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River Culture: Living with the River, Loving the River, Taking Care of the River

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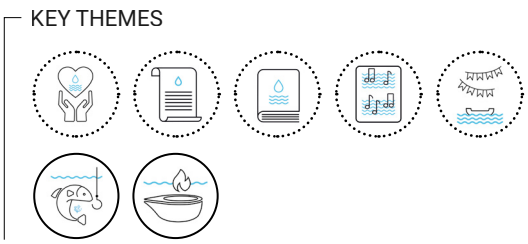
An unbelievably small portion of the water available on planet Earth, just 0.00015 per cent of it, runs in rivers (Garcia-Moreno et al. 2014). And yet, this is the most important water source, not only for humans, but also for animals, plants and entire ecosystems on all continents. The natural flow regime of rivers, including periods of floods and low flows, has set the pace for cultural activities and biological evolution since the earliest days. But, in assuming that water is a resource that can be exploited without limits, humanity and global life support systems are running into an existential crisis, recently worsened by climate change. This article presents the book publication River Culture – Life as a Dance to the Rhythm of the Waters, *which bears the name of a scientific concept that offers a way out of this crisis. Its innovative approach combines adaptive strategies developed by non-human biota with cultural practices resulting from human-nature interactions. The goal is to develop sustainable management options for river catchments (Wantzen 2022, 2023).*



< Fig.1 Traditional boat architecture is one expression of river culture (Source: Karl M. Wantzen, 2022, CC-BY).

Introduction

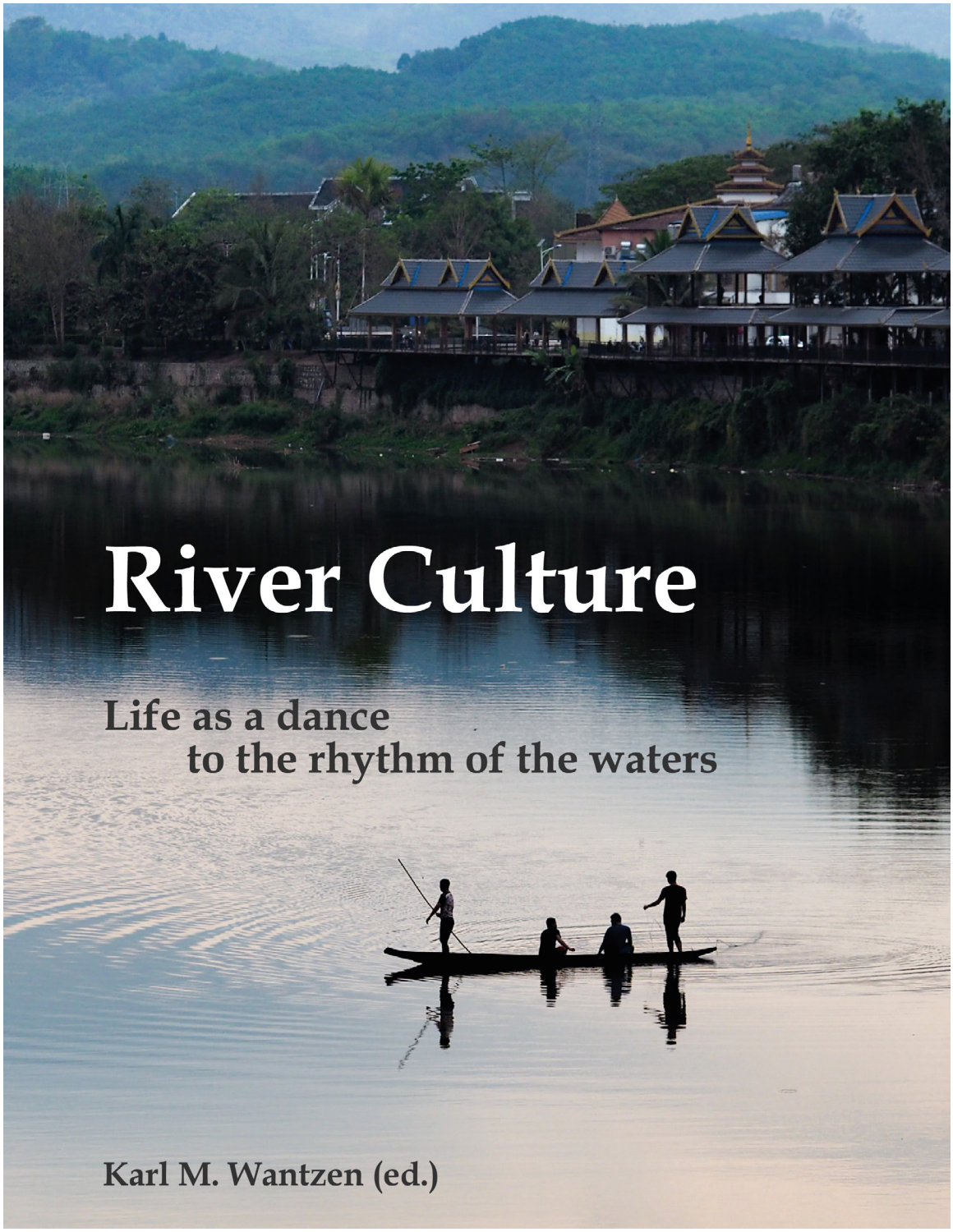
Rivers are both cradles of innovation and cultural conveyor belts. In a recent worldwide study, more than 120 scientists from different academic fields and 24 countries of origin jointly analyzed the biocultural diversity of rivers, the threats to this diversity, and examples and perspectives that can be helpful for overcoming the meltdown of biological and cultural diversity (fig. 2) (Wantzen 2023). *River Culture – Life as a Dance to the Rhythm of the Waters* presents socio-ecological portraits of twenty-eight rivers from four continents: six river case studies in Africa, seven in Asia, six in the Americas and nine in Europe. Five reviews explain sustainable concepts for riverscape management in the Anthropocene, two chapters deal with artists' perspectives on environmental communication and one with gender equality. *River Culture* delivers, for the first time, a synopsis of the diversity of cultural practices linked to rivers – from religious practices to architecture – and their historical development from ancient times to the postmodern era. Not only did the study envisage a list of elements of biological and cultural diversity, but also it investigated how these adaptive mechanisms (in the case of non-human biota) and the cultural practices (by humans) could be used to improve the management of riverine landscapes. The book has been designed to serve as a toolbox of examples, showing how river-related problems can be overcome, and how engaged societal groups have succeeded in implementing widespread solutions that contribute to the shared 2030 Agenda for Sustainable Development.

