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# Investing in social learning processes to support science-engaged governance of strategic water source areas

**Significance:**

To address water challenges, several strategic water source areas (SWSAs) have been defined as important for water security in South Africa. The governance of SWSAs is faced with a series of interconnected tensions. The Living Catchments Project was implemented in four SWSAs, and provides an example of how social processes and learning projects can be funded, designed and implemented at different levels. At all of these levels, conceptualisation and evaluation of social learning processes are important for capturing the lessons learnt and advocating investment in community-engaged governance of SWSAs. Ongoing research is required for observing, examining and improving social learning processes in the governance of SWSAs.

**Introduction**

Strategic water source areas (SWSAs) are natural source areas for water that supply disproportionately large volumes of water per unit area and that are considered of strategic significance for water security from a national planning perspective.<sup>1</sup> It has been estimated that SWSAs in South Africa supply water for 60% of the population, more than 90% of urban water users, 67% of national economic activity, and 70% of irrigated agriculture.<sup>2,3</sup> This makes SWSAs crucial to the social, economic, and water security of South Africa. However, the governance of SWSAs is faced with a series of interconnected tensions which necessitate robust, long-term social processes and learning. At different levels of SWSA governance, social learning is key to nurturing the social capacities and capabilities needed to govern and collaborate amidst the complexities of SWSAs and their management.

**Social learning in Living Catchments**

Eaton et al.<sup>4</sup> state that social learning refers to information sharing and learning that enables actors within an expanding network to alter, or at least call into question, common knowledge on the issue or solution at hand, together with related stakeholders. Other researchers, such as Herero et al.<sup>5</sup> and Pahl-Wostl<sup>6</sup>, focus on the types of change (individual, action and systemic) at different levels of the system that result from social learning. The Living Catchments Project (LCP) aimed to foster effective catchment governance through the establishment of communities of practice (CoP) (drawing on Wenger's<sup>7</sup> interpretation of social learning) working together in different groups across and within the living catchments to strengthen catchment management practices. It also sought to develop insight into the role of social learning in research and innovation policy and implementation through the use of transformational social learning approaches. Wenger-Trayner et al.<sup>8</sup> defined a community of practice as:

*Groups of people who share a concern, a set of problems, a passion about a topic or practice, and who deepen their knowledge and expertise in that area by interacting on an ongoing basis. (p.4)*

CoPs are a helpful vehicle for facilitating social learning, through observing and supporting the deepening of enabling social processes, particularly nurturing relationship capital and relational agency to collectively develop shared practices. CoPs can bring together a wide range of individuals and foster continued connections and cooperation around common interests and practices. In the case of the LCP, water governance was the shared interest across the CoPs. In addition, the social learning focus of the LCP initiative aimed to provide safe places for collaboration, mutual learning, and cooperative problem-solving between researchers, communities, policymakers and implementers.<sup>1</sup>

The LCP was implemented between July 2019 and November 2023. The LCP provides an example of how social learning processes can be funded, designed and implemented. The LCP aimed to:

*... create more resilient, more resourced, and more relational communities at both catchment and national scales, that are able to draw from the best that the research has to offer in the process of governing the equitable, productive, and sustainable use of water resources and ecosystem services. <sup>1(p.4)</sup>*

The LCP was implemented in four catchments that are linked with SWSAs for surface water across South Africa, namely, the uMzimvubu (Eastern Cape Drakensberg SWSA), Berg-Breede (Boland SWSA), Olifants (Mpumalanga Drakensberg SWSA) and the uThukela (Northern Drakensberg SWSA).<sup>1</sup>

At its core, the LCP, with its emphasis on social learning processes, aimed to deepen the relationships, connection, and co-learning between the varied stakeholders involved in the governance of SWSAs, such that greater long-term capacity for governance and resilience could be unlocked and sustained. The LCP ultimately implemented CoPs, led by locally appointed facilitators and champions who convened learning platforms in their respective catchments. The catchment conveners were appointed as follows: Environmental and Rural Solutions in the uMzimvubu catchment, Living Lands in the Berg-Breede catchment, Institute of Natural Resources in the uThukela catchment, and Kruger to Canyons Biosphere Region in the Olifants catchment. The different catchment conveners connected through engaged and safe learning platforms, and they also gauged the need for establishment of new learning platforms. The social learning took place through the learning spaces which the respective local champions



convened (new or already existing); this included the Catchment Indabas which persist even after the LCP has ended.

The CoPs aimed to deepen the capacity of diverse research, policy, implementation, and community stakeholders to learn and work together towards more resilient water governance in their catchments. This CoP work was supported by a series of collaborative research processes that deepened understanding of the role of social learning in the LCP, and surfaced implementation tools and policy advice, while facilitating social learning processes in SWSAs. Careful attention was paid to creating spaces for learning, both within SWSAs and between different catchments, to strengthen implementation and policy relevance. Social learning was designed at three levels in the LCP programme.

