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BOOK OF ABSTRACTS

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SMART Research: Outcomes of a nine-year international interdisciplinary doctoral programme in river science

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River science is an emerging interdisciplinary scientific field that aims to provide a multidimensional knowledge basis needed to understand the complex functioning of river systems that is essential for their sustainable management. Here we present an assessment of the 'Science for MAnagement of Rivers and their Tidal systems' Erasmus Mundus Joint Doctorate (SMART EMJD), a nine-year European programme in river science (2011-2019). A new generation of 36 young scientists (15 EU and 21 non-EU nationals) was trained to engage in state-of-the-art interdisciplinary research within an international context.

Training was delivered by three high-ranking national academic institutions with complementary specialisms: University of Trento (Department of Civil, Environmental and Mechanical Engineering), in collaboration with the hydrobiology research unit at the Edmund Mach Foundation; Freie Universität Berlin (Institute of Biology), in collaboration with the Leibniz-Institute of Freshwater Ecology and Inland Fisheries; and Queen Mary University of London (School of Geography). Through mandatory secondments, additional training was provided by associate partners, including also government agencies. Each candidate was assigned to a primary institution, which defined general regulations for conferral of the joint doctoral degree, and a secondary institution, where they undertook coursework and/or conducted research for a minimum of six months.

Three aspects of the SMART EMJD were investigated in this study (1) interdisciplinarity in research; (2) internationalism; (3) global impact; and (4) science for management. Seventy scientific publications have so far been produced by the SMART candidates, which have been cited 831 times to date. Publications were reviewed together with the doctoral theses and official reports. We also administered two surveys (one to alumni and one to supervisors) to gain feedback on the four key aspects.

Candidates were supervised by at least two supervisors of different disciplinary backgrounds. The study showed that more than 90% of candidates and supervisors dealt with at least one new subdisciplinary research area in relation to their background. The average duration of a doctoral thesis was 3.4 years, and 86 % of all candidates successfully finished their thesis. After finishing their doctorate 50% of the candidates worked in academia, 17% in governmental institutions, 11% in the private sector, 8% in research institutions or NGO and only 1 was unemployed. Only 36% returned back to their home country.

Interdisciplinarity was recognized as one of the most rewarding aspects of the program. The main challenges of the program were related to the short duration and differences between backgrounds of candidates and supervisors. This study can provide guidance for similar initiatives aimed at training early stage researchers in river science that might develop in the future.