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Anthropogenic Rivers

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Living labs for improved collaboration in river management

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Introduction

Living labs are increasingly recognized as a way of promoting innovation and strengthening collaborative planning (Lupp, Zingraff-Hamed et al. 2021). As of recent years, the concept of the living lab has gained strong attention in European Union research and innovation agendas (Lupp, Zingraff-Hamed et al. 2021). With the shift in paradigm from closed to open innovation, living labs are referred to as a suitable example of open innovation environment that combine the changes in the socio-economic environment along with technical opportunities for the given context (Leminen 2015). Hence, living labs are increasingly applied across many disciplines including water and river management (Westerlund and Leminen 2011). In this paper, we aim to characterize living labs and understand their relevance to river

management, their envisioned and realized impact, and how living labs improve collaboration, if any, for river management. The results are based on a literature study and empirical data on living labs for river management.

Living labs characteristics and their relevance to river water management:

The concept of living labs is still very vague and remains open for different interpretations. This diverse definition of living labs has led it to be used as an umbrella term under which a large diversity of projects and activities are included (Capdevila 2014). However, the core of a living lab is mainly driven by two ideas; (i) involving stakeholders and users as co-creators, and (ii) experimentation/ innovation in a real-world setting (Almirall, Lee et al. 2012).

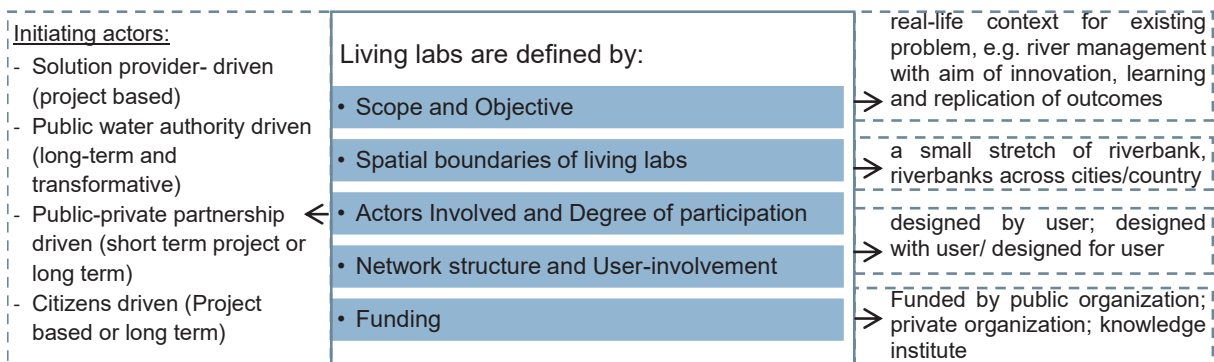


Fig: Living labs characteristic and typologies

The living labs are highly relevant for river management problems where multi-functional solutions are required with broad collaboration between multiple stakeholders such as citizens, companies and knowledge institutes. The challenges faced by river-managers requiring multi-functional solutions such as (i) integrated approach of flood risk management, (ii) cohesive task of dike improvement, nature conservation and recreation, (iii) integrated flood risk management with a focus on nature

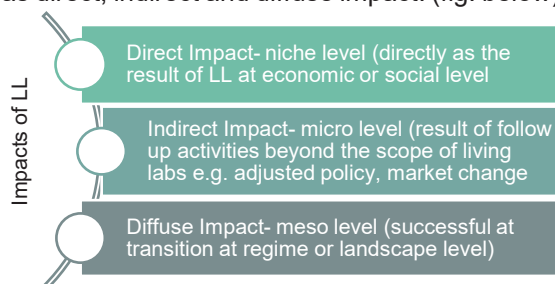
and tourism, (iv) connecting and balancing floods and droughts, etc. can be addressed successfully using living lab approach through close collaboration with residents, entrepreneurs, research institutes and governmental organizations. An example of such living lab in the Netherlands developed under the Delta programme is Overijssel living lab in IJssel-Vecht delta which was centred on climate resilience (Kennisportal Klimaat adaptatie 2020). Other living labs with a focus on river management are the Grensmaas Project (Living Lab Grensmaas) and Hedwige-Prosper polder (Antoine, Fauchard et al. 2021) that are currently being developed (researched).

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(Envisioned) Impact of living labs on river management:

Living labs are intended to enhance the creation of research and innovation synergies through the integration of knowledge, experience and expertise under the inclusion of different views and perspectives to create a useful and innovative product or service e.g. river management (Papadopoulou, Sophronides et al. 2018). The impacts of living lab can be seen as direct, indirect and diffuse impact. (fig. below)



One of the direct expected impacts of implementing living labs on river management is that the involvement of multiple stakeholders leads to the socio-economic feasibility of the innovation. For example, projects such as living lab Grensmaas created a platform for a dynamic trans-disciplinary community where professionals, businesses and locals worked together to make the project a long-lasting success. Since the Grensmaas project followed the living lab approach, residents' knowledge about nature and ecology could be used to improve integrated flood models as it was evident that many residents were experts by experience. As a result, the project successfully combines flood risk management, nature development and commercial gravel excavation (Consortium Grensmaas, Living Lab Grensmaas). Similarly, the Hedwige-Prosper polder project under Living Labs for Dutch Delta (LLDD) aims to re-design dikes under nature restoration context and reconnect people with the changing landscape (TUDelft 2019). The indirect impact of living lab takes longer time than direct impact while diffuse impact takes a long time and is difficult to measure as it usually lies beyond the scope of the project.

Collaboration as a result of living labs:

Existing examples of living labs in various disciplines show improved understanding of system elements, capacity building, and trust & relationship building among participants (stakeholders) which allows for the creation of a mutual understanding between science, policy and society (Veeckman and Temmerman 2021). The equivalent role of end-users in living labs makes them feel heard by scientists and policymakers, thus improving collaboration

leading to the social and economic success of the projects. Even though the living labs appear to be a perfect way of testing, demonstrating and initiating the spread of knowledge, practices and socio-technical solutions, they might not always necessarily provide the resources for diffusion beyond a certain boundary (von Wirth, Fuenfschilling et al. 2019). In the context of living labs for river management, which usually has a bigger spatial scope and objective of safety and risk minimization, a greater attention for interrelations with more formal structures, institutions and governance is required so that innovations in the living labs are effective and can be translated into policy development.

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