### **Level 1: Social learning as a feature of Transformative Innovation Policy**

As a means to include people in the innovation process, the South African Department of Science and Innovation (DSI) developed the STI Decadal Plan (the Decadal Plan) which is geared towards shifting the South African National System of Innovation (NSI) towards having a more positive impact on the country's social and environmental priorities, in a manner that prioritises inclusive innovation, impact and investment in the NSI.<sup>9</sup> In support of its integrated goals, the Decadal Plan advises the importance of transdisciplinary social and research processes to analyse, quantify and develop a set of impact measures that can be utilised to recalibrate, refocus and scale up the contribution of innovation to socio-economic development.<sup>9</sup> A key theme emerging from the decadal plan is that science has to have social relevance, and if this is to be achieved it is going to be imperative to invest not just in multidisciplinary research projects, but also carefully designed social process programmes and collaborations that nurture the space for co-learning, collaboration, connecting and relationship building. The LCP was a national programme seeking to realise and contribute to the NSI.

Over the 4-year period, a potentially impactful story with certain key perspectives emerged from the LCP. This story includes evidence of (1) how the LCP facilitated stakeholder dialogue within and between SWSAs, (2) the formation of new partnerships in the implementation and research space, (3) the sharing of learnings and transfer of projects and pilots between catchments, (4) a closer understanding of how to co-create impactful research in these catchments, and (5) upskilling of youth and social learning facilitators, amongst others.<sup>1</sup> This level of social learning confirmed that the inclusion of society is imperative in fostering innovation and developing solutions that are underpinned by sustainability principles at the core. Science, technology and innovation (STI) are essential for solving societal issues and fostering a competitive, sustainable economy; however, as technology becomes more and more integrated into society and the economy, people should not be left behind<sup>9</sup> – people's learning in catchments at all levels is crucial for science and governance innovations in Living Catchments<sup>1</sup>.

To evaluate and better understand this social learning at the level of innovation policy, the LCP team developed a draft theory of change for the evaluation<sup>1</sup>, based in part on the Transformative Innovation Policy Consortium (TIPC) conceptual approach to transformative change, which includes a focus on transitioning systems<sup>10</sup>, transdisciplinary co-engagement<sup>11</sup> and advancing social learning<sup>1</sup>. South Africa is a partner in the TIPC worldwide initiative through the DSI.<sup>1</sup> The TIPC is a 5-year programme with the goal of exploring possible transformation of innovation policy from a direct technological research, design and implement focus, to a focus that is more co-engaged and transdisciplinary, and that makes environmental and social concerns a focus.<sup>1</sup> The LCP, which is the first transformative innovation policy experiment in South Africa, is a component of a portfolio of experiments to trigger innovation for transformative change in the water sector.<sup>12</sup>

### **Level 2: Planning for and supporting social learning in the LCP**

In working with the transformative innovation policy framework, the LCP project team adopted a lens for the observance of transformative changes in governance, interactions, relationships, connections, etc.

in and across the LCP catchments and five CoPs. The transformative innovation policy framework offered 12 types of transformative outcomes<sup>13</sup>, with the outcomes identifiable in individuals, groups, and organisations involved in transformative innovation policy programmes such as the LCP. These helped to guide evaluation of social learning across the LCP.<sup>13,14</sup> The LCP evaluation design enabled the LCP team to observe changes in water governance, organisational connections and collaborations at catchment and national levels around SWSAs. Transformative outcomes were defined, with transformative outcomes 1–3 focusing on the social learning intentions of cluster 1 of the Living Catchments project activities<sup>1(p.5)</sup>:

- *Catchment-based social spaces foster agency, trust, connection, convening, collaboration, co-creation, co-learning, and agenda setting between scientists, policymakers, implementers and local stakeholders working in SWSAs at the nexus of built and ecological infrastructure.*
- *Co-learning occurs within and between different SWSAs at the nexus of built and ecological infrastructure.*
- *Social spaces fostering collaboration and co-learning are sustainable and locally institutionalised.*

Transformative outcome 4 associated with the work of cluster 2 of the Living Catchments Project also emphasised social learning<sup>1(p.6)</sup>:

*The science of transformative social learning facilitation is visible and valued by key institutions and individuals working at the nexus of water and ecosystems.*

And transformative outcome 5 associated with the work of cluster 3 of the Living Catchments Project emphasised social learning as follows<sup>1(p.7)</sup>:

*Policy and associated advice (operating at the nexus of water and ecosystems) is articulated and mainstreamed in a way that is responsive to current needs, co-owned by key stakeholders and implementable.*

This work – in setting the outcomes of the programme with a focus on transformative innovation policy intentions – allowed for a means to evaluate and proactively support social learning endeavours. Evaluation of the social learning and the framing of outcomes that focus explicitly on social learning, enabled and strengthened the desire to invest in transformative social learning and to pursue alternative paths to traditional accepted norms of catchment management.<sup>1</sup> In other words, this allowed for an explicit focus on social learning, which was a policy innovation, as few other policy interventions provided such an explicit focus on social learning.<sup>1</sup> The major lessons which emerged from this focus in the LCP at broad programme level are:

- It is important to carefully map the social structures that are present on the ground in catchments, and then build from there.
- The facilitation of CoPs in and across catchments requires time and investment of resources (a budget is required).
- It is imperative to identify the right local champions (local conveners) to help lead CoPs within and across catchments.

This level of focus on social learning also identified that there is a need for ongoing research into how to observe and examine social learning, and how to improve the practices of social learning.<sup>1</sup> It was noted that a focus on the processes of social learning needs to be built into the design of social learning implementation projects<sup>1</sup>; this is addressed in the next section.

### **Level 3: Niche level advancement of social learning**

Niche-level studies<sup>15</sup> were supported by the LCP via support of postgraduate research into the processes of understanding and advancing social learning amongst catchment stakeholders. These niche-level studies offer understanding of how transformative social learning supports boundary-crossing learning exchanges among diverse stakeholders in a community of practice, and can evaluate the



efficacy of social learning and transformation at ground level. One such study was undertaken in one of the Living Catchments, the uMzimvubu catchment, which is located in the former Transkei homeland and which is impacted by the contemporary difficulties of poverty and environmental deterioration. The catchment serves almost 2 million people, the majority of whom live in rural and peri-urban areas. As a result, there is an urgent need for water improvements that meet the increasing water demand (e.g. residential usage, agricultural) in order to improve the quality of life for those living in this landscape.<sup>16</sup>

A niche-level study was undertaken<sup>17</sup> to explore the importance of expansive learning as a method of social learning. Using this method from the learning sciences helped to make in-depth processes of transformative learning facilitation visible, showing *how* such facilitation can foster collaboration between different stakeholders in communities of practice to work towards the shared object of co-managing water resources. One of the tools to facilitate expansive learning (which is different from day-to-day learning in communities of practice) is the change laboratory method.<sup>18</sup> This method allows for explicit and concrete facilitation of learning by formative interventionist researchers<sup>19</sup> in ways that can assist the learning actors in the CoP to identify contradictions in their practices, to develop shared model solutions, and to express their collective agency.

An outcome of this research was that the research participants developed two outputs: a tool to monitor water issues in their communities and a management approach/strategy to assist in wattle management, which is a dire environmental challenge in SWSAs. It was recommended that the LCP should take up these process facilitation tools for working with multiple stakeholders who often share an interest in co-management but do not have the opportunities to co-engage and solve shared problems together. These methods can be developed further because they can be contextualised. Both solutions which emanated from the communities are important for the LCP endeavours and also for the greater TIPC work because they show that the live experiment, in this case at the niche level, yields benefits for collaborative management of the living catchments. Importantly, the methodological approach and tools emerging from the niche-level study are rooted in empathy and listening. These are two foundational processes necessary for embarking on transformative and transdisciplinary research in local contexts where diversity of context and issue predominate. These are not merely 'soft skills'; they are highly sophisticated skills, as they allow individuals or communities involved in interventions to voice their needs or desires.

Expansive learning is a form of social learning that gives more attention to a culturally and historically grounded expansive learning process with the potential to strengthen collaboration and transformative agency<sup>20</sup>, especially regarding the inclusion of marginalised voices<sup>17</sup>. This gives meaning to realising the policy intentions and the LCP aspirations of contributing to transformative innovation policy via the TIPC. As noted above, an integral component of the DSI Decadal Plan for Science and Innovation involves investing in transformative social learning and innovation. Using expansive learning to bring together different stakeholders involved in managing water resources in the uMzimvubu catchment was an expression of investment in innovation which surfaced the voices of those most marginalised in catchment management policy and practice.

## Conclusion

In this Commentary, we have offered insight into the importance of investing in social learning in South Africa's SWSAs, and we have shared experience of some of the key considerations of how to design and where to focus when implementing social learning projects. We have contextualised this within the wider policy arena that seeks to advance collaborative catchment management as a process of innovation in the South African water security policy landscape. This Commentary has opened a vantage point on different types and levels of social learning within this multi-levelled process, with each offering a different way of framing social learning, with implications for system and niche-level innovations and inclusion in the transition to more inclusive water management in South Africa. Although we did not focus on the

challenges of the social learning approach, it is necessary to highlight that such approaches are not without challenges. For example, social learning requires time; it also requires careful facilitation and continuous support. This needs to be carefully planned for inclusion in institutional budgets as an explicit form of work. The work also brings to the fore the potential research questions that can inform the future work of the LCP. These include questions such as: (1) How can social learning enable bridging the gap between conventional science and traditional ecological knowledge at local levels? (2) How can social learning help to surface both insight into and practices of enabling the participation of local and other levels of stakeholders in decision-making processes? And (3) how can social learning facilitate co-management of living catchments involving all stakeholders in changing landscapes?

## Declarations

We have no competing interests to declare. We have no AI or LLM use to declare. All authors read and approved the final version.

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