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Educating for action: Aligning skills with policies for sustainable development in the Danube river basin

Kenneth Irvine^{a,*}, Gabriele Weigelhofer^{b,c}, Ioana Popescu^a, Ellen Pfeiffer^d, Andrei Păun^{e,f}, Radu Drobot^g, Gretchen Gettel^a, Bernadette Staska^c, Adrian Stanica^h, Thomas Hein^{b,c}, Helmut Habersack^c

^a UNESCO IHE Institute of Water Education, Westvest 7, 2611 AX Delft, The Netherlands

^b WasserCluster Lunz GmbH, Dr. Carl Kupelwieser Promenade 5, 3293 Lunz am See, Austria

^c University of Natural Resources and Life Sciences, Institute of Hydrobiology and Aquatic Ecosystem Management, Max-Emanuel Straße 17, 1180 Vienna, Austria

^d Managing for Sustainability, Lookwatering 7b, 2635CJ Den Hooft, The Netherlands

^e Bioinformatics Department, National Institute of Research and Development for Biological Sciences, Splaiul Independentei nr. 296, CP 16-17, 060031 Bucharest, Romania

^f Escuela Técnica Superior de Ingenieros Informáticos, Universidad Politécnica de Madrid, Campus de Montegancedo s/n, Boadilla del Monte, 28660 Madrid, Spain

^g Technical University of Civil Engineering, Bucharest, Romania

^h Romanian National Institute of Marine Geology and Geoecology, GeoEcoMar, Str. Dimitrie Onciul 23-25, Sector 2, 024053 Bucharest, Romania

HIGHLIGHTS

- The Danube requires a coherent educational strategy for integrated basin management;
- Basin managers as sustainability change agents need technical and relational skills;
- Harmonizing economic, educational, environmental and social strategies is essential;
- Regional knowledge networks can be effectively supported by the EU Bologna Process;
- Filling governance gaps across the region stimulates effective natural resource use.

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ABSTRACT

Sustainable river basin management depends on knowledge, skills and education. The DANCERS project set out to identify feasible options for achieving education for sustainable water management across the Danube river basin, and its integration with broader education and economic development. The study traced the historic, regulatory and educational landscape of water management in the basin, contrasting it with the complex political decision-making, data-heavy decision support, learning-centred collaboration, and information-based participation that are all inherent components of Integrated Water Resource Management (IWRM). While there is a wide range of educational opportunities and mobility schemes available to individuals, there is no coherent network related to training in water management and sustainable development in the study region. Progress in addressing the multi-layered environmental challenges within the basin requires further aligning of economic, environmental and educational policies, advancing the EU Bologna Process across the region, and the development of dedicated training programmes that combine technical and relational skills.

The DANCERS project identified key short and medium term needs for education and research to support progressive adoption of sustainable development, and the necessary dialogue across the public and private sectors to align policies. These include the development of new education networks for masters and PhD programmes, including joint programmes; improved access to technical training and life-long learning programmes for skills development; developing formalized and certified competency structures and associated accreditation of institutions where such skilled individuals work; and developing a co-ordinated research infrastructure and pan-basin programme for research for water management and sustainable development.

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* Corresponding author.

E-mail addresses: K.Irvine@unesco-ihe.org (K. Irvine), gabriele.weigelhofer@wkl.ac.at (G. Weigelhofer), i.popescu@unesco-ihe.org (I. Popescu), mail@ellen-pfeiffer.de (E. Pfeiffer), andreipaun@gmail.com (A. Păun), drobot@utcb.ro (R. Drobot), g.gettel@unesco-ihe.org (G. Gettel), Bernadette.Staska@boku.ac.at (B. Staska), astanica@geocomar.ro (A. Stanica), thomas.hein@boku.ac.at (T. Hein), helmut.habersack@boku.ac.at (H. Habersack).

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1. Education for sustainable water management: making the case

Without knowledge, action is useless. Without action, knowledge is futile.

[Abu Bakr]

A sustainable world is an educated world. Its 'green economy'¹ is based on skills, innovation, and 'big data' (Manyika et al., 2011). Its political leadership tackles 'super wicked problems' (Levin et al., 2009) using complex science of the 'total environment' and global collaboration. Informed citizens play a central role in its participatory processes. The global search for a more sustainable trajectory of human development is powerfully expressed in the upcoming Sustainable Development Goals (SDGs) (United Nations, 2013) and Europe aspires to create 'smart, sustainable and inclusive' economies.² In practice, however, European policy remains firmly committed to economic growth as the prime objective. As the cost that current economic logic imposes on future generations becomes ever more visible (Steffen et al., 2007; Rockström et al., 2009), effective implementation of sustainability policies gains more attention. Results beyond rhetoric depend on many individual actions, choices and decisions across societies. In an era that increasingly recognizes systemic fallacies in human decision making and behaviour (Vandenbergh et al., 2011; Ansar et al., 2014; The World Bank, 2015), the role of education as enabler for sustainability becomes undeniable.

