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How can living labs contribute to policymaking?

Authors

Astha Bhatta[1, 2], Heleen Vreudenhil[1, 2], Jill Slinger[1,3]

[1] Delft University of Technology, Netherlands,
[2] Deltares, Netherlands
[3] Rhodes University, South Africa

Abstract

For many years now, various knowledge evidence has indicated that the Dutch land and water systems are reaching their limits. Thus, instead of manipulating the water and subsurface to achieve the desired functions, functions need to follow what the land and water system can offer. Consequently, in 2022, the Dutch Ministry of Infrastructure and Water forwarded an innovative and transitional approach of letting water and soil guide the policymaking, namely 'water and soil guiding'. In this light, this research on progress paper aims to understand the cumulative role that living labs and similar projects existing before the policy guide had in the institutionalization of this policy guide. Further, 'water and soil guiding' is just at an initiation stage. This paper further tries to understand in what capacity can living labs support the operationalization, execution, and monitoring of this policy guide. In our preliminary finding, a direct link between the establishment of policy guide and the living labs existing before this establishment has not been formulated yet. However, indirect links such as delivering hard knowledge evidence, and formation and expansion of networks with relevant stakeholders has been recognized as indirect links.

Key words

Water and soil system, policy cycle, stakeholder network, impacts

Introduction

With water and land systems undergoing continuous changes due to natural and human factors, managing local and regional water and landscape has become a complex societal issue requiring long-term strategic visions for a resilient future (Bhatta et al., 2023; Haddeland et al., 2014). Land and water systems worldwide are characterized by a long history of human-landscape interaction. Especially in the case of the Netherlands, these systems were continuously manipulated to desired human needs for many centuries (Pronk et al., 2021). Meandering rivers were strengthened, polders were drained, and land was reclaimed by digging canals to drain out water and enhance agricultural productivity (Niesten & Frambach, 2023; Stouthamer et al., 2020). As a result, elaborate technical and organizational water-management systems have been designed to preserve the balance between agricultural activities and water safety (Van Lanen & Kosian, 2020). These systems have been used so intensively that they are increasingly running against their limits. For example, there is increasingly severe land subsidence and pressure on quality and quantity of water affecting shipping, agriculture, industry, and nature (Stouthamer et al., 2020). The system is no longer resilient or flexible enough to respond to the shock events such as floods and droughts because of changing climate, which further heightened the tension and uncertainty (Buitenhuis et al., 2020; Deltares et al., Jul, 2021). Therefore, a resilient and sustainable system is required for the changing environment (Niesten & Frambach, 2023).

The water and soil experts in the Netherlands have been pursuing these issues through diverse programs, citizen-science projects, living labs, and other similar approaches for a long time. Many knowledge institutions, along with government bodies, industrial partners, and local communities, have researched over time, proving the imminent need for integrated approaches to these systems by taking extremes into account. For example, '*Op Waterbasis,'* i.e., '*Based on water'* produced through knowledge collaboration among three institutes, highlights the limits to the feasibility of Dutch water and soil systems and the need for a paradigm shift (Deltares et al., Jul, 2021). Similarly, '*Water verbindt,' i.e.*, '*water connects,'* produced by the Union of water authorities and Association of water companies in the Netherlands, argues the need for a national water transition for a climate-robust water system (*Water Verbindt*, Feb 2021). Alongside such reports, many local and regional collaborative projects, Community of Practice (COP), and living labs for sandy soil and coastal areas have been working on the fields with locals, knowledge partners, and local government to understand and derive plausible solutions that lead to sustainable and climate-resilient land and waterscapes.

In response to the challenge of changing climate and intensive use of land and water, as evidenced by widespread reports and research, the Dutch cabinet decided that water and soil should lead the decision-making in country's spatial planning. Thus, endorsed by the Ministry of Infrastructure and Water, water and soil will become the guiding elements in policymaking in the Netherlands known as '*Water-en-bodem sturend'* i.e., '*Water and soil guiding'* ("Water-Bodem-Sturend," Nov 2022). The *'Water and soil guiding'* aims to restore natural water and soil systems, emphasizing the need to enhance resilience and robustness. By designing land use functions to promote cohesion and sustainability, this approach is critical in shaping the country's resilience to climate change and biodiversity preservation (de Rooij et al., 2023). This is an important transition step requiring an area-oriented approach and cooperation between different levels of government and stakeholders which is just in its initiation phase. As such, the living lab approach can be strategically employed to engage all relevant stakeholders in the co-creative approaches to further operationalize, implement, and monitor the policy guide.