Surprising similarities were found between riverine contexts, despite huge geographical distances and cultural differences, such as the alternating "common use" of assets during high water periods and the "ownership of territories" during dry periods in floodplains in Africa and South America. Consideration of this alternating use form, originally driven by the rhythm of the waters, could stimulate ideas for tackling problems of poverty and resource overuse.

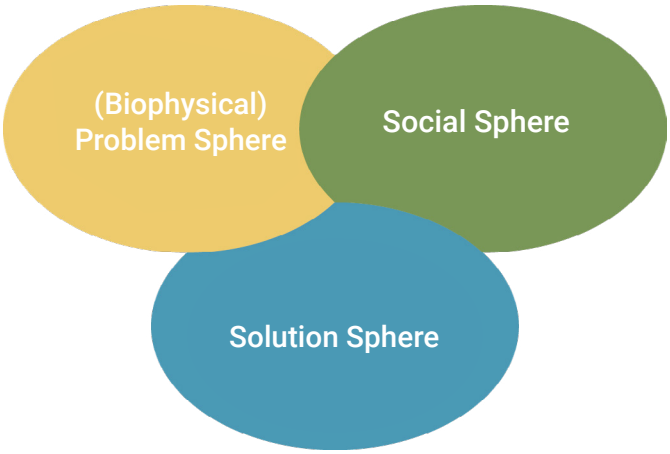
Global Similarities and Culture-Specific Patterns in Human-River Relationships

The authors of *River Culture* are campaigning for justice between upstream and downstream communities along rivers (especially in the case of dam construction and interbasin water transfer [Boelens et al. 2022]), as well as between humans and non-human species, stating: "Those who have a snout or a beak cannot complain when all the water becomes deviated for irrigation or energy production, but they also have a right to live." Moreover, the authors warn that most natural floodplain wetlands and practically all river deltas are vanishing as a result of the blocking of environmental flows of water and transport of sediments by dam construction. In the case of the Mekong, just 1 per cent of the original amount of sediment, before damming, reaches the sea. At the same time, migratory fish (including the most important species for inland fisheries) and other freshwater species are vanishing worldwide, and, along with them, the cultural activities connected to them. The authors of *River Culture* state that they recently observed an intergenerational disruption of cultural memories and they show how those memories can be revitalized and integrated into global actions, such as the UNESCO Global Network of Water Museums and the Intergovernmental Hydrological Programme (IHP).