Water has a central role in sustainable development. Essential for human survival and economic activity, it is also under increasing pressure, with urgent implications for food security and human well-being (Falkenmark et al., 2009; Bigas, 2012; UN-Water, 2013). A putative SDG dedicated to water-related issues aspires to worldwide implementation of Integrated Water Resource Management (IWRM) by 2030.³ IWRM, the coordination of all water related decision making across a drainage basin, is supported and promoted by many international agencies, think tanks, consultancies and academia (Global Water Partnership, 2009; Mollé, 2009; Mukhtarov, 2008; Sanchez and Eds, 2014; Snellen and Schrevel, 2004). All versions share the conviction that only a holistic, integrated approach to water management will reduce catastrophic water crises and events in the future. However, integrating policies across political boundaries is difficult. Nowhere in Europe is this more evident than in the river basin of the Danube that connects 10 countries with very different histories, cultures, living standards and governance capacities (Sommerwerk et al., 2010). In recent years, extreme flooding has highlighted vulnerability to extreme weather events and the gaps in adaptive and responsive management capacities in the basin (UNECE, 2009; ICPDR, 2014).

DANCERS (Capacity building and Excellence in River Systems (delta, river and sea)), a basin-wide EU FP7 project, set out to identify feasible options for achieving education for sustainable water management across the Danube river basin, delta and coastal sea. Calls for capacity development supporting creation of effective IWRM institutions are omnipresent (UNESCO, 2009; UNECE, 2013; UNU-INWEH, 2015), but the full extent to which sustainable water management depends on knowledge, skills and education is rarely acknowledged. Common presumptions are that the necessary skills are mostly technical, and restricted to the training and hiring experts for a limited number of positions in relevant agencies. In reality, coordinating policies across basins confronts water managers, policy-makers and societies with highly complex questions. Typically, policies are designed for different scales (Young, 2002; Cash et al., 2006), different environmental spheres, and diverse forms of human activities (Pahl-Wostl, 2007; Oberthür and Stokke, 2011). Because long delays occur between policy adoption and visible – positive or negative – impacts on hydrological and natural

systems, water governance requires both strong political will and policy-makers capable of grasping long-term impacts of policy decisions or environmental changes. Increasing variability in water flows and weather caused by climate change adds the need for a transition to 'adaptive' policies that change whenever natural, social or technical changes render achievement of current objectives impossible (Jeuken and Reeder, 2001; Pahl-Wostl, 2007; Pahl-Wostl et al., 2010a). At the same time, rapid advances in digital technologies dramatically increase the demand for 'big data'-evidence that supports management (Desouza and Lin, 2011; United Nations, 2014), while simultaneously requiring its validation and legitimacy through public participation and transboundary scientific collaboration (Mason, 2010; UNECE, 2013).

Large data-sets are useless without qualified interpretation, and can even hide the lack of knowledge underpinning policy initiatives. Managing knowledge and policy networks successfully and productively requires cultural sensitivity and highly sophisticated management, communication and negotiation skills; especially in a basin with many member countries and large differences in technical and social realities (Creech and Willard, 2001; Klein, 2005; Cap-Net, 2008; Castells, 2008; Jarvis and Wolf, 2010; Klijn et al., 2010; Newig et al., 2010). In short, IWRM requires social and relational competencies as much as technical ones, an enabling environment of formal and informal institutions, an informed political community willing to act, and ultimately a functioning and vivid civil society (Saleth and Dinar, 2005; OECD, 2011; Sterner, 2011). The list reveals the strong interconnectedness between the specific goal of capacity development for IWRM and broader educational and economic agendas. Most competencies described are not water-specific, but largely identical with those required for a dynamic, sustainable knowledge economy: Education for effective water management serves sustainable development, and education for sustainable development benefits water management.

The following sections outline the characteristics of a comprehensive regional educational strategy designed to support sustainable water management. Sections 2 and 3 briefly present the historical background, political context and legal framework for water management and skill development in the Danube macroregion. Section 4 summarizes educational needs and opportunities identified by the DANCERS project. Section 5 considers the implications of regional policy integration and an overarching sustainability agenda for the training of future water managers and develops a holistic competency profile. Recommendations on how to begin 'educating for action' conclude the analysis.

2. The state of sustainable basin management in the Danube region

The Danube flows through 10 countries from its origins in southern Germany to the Black Sea, approximately 2860 km downstream (Sommerwerk et al., 2009; Jelev and Jelev, 2012). On that journey, it drains a catchment of 808,000 km² from 19 countries, and from more than 60 navigable tributaries (Fig. 1). It transverse diverse landscapes and cultures that have shaped the history of the region. As with most trans-boundary rivers, basin management was historically driven by the economic relevance of trade and shipping routes. Already in Roman times, a major road connected four provincial capitals, trade centres and 200 military forts along the river (Grant, 1994). The river's strategic importance continued through medieval and modern history, with centuries of political disruption and war affecting both the social and economic fabric of the region, the river and delta (Glenny, 2012; Priagarin, 2015).

From the mid-eighteenth century a coordinated approach to navigation and trade evolved. The 1856 Treaty of Paris established a set of commissions controlling navigation, commerce and 'improvements' on the river. In various incarnations, and since the 1920s with the support of taxes and duties levied for the purpose, the Danube Commission oversaw increasing modification of the river's hydromorphology. Since the 1950s, oversized and largely unproductive fish ponds, separation of back waters from main channels and artificial connection of water bodies altered

¹ <http://www.unep.org/greeneconomy/>.

² http://ec.europa.eu/europe2020/index_en.htm.

³ <https://sustainabledevelopment.un.org/focussdgs.html>.

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