Initially adopted in the private firms and industrial context, the living labs concept has emerged as a significant stream in innovation research and is extensively applied to involve citizens and end-user communities in business-citizens-government-academia partnership (Bergvall-Kareborn & Stahlbrost, 2009; Dutilleul et al., 2010; Ståhlbröst, 2012). Living labs have, in recent days, evolved into a policy tool utilized to improve innovation within the public sector (Nesti, 2017). Living labs can be positioned as a policy tool in different ways, one of them being supporting support policymaking with real-world evidence. They facilitate the development of innovative solutions and generate public value in tackling complex societal issues by co-creating innovations among quadruple helix stakeholders (Hansen & Fuglsang, 2020). Moreover, innovative policies and transition plan can often become politically sensitive issue (de Rooij et al., 2023). Thus, policymakers increasingly seek refuge in experimentation and innovation through living labs and other co-creative approaches for complex societal issues (Dekker et al., 2021).

Over the years, numerous living labs and co-creative projects have focused on climate-resilient land and water systems in the Netherlands, highlighting the importance of viewing water and soil management holistically rather than separately, leading to the introduction of *'Water and soil guiding'* for policymaking. Thus, in this paper, we aim to study in what ways did the existing living labs in the period before the policy formulation facilitated the establishment of the 'water and soil guiding.' Next, the paper seeks to understand how the real-world collaboration and innovation in living labs can further support in preparing, operationalizing, implementing, and monitoring such policies.

Case Study

To understand the roles that living labs can play in policy formation, implementation, and monitoring, we take two case studies, namely, Lumbricus and KLIMAP living labs (*KLIMAP*, 2022; Lumbricus, 2017-2020). The selected cases adopt real-world co-creative approaches to generate knowledge on climate-resilient land and water adaptation in the Dutch sandy soil region. Further, after the end of the Lumbricus program, KLIMAP carried its knowledge forward. Thus, these cases are apt to understand the ripple effect of one project leading to next to ultimately influencing policy making.

Both KLIMAP and Lumbricus investigated measures to retain and store water to combat extreme precipitation and prolonged periods of drought, especially in the higher sandy soil region. In this regard, the permeable nature of sandy soil poses a particular challenge, making it more susceptible to climate extremes (Ladányi et al., 2021). While both Lumbricus and KLIMAP worked with different water authorities, knowledge institutes, and local farmers to create healthy soil for agriculture and nature and optimize local and regional water systems, the stakeholder group, and scale of operation in KLIMAP was much more extensive. KLIMAP had a consortium of 24 stakeholders and experimentation was conducted at different levels. The living lab within KLIMAP experimented with potential innovations related to diverse crop types, improving water retention and soil structure in over 25 pilot areas via technical and nature-based solutions. The results of these experiments, along with the ones from Lumbricus, were put together in a catalogue mentioning which measures are applicable under what conditions. These measures were applied in designing the flexible, less-regret climate adaptive pathways at the regional level with the stakeholders.

Method

The research employs a qualitative analysis approach using multiple methods. First, desk research was conducted to understand the activities of KLIMAP and Lumbricus. Then, various documents on the ‘Water and soil guiding’ were analysed. Next, semi-structured interviews were conducted with the coordinators, project leaders, and experts (N=6) involved in KLIMAP, Lumbricus, and other relevant knowledge organizations. All interviewees were active in the field of water and soil (land) management and were related to the ‘water and soil guiding’ policy in different capacities. The questions were self-reflective regarding the role of living labs, their outcomes, impacts, and lessons learned. The study followed the snowball sampling procedure by Goodman (1961) to attain the interviews. The study started with a small pool of known informants and asked them to recommend potential interviewees. However, to get a comprehensive understanding of

the role of living labs in policymaking, other living labs and policy officers working with similar goals need to be interviewed. The insights gained so far were applied to position living labs as a 'knowledge and innovation' tool providing evidence for policymaking.

Preliminary Findings

The following preliminary findings were observed to link the output from KLIMAP and Lumbricus to the new policy guide.

1. Hard evidence: Deltafacts are short and factual summaries of practical knowledge in the field of water management, mostly consulted by policy officers, managers, and experts. Both these projects have made numerous contributions to Deltafacts, putting their knowledge output in an accessible platform for policymakers (*KLIMAP*, 2022; Lumbricus, 2017-2020).

