# Exploring learning within living labs to improve their impact on policy sphere

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### Exploring learning within living labs to improve their impact on policy sphere

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The necessity for evidence-based and socially applicable knowledge in policy processes underscores the importance of the science, policy, and society interface. This interface is increasingly desired to obtain a holistic perspective by integrating sectoral and interdisciplinary knowledge to address complex socio-technical issues (Eberle et al., 2021). Living labs have emerged as promising vehicle fostering collaboration among diverse stakeholders from academia, public and private organizations, and civil society to drive innovative solutions. While living labs provide contextual understanding through real-life experiments and engage diverse stakeholders, they do not inherently enhance policy integration (Willems et al., 2023). To leverage the knowledge and resources from living labs to policymaking, learning from these environments must be scaled up or replicated to tackle similar challenges elsewhere. Consequently, living labs must showcase their impact through tangible results (innovations), enhance stakeholder capacities, and facilitate iterative learning for continual improvement. While there have been some efforts in scaling up and iterating outcomes as well as improving the impacts, understanding the occurrence of learning within living labs is often overlooked.

Thus, in this study, we analyze the learning dynamics in living labs, recognizing that attention to learning within co-creative environments can help realize the desired outcomes and impacts by exploring what is being learned, who is learning, and how learning occurs (Bhatta et al., 2023). To this end, we first developed a learning framework for living labs, identifying (i) types of learning as content-, capacity- and networking-related, (ii) levels of learning as individual-, group- and organization/societal-level, and (iii) processes of learning as intentional and incidental. Subsequently, we applied this framework to the KLIMAP project, which aimed to develop climate adaptive water and soil management pathways in Dutch sandy soil region. Our analysis uncovered several evidence of various learning types, levels and processes linked to the project's outcomes. An indirect yet significant policy outcome of KLIMAP is the attention to water and soil management in Dutch policymaking through the water-bodem sturend framework. This outcome is attributed to years of research and numerous climate adaptation, land, and water management projects, including KLIMAP. Additionally, we formulated recommendations to enhance the impacts of the living labs as, ensuring inclusion of all relevant stakeholders, emphasizing effective communication among project stakeholders and with the wider public, providing accessible content through diverse mediums like audio-video, flyer and text, and acknowledging the time and labor-intensive nature of these interactions.