The effects of biophysical deterioration and the concomitant meltdown of cultural diversity are remarkably similar worldwide; however, motivations – that is, why people begin to take action



^ Fig. 2 The book *River Culture – Life as a Dance to the Rhythm of the Waters* (Wantzen 2023) delivers a global study of human-river relationships (Source: Photo by Pia Parolin, 2023; cover design by Karl M. Wantzen, CC-BY-SA 3.0 IGO).



^ Fig. 3 Actions toward sustainability (e.g. river restoration projects) require matching the "problem-sphere" with the "social sphere" to result in efficient solutions (Source: Karl M. Wantzen, 2023).

to solve or mitigate the problem – show great intercultural variation and may involve both bottom-up and top-down approaches. For example, religious or educational motivations drive community-based conservation initiatives in India, while the River Chief System in China was implemented by the government to combat water pollution (Cao and Vazhayil 2023).

Current and Future Challenges to the Sustainable Management of Riverscapes

The greatest challenge involved in saving the ecological and social functions of rivers as life support systems for all continental biota, human and non-human, involves the transfer from well-established knowledge about urgently needed actions (detailed, for example, in the water-related SDGs) to successfully implemented (and not only planned) actions (Vörösmarty et al. 2018). The warnings about global tipping points are old news – especially when it comes to the essential freshwater ecosystems – but the global trends of further deterioration, e.g. building more dams, polluting water and overexploiting the remaining freshwater fauna, continue unchanged. For instance, in 2018, the global average of the Living Planet Index for freshwater was only 16 percent that of 1970. Facts and evidence alone do not suffice; rather, what is necessary are globally binding contracts and the issuing and reinforcing of laws. To find support for these measures, human-nature relationships (or in this case, human-riverscape relationships) need to be strengthened. However, these linkages are often bound to intangible cultural practices that were ignored by previous management policies.

The River Culture concept (Wantzen et al. 2016), with its innovative, double-sided approach of learning from selected biotic strategies and cultural practices (both of which have been tested for their capacities in sustainability) supports these initiatives to take action by adding new aspects. Recent global analyses of practical (and successful) applications, for example, in the context of urban hydrosystem restoration (Wantzen et al. 2019), the planning of hu-

man-river encounter sites (Zingraff-Hamed et al. 2021), stream daylighting (Wantzen et al. 2021), river restoration (Wantzen et al. 2022), and the management of dedicated sites in riverscapes (Yousry et al. 2022), show how the "biophysical problem-sphere" and the "social sphere" need to be matched into a "solution sphere" to support and gain social acceptance of the needed project (fig. 3). In this context, it is important to note that the more complex the problem, the more intense the social adherence to natural processes and sustainability should be. Relatively simple projects, such as the establishment of wastewater treatment to overcome water pollution, are easily understood and readily supported by the concerned population. However, if complex restoration projects, such as dam removal, are not sufficiently incorporated in the perception and understanding of the community, they may provoke resistance, as recently seen in the case of the Sélune River in France, where after dam removal, a protest movement resulted in a checkmate situation in national dam removal policies.

Conclusion

River culture, that is, the combination of evolved (biological and cultural) practices that are adapted to the natural rhythms of water (also known as flood pulse or natural flow regime), provides a sustainable approach to riverscape management. The currently prevailing value systems, which only consider the river as a set of assets to be maximally exploited, is definitively unsustainable. Current tendencies to change this value system by acknowledging the water needs of ecosystems to function well (environmental flows, ecological flows), the rights of non-human species to live well (that is, not only to survive but also to evolve further), and the rights of First Nations as users of rivers, and so on, are currently gaining increasing importance, for example in global and political frameworks such as UNESCO's IHP IX, the European Water4all policies and the French OneWater research program. The critical question is whether this development can happen quickly enough to cope with the increasing speed of socio-environmental degradation and the decreasing resilience of multiple stressed ecosystems. Most often, human activities in favor of nature only arise after catastrophic events such as the 1986 Sandoz accident, which resulted in initiating the first serious international treaties intended to reduce water pollution in the Rhine catchment. But do we need life-threatening events (including irreversible damages to our life-support systems) to take action? With the *River Culture* approach, the natural, cultural and emotional connections to the river are in focus and it is recognized that people who love their rivers (again) will respect them, take care of them and prevent them from harm, as they would for another human being.

Despite the many unpleasant truths shown in the *River Culture* case studies, there are also positive signs. The publication presents various examples of participatory management and governmental programs facing the global river crisis. "In many societies, a katharsis moment has taken place, and the insight that we need to protect entire riverscapes better than before is gaining momentum," the River Culture authors conclude optimistically.

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