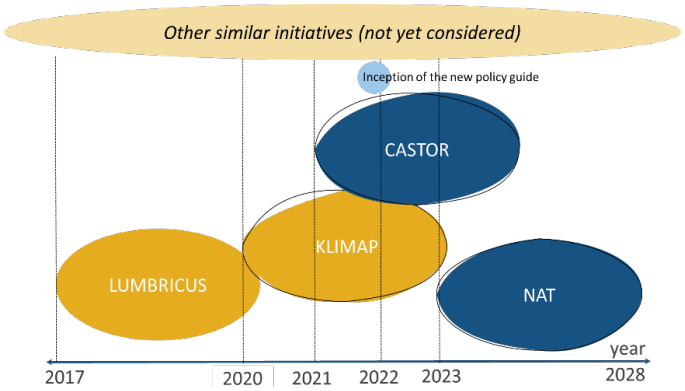

Figure 1. Projectscapes with living labs working on designing climate-resilient land and water systems

2. Network formation: Some of the experiments in KLIMAP were continued from Lumbricus. Thus, the project could strengthen the existing relationship with policy officers and locals while saving the resources required when starting from scratch. Further, relevant organizations such as different government organizations were involved in both projects, thus influencing the process in both directions. In addition, this network has resulted in newer projects such as CASTOR and NAT (***Errore. L'origine riferimento non è stata trovata.*** *1*) that aim to research the significance of living labs in policy landscape and employ them to design nature-based climate-robust approaches (*NAT*, 2023).

When the new policy guide was forwarded, Lumbricus had already ended for three years, and KLIMAP was running in its third year. However, the inception of this guide has its roots much earlier than these projects, to the 1990s in projects such as 'Room for Rivers' (Niesten & Frambach, 2023). The cumulative, reliable, replicable, relevant, and practical evidence from multiple projects with similar goals for decades that led to this new agenda-

setting. However, policies are influenced by factors other than evidence, such as the urgency of the issue, personal expertise, judgment, and values, and so on (Sutcliffe, 2005).

Living labs can play an informing or influencing role in different steps of the policy cycle, as shown in Figure 2.

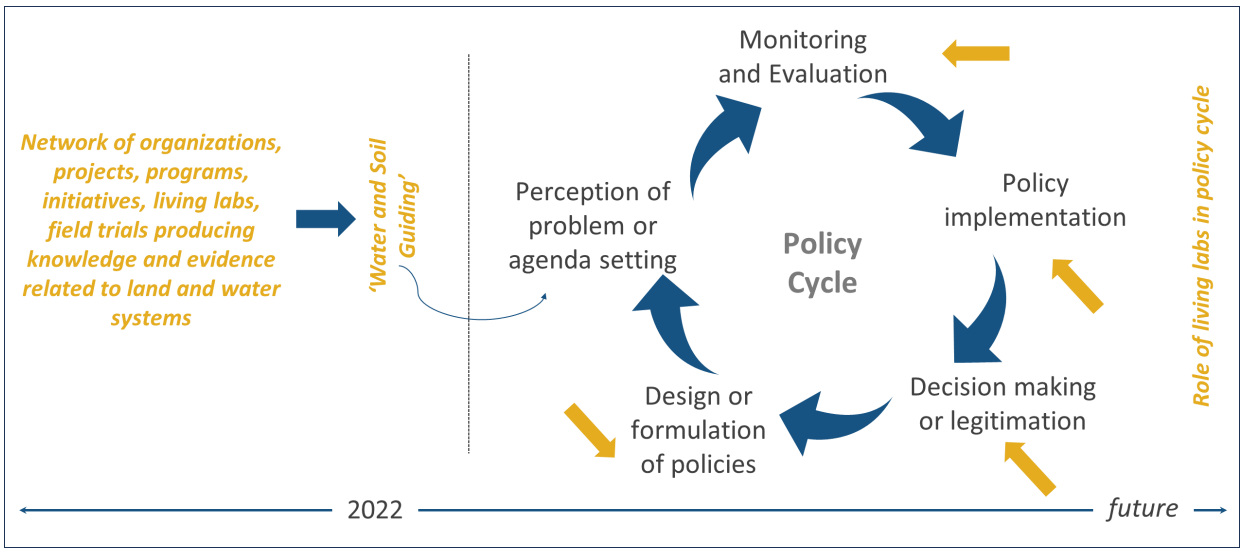

Figure 2. The left section shows past initiatives resulting in a new policy agenda in 2022; the right section shows a standard policy cycle with yellow arrows indicating the opportunities for living labs to influence and support different stages of policy cycle

Conclusion

Many living labs and similar approaches do not usually employ monitoring and evaluation approaches to identify their outcome and impact. This missing information on outcome and impact makes the task of identifying clear links between these approaches and policymaking daunting and often dubious. However, some hard evidence such as research output, and network formation can be indirectly but clearly linked to influencing the inception of the policy guide. The research, when completed, aims to collect all relevant connecting points. Further, this study only highlights potential opportunities for living labs to influence and support different stages of policy cycle. Upon completion, we aim to operationalize comprehensively in which role and under what capacities can living labs influence various stages of policymaking.

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