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Issue #03 Delta Challenges under Nature-Based Solutions Perspectives

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Delta Challenges under Nature-Based Solutions Perspectives

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Deltaic areas and coasts tend to be extremely vulnerable as a result of the fusion of high-density urban agglomerations, overexploitation, and degradation of natural resources and the increase of climate events. The complexity of the combination of natural coastal and deltaic processes and human-made activities requires an integral perspective regarding planning, design, and governance (Meyer, 2009; Zagare, 2018).

This issue examines Nature-based solutions approaches to reach integral perspectives for achieving societal challenges in deltas and coasts, including climate adaptation, socio-economic development, and disaster risk reduction. By identifying major challenges worldwide on three socio-economic, biophysical, and governance perspectives, this issue explores the potentialities and possible constrains of these new perspectives to address societal challenges as well as dealing with the high level of complexity and uncertainty that characterizes these areas.

Nature-based Solutions (NbS) comprise “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits” (Cohen-Shacham et al., 2016). It is an umbrella concept that covers a whole range of ecosystem-related approaches, which can be implemented alone combined with more “traditional” solutions, basically related to grey infrastructure.

The design and implementation of NbS in deltas implies the recognition of four main challenges. The first challenge is related to the comprehension of Urban Deltas as complex adaptive systems which are subjected to internal and external drivers of change, in a context of high uncertainty. This means that these systems are constituted by components at different scales (element, subsystem, system, etc.), which interact as a result of constant adaptation processes. Working with NbS requires the understanding of the interrelationships that take place within the system and between the system and its environment, which are in a dynamic equilibrium (Manson, 2001).

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The second challenge is related to the change of paradigm associated with water management and risk reduction, from "grey" solutions to "green and blue" solutions, or a combination between them. The notion of controlling nature usually associated with the development of infrastructure has become obsolete in the face of present and future challenges. Nature based Solutions require integral approaches that acknowledge natural dynamics and a high level of uncertainty as part of the problem, but also the solution. Water management and risk reduction can be achieved through ecosystem-based actions without dismissing socio-economic development, and nature, within its own dynamics, can also enhance the efficiency of grey infrastructure when implemented combined as part of the same integrated strategy.

The third challenge is integration. The recognition of the complexity that lies behind sustainable transitions demands cross-sector and cross-scale alignment, and the development of integral plans that include all the dimensions and the stakeholders involved (Loorbach & Rotmans, 2006). In order to increase resilience, and adaptive capacity, it is necessary to build robust structures linking "soft" actions (capacity building, knowledge transfer, Integral Water Management Plans, etc.) and "hard" actions (infrastructure development, flood protection, Sustainable Urban Drainage Systems, etc.). This demands a change of paradigm in the existing planning framework, from adaptative planning towards planned adaptation. The systemic interdependencies are complex and dynamic; they can result in positive interactions but also present trade-offs which need to be assessed, projected, and acknowledged within a clear spatial adaptive planning system.

Finally, integration leads to the fourth challenge: participation. Social involvement and appropriate governance processes are critical for the success of NbS towards triggering transformative change. Governance of NbS must include opportunities for people to participate in the decision-making process, addressing inequities between the different groups, especially empowering the most vulnerable ones (IUCN, 2020). Integration in the delta management perspective can be enhanced by the consolidation and expansion of NbS approaches, going beyond the supportive perspectives that can be created through time via a robust and evolving system of care.

This issue presents collaborations of different authors in the fields of theory, project, and practice. All the articles pay special attention to the design and implementation of NbS in deltas, riverine, and coastal areas, addressing the challenges previously mentioned following different pathways and methods.

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JDU's' “Delta challenges under NbS perspectives” issue starts with the “Paper” section, bringing two contributions related to complexity approaches to deltas. Han Meyer presents a reflection on different perspectives to address the complex relations between natural and urban processes within delta areas. He emphasizes the need for a “second game change” to reactivate the dynamics and resilience of deltas giving priority to Nature-based Solutions and energy transition. The second Paper is a contribution by Veronica Zagare, who delves into the concept of Nature-based Solutions in relation to delta and coastal areas, focusing on complexity approaches to generate pathways for sustainable transition.

The “Dialogue” section of this issue presents and interesting contribution that discuss the challenges of deltas and a change of paradigm on delta management related to the concept of sustainable transitions and Nature-based Solutions, from the perspective of three experts on the field, Kim van Nieuwaal, Niki Frantzeskaki, and Emmanuelle Cohen Shacham.

The section “Practice” starts with a case of wetland restoration through a participatory process using autochthonous techniques in Argentina, presented by Heber Sosa and Nidia Amaya. It follows with the case of Water as Leverage – Cascading Semarang project (Indonesia), presented by Begoña Jaimerena, which focuses on closing the gap between Nature-based Solutions plans and implementation through strategies based on the theory of change. The section closes with the contribution of Michael van Buuren, who presents a method for research (through) landscape design to operationalize within the interface between science and practice.

The “Project” section includes the contribution of Johnathan Subendran, M. Van Nieuwehove, A. Menge, and K. Vanackere. They present experiences of Nature-based Solutions as productive interfaces enabling socio-ecological transformation along the Flemish coast, particularly in Blankebberge, Ostend, and Middelkerke. The section continues with an article by Hugo Lopez, who proposes a conceptual methodology for the landscapes within the Rhine Basin in the context of rapid energy transition.

The Dictionary section will delve into the concepts of Delta (by Cornelia Redeker) and Urbanism (by Giambattista Zaccariotto).

We expect that this special edition will contribute to the knowledge on Nature-based Solutions in relation to Delta territories, riverine, and coastal areas, and encourage new stakeholders from academia and practice, to get involved in the subject.

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