tools. A new generation of scientists shall be trained in a multi- and trans-disciplinary environment and interdisciplinary Human-River-System research shall be strengthened. HR21 targets to provide a new interdisciplinary understanding of the future development of IRL and their efficient and sustainable management. The program starting in 2018 will also foster international cooperation by creating an international working atmosphere at several levels (e.g. international experts in

mentoring teams, research stays abroad, guest scientists) and will establish linkages to other national and international programs, thus increasing the number of PhD students in that field.

The ultimate long-term goal of HR21 is to establish a centre of excellence for socio-ecological system research of riverine landscapes in Austria. The Danube and its tributaries will be a strong spatial focus and international cooperation on the catchment level is a clear necessity in this new endeavour.

INADAR – a EU-Life Project addressing current problems in a modern river management in Southern Germany

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EU-Life Project INADAR (Innovative Approaches to Dam Restoration and the Environmental Improvement of River Banks)

Many dams along the impoundment area of barrages are now in need of restoration and must be elevated for flood protection due to increased requirements. For dam elevation the dam is usually widened not on the water but on the air side, resulting in higher land consumption and damages on

the riparian forests (often FFH areas). Usually, extensive authorization procedures are necessary and high costs for the rehabilitation occur.

As part of the EU-Life project INADAR, an innovative approach for ecological dam restoration is developed and implemented in two test sites. The restoration and/or elevation of the dams and the improvement of the ecological situation according to the Water Framework Directive (WFD) should be fulfilled effectively and economically in one process. The focus is the installation of so-called 'eco-berms' that ensure dam stability as well as the improvement of the ecological situation in the shore area of the dams. Due to the implementation of the measures solely on the water side damages on the riparian forest can be completely